

**2015**

# **Comprehensive Annual Financial Report**

With Independent Auditors' Report for Fiscal Years Ended  
December 31, 2015 and 2014

Commonwealth of Pennsylvania  
State Employees' Retirement System

A Component Unit of the Commonwealth of Pennsylvania



2015

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With Independent Auditors' Report for Fiscal Years Ended  
December 31, 2015 and 2014

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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State Employees' Retirement System**

For its Comprehensive Annual  
Financial Report  
for the Fiscal Year Ended

**December 31, 2014**

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

Executive Director/CEO



Public Pension Coordinating Council

***Public Pension Standards Award  
For Funding and Administration  
2015***

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 cursive script that reads "Alan H. Winkle".

Alan H. Winkle  
Program Administrator

June 1, 2016

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

Dear Chairman Fillman,

Each year, the Pennsylvania State Employees' Retirement System (SERS) produces a Comprehensive Annual Financial Report (CAFR) to provide the governor, legislature, system members and annuitants, as well the general public with a clear accounting of its operations and financial position. We are pleased to present the 2015 edition for the calendar year ending December 31, 2015, and hope you will find this financial, investment, actuarial, and statistical material to be both interesting and useful.

The CAFR remains the cornerstone of our commitment to ensure delivery of accurate, meaningful information to policymakers and SERS members, as well as to provide context for our independently audited financial statements, which are required to be published on or before July 1 of each year.

KPMG has conducted an independent audit of SERS 2015 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 2015.

As of December 31, 2015, SERS had approximately \$26.1 billion after paying out \$3.1 billion in retirement benefits to nearly 125,000 retirees and beneficiaries; \$2.8 billion – more than 90% – was paid to people living in Pennsylvania, stimulating local economies.

In 2015, SERS served 104 agencies/employers, as well as over 235,000 total members. As such, our benefit payroll obligations, continue to steadily grow, from about \$1 billion just two decades ago to our current payroll. Last year, SERS welcomed nearly 6,700 new retirees whose average annual benefit was about \$26,100. More than 4,000 retirees, who had average annual benefits of about \$14,600, were removed from the rolls.

Continued volatility in the global markets impacted investment returns, yet SERS was able to earn nearly \$88 million through investment earnings net of all fees and expenses. While the system's 0.4% return fell short of the 7.5% assumed long-term rate of return, 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 13 of them.

Based on the actuarial methods used for financial reporting purposes as of December 31, 2015, the resulting net pension liability was \$18.2 billion. SERS plan fiduciary net position as a percentage of the total pension liability was approximately 58.9%. Based on the actuarial methods used for funding purposes

as of December 31, 2015, the unfunded actuarial accrued liability was \$19.5 billion. SERS funded ratio was 58.0%. 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.

Within the next two budget cycles, we anticipate that Act 2010-120 collars will no longer apply to employer contributions, which is expected to further improve the health of the SERS Fund. Additionally, employer contributions are expected to decline from that point forward.

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 \$69 million. In an effort 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 member’s money. In addition, we continue to enhance our member materials, making the information contained within more understandable and accessible to a range of employees. This year alone, we redesigned two major publications and several fact sheets that will help members understand their options and make informed decisions. It should also be noted that SERS is in the midst of a 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.

SERS continues to carefully manage the funds entrusted to the Board, and SERS’ members can be assured that their retirement system is well managed.

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 are essential.


Nearly 200 SERS employees’ daily work enables our organization to 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. In addition to assisting with annual independent audits and preparation of this CAFR, these are the same professionals whose work last year, again, earned SERS the Public Pension Coordinating Council Standards Award for our “high level of plan design, funding, member communications and administrative practices” as well as a Certificate of Achievement of Excellence in Financial Reporting from the Government Finance Officers Association of the United States and Canada.

Our professionals are 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, 2015

**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, 2015

**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 M. Joseph Rocks**  
Retired Member and Former State Senator



# INTRODUCTORY SECTION

## SERS Mission, Vision, and Organizational Chart

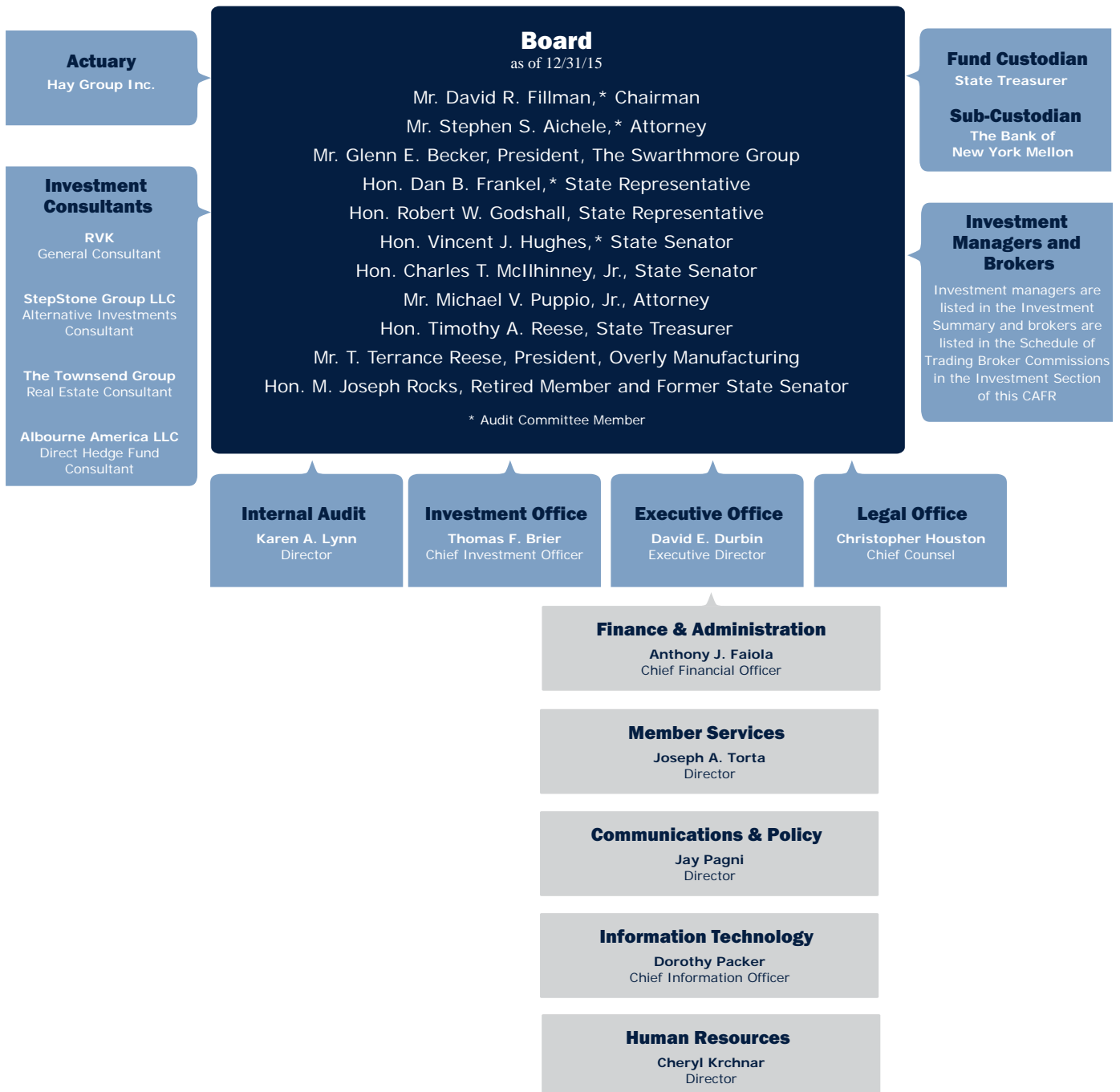
### Mission

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

### Vision

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

### Organizational Chart



**2015**

**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, 2015 and 2014, 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, 2015 and 2014, 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,  
the U.S. member firm of KPMG International Cooperative  
("KPMG International"), a Swiss entity.



## ***Other Matters***

### *Required Supplementary Information*

U.S. generally accepted accounting principles require that the management's discussion and analysis on pages 3–11 and the required supplementary information in schedules 1 through 3 on pages 31–32 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 33–34, 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. Such information has been subjected to the auditing procedures applied in the audit of the basic financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the basic financial statements or to the financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the supplementary information in schedules 4 and 5 is fairly stated in all material respects in relation to the basic financial statements as a whole.

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

**KPMG LLP**

Harrisburg, Pennsylvania  
May 20, 2016



## Management's Discussion and Analysis

December 31, 2015 and 2014 (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 which affected the operations and performance of SERS during the years ended December 31, 2015, 2014, and 2013.

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 Financial Statements and Accompanying Information

- (1) **Fund Financial Statements.** SERS presents Statements of Fiduciary Net Position as of December 31, 2015 and 2014 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 Financial Statements.** The notes to financial statements are an integral part of the statements. SERS encourages readers to review them because the additional detail will provide a better 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.

### Significant Financial Reporting Change

The Governmental Accounting Standards Board (GASB) issued GASB Statement No. 67, *Financial Reporting for Pension Plans – an amendment of GASB Statement No. 25* (GASB 67), the provisions of which were reflected in the financial statements for the year ended December 31, 2014. This statement replaced the requirements of Statements No. 25 and No. 50 related to pension plans that are administered through trusts or equivalent arrangements like SERS. Since the requirements for GASB 67 were effective for financial statements for fiscal years beginning after June 15, 2013, the first year that GASB 67 was applicable to SERS was 2014. The adoption of GASB 67 did not impact the fiduciary net position of SERS, however certain changes to note disclosures and RSI have been incorporated to comply with this new statement. The financial statements are now titled: statement of fiduciary net position and statement of changes in fiduciary net position. Key changes in the notes to the financial statements include: SERS asset allocation, long-term expected real rates of return, net pension liability/asset, assumptions used in financial

# FINANCIAL SECTION

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## Management's Discussion and Analysis

December 31, 2015 and 2014 (unaudited)

reporting actuarial valuation, and money-weighted rate of return. Additionally, the new schedules reported in the RSI include: schedule of changes in net pension liability and related ratios, schedule of employer contributions, and schedule of investment returns. On the schedule of investment returns, SERS discloses a money-weighted rate of return that expresses investment performance, net of investment expense, adjusted for the changing amounts actually invested, which is similar to an internal rate of return.

### 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 decreased approximately \$1.3 billion for the year ended December 31, 2015 compared to a decrease of approximately \$56 million for the year ended December 31, 2014, as reflected in the table on page 11. SERS earned returns of 0.4%, 6.4%, and 13.6% in 2015, 2014, and 2013, respectively.

### Member Contributions

Member contributions were approximately \$372 million for the year ended December 31, 2015, \$366 million for the year ended December 31, 2014, and \$352 million for the year ended 2013. There was a slight increase in gross salaries, which were nearly \$6.0 billion for 2015 and \$5.7 billion for 2014. This was the result of across the board salary increases and an increase of 594 in active membership as of year end. 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 \$1.4 billion, \$1.1 billion, and \$795 million for the years ended December 31, 2015, 2014, and 2013, respectively. The 2015 contributions represented an increase of \$276 million – or 25.5% – compared to 2014. The growth was due to an increase in the employer rate to 25.0% from 20.5% on July 1, 2015, (excluding the Benefits Completions Plan (BCP) as described in note 3 to the financial statements). The \$289 million – or 36.4% – growth in 2014 from 2013 was due to an increase in the employer rate to 20.5% from 16.0% on July 1, 2014.

Since 2005, employer contribution rates were statutorily suppressed per Pennsylvania law, primarily by the passage of Act 2003-40 and Act 2010-120. Act 2010-120 limited the rate at which employer contributions to SERS can increase in any given year, including a maximum of 3.5% for FY 12/13 and 4.5% each year thereafter until no longer needed. According to this schedule, employer contributions are set to rise 4.5% next year and are expected to peak at 31.7% for FY 17/18. Consequently as a result of the high employer contribution rate, SERS has been providing data and technical assistance to Pennsylvania policy makers as they explore possible changes to the State Employees' Retirement Code (SERC).

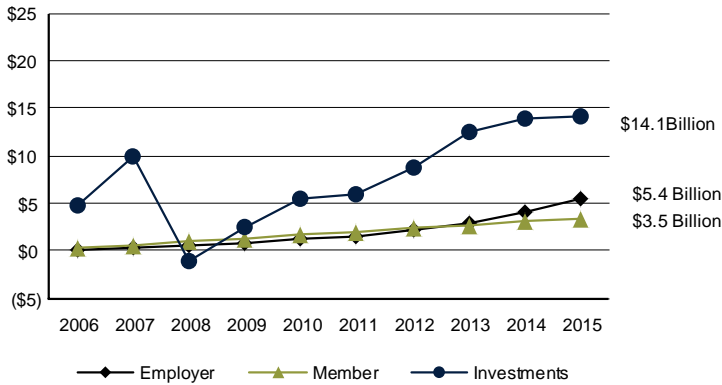
From 2006 through 2015, employer contributions totaled \$5.4 billion – or 24% – of total additions to fiduciary net position, compared to \$3.5 billion – or 15% – of total additions attributed to member contributions, and \$14.1 billion – or 61% – of total additions attributed to investment earnings as illustrated in the following charts.

## Management's Discussion and Analysis

December 31, 2015 and 2014 (unaudited)

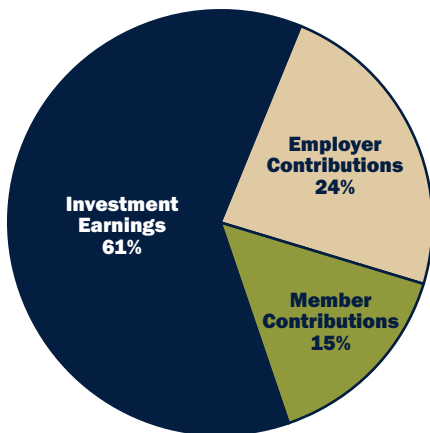
### 10-Year Cumulative Additions to Fiduciary Net Position

(\$ billions)



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

(10-Year History)



Suppressed employer contributions provide budgetary relief to commonwealth agencies and the taxpayers of Pennsylvania. However, the short-term benefits resulting from artificially suppressed rates 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 investment returns, net of expenses, were 0.4%, 6.4%, and 13.6% for the years 2015, 2014, and

2013, respectively. Positive investment performance contributed approximately \$88 million, \$1.5 billion, and \$3.7 billion to net investment income for the years 2015, 2014, and 2013, respectively. Strong performance in the Alternative Investments asset class helped the overall SERS Fund performance for 2015. For the most recent three years, the total annual returns and returns by asset class are disclosed in the following table.

### Annual Rates of Return

Asset Class	2015	2014	2013
Alternative Investments	7.8%	13.1%	12.8%
Global Public Equity	-1.8	3.3	26.3
Real Assets	-2.2	6.3	8.0
Diversifying Assets	0.1	6.7	11.2
Fixed Income	-0.7	6.1	-2.2
Liquidity Reserve	0.7	0.5	0.3
<b>Total SERS Fund</b>	<b>0.4%</b>	<b>6.4%</b>	<b>13.6%</b>

Biennially, SERS reviews and modifies its strategic investment plan, as necessary. The ultimate objective of SERS 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 plan emphasized liquidity, reduction of cash flow volatility, and pursuit of capital protection strategies to ensure that SERS assets are best positioned to meet the SERS Fund's continuing obligations to its beneficiaries.

All of 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.



# FINANCIAL SECTION

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## Management's Discussion and Analysis

December 31, 2015 and 2014 (unaudited)

The majority of the fees that SERS pays is to Alternative Investments and Real Assets managers due to the complex and time consuming nature of these investments.

Investment expenses, which include fees paid to managers, were \$167 million and \$187 million for the years ended December 31, 2015 and 2014, respectively. This \$20 million decrease is primarily due to SERS focus on negotiating lower fees for top performing managers and the fact that SERS is not paying performance fees at the same rate as in prior years.

### Benefits, Refunds, and Expenses

Benefit payments to annuitants are the most significant recurring deductions from fiduciary net position. During 2015 and 2014, SERS paid out approximately \$3.1 billion and \$2.9 billion in benefits and refunds.

There were approximately 6,700 new retirees added to the annuity payroll in 2015 with an average annual benefit of \$26,100. This was an increase from the approximately 6,200 new retirees added to the annuity payroll in 2014 with an average annual benefit of \$25,200. As is typical in mature retirement plans, new retirees in 2015 received a much higher annual benefit than those removed from rolls.

There were more than 4,300 and 4,000 retirees removed from the rolls with an average annual benefit of \$14,600 and \$14,700 in 2015 and 2014, respectively. The benefits expense on the financial statement consists of two primary components: monthly annuity payments and supplemental payments. Most of the supplemental payments are paid to retiring members who choose to withdraw their contributions and interest at retirement.

Supplemental payments were \$462 million and \$430 million for 2015 and 2014, respectively. Such withdrawals reduce retirees' payments over their remaining life for most members who joined SERS before January 1, 2011.

The prohibition of lump sum withdrawals upon retirement on new classes of employees (A-3 and A-4) was one provision of Act 2010-120. 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 60% higher than the number of retirees removed from the rolls. Additionally, despite the benefit reductions, new retirees' monthly annuities are projected to be approximately 80% 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.

## Management's Discussion and Analysis

December 31, 2015 and 2014 (unaudited)

### Growth in Annuity Payroll

	December		
	2015	2014	2013
Monthly annuity payroll (\$ millions)	\$222	\$213	\$205
Retirees	124,689	122,249	120,052

SERS administrative expenses represented 0.1% of fiduciary net position in 2015 and 2014. All expenses were within budget.

### SERS Assets

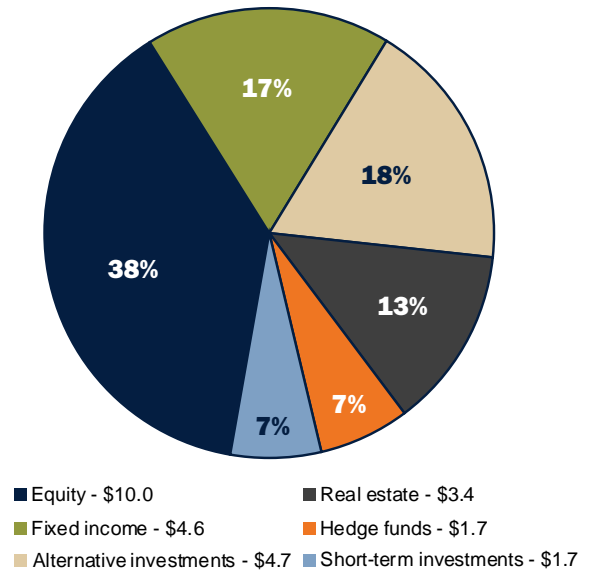
Investments are the most significant component of SERS assets. The fair value of investments decreased to \$26.1 billion in 2015 from \$27.4 billion in 2014. The decrease is related to the fact that benefit payments exceeded contributions and net investment income for the year. SERS reports assets at fair value as discussed in accounting policies note 2(c) to the financial statements. Fair value is the value SERS expects to receive in a current sale between a willing buyer and a willing seller that are equally motivated; that is, not a forced or liquidation sale.

The total investment portfolio fair value was \$26.1 billion for 2015 as compared to \$27.4 billion for 2014. Equity values increased to \$10.0 billion in 2015, from \$9.9 billion in 2014. Fixed income values decreased to \$4.6 billion in 2015, from \$4.7 billion in 2014. Alternative investments values decreased to \$4.7 billion in 2015, from \$5.5 billion in 2014. Most of the decrease in alternative investments was due to distributions exceeding contributions. Real estate values decreased to \$3.4 billion in 2015, from \$4.0 billion in 2014. The decrease in real estate values was mostly attributable to distributions exceeding contributions and less favorable market returns in the commodities and infrastructure sub-asset class. Hedge funds values remained unchanged at \$1.7 billion in 2015 and 2014, respectively. Short-term investments values increased to \$1.7 billion in

2015, from \$1.6 billion in 2014. The total investment portfolio fair value of \$26.1 billion for 2015 was comprised as shown by the chart below:

### Investments at Fair Value (2015)

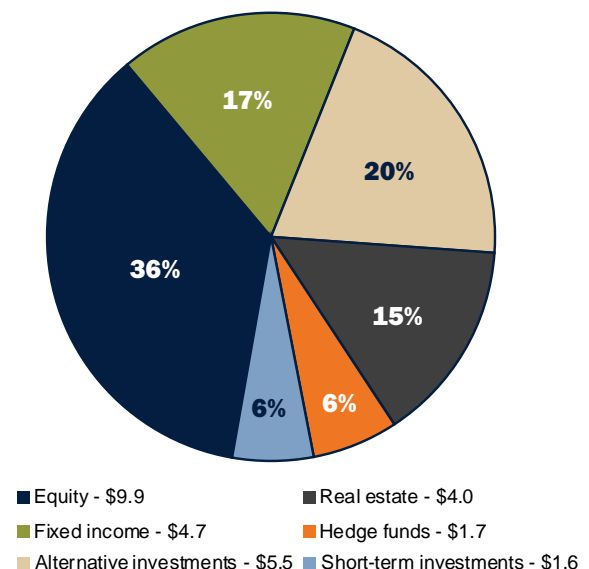
(\$ billions)



The total investment portfolio fair value of \$27.4 billion for 2014 was comprised as shown by the chart below:

### Investments at Fair Value (2014)

(\$ billions)



# FINANCIAL SECTION

## Management's Discussion and Analysis

December 31, 2015 and 2014 (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 \$49 million over the last 10 years. However, since 2008 due to the increased risk associated with the market uncertainty, SERS securities lending program was scaled back in both the number of securities on loan and the market value of those securities for which cash collateral was provided. The pool's guidelines provide for investment of cash collateral in highly-liquid, highly-rated securities.

As of December 31, 2015 and 2014, the fair value of loaned securities was \$628 million and \$460 million, respectively. The fair value of the associated collateral was \$652 million and \$479 million, of which \$371 million and \$362 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 2014-2015 Strategic Investment Plan continues using 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, 2015, the SERS Fund held approximately \$1.7 billion in Liquidity Reserve.

### 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 method) compared to those used for funding purposes (funding method). Key differences are shown in the following table:

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

## Management's Discussion and Analysis

December 31, 2015 and 2014 (unaudited)

Key valuation results for the accounting method compared to the funding method for the years ended December 31, 2015 and 2014 are as shown in the following tables:

### As of December 31, 2015

(\$ millions)

GASB 67 - Accounting Method		Funding Method	
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 Actuarial Accrued Liability (UAAL)</b>	<b>\$19,452</b>
Ratio - Fiduciary Net Position/TPL	58.9%	Funded Ratio	58.0%

### As of December 31, 2014

(\$ millions)

GASB 67 - Accounting Method		Funding Method	
Total Pension Liability (TPL)	\$42,195	Actuarial Accrued Liability (AAL)	\$44,751
Fiduciary Net Position	27,338	Actuarial Value of Assets	26,585
<b>Net Pension Liability (NPL)</b>	<b>\$14,857</b>	<b>Unfunded Actuarial Accrued Liability (UAAL)</b>	<b>\$18,166</b>
Ratio - Fiduciary Net Position/TPL	64.8%	Funded Ratio	59.4%

Under the accounting method, the net pension liability increased to \$18.2 billion in 2015 from \$14.9 billion in 2014. The increase was mostly from a \$2.0 billion growth in the total pension liability due to benefits earned and the adoption of assumption changes from the *18th Investigation of Actuarial Experience* study (as discussed below). The effect of the total pension liability increase was compounded by a \$1.3 billion decrease in the fiduciary net position. The decrease in fiduciary net position was mainly the result of benefit payments exceeding contributions and investment income. Employer contributions were collared under Act 2010-120 and investment income fell short of the actuarial assumed rate of return.

Under the funding method, the unfunded actuarial accrued liability increased to \$19.5 billion in 2015 from \$18.2 billion in 2014 due mostly to the same factors as discussed above.

The unfunded actuarial accrued liability under the funding method was \$1.3 billion and \$3.3 billion higher than the net pension liability under the

accounting method in 2015 and 2014, respectively. The more favorable result under the accounting method 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 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 method.

Additionally, every five years, SERS is required to conduct an actuarial experience study to determine whether the assumptions used in its annual actuarial valuations remain accurate based on current and anticipated demographic trends and economic conditions. The *18th Investigation of Actuarial Experience* study for the period 2011 – 2015 was

# FINANCIAL SECTION

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## Management's Discussion and Analysis

December 31, 2015 and 2014 (unaudited)

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.

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. 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.

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 highlighted 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.

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).

### **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, 2015 and 2014 (unaudited)

### Condensed Financial Information

(\$ millions)

#### Fiduciary Net Position

<b>Assets</b>	<b>2015</b>	<b>Increase (Decrease)</b>	<b>2014</b>	<b>Increase (Decrease)</b>	<b>2013</b>
Total receivables	\$271	\$52	\$219	\$2	\$217
Total investments	26,129	(1,315)	27,444	(233)	27,677
Securities lending collateral pool	371	9	362	150	212
<b>Total assets</b>	<b>26,771</b>	<b>(1,254)</b>	<b>28,025</b>	<b>(81)</b>	<b>28,106</b>
<b>Liabilities</b>					
Accounts payable and accrued expenses	52	(4)	56	1	55
Securities lending collateral pool payable	-	-	-	(7)	7
Investment purchases and other liabilities	293	24	269	(169)	438
Obligations under securities lending	371	9	362	150	212
<b>Total liabilities</b>	<b>716</b>	<b>29</b>	<b>687</b>	<b>(25)</b>	<b>712</b>
<b>Net position restricted for pensions</b>	<b>\$26,055</b>	<b>\$(1,283)</b>	<b>\$27,338</b>	<b>\$(56)</b>	<b>\$27,394</b>

#### Changes in Fiduciary Net Position

<b>Additions</b>	<b>2015</b>	<b>Increase (Decrease)</b>	<b>2014</b>	<b>Increase (Decrease)</b>	<b>2013</b>
Member contributions	\$372	\$6	\$366	\$14	\$352
Employer contributions	1,360	276	1,084	289	795
Net investment income	88	(1,374)	1,462	(2,262)	3,724
<b>Total additions</b>	<b>1,820</b>	<b>(1,092)</b>	<b>2,912</b>	<b>(1,959)</b>	<b>4,871</b>
<b>Deductions</b>					
Benefits and refunds	3,081	135	2,946	102	2,844
Administrative expenses	22	-	22	-	22
<b>Total deductions</b>	<b>3,103</b>	<b>135</b>	<b>2,968</b>	<b>102</b>	<b>2,866</b>
<b>Increase/(decrease) in net position restricted for pensions</b>	<b>\$(1,283)</b>	<b>\$(1,227)</b>	<b>\$(56)</b>	<b>\$(2,061)</b>	<b>\$2,005</b>

# FINANCIAL SECTION

## Statements of Fiduciary Net Position

### Statements of Fiduciary Net Position

December 31, 2015 and 2014  
(\$ thousands)

	2015	2014
<b>Assets</b>		
Receivables		
Plan members	\$3,136	\$1,311
Employers	103,415	75,571
Investment income	61,664	57,805
Investment proceeds and other receivables	98,239	79,732
Miscellaneous	4,717	4,432
Total receivables	271,171	218,851
Investments		
Short-term investments	1,711,654	1,648,976
United States government securities	2,531,112	2,474,798
Corporate and foreign bonds and notes	2,058,179	2,135,744
Common and preferred stocks	9,984,352	9,946,332
Hedge funds	1,673,295	1,720,740
Real estate	3,419,045	3,972,621
Alternative investments	4,751,827	5,544,714
Total investments	26,129,464	27,443,925
Securities lending collateral pool	370,517	362,217
Total assets	26,771,152	28,024,993
<b>Liabilities</b>		
Account payable and accrued expenses	51,995	56,313
Investment purchases and other liabilities	293,750	268,685
Obligations under securities lending	370,517	362,217
Total liabilities	716,262	687,215
<b>Net position restricted for pensions</b>	<b>\$26,054,890</b>	<b>\$27,337,778</b>

See accompanying notes to financial statements.



## Statements of Changes in Fiduciary Net Position

### Statements of Changes in Fiduciary Net Position

Years Ended December 31, 2015 and 2014

(\$ thousands)

	2015	2014
<b>Additions</b>		
Contributions		
Plan members	\$371,624	\$365,923
Employers	1,360,431	1,084,104
Total contributions	1,732,055	1,450,027
Investment income		
From investing activities		
Net (depreciation)/appreciation in fair value of investments	(216,817)	1,155,301
Interest	130,616	142,434
Dividends	223,927	246,528
Real estate income	108,844	93,167
Miscellaneous income	3,426	1,799
Total investing activities income	249,996	1,639,229
Investment expenses	(166,610)	(186,527)
Net income from investing activities	83,386	1,452,702
From securities lending activities		
Securities lending income	5,105	9,917
Securities lending expenses	(501)	(568)
Net income from securities lending activities	4,604	9,349
Net investment income	87,990	1,462,051
Total additions	1,820,045	2,912,078
<b>Deductions</b>		
Benefits	3,069,328	2,936,591
Refund of contributions	11,533	9,874
Administrative expenses	22,072	21,991
Total deductions	3,102,933	2,968,456
Net decrease	(1,282,888)	(56,378)
Net position restricted for pensions		
Balance, beginning of year	27,337,778	27,394,156
<b>Balance, end of year</b>	<b>\$26,054,890</b>	<b>\$27,337,778</b>

See accompanying notes to financial statements.



# FINANCIAL SECTION

## Notes to Financial Statements

December 31, 2015 and 2014

### (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 39 employers and the commonwealth is classified as its largest employer. The commonwealth is comprised of 66 agencies and when everything is evaluated separately, SERS has a total of 104 participating employers/agencies.

At December 31, 2015 and 2014, SERS membership consisted of the following:

#### SERS Membership

	2015	2014
Inactive plan members or beneficiaries currently receiving benefits	124,689	122,249
Inactive plan members entitled to but not yet receiving benefits	6,918	7,054
Active plan members	105,025	104,431
<b>Total members</b>	<b>236,632</b>	<b>233,734</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, 2015, the statutorily required composite contribution rate as collared by Act 2010-120 including the Benefits Completion Plan

# FINANCIAL SECTION

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## Notes to Financial Statements

December 31, 2015 and 2014

(BCP) was 25.01% while the actuarially determined rate would have been 31.52%. At December 31, 2014, the statutorily required composite contribution rate as collared by Act 2010-120 including the BCP was 20.53% while the actuarially determined rate would have been 31.44%.

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 of December 31, reflect a blended average of calculated rates. As of December 31, 2015 and 2014, the blended contribution rates, which include the BCP, were 22.77% and 18.29%, 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 amount that the plan can reasonably expect to receive for an investment in a current sale between a willing buyer and a willing seller – that is, other than in a forced or liquidation sale. U.S. government securities, corporate and foreign bonds and notes, 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. Securities that are not traded on a national security exchange are valued by the asset manager, valued by third parties based on similar sales, or valued by valuation committees. Such prices are affected by liquidity, current events, the size of lots being traded, and other factors.

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.

Foreign exchange, futures, and swap contracts are marked to market daily with changes in fair value recognized as part of investments and investment income. Commingled funds are generally valued using the net asset value of the fund. SERS reports a limited number of commingled funds in their respective asset classes.

Real estate is valued by the investment manager using discounted cash flows, recent comparable sales, and current market conditions to arrive at net asset value. Net asset value approximates fair value. Real estate funds estimated fair values are updated by routine independent appraisals 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.

Alternative investment and real estate limited partnerships are valued at net asset value, which are determined by the general partners using processes that have been reviewed and approved by valuation committees. The partnerships' investments, as well as the assumptions and estimates used in developing the net asset values, approximate fair value. Because the investments in such partnerships are generally illiquid and holding periods may last for several years, the value realized by SERS upon disposition may differ materially from estimated values reflected in the financial statements.

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, 2015 and 2014, SERS had contractual commitments totaling approximately \$1.8 billion and \$1.6 billion, respectively, to fund future alternative investments 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.

### **(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

# FINANCIAL SECTION

## Notes to Financial Statements

December 31, 2015 and 2014

employees. Member balances are transferred to the Annuity Reserve Accounts as members retire.

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

The **Directed Commissions Reserve Account** accumulates the income from 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, 2015 and 2014, SERS earned approximately \$136 thousand and \$98 thousand of income resulting from a commission recapture program, respectively. As of December 31, 2015 and 2014, SERS used the program to pay approximately \$308 thousand and \$397 thousand of administrative expenses, respectively. At December 31, 2015 and 2014, SERS had accumulated commission reserves of \$3.6 million and \$3.8 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 26 and 24 individuals receiving benefits from the BCP at December 31, 2015 and 2014, respectively.

Account balances at December 31, 2015 and 2014 are as follows:

### Account Balances

(\$ thousands)

	2015	2014
Member savings account	\$4,816,121	\$4,733,833
State accumulation account	(3,925,580)	(1,277,415)
Directed commissions reserve account	3,661	3,833
Annuity reserve accounts		
Annuitants and beneficiaries	22,800,203	21,648,580
State police	2,310,957	2,179,406
Enforcement officers	44,965	44,672
Benefits completion plan reserve account	4,563	4,869
<b>Total</b>	<b>\$26,054,890</b>	<b>\$27,337,778</b>



## Notes to Financial Statements

December 31, 2015 and 2014

### (4) Investments

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

For the years ended December 31, 2015 and 2014, the money-weighted rate of return for SERS, net of investment expense, was 0.4% and 6.4%, respectively. A money-weighted rate of return expresses investment performance, net of investment expense, adjusted for the changing amounts actually invested.

In April 2014, the board approved the SERS *2014-2015 Strategic Investment Plan*. SERS assets are managed according to this plan with a long-term objective of achieving and maintaining a fully funded status for the benefits provided by SERS.

Under this plan, the following table shows the target asset allocation for the 2014-2015 investment period:

### Target Asset Allocation

Asset Class	2014-2015 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>

SERS investment office, in consultation with the board and its investment consultants, update the SERS strategic investment plan every two years. Therefore, the target asset allocation shown in the preceding table remained the same over the two financial reporting periods.

Under this 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 15%. This allocation is divided among distinct segments, each of which fulfills a specific role within the scope of the Fixed Income structure.

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## Notes to Financial Statements

December 31, 2015 and 2014

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.
- **Liquidity Reserve** 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. Each of these is discussed in more detail on the following pages.

Concentration of credit risk is the risk of loss attributed to the magnitude of investment in a single issuer. As of December 31, 2015 and 2014, 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.

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).

## Notes to Financial Statements

December 31, 2015 and 2014

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, 2015 and 2014 by debt sector:

### 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
Mortgage-backed securities	162,521	323,087	15,673	3,149	42,052	2,303	-	548,785
Private placements <sup>4/</sup>	12,020	31,271	42,944	156,107	228,846	31,406	-	502,594
Asset-backed securities	60,022	2,937	13,554	5,011	238,061	2,559	-	322,144
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>NA represents securities that were either not rated or had a withdrawn rating.

<sup>2/</sup>Represents short-term investments mostly in the Commonwealth of Pennsylvania Treasury Department's Short-Term Investment Fund (STIF). This category is comprised of 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, are comprised of 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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## Notes to Financial Statements

December 31, 2015 and 2014

### Debt Securities Exposed to Credit Risk (2014)

(\$ 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>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$1,647,734	\$1,647,734
Corporates	28,437	35,724	237,354	438,703	174,256	5,027	-	919,501
Mortgage-backed securities	173,342	284,198	18,662	8,931	26,945	-	-	512,078
Private placements <sup>4/</sup>	15,925	27,989	53,672	158,019	216,093	23,778	-	495,476
Asset-backed securities	48,321	1,431	16,576	4,648	254,255	3,041	-	328,272
Sovereign debt	19,435	82,194	41,377	114,303	39,949	1,672	-	298,930
Agencies	10,106	122,499	-	-	-	-	-	132,605
Government	345	12,768	19,560	211	-	-	-	32,884
Other investments	-	-	-	-	-	14,825	-	14,825
<b>Total</b>	<b>\$295,911</b>	<b>\$566,803</b>	<b>\$387,201</b>	<b>\$724,815</b>	<b>\$711,498</b>	<b>\$48,343</b>	<b>\$1,647,734</b>	<b>\$4,382,305</b>

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

<sup>2/</sup>Represents short-term investments mostly in the Commonwealth of Pennsylvania Treasury Department's Short-Term Investment Fund (STIF). This category is comprised of 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, are comprised of 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 \$1.9 billion as of December 31, 2015 and 2014, 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 Barclays U.S. Aggregate Bond Index. Duration is a measure of an investment's sensitivity to changes in interest rates. The higher the duration, the greater the changes in fair value when interest rates change. SERS measures interest rate risk using option-adjusted duration, which considers the effect of a security's embedded options on cash flows.

At December 31, 2015 and 2014, SERS Fixed Income portfolio had the following option-adjusted durations by debt sector:

### Debt Option-Adjusted Durations

(\$ thousands)

	2015		2014	
	Fair Value	Option-Adjusted Duration	Fair Value	Option-Adjusted Duration
Sovereign debt	\$245,552	8.3	\$298,930	8.0
Government	1,875,233	6.5	1,832,702	6.6
Corporates	895,622	5.4	919,501	5.7
Agencies	111,703	4.2	132,605	4.3
Private placements <sup>1/</sup>	502,594	3.1	495,477	4.3
Mortgage-backed securities	626,403	3.0	589,472	3.6
Asset-backed securities	322,144	2.6	328,272	3.1
Short-term investments	1,711,312	0.1	1,647,734	0.1
Other investments <sup>2/</sup>	10,382	NA	14,825	NA
<b>Total<sup>3/</sup></b>	<b>\$6,300,945</b>		<b>\$6,259,518</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>Other investments represent certain securities for which durations are not available.

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

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## Notes to Financial Statements

December 31, 2015 and 2014

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, 2015 and 2014, SERS had the following currency exposures:

### Foreign Currency Exposures (2015)

(\$ thousands)

Currency	Short-Term Investments <sup>1/</sup>	Fixed Income	Equity	Real Estate	Alternative Investments	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.

**Foreign Currency Exposures (2014)**

(\$ thousands)

Currency	Short-Term Investments <sup>1/</sup>	Fixed Income	Equity	Real Estate	Alternative Investments	Total
European Euro	\$2,615	\$16,776	\$955,217	\$21,141	\$690,422	\$1,686,171
British Pound Sterling	2,079	43,952	690,845	20,281	14,774	771,931
Japanese Yen	3,564	1,819	571,691	43,544	-	620,618
Swiss Franc	2,336	-	368,363	1,263	-	371,962
Hong Kong Dollar	(292)	-	314,929	21,023	-	335,660
Australian Dollar	1,044	10,218	163,696	16,230	-	191,188
Canadian Dollar	453	12,551	163,982	983	-	177,969
South Korean Won	1,014	-	130,127	-	-	131,141
Swedish Krona	(276)	851	71,523	996	22,246	95,340
New Taiwan Dollar	788	-	87,015	-	-	87,803
Mexican Peso	107	27,631	22,797	22,451	-	72,986
Singapore Dollar	197	-	56,149	10,951	-	67,297
Brazilian Real	632	8,543	46,325	-	-	55,500
Danish Krone	4	273	46,282	-	-	46,559
South African Rand	296	6,779	37,309	-	-	44,384
Norwegian Krone	30	-	34,047	-	-	34,077
Indonesian Rupiah	183	8,234	14,164	-	-	22,581
Thai Baht	28	-	18,681	-	-	18,709
Chilean Peso	16	14,822	2,790	-	-	17,628
Malaysian Ringgit	44	3,788	12,350	-	-	16,182
Turkish Lira	21	623	14,346	-	-	14,990
Hungarian Forint	107	7,358	4,449	-	-	11,914
Other currencies (9)	1,356	11,397	23,868	-	-	36,621
<b>Total</b>	<b>\$16,346</b>	<b>\$175,615</b>	<b>\$3,850,945</b>	<b>\$158,863</b>	<b>\$727,442</b>	<b>\$4,929,211</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.

As of December 31, 2015 and 2014, 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

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## Notes to Financial Statements

December 31, 2015 and 2014

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, 2015 and 2014 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, 2015 and 2014 was one day and two days, respectively. Interest rate risk may be posed by mismatched maturities and could be affected by other program features, such as the lending agent's ability to reallocate loaned securities among all of its lending customers.

As of December 31, 2015 and 2014, the fair value of loaned securities was \$628 million and \$460 million, respectively; the fair value of the associated collateral was \$652 million and \$479 million, of which \$371 million and \$362 million was cash, respectively. As of December 31, 2015 and 2014, noncash collateral of \$281 million and \$117 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, 2015 and 2014, 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 through a securities lending collateral pool, 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 credit worthiness. The unrealized gain/loss on contracts is included in SERS net position and represents the fair value of the contracts on December 31.

## Notes to Financial Statements

December 31, 2015 and 2014

At December 31, 2015 and 2014, SERS contracts to purchase and sell by foreign currencies are shown in the following tables:

### 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>

### Foreign Exchange Contracts (2014)

(\$ thousands)

Currency	Purchases	Unrealized Gain/(Loss)	Sales	Unrealized Gain/(Loss)
Chilean Peso	\$14,822	\$(553)	\$15	\$ -
Australian Dollar	9,538	(253)	28,380	2,578
Indian Rupee	9,033	(83)	-	-
South Korean Won	8,677	(280)	8,677	89
European Euro	4,063	(89)	26,651	959
Norwegian Krone	3,660	(131)	6,315	1,512
Mexican Peso	2,657	(25)	2,669	122
British Pound Sterling	2,021	7	3,089	11
Canadian Dollar	905	5	-	-
Colombian Peso	640	2	1,279	20
Swiss Franc	222	(1)	19,671	461
Polish Zloty	96	-	4,334	253
New Zealand Dollar	-	-	6,726	211
Other (6)	1,133	(2)	1,009	-
<b>Total</b>	<b>\$57,467</b>	<b>\$(1,403)</b>	<b>\$108,815</b>	<b>\$6,216</b>



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## Notes to Financial Statements

December 31, 2015 and 2014

Futures contracts are standardized, exchange-traded contracts to purchase or sell a specific financial instrument at a predetermined price. Gains and losses on futures contracts are settled daily based on a notional (underlying) principal value and do not involve an actual transfer of the specific instrument. The exchange assumes the risk that the counterparty will not pay and generally requires margin payments to minimize such risk. Futures are generally used to achieve the desired market exposure of a security or index or to rebalance the total portfolio. SERS exposure to futures contracts was not significant at December 31, 2015 and 2014.

Swap agreements provide for periodic payments between parties based on the change in value of underlying assets, indexes, rates, and credit worthiness. 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, 2015 and 2014.

### (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, 2015, 2014, and 2013 were \$2.3 million, \$1.9 million, and \$1.3 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 2015, SERS funded REHP benefits by paying \$334 (actual dollars) per pay period from January 1 to June 30, 2015, and \$418 (actual dollars) per pay period from July 1 to December 31, 2015 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
2015	\$1,136,817	\$3,020	\$906
2014	898,330	2,315	536
2013	869,140	2,240	658
<b>Three-year cumulative OPEB</b>			<b>\$2,100</b>

In the previous table, the commonwealth's 2015 biennial actuarial valuation was used for 2015 while the commonwealth's 2013 biennial actuarial valuation was used for 2014 and 2013. 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.

### (9) Net Pension Liability

The components of the net pension liability of participating employers at December 31, 2015 and 2014, were as follows:

#### Net Pension Liability

(\$ thousands)

	2015	2014
Total pension liability	\$44,238,721	\$42,195,186
Plan fiduciary net position	26,054,890	27,337,778
<b>Net pension liability</b>	<b>\$18,183,831</b>	<b>\$14,857,408</b>
Plan fiduciary net position as a percentage of the total pension liability	58.9%	64.8%

The total pension liability was determined by an actuarial valuation for financial reporting purposes as of December 31, 2015 and 2014, using some of the following actuarial methods and assumptions:

- Actuarial cost method: Entry age
- Investment rate of return: 7.50% net of expenses including inflation

- Projected salary increases: average of 5.70% with range of 3.85% – 9.05% including inflation for 2015 and an average of 6.10% with range of 4.30% – 11.05% including inflation for 2014
- Asset valuation method: fair (market)
- Inflation: 2.75%
- Mortality rate: projected RP-2000 Mortality Tables adjusted for actual plan experience and future improvement

The assumptions are based on the *18th Investigation of Actuarial Experience* study covering the periods 2011 – 2015, which was released in March 2016. Some of the 2014 assumptions were based on the prior study, which was released in January 2011.

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 pension plan investment expense 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, 2015 and 2014 (see the discussion of the pension plan's investment policy) are summarized in the following table:

#### Long-Term Expected Real Rate of Return

Asset Class	2014 and 2015 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

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## Notes to Financial Statements

December 31, 2015 and 2014

The discount rate used to measure the total pension liability was 7.50%. 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 7.50%, 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 Changes in the Discount Rate

(\$ thousands)

	1% Decrease to 6.50%	Current Discount Rate of 7.50%	1% Increase to 8.50%
2015 Net pension liability	\$22,587,745	\$18,183,831	\$14,407,719
2014 Net pension liability	19,017,125	14,857,408	11,280,725

## Required Supplementary Information

December 31, 2015 (unaudited)

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

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

See accompanying independent auditors' report.

# FINANCIAL SECTION

## Required Supplementary Information

December 31, 2015 (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
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
2006	196	196	-	5,118	3.83

<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: 5-year smoothing (all years)
- Inflation: 3.0% from valuation years 2006-2009 and 2.75% from valuation years 2010-2015
- Projected average salary increases: 7.1% from valuation years 2006-2009, 6.2% from valuation years 2010-2012, 6.1% from valuation years 2013-2014, and 5.7% for valuation years 2015
- Investment rate of return (net of expenses including inflation): 8.50% from valuation years 2006-2007, 8.0% from valuation years 2008-2010, and 7.50% from valuation years 2011-2015

<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.

### Schedule 3 Schedule of Investment Returns

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

See accompanying independent auditors' report.

**Schedule 4  
Schedule of Administrative Expenses**

(\$ thousands)

Personnel services	
Salaries	\$9,023
Benefits	5,726
Temporary personnel wages, overtime, and out-service training	89
Total personnel services	14,838
Professional services	
Information technology services	1,419
Treasury department services	797
Consultant fees	595
Other commonwealth services	288
Legal fees	78
Total professional services	3,177
Rentals	
Real estate rent	1,594
Other equipment rental	77
Total rentals	1,671
Communication	
Postage	391
Telephone	279
Printing and advertising	109
Total communication	779
Other expenses	
Maintenance	1,046
EDP and office equipment	446
Supplies	61
Subscriptions and memberships	34
Travel and conferences	20
Total other expenses	1,607
<b>Total administrative expenses</b>	<b>\$22,072</b>

See accompanying independent auditors' report.



# FINANCIAL SECTION

## Supplementary Information

December 31, 2015

### Schedule 5 Summary of Investment and Consultant Expenses (\$ thousands)

#### Investment Expenses

Expense Category	Expenses
Manager investment expenses	
Alternative Investments	\$69,328
Real Assets	36,628
Global Public Equity	24,014
Diversifying Assets	16,249
Fixed Income	11,153
Liquidity Reserve	559
Total manager investment expenses	157,931
Investment consultants	3,899
Investment professional personnel	3,139
Custodian	1,292
Subscription and membership	242
Legal	57
Operational	50
<b>Total investment expenses</b>	<b>\$166,610</b>

#### Consultant Expenses

Firm	Service Type	Expenses
Investment consultant expenses:		
StepStone Group	Alternative investments	\$1,975
RVK	General investments	606
The Townsend Group	Real estate investments	538
Albourne America	Direct hedge fund investments	400
GCM Customized Investment Group	Investment portfolio management	241
Institutional Shareholder Services	Proxy services	92
Abel/Noser	Transaction cost analysis	47
Total investment consultant expenses		3,899
Administrative consultant expenses		
The Hay Group	Actuary	532
Other	Miscellaneous	63
Total administrative consultant expenses		595
<b>Total consultant expenses</b>		<b>\$4,494</b>

See accompanying independent auditors' report.

**2015**

**Investment Section**

May 30, 2016

Dear Members:

On behalf of SERS investment office, I am pleased to report on SERS' investment program for the calendar year 2015.

As a long-term investor, SERS remains committed to utilizing best practices in governance, asset allocation, and managing risks. Specifically, SERS will continue to enhance its efficiency, lower total investment costs by continuing to invest in low-cost index funds and by only allocating resources to assets where the board, investment office, and external consultants have the highest conviction that active management could provide the best opportunity to generate excess return.

SERS focuses on risk mitigation to preserve capital during prolonged periods of economic decline while paying greater than \$3 billion annually in retirement benefits. What we know is that economic growth and inflation have the most significant impact on SERS' investment returns. What we do not know is when or to what degree economic growth and inflation will expand or contract. And more often than not, market disruptions come from unexpected sources.

With that in mind, SERS considers liquidity to be the predominant risk and constructs an asset allocation policy that provides a high expected probability of achieving SERS' long-term actuarially assumed rate of return, consistent with the board's tolerance for risk, while continuing to meet its retirement payment obligations. The SERS board, investment professional staff, and external consultants spend a considerable amount of time thinking about and discussing liquidity, capital markets, expected returns, and expected risks. SERS historical adherence to its asset allocation process generated investment returns that added 61% of the assets in the fund over the past decade. Employee contributions added 15% and employer contributions added 24% of the assets to the fund during the same period.

SERS' return in 2015 marked the seventh consecutive positive returning year. On a risk-adjusted basis, SERS' five year historical performance is ranked in the top-decile amongst its peer group of public plans. Since the credit crisis of 2008, SERS returned 7.9% (net of fees), outperformed its actuarial assumed rate of return, and paid over \$19 billion in retirement benefits.

Several significant accomplishments were achieved in 2015:

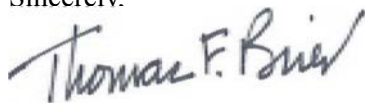
- Continued to lower its manager investment expenses to approximately 59 basis points (0.59%) of the total fund.
- Committed \$425 million to 11 best-in-class private equity funds.
  - ADV Opportunities Fund I, L.P.
  - Audax Private Equity Fund V
  - Blackstone Capital Partners VII, L.P.
  - Clearlake Capital Partners IV, L.P.
  - Francisco Partners IV
  - H.I.G. Brazil and Latin America Partners

- Lightspeed India Partners I
  - Primavera Capital Fund II
  - Ridgemont Equity Partners II
  - RRJ Capital Master Fund III
  - Sterling Group Partners IV, L.P.
- Developed a new Strategic Investment Plan which provides a clear strategic direction for SERS' investment program.
  - Restructured SERS' Real Estate program to increase expected return, liquidity, diversification, and inflation hedging while decreasing expected risk.
  - Completed an Asset/Liability Study that fully links all three aspects of a Plan's key financial drivers –Investment Policy, Contribution Policy, and Benefit Policy.
  - Updated three primary investment governance documents which formalize the board's investment objectives (Statement of Investment Policy, Private Equity Statement of Investment Policy, and Real Estate Statement of Investment Policy).
  - Updated an Investment Manager Monitoring Policy which is an enhanced communication tool to keep the board informed and to formalize the identification and application of qualitative and quantitative criteria employed by SERS with respect to the monitoring of current investment managers.
  - Updated SERS' Master Due Diligence Questionnaire for all asset classes, in collaboration with SERS' legal team.

SERS investment professionals and consultants vigilantly monitor economic conditions and market events, working to position the fund to achieve its performance objectives under a wide variety of economic scenarios.

I remain confident that under the leadership and guidance of the board, SERS will continue with its disciplined investment decision making process to ensure that all new investments are the best available opportunities and aligned with the Strategic Investment Plan objectives.

Sincerely,



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

### 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 January 2016.

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 moneys 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, 2015 (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 *Strategic Investment Plan* approved by the board.



## Investment Returns

December 31, 2015 (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
Alternative Investments <sup>2/, 5/</sup>	7.8%	11.2%	11.5%	10.8%
<i>Burgiss All Private Equity Custom Index <sup>3/, 5/</sup></i>	10.2	14.0	13.4	11.6
<i>Russell 3000 Index + 3% <sup>4/, 5/</sup></i>	2.5	15.9	16.7	10.1
Global Public Equity	-1.8	8.6	7.0	4.5
<i>MSCI ACW Investable Market Index (Net)</i>	-2.2	7.9	6.1	5.0
Real Assets <sup>5/</sup>	-2.2	3.9	5.2	4.1
<i>Real Assets Custom Benchmark <sup>5/</sup></i>	1.5	5.3	6.9	4.1
<i>Consumer Price Index + 3%</i>	3.8	4.0	4.6	4.9
Diversifying Assets	0.1	5.9	4.8	NA
<i>DA Custom Index <sup>6/</sup></i>	-0.7	8.1	6.8	NA
Fixed Income	-0.7	1.0	3.8	5.3
<i>Barclays U.S. Aggregate Bond Index</i>	0.5	1.4	3.2	4.5
Liquidity Reserve	0.7	0.5	0.4	1.6
<i>BofA ML 3 Month U.S. T-Bill Index</i>	0.1	0.1	0.1	1.2
<b>Total Fund</b>	<b>0.4%</b>	<b>6.7%</b>	<b>6.9%</b>	<b>5.2%</b>
<i>Total Fund Custom Benchmark</i>	<i>1.2%</i>	<i>6.9%</i>	<i>7.1%</i>	<i>6.3%</i>
<i>Total Fund Custom Public Market Equivalent Benchmark</i>	<i>0.6%</i>	<i>7.7%</i>	<i>7.9%</i>	<i>6.7%</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 Alternative Investments performance includes Private Equity, Special Situations, and Venture Capital.

<sup>3/</sup>The Burgiss All Private Equity Custom Index is intended to compare the program's performance to its peers.

<sup>4/</sup>The Russell 3000 Index + 3% is a 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>Alternative Investments, its corresponding benchmarks, the Private Energy, Non-Core Real Estate, Core Real Estate, and REITs sections of Real Assets, and the corresponding Real Assets Custom Benchmark are reported on a quarter lagged basis.

<sup>6/</sup>Beginning April 2014, the DA 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 Diversifying Assets with regard to its composition and objectives.

# INVESTMENT SECTION

## Fund Values and Annual Returns

December 31, 2015 (unaudited)

### Fund Values and Annual Returns

(\$ millions)

Year Ended	SERS Fund Fair Value	Annual Total Fund Rate of Return <sup>1/</sup>
1986	\$7,120	15.2%
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

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

# INVESTMENT SECTION

## Largest Assets Held

December 31, 2015 (unaudited)

### U.S. Equity

### Non-U.S. Equity

Holding	Fair Value
Apple Inc	\$137,540,821
Microsoft Corp	97,534,395
JPMorgan Chase and Co	59,509,339
Alphabet Inc Class C	59,304,954
TJX Companies Inc	58,985,703
Facebook Inc	56,781,294
Johnson and Johnson	53,816,960
Proctor and Gamble Co	53,501,773
Cisco Systems Inc	52,057,819
Alphabet Inc Class A	51,419,459

Holding	Fair Value
Roche Holdings AG	\$75,261,152
Nestle SA	74,287,623
Novartis AG	64,505,407
Bayer AG	50,778,701
Toyota Motor Corp	48,957,244
AIA Group Ltd	47,022,398
Reckitt Benckiser Group PLC	42,005,742
GlaxoSmithKline PLC	34,718,578
Sanofi SA	33,019,810
British American Tobacco PLC	31,837,276

### Non-U.S. Fixed Income

Holding	Fair Value
United Mexican States, 7.750% November 13, 2042	\$9,597,737
Buoni Poliennali Del Tesoro, 5.000% August 1, 2039	8,245,399
United Mexican States, 8.500% November 18, 2038	7,120,766
United Mexican States, 8.500% May 31, 2029	7,109,399
Neder Waterschapsbank, Variable Rate February 14, 2018	6,043,866
Republic of Slovenia, 5.850% May 10, 2023	5,127,165
Italy Government International Bond, 5.375% June 12, 2017	4,940,922
New Zealand Government, 5.500% April 15, 2023	4,804,359
New South Wales Treasury Corp, 5.000% August 20, 2024	4,689,016
United Mexican States, 4.000% October 2, 2023	4,504,811

Note: A detailed list of SERS investment holdings at December 31, 2015, may be viewed at [www.SERS.pa.gov](http://www.SERS.pa.gov).

# INVESTMENT SECTION

## Largest Assets Held

December 31, 2015 (unaudited)

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

Holding	Fair Value
U.S. Treasury Note, 2.250% November 15, 2025	\$216,597,907
U.S. Treasury Note, 2.375% August 15, 2024	168,090,083
U.S. Treasury Inflation Index Note, 1.250% July 15, 2020	61,803,621
U.S. Treasury Inflation Index Note, 0.125% January 15, 2023	60,403,343
U.S. Treasury Inflation Index Note, 0.125% January 15, 2022	56,358,727
U.S. Treasury Inflation Index Note, 0.125% April 15, 2018	38,776,281
U.S. Treasury Note, 2.000% February 15, 2025	37,752,595
U.S. Treasury Inflation Index Note, 0.125% April 15, 2017	37,420,456
U.S. Treasury Note, 0.750% October 31, 2017	36,667,257
U.S. Treasury Inflation Index Note, 0.1250% April 15, 2019	35,817,003

### U.S. Corporate Fixed Income

Holding	Fair Value
Resolution Funding Corp, 0.000% April 15, 2030	\$9,064,965
Goldman Sachs Group Inc, 5.750% January 24, 2022	8,642,872
SRERS Funding Ltd, Variable Rate May 9, 2046	8,056,339
Morgan Stanley, 4.750% March 22, 2017	6,411,726
Goldman Sachs Group Inc, Variable Rate November 15, 2018	5,984,198
Cobalt CMBS Commercial Mortgage Trust, Variable Rate May 15, 2046	5,537,345
Countrywide Home Equity Loan Trust, Variable Rate November 15, 2035	5,385,971
Verizon Communications Inc, 5.150% September 15, 2023	5,232,811
Bank of America Corp, 1.350% November 21, 2016	5,103,255
Gramercy Real Estate CDO, Variable Rate August 15, 2056	5,029,719

Note: A detailed list of SERS investment holdings at December 31, 2015, may be viewed at [www.SERS.pa.gov](http://www.SERS.pa.gov).

## Schedule of Trading Broker Commissions

December 31, 2015 (unaudited)

Broker commissions on equity and fixed income investment transactions for the year ended December 31, 2015, were \$4.5 million. Below is a list of brokers receiving commissions in excess of \$20,000 during the year.

Broker	Commissions	Broker	Commissions
Merrill Lynch	\$519,316	ISI	\$57,430
JP Morgan Chase	320,056	Stifel Nicolaus	52,178
UBS	288,688	CITIC	46,022
Morgan Stanley Smith Barney	263,536	Macquarie Bank	44,866
Goldman Sachs	259,050	Wells Fargo and Company	36,457
Citigroup	225,118	Daiwa Bank	35,652
Credit Suisse First Boston	186,356	Redburn Partners	34,151
Liquidnet	153,605	Keefe Bruyette & Woods	32,686
HSBC Securities	145,835	BNP Paribas	32,297
Credit Agricole	120,789	Pershing	28,638
Barclays	108,988	RBC Dominion Securities	28,238
Investment Technology Group	107,419	Boenning & Scattergood	28,215
Deutsche Bank	99,074	CL King & Associates	28,184
Sturdivant and Company	95,495	BTIG	27,115
KCG Holdings	82,358	Island Trader Securities	26,510
Jefferies and Company	74,716	Mizuho	23,631
Bloomberg Tradebook	70,214	Nomura Group	22,524
Nomura Group	69,517	Yuanta Financial Holdings	20,290
Sanford C Bernstein & Company	62,968		

# INVESTMENT SECTION

## Investment Summary

December 31, 2015 (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 govern 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.

### Asset Allocation

(\$ millions)

Asset Class	Market Exposure <sup>1/</sup>	% of Total Fund	Long-Term 10-Year Strategic Target
Alternative Investments	\$4,683.4	18.0%	15.0%
Global Public Equity	10,046.7	38.7	40.0
Real Assets	3,590.7	13.8	17.0
Diversifying Assets	1,673.3	6.4	10.0
Fixed Income	4,285.2	16.5	15.0
Liquidity Reserve	1,703.9	6.6	3.0
<b>Total Fund</b>	<b>\$25,983.2</b>	<b>100.0%</b>	<b>100.0%</b>

<sup>1/</sup>Market exposure includes receivables and accruals at year's end.

### Number of Investment Managers

Asset Class	Investment Managers
Alternative Investments	148
Global Public Equity	15
Real Assets	36
Diversifying Assets	14
Fixed Income	15
Liquidity Reserve	3
<b>Total Managers</b>	<b>231</b>

### Number of Investment Portfolios

Asset Class	Investment Portfolios
Alternative Investments	341
Global Public Equity	18
Real Assets	70
Diversifying Assets	16
Fixed Income	18
Liquidity Reserve	5
<b>Total Portfolios</b>	<b>468</b>



## Investment Summary - Alternative Investments

December 31, 2015 (unaudited)

### Asset Class Description

The Alternative Investments program includes SERS Fund assets held in partnerships that pursue private market strategies in private equity, special situations, and venture capital with investments typically made over a multi-year period and which offer premium returns to compensate for illiquidity.

### Role in the SERS Fund

The program seeks high, long-term capital appreciation to enhance total SERS Fund returns with an investment return horizon that is typically seven or more years.

### Portfolio Exposure

The Alternative Investments program is well diversified by sub-sector, geography, and industry focus. As of September 30, 2015, based on fair value, the program's exposure was:

#### By Fund Sub-Sector

U.S. Private Equity	35.5%
Non-U.S. <sup>1/</sup>	23.4
U.S. Venture Capital	22.4
Distressed/Oppportunistic	12.3
Pennsylvania-Related	6.4

#### By Geography<sup>2/</sup>

United States	69.9%
United Kingdom	5.3
China	4.4
Germany	1.6
Canada	1.4
France	1.3
Italy	1.2
Rest of World	14.9

#### By Industry<sup>2/</sup>

Financials	26.5%
Information Technology	22.0
Consumer Discretionary	17.5
Health Care	15.4
Industrials	8.2
Consumer Staples	3.0
Materials	2.8
Energy	2.4
Telecommunication Services	1.3
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 - Alternative Investments

December 31, 2015 (unaudited)

### Benchmarks

The program's objective is to generate investment returns that exceed the total return of public equity markets by at least 3% and that 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

### Alternative Investments

Sub-Asset Class	Unfunded Commitments (\$ millions)	Fair Value (\$ millions)	% of Total Fund
Private Equity	\$1,075.5	\$2,692.1	10.3%
Special Situations	288.8	750.8	2.9
Venture Capital	147.9	1,240.5	4.8
<b>Total Alternative Investments</b>	<b>\$1,512.2</b>	<b>\$4,683.4</b>	<b>18.0%</b>

## Investment Summary - Alternative Investments

December 31, 2015 (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.

### Private Equity Committed, Drawn, and Distributed

Active Private Equity Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions <sup>2/</sup>
1. ABRYPartners IV	Middle	03/30/2001	\$35,000,000	\$25,444,662	\$52,812,428
ABRYPartners V	Middle	07/29/2005	45,000,000	41,625,575	81,197,347
ABRYPartners VI	Middle	03/26/2008	50,000,000	59,301,733	80,688,631
ABRYPartners VII	Middle	08/10/2011	30,000,000	36,019,542	12,916,353
ABRYPartners VIII	Middle	05/05/2015	25,000,000	7,795,584	770,986
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	28,659,162
ABS Capital Partners VI	Growth Equity	03/13/2009	40,000,000	38,372,783	14,075,882
3. Advent Latin American Private Equity Fund IV	Middle	08/02/2007	30,000,000	29,297,073	29,465,921
Advent International GPE VI-A	Large	07/07/2008	35,000,000	33,763,830	27,926,940
Advent Latin American Private Equity Fund V	Middle	05/17/2010	15,000,000	13,155,000	2,355,000
Advent International GPE VII-B	Large	12/06/2012	40,000,000	28,400,000	4,799,752
Advent Latin American Private Equity Fund VI	Middle	05/11/2015	25,000,000	2,000,000	0
4. Alpha Private Equity Fund 4	Small	05/15/2002	26,508,000	35,605,050	77,986,040
Alpha Private Equity Fund 5	Small	04/01/2006	57,796,800	65,860,055	78,388,189
5. APAX Excelsior VI	Small	07/03/2000	35,000,000	34,151,324	56,091,968
APAX Europe V	Mega	04/27/2001	53,262,000	70,406,088	150,017,403
APAX Europe VI	Mega	05/19/2005	76,349,190	76,478,697	99,562,744
APAX Europe VII	Mega	06/27/2007	132,170,235	138,120,563	108,073,027
6. Apollo Investment Fund IV	Mega	09/30/1998	75,000,000	74,838,620	124,791,970
Apollo Investment Fund V	Mega	08/23/2001	50,000,000	44,948,713	121,848,314
Apollo Investment Fund VI	Mega	07/19/2006	40,000,000	38,908,796	50,854,006
7. Asia Alternatives Capital Partners	Fund of Funds	06/26/2007	50,000,000	24,717,140	21,644,324
Asia Alternatives Capital Partners II	Fund of Funds	03/07/2008	50,000,000	26,760,125	11,595,135
Asia Alternatives Korea Buyout Investors (Hahn & Co)	Small	07/22/2011	7,000,000	7,735,675	1,834,396
Asia Alternatives Capital Partners III	Fund of Funds	08/03/2012	50,000,000	35,725,698	8,327,308
Penn Asia Investors	Fund of Funds	09/28/2012	83,000,000	35,406,865	6,188,843
8. Asia Pacific Growth Fund III	Growth Equity	09/28/1999	15,000,000	15,334,963	15,580,729
9. Audax Private Equity Fund	Middle	05/25/2000	35,000,000	36,839,098	55,479,437
Audax Private Equity Fund II	Middle	06/17/2005	25,000,000	25,517,169	42,679,093
Audax Private Equity Fund III	Middle	11/07/2007	37,000,000	40,942,126	40,803,897
Audax Private Equity Fund V	Middle	*	50,000,000	0	0

# INVESTMENT SECTION

## Investment Summary - Alternative Investments

December 31, 2015 (unaudited)

### Private Equity Committed, Drawn, and Distributed (continued)

	Active Private Equity 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	07/06/2000	\$25,000,000	\$25,000,000	\$47,998,008
	Bain Capital Fund VIII-E	Mega	12/15/2004	12,144,000	13,438,216	15,494,080
	Bain Capital Fund IX	Mega	04/10/2006	75,000,000	75,216,743	100,307,583
	Bain Capital IX Coinvestment Fund	Mega	04/20/2006	15,000,000	15,468,923	21,059,588
	Bain Capital Asia Fund	Middle	10/18/2007	12,000,000	11,430,000	8,921,175
	Bain Capital Fund X	Mega	01/15/2008	90,000,000	87,255,000	56,459,016
	Bain Capital Europe III	Mega	07/10/2008	72,432,276	65,751,447	25,401,241
	Bain Capital X Coinvestment Fund	Mega	07/28/2008	5,000,000	1,225,000	708,402
11.	Baring Vostok Private Equity Fund IV	Middle	03/10/2008	30,000,000	29,762,078	9,210,189
	Baring India Private Equity Fund III Limited	Small	10/10/2008	5,000,000	5,013,642	1,066,510
12.	BC European Capital VII	Large	07/28/2000	32,658,500	37,921,761	96,576,440
	BC European Capital VII Top Up	Large	07/02/2001	10,046,300	12,351,504	32,386,202
	BC European Capital VIII	Large	12/13/2005	98,107,500	97,538,004	91,828,071
	BC European Capital IX	Large	09/16/2011	26,472,535	19,573,324	3,919,847
13.	Berkshire Fund VI	Middle	07/11/2002	20,000,000	18,828,770	38,856,970
	Berkshire Fund VII	Middle	11/15/2006	32,000,000	31,197,916	34,391,370
	Berkshire Fund VIII	Middle	08/25/2011	30,000,000	20,100,066	543,427
14.	Blackstone Communications Partners I	Mega	08/29/2000	25,000,000	25,110,848	27,605,755
	Blackstone Capital IV	Mega	02/26/2003	75,000,000	68,894,116	168,235,277
	Blackstone Capital Partners V	Mega	05/30/2006	150,000,000	149,522,744	157,404,861
	Blackstone Capital Partners VII	Mega	*	50,000,000	0	0
15.	Brait IV	Small	12/11/2006	25,000,000	21,926,276	2,873,282
16.	Brynwood Partners V	Small	07/31/2005	10,000,000	10,491,974	18,777,863
	Brynwood Partners VI	Small	10/13/2009	10,000,000	10,901,079	12,062,446
17.	Capvis Equity IV	Middle	01/30/2014	49,855,591	14,158,563	0
18.	Charterhouse Capital Partners VII	Middle	01/17/2003	55,482,500	54,972,470	103,970,347
	Charterhouse Capital Partners VIII	Middle	04/19/2006	74,636,149	72,831,664	54,740,073
	Charterhouse Capital Partners IX	Middle	04/28/2009	66,385,000	58,665,385	50,647,085
19.	Chequers Capital XV	Middle	07/05/2006	31,133,996	32,668,266	39,945,160
20.	Clayton Dubilier & Rice VI	Middle	12/31/1998	50,000,000	36,437,713	57,754,625
21.	Clearlake Capital Partners IV	Middle	09/01/2015	15,000,000	648,462	0
22.	Clessidra Capital Partners II	Middle	11/05/2008	25,631,168	17,599,252	20,338,232
23.	Code Hennessy & Simmons III	Middle	09/30/1997	40,000,000	38,724,000	56,329,887
	Code Hennessy & Simmons IV	Middle	09/16/1999	100,000,000	100,000,000	156,498,466
	Code Hennessy & Simmons V	Middle	11/10/2005	50,000,000	53,741,751	72,150,500
24.	DLJ Merchant Banking Fund II	Large	03/31/1997	75,000,000	83,303,289	106,211,436
25.	Elevation Partners	Middle	11/10/2005	35,000,000	31,022,483	47,214,491

## Investment Summary - Alternative Investments

December 31, 2015 (unaudited)

### Private Equity Committed, Drawn, and Distributed (continued)

Active Private Equity Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions <sup>2/</sup>
26. Eureka II	Growth Equity	01/30/2006	\$20,000,000	\$19,030,710	\$14,626,130
Eureka Growth Capital III	Growth Equity	10/21/2013	20,000,000	6,181,740	3,982,122
27. Excelsior Capital Asia Partners III	Small	08/17/2006	25,000,000	24,882,637	12,550,708
28. Francisco Partners	Middle	07/27/2000	50,000,000	47,732,638	54,306,406
Francisco Partners II	Middle	07/10/2006	30,000,000	28,127,870	32,695,480
Francisco Partners III	Middle	10/17/2011	20,000,000	18,070,000	1,919,238
Francisco Partners IV	Middle	04/15/2015	25,000,000	6,187,500	0
29. FSN Capital IV	Middle	12/19/2013	46,049,703	24,962,856	3,892,055
30. Great Hill Equity Partners	Middle	04/12/1999	30,000,000	30,000,000	30,444,856
Great Hill Equity Partners II	Middle	03/28/2001	35,000,000	35,063,336	76,975,735
Great Hill Equity Partners III	Middle	03/07/2006	35,000,000	35,000,000	39,987,500
Great Hill Equity Partners IV	Middle	09/08/2008	25,000,000	24,525,662	23,725,662
31. Gryphon Partners II	Small	11/03/1999	35,000,000	34,700,788	41,953,023
Gryphon Partners III	Small	09/08/2004	30,000,000	37,599,444	49,184,852
32. GTCR VI	Middle	09/30/1998	50,000,000	50,000,000	43,229,799
GTCR VII	Middle	03/15/2000	55,000,000	50,074,671	121,784,179
GTCR VIII	Middle	07/07/2003	75,000,000	69,393,599	113,622,031
GTCR IX	Middle	12/01/2006	50,000,000	46,666,718	74,010,289
GTCR XI	Middle	09/02/2014	25,000,000	6,625,000	0
33. H.I.G. Growth Buyouts & Equity Fund II	Growth Equity	07/20/2011	15,000,000	5,584,431	1,262,815
H.I.G. Europe Capital Partners II	Small	01/10/2014	27,544,596	345,686	0
H.I.G. Brazil and Latin America Partners	Middle	08/12/2015	50,000,000	1,256,862	0
34. Hahn & Company II	Middle	05/29/2015	50,000,000	11,031,449	129
35. Halpern Denny Fund III	Growth Equity	04/26/2000	25,000,000	24,886,871	28,106,844
36. HarbourVest IPEP III	Fund of Funds	06/30/1998	40,000,000	39,400,000	59,871,083
HarbourVest Partners VI	Fund of Funds	05/07/1999	200,000,000	196,586,055	218,164,754
HarbourVest IPEP IV	Fund of Funds	04/09/2001	40,000,000	39,000,000	62,146,297
HarbourVest Partners VII	Fund of Funds	03/24/2003	75,000,000	73,312,500	67,344,750
HIPEP V-Asia Pacific & Rest of World	Fund of Funds	05/09/2006	30,000,000	27,945,316	23,953,451
HarbourVest Partners VIII	Fund of Funds	10/05/2006	100,000,000	96,000,000	67,733,307
37. Hellman & Friedman Capital Partners V	Large	12/20/2004	80,000,000	71,538,366	191,258,607
Hellman & Friedman Capital Partners VI	Large	06/05/2007	125,000,000	119,124,961	183,153,728
Hellman & Friedman Capital Partners VIII	Large	*	50,000,000	0	0
38. Horizon Strategic Fund - Carlyle Group	Small	09/19/2014	100,000,000	35,248,060	2,329,107
Horizon Impact Fund - BAML	Small	10/24/2014	50,000,000	12,970,238	235,251
39. Incline Equity Partners III	Small	01/14/2013	15,000,000	6,387,977	1,426,200
40. InterMedia Partners VII	Small	01/05/2007	15,000,000	17,473,382	9,647,740
41. Invemed Catalyst Fund	Small	10/19/1999	25,000,000	14,738,867	11,020,750

# INVESTMENT SECTION

## Investment Summary - Alternative Investments

December 31, 2015 (unaudited)

### Private Equity Committed, Drawn, and Distributed (continued)

	Active Private Equity Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed <sup>y</sup>	Accumulated Capital Drawn	Accumulated Distributions <sup>z</sup>
42.	J.H. Whitney IV	Small	02/01/2000	\$20,000,000	\$17,958,772	\$6,970,458
	J.H. Whitney VI	Small	01/05/2006	50,000,000	49,616,832	40,539,938
	J.H. Whitney VII	Small	10/12/2010	25,000,000	22,827,498	8,784,711
43.	J.W. Childs Equity Partners III	Middle	08/20/2002	40,000,000	41,966,504	76,553,620
44.	JMI Equity Fund V	Growth Equity	06/07/2005	24,000,000	24,009,205	118,917,437
	JMI Equity Fund VI	Growth Equity	06/27/2007	40,000,000	39,120,000	51,060,358
	JMI Equity Fund VII	Growth Equity	02/14/2011	10,000,000	9,500,000	4,631,456
	JMI Equity Fund VIII	Growth Equity	*	25,000,000	0	0
45.	Kelso VII	Middle	10/18/2004	40,000,000	41,147,081	65,111,995
	Kelso VIII	Middle	11/29/2007	150,000,000	140,451,008	61,254,544
46.	Leeds Equity Partners IV	Small	11/12/2004	20,000,000	20,396,198	21,192,794
47.	LLR Equity Partners	Middle	02/04/2000	25,000,000	24,576,062	52,558,191
	LLR Equity Partners II	Middle	01/29/2004	25,000,000	25,000,000	35,987,257
	LLR Equity Partners III	Middle	07/24/2008	30,000,000	29,108,721	25,254,905
	LLR Equity Partners IV	Middle	03/14/2014	50,000,000	18,167,708	0
48.	Madison Dearborn Capital Partners IV	Middle	04/02/2001	90,000,000	90,365,390	164,788,730
	Madison Dearborn Capital Partners V	Middle	07/31/2006	75,000,000	71,452,654	66,481,198
	Madison Dearborn Capital Partners VI	Middle	05/27/2008	50,000,000	49,184,218	43,738,060
49.	Meridian Venture Partners II	Small	02/11/2005	10,000,000	10,000,000	9,971,195
50.	Motion II B	Middle	11/02/2005	48,204,998	47,474,492	20,440,413
51.	New York Life Capital Partners III	Fund of Funds	06/30/2006	50,000,000	54,633,766	27,015,711
	New York Life Capital Partners IV	Fund of Funds	04/04/2008	50,000,000	53,836,943	46,876,514
52.	NewSpring Growth Capital II	Growth Equity	12/05/2006	10,000,000	9,650,000	12,229,434
	NewSpring Growth Capital III	Growth Equity	07/27/2012	25,000,000	14,718,750	2,091,744
53.	Nordic Capital V	Middle	05/07/2004	34,996,500	46,006,700	131,078,798
	Nordic Capital VI	Middle	07/25/2006	54,369,000	64,433,447	59,094,573
	Nordic Capital VII	Middle	05/02/2008	92,519,165	94,732,061	23,268,509
54.	Oakhill Capital Partners	Middle	05/17/1999	50,000,000	53,718,802	93,999,577
55.	Parthenon Investors II	Small	08/09/2001	20,000,000	22,170,045	35,602,239
56.	Patriot Financial Partners	Small	06/12/2008	25,000,000	25,017,767	11,938,334
57.	Permira European Fund	Large	09/30/1997	33,494,536	32,159,947	84,005,717
	Permira European Fund II	Large	06/07/2000	48,000,000	45,672,612	91,464,087
	Permira European Fund III	Large	01/12/2004	115,960,000	127,340,454	207,867,572
	Permira IV	Large	12/14/2006	127,779,198	133,445,310	129,010,940
58.	PNC Equity Partners II	Small	08/30/2007	15,000,000	13,299,943	16,490,348
59.	Primavera Capital Fund II	Large	*	50,000,000	0	0
60.	Providence Equity Partners IV	Large	11/27/2000	25,000,000	23,439,922	55,857,767
	Providence Equity Partners V	Large	04/04/2005	45,000,000	42,595,818	38,982,836
	Providence Equity Partners VI	Large	03/16/2007	50,000,000	51,959,744	37,081,372



## Investment Summary - Alternative Investments

December 31, 2015 (unaudited)

### Private Equity Committed, Drawn, and Distributed (continued)

Active Private Equity Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions <sup>2/</sup>
61. Ridgemont Equity Partners II	Small	*	\$50,000,000	\$0	\$0
62. Segulah IV	Middle	09/25/2008	16,705,647	16,460,609	6,248,327
63. Sentinel Capital Partners V	Middle	07/15/2014	10,000,000	3,546,143	48,630
64. ShoreView Capital Partners	Small	06/16/2003	38,000,000	32,440,363	51,944,029
ShoreView Capital Partners II	Small	03/27/2008	40,000,000	37,511,284	25,020,529
65. Siguler Guff BRIC Opportunities Fund	Fund of Funds	05/08/2006	10,000,000	9,558,299	6,101,472
Siguler Guff BRIC Opportunities Fund II	Fund of Funds	04/09/2008	25,000,000	22,248,443	4,458,920
66. Sterling Capital Partners I	Middle	10/31/2002	15,000,000	14,979,168	30,283,347
Sterling Capital Partners II	Middle	08/18/2005	30,000,000	29,893,709	27,324,339
Sterling Capital Partners III	Middle	08/13/2007	32,000,000	31,610,435	26,771,623
Sterling Group Partners IV	Middle	*	20,000,000	0	0
67. Summit IV	Middle	09/30/1995	25,000,000	24,250,000	183,419,644
Summit V	Growth Equity	03/31/1998	37,500,000	36,187,500	49,906,903
Summit Ventures VI	Growth Equity	03/23/2001	62,000,000	63,914,751	123,202,183
Summit Partners Private Equity Fund VII	Middle	02/09/2006	97,134,500	97,134,505	88,461,625
68. TA IX	Middle	09/20/2000	45,000,000	43,741,796	105,463,424
TA X	Middle	04/25/2006	70,000,000	69,732,009	63,432,009
69. Thomas H. Lee Equity Fund V	Large	07/03/2001	100,000,000	104,848,200	175,331,220
Thomas H. Lee Equity Fund VI	Large	11/14/2006	50,000,000	51,397,868	43,911,567
70. TPG Partners III	Mega	01/13/2000	75,000,000	64,119,169	163,679,936
Newbridge Asia III	Middle	02/15/2001	15,000,000	14,438,357	55,662,218
TPG Partners IV	Mega	12/29/2003	30,000,000	27,981,463	48,998,171
Newbridge Asia IV	Middle	09/27/2005	40,000,000	38,903,378	82,409,421
TPG Partners V	Mega	06/27/2006	95,756,241	92,531,812	69,758,667
TPG Asia V	Large	02/19/2008	22,500,000	21,714,904	13,471,153
TPG Partners VI	Mega	05/22/2008	45,000,000	47,749,575	35,565,659
71. Vestar Capital Partners III	Middle	06/30/1997	25,000,000	24,362,534	27,746,687
Vestar Capital Partners IV	Middle	01/25/2000	100,000,000	97,632,498	171,785,140
Vestar Capital Partners V	Middle	01/25/2006	50,000,000	51,379,800	19,925,076
72. Weston Presidio III	Growth Equity	12/31/1998	35,000,000	31,989,586	30,440,421
Weston Presidio IV	Growth Equity	06/21/2000	35,000,000	34,451,015	38,399,714
Weston Presidio V	Growth Equity	12/08/2005	50,000,000	49,037,193	66,805,218
73. Yucaipa American Alliance Fund II	Middle	01/13/2009	25,000,000	29,225,349	15,280,372
<b>Total Active Private Equity</b>			<b>\$7,956,585,824</b>	<b>\$7,026,635,872</b>	<b>\$8,707,546,470</b>

Cash flows as of September 30, 2015.

\*Not funded as of September 30, 2015.

<sup>1/</sup>Commitments as of December 31, 2015.

<sup>2/</sup>Distributions include stock distributions.

# INVESTMENT SECTION

## Investment Summary - Alternative Investments

December 31, 2015 (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	03/15/2002	\$30,000,000	\$26,698,593	\$46,795,147
ABRY Senior Equity II	Mezzanine	07/27/2006	30,000,000	28,019,267	43,788,432
ABRY Advanced Securities Fund	Distressed/ Restructuring	08/01/2008	25,000,000	23,419,669	38,645,084
2. ADV Opportunities Fund I	Distressed/ Restructuring	*	50,000,000	0	0
3. AG Capital Recovery Partners IV	Distressed/ Restructuring	02/04/2003	50,000,000	35,415,216	55,993,470
AG Capital Recovery Partners V	Distressed/ Restructuring	04/17/2006	20,000,000	20,000,000	20,312,163
4. Avenue Special Situations Fund IV	Distressed/ Restructuring	03/27/2006	50,000,000	50,000,000	68,816,017
Avenue Asia Special Situations Fund IV	Distressed/ Restructuring	06/30/2006	50,000,000	31,897,973	24,590,247
Avenue Special Situations Fund V	Distressed/ Restructuring	06/04/2007	70,000,000	70,004,050	92,444,416
Avenue Europe Special Situations Fund	Distressed/ Restructuring	07/30/2008	38,632,500	25,749,356	37,284,263
Avenue Special Situations Fund VI	Distressed/ Restructuring	11/02/2010	20,000,000	20,068,464	12,031,191
5. AXA Secondary Fund III	Secondaries	11/19/2004	26,000,000	21,729,005	35,450,439
AXA Secondary Fund III-2	Secondaries	11/24/2004	14,000,000	11,677,210	18,091,006
AXA Secondary Fund IV	Secondaries	02/26/2007	80,000,000	68,942,813	73,090,550
AXA Secondary Fund V B	Secondaries	06/19/2012	75,000,000	56,279,763	30,398,609
6. Centerbridge Capital Partners I	Distressed/ Restructuring	02/27/2007	50,000,000	56,486,029	91,801,176
Centerbridge Capital Partners III	Distressed/ Restructuring	05/21/2015	30,000,000	4,774,032	0
7. Cerberus Institutional Partners	Distressed/ Restructuring	03/05/1999	35,000,000	35,000,000	79,906,454
Cerberus Institutional Partners Series Two	Distressed/ Restructuring	10/09/2001	35,000,000	30,100,793	93,440,504
Cerberus Institutional Partners Series Three	Distressed/ Restructuring	11/13/2003	35,000,000	22,321,354	44,589,261
Cerberus Institutional Partners Series Four	Distressed/ Restructuring	11/27/2006	75,000,000	69,258,215	80,738,061
8. CVI Global Value Fund	Distressed/ Restructuring	02/23/2007	60,000,000	57,151,667	74,919,103
9. Dover Street VII	Secondaries	07/02/2008	30,000,000	28,595,287	28,538,793

## Investment Summary - Alternative Investments

December 31, 2015 (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.	H.I.G. Bayside Debt & LBO Fund II	Distressed/ Restructuring	06/17/2008	\$30,000,000	\$27,100,000	\$19,471,584
	H.I.G. Bayside Loan Opportunity Fund III	Distressed/ Restructuring	06/12/2013	50,000,000	22,782,558	3,067,566
	H.I.G. Bayside Loan Opportunity Fund IV	Distressed/ Restructuring	01/16/2015	25,000,000	1,250,000	0
11.	JP Morgan U.S. Corp Finance Investors II	Distressed/ Restructuring	01/14/2003	50,000,000	53,017,192	71,564,865
12.	KPS Special Situations Fund IV	Distressed/ Restructuring	05/08/2014	25,000,000	2,281,153	1,019,917
13.	Landmark Equity IV	Secondaries	03/31/1995	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
14.	LBC Credit Partners III	Mezzanine	03/04/2013	50,000,000	34,651,834	11,758,372
15.	Lexington Capital Partners II	Secondaries	06/30/1998	40,000,000	39,538,000	52,184,319
	Lexington Capital Partners III	Secondaries	01/26/1999	35,000,000	34,516,449	43,094,145
	Lexington Capital Partners V	Secondaries	01/17/2002	75,000,000	74,623,418	118,366,242
	Lexington Capital Partners VI	Secondaries	10/21/2005	50,000,000	53,066,325	53,539,647
16.	Matlin Patterson Global Opportunities Partners	Distressed/ Restructuring	05/31/2001	35,000,000	30,091,262	56,689,513
	Matlin Patterson Global Opportunities Partners II	Distressed/ Restructuring	06/30/2004	30,000,000	30,410,597	10,578,309
17.	OCM Opportunities Fund III	Distressed/ Restructuring	01/20/2000	60,000,000	60,007,890	89,378,449
	OCM Principal Opportunities II	Distressed/ Restructuring	04/24/2001	25,000,000	25,000,000	43,867,500
	OCM Opportunities Fund IV	Distressed/ Restructuring	09/26/2001	70,000,000	70,000,000	115,463,024
	Oaktree Capital Management	Distressed/ Restructuring	05/28/2004	40,000,000	40,581,778	102,648,889
	OCM Opportunities Fund V	Distressed/ Restructuring	08/12/2004	40,000,000	40,003,507	63,462,053
	OCM Opportunities Fund VI	Distressed/ Restructuring	09/28/2005	40,000,000	40,000,000	60,678,867
	OCM Principal Opportunities Fund IV	Distressed/ Restructuring	01/24/2007	20,000,000	20,400,000	20,812,996
	OCM Opportunities Fund VII	Distressed/ Restructuring	05/16/2007	40,000,000	40,000,000	49,960,261
	OCM Opportunities Fund VIIb	Distressed/ Restructuring	06/03/2008	40,000,000	36,000,000	57,846,712
	Oaktree Opportunities Fund VIII	Distressed/ Restructuring	09/20/2010	12,500,000	12,583,425	10,425,994
	Oaktree Opportunities Fund VIIIb	Distressed/ Restructuring	08/22/2011	12,500,000	12,500,000	2,681,889
	Oaktree Opportunities Fund IX	Distressed/ Restructuring	03/26/2013	50,000,000	47,500,000	0

# INVESTMENT SECTION

## Investment Summary - Alternative Investments

December 31, 2015 (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>
18. Platinum Equity Capital Partners III	Distressed/Restructuring	08/05/2013	\$50,000,000	\$26,577,598	\$18,921,290
19. RRJ Capital Master Fund III	Growth Equity	*	50,000,000	0	0
20. Sankaty Credit Opportunities III	Distressed/Restructuring	03/08/2007	50,000,000	50,000,000	44,479,364
Sankaty Credit Opportunities IV	Distressed/Restructuring	07/15/2008	40,000,000	38,000,000	47,579,989
21. Templeton Strategic Emerging Markets Fund III	Distressed/Restructuring	05/29/2009	100,000,000	95,482,762	19,825,294
22. Versa Capital Partners	Distressed/Restructuring	10/16/2005	20,000,000	23,611,753	15,988,714
Versa Capital Partners II	Distressed/Restructuring	07/31/2008	15,000,000	15,154,364	5,867,313
23. W Capital Partners II	Secondaries	08/08/2007	40,000,000	39,034,444	42,438,800
<b>Total Active Special Situations</b>			<b>\$2,323,179,904</b>	<b>\$1,961,285,862</b>	<b>\$2,387,576,680</b>

Cash flows as of September 30, 2015.

\*Not funded as of September 30, 2015.

<sup>1/</sup>Commitments as of December 31, 2015.

<sup>2/</sup>Distributions include stock distributions.

## Investment Summary - Alternative Investments

December 31, 2015 (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	09/01/2003	\$20,000,000	\$19,858,273	\$20,261,429
Abingworth Bioventures V	Balanced	01/23/2007	33,775,000	27,388,013	34,609,983
2. Accel Europe	Early Stage	07/02/2001	15,000,000	11,350,000	12,366,539
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	03/09/2000	10,000,000	10,000,000	4,320,705
Advanced Technology Ventures VII	Balanced	07/11/2001	27,000,000	27,000,000	27,000,001
5. Alloy Ventures 2000	Early Stage	05/19/2000	20,000,000	20,000,000	5,125,846
Alloy Ventures 2002	Early Stage	07/22/2002	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	08/11/2005	25,000,000	25,000,000	7,492,217
6. APEX Investment Fund V	Early Stage	04/19/2002	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	08/09/2010	20,000,000	17,410,000	0
8. Atlas Venture Fund V	Early Stage	02/07/2000	37,200,000	37,211,109	40,115,109
Atlas Venture Fund VI	Early Stage	08/01/2001	24,800,000	24,800,000	11,980,477
9. Austin Ventures VIII	Balanced	07/26/2001	20,932,140	21,100,362	32,354,375
Austin Ventures IX	Balanced	01/09/2006	15,000,000	15,070,611	12,256,015
10. Battery Ventures VIII	Balanced	08/13/2007	25,000,000	24,747,225	29,513,693
Battery Ventures VIII Side Car Fund	Balanced	08/29/2008	9,000,000	6,559,483	17,349,638
11. Birchmere Ventures III	Early Stage	05/05/2005	10,000,000	10,386,534	8,692,184
12. Care Capital Investments III	Balanced	02/08/2006	25,000,000	22,050,338	4,940,190
13. Charles River Partnership XI	Early Stage	02/15/2001	11,032,259	11,032,259	14,360,660
14. CID Greater China Venture Capital Fund II	Balanced	08/10/2007	20,000,000	18,120,000	16,768,630
15. Clearstone Venture Partners III-A	Early Stage	12/22/2004	25,000,000	23,500,000	4,156,842
16. Cross Atlantic Technology Fund	Balanced	02/14/2000	20,000,000	20,149,041	23,742,240
Cross Atlantic Technology Fund II	Balanced	01/28/2002	32,900,000	32,900,000	27,178,304
17. Devon Park Bioventures	Balanced	12/15/2006	10,842,697	9,589,743	4,460,728
18. Draper Fisher Jurvetson VI	Early Stage	08/13/1999	8,000,000	8,000,000	4,973,853
Draper Triangle Ventures	Early Stage	12/20/1999	20,000,000	20,708,908	11,357,493
Draper Fisher Jurvetson VII	Early Stage	09/22/2000	20,000,000	20,000,000	7,893,620
Draper Triangle Ventures II	Early Stage	10/13/2004	12,000,000	12,866,238	11,286,921
Draper Triangle Ventures III	Early Stage	01/28/2015	10,000,000	2,915,026	0
19. Fairview Capital	Fund of Funds	09/30/1994	10,000,000	10,000,000	4,543,128
Fairview II	Fund of Funds	03/31/1998	10,000,000	9,870,000	3,982,519

# INVESTMENT SECTION

## Investment Summary - Alternative Investments

December 31, 2015 (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>
20. Frazier Healthcare III	Balanced	03/31/1999	\$30,000,000	\$30,000,000	\$12,700,255
Frazier Healthcare IV	Balanced	09/27/2001	30,000,000	29,820,000	24,821,191
Frazier Healthcare V	Balanced	05/10/2005	30,000,000	29,625,000	36,819,209
21. Grotech Partners V	Early Stage	09/30/1998	25,000,000	25,000,000	24,521,934
22. Guggenheim Technology Ventures I	Early Stage	11/17/2008	2,000,000	2,000,000	554,674
23. Healthcare Ventures VI	Early Stage	06/19/2000	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	08/22/2005	30,000,000	28,875,000	9,581,777
24. Highland Capital Partners VI	Early Stage	10/25/2001	25,000,000	25,000,000	34,486,407
Highland Capital Partners VII	Early Stage	10/13/2006	35,000,000	35,001,991	19,129,884
Highland Consumer Fund I	Early Stage	05/04/2007	25,000,000	23,763,199	4,998,050
25. IP II	Balanced	12/17/2001	8,600,000	8,584,074	2,799,296
IP III	Balanced	11/19/2004	10,500,000	9,555,000	12,722,259
IP IV	Balanced	09/21/2007	14,000,000	13,300,000	9,724,773
26. Insight Venture Partners VI	Balanced	08/21/2007	30,000,000	32,244,177	50,756,194
Insight Venture Partners VII	Balanced	04/27/2011	20,000,000	20,781,338	10,493,635
Insight Venture Partners VIII	Balanced	07/10/2013	50,000,000	47,700,000	622,752
Insight Venture Partners IX	Balanced	03/24/2015	50,000,000	13,000,000	22,498
27. InterWest Partners VIII	Early Stage	08/25/2000	25,000,000	25,000,000	11,786,981
InterWest Partners IX	Balanced	10/19/2005	20,000,000	19,000,000	15,163,946
InterWest Partners X	Balanced	10/30/2008	30,000,000	25,500,000	2,300,138
28. JP Morgan Venture Capital Investors	Fund of Funds	07/08/1999	100,000,000	107,682,691	67,130,528
JP Morgan Venture Capital Investors II	Fund of Funds	09/08/2000	100,000,000	111,720,310	97,413,531
JP Morgan Venture Capital Investors III	Fund of Funds	06/20/2006	100,000,000	108,588,377	59,498,106
29. Kline Hawkes Pacific	Balanced	08/30/2000	15,000,000	15,100,498	7,024,260
30. Knightsbridge Venture Capital VI	Fund of Funds	12/07/2004	20,000,000	18,266,667	9,633,946
31. Lightspeed Venture Partners VII	Early Stage	02/27/2006	18,000,000	17,737,490	6,660,237
Lightspeed Venture Partners VIII	Early Stage	06/27/2008	15,000,000	14,400,000	14,943,179
Lightspeed India Partners I	Early Stage	08/14/2015	15,000,000	1,875,000	0
32. Media/Communications Ventures Fund V	Growth Equity	09/27/2000	35,000,000	34,812,205	55,791,912
33. Meritech Capital Partners II	Late Stage	01/02/2001	26,475,166	24,842,529	37,600,668
Meritech Capital Partners III	Late Stage	04/05/2006	35,000,000	34,475,000	164,200,262
Meritech Capital Partners IV	Late Stage	02/10/2011	20,000,000	18,300,000	8,621,882
Meritech Capital Partners V	Late Stage	09/03/2014	23,000,000	5,347,500	0
34. Mid-Atlantic Venture Fund III	Early Stage	06/30/1997	20,008,308	20,000,000	5,654,702
Mid-Atlantic Venture Fund IV	Early Stage	05/04/2000	30,000,000	30,246,718	9,177,849
35. Morgenthaler Partners VII	Balanced	07/26/2001	35,000,000	35,143,798	28,302,655
Morgenthaler Partners VIII	Balanced	10/03/2005	35,000,000	35,754,696	32,623,615
Morgenthaler Partners IX	Balanced	11/25/2008	20,000,000	19,200,000	18,162,195



## Investment Summary - Alternative Investments

December 31, 2015 (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. NEPA Venture-II	Balanced	12/31/1992	\$7,500,000	\$7,500,000	\$34,879,769
37. 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	34,503,000	32,493,542
New Enterprise Associates 11	Early Stage	03/01/2004	25,000,000	25,000,000	49,921,379
New Enterprise Associates 12	Early Stage	06/26/2006	35,000,000	35,631,130	33,334,405
38. Novitas Capital III	Early Stage	04/17/2003	10,000,000	9,925,000	3,924,047
39. Oak Investment Partners XI	Late Stage	07/21/2004	35,000,000	34,989,508	15,565,248
Oak Investment Partners XII	Late Stage	07/10/2006	40,000,000	39,968,468	19,176,423
40. Permira UK Venture Fund IV	Balanced	09/30/1996	15,248,000	15,993,572	23,494,012
41. Pitango Venture Capital Fund IV	Early Stage	07/19/2004	20,000,000	20,001,534	9,809,664
Pitango Venture Capital Fund V	Early Stage	08/22/2007	30,000,000	28,163,295	16,866,840
42. Polaris Venture Partners II	Balanced	09/30/1998	25,000,000	24,750,000	40,118,427
Polaris Venture Partners III	Balanced	01/21/2000	50,000,000	49,500,000	29,629,123
Polaris Venture Partners IV	Balanced	09/30/2002	50,000,000	49,750,000	37,609,685
Polaris Venture Partners V	Balanced	08/08/2006	50,000,000	49,000,000	33,243,318
43. Quaker BioVentures	Balanced	02/20/2003	20,000,000	20,000,000	3,526,430
Quaker BioVentures II	Balanced	04/03/2007	25,000,000	22,750,000	13,046,843
44. SCP Private Equity Partners II	Late Stage	06/15/2000	25,000,000	25,000,000	6,219,887
45. Sofinnova Venture Partners VII	Early Stage	01/18/2007	20,000,000	19,600,000	25,412,872
46. Summit Accelerator Fund	Early Stage	11/15/1999	8,000,000	7,609,500	13,127,408
Summit Partners Venture Capital Fund II	Early Stage	09/22/2006	15,000,000	15,823,703	22,536,326
47. T. Rowe Price Stock Distribution Account <sup>3/</sup>	Late Stage	01/03/2005		See Footnote	
48. Three Arch Capital	Balanced	12/20/2000	20,000,000	19,500,000	15,455,458
Three Arch Partners IV	Balanced	06/04/2004	20,000,000	19,050,000	15,945,483
49. TL Ventures IV	Early Stage	05/13/1999	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
50. US Venture Partners VII	Balanced	02/18/2000	13,750,000	13,750,000	4,800,279
US Venture Partners VIII	Early Stage	06/01/2001	26,250,000	25,830,000	30,849,103
51. Weathergag Venture Capital	Fund of Funds	06/26/2007	25,000,000	22,875,000	14,151,174
Weathergag Venture Capital II	Fund of Funds	06/29/2010	25,000,000	21,500,000	1,692,670
52. Worldview Technology Partners IV	Balanced	01/31/2001	18,130,023	16,951,175	7,034,048
<b>Total Active Venture Capital</b>			<b>\$2,688,943,593</b>	<b>\$2,592,040,832</b>	<b>\$2,079,478,967</b>

Cash flows as of September 30, 2015.

<sup>1/</sup>Commitments as of December 31, 2015.

<sup>2/</sup>Distributions include stock distributions.

<sup>3/</sup>T. Rowe Price acts as a stock liquidation account. All cash and stock distributions are reflected in the corresponding distributions.



# INVESTMENT SECTION

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## Investment Summary - Global Public Equity

December 31, 2015 (unaudited)

### Asset Class Description

Global Public Equity includes SERS Fund assets held in publicly traded securities of companies throughout the developed world and in emerging markets.

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

Global Public Equity is the most highly volatile asset class in SERS Fund, and thus, the largest contributor to total SERS Fund volatility. This asset class contributes a high expected long-term return to SERS Fund but also brings the largest measure of near-term downside risk.

### Role in the SERS Fund

The program seeks high total return, which may be accompanied by higher volatility. This asset class offers a high degree of immediate liquidity in normal market conditions and can provide moderate inflation protection.

### Program Structure

The Global Public Equity program accomplishes its objective through active and passive ownership of large, mid, and small capitalization stocks worldwide.

The program maintains a neutral profile compared to the composition of the program's benchmark. Regional and capitalization exposures emulate the benchmark. This neutral structure reduces uncompensated risk and makes security selection the primary determinant of excess return performance.

Within the context of benchmark neutrality, the portfolio is organized in a core/satellite structure. In developed markets, core investments include low-cost

index funds, which provide equity market exposure in the most efficient regions of the global equity market. In emerging markets, core investments include diverse, actively-managed strategies that provide moderate excess return expectations. The goal of the core portion in less-efficient emerging markets is to capture all available excess returns while controlling risk.

Regardless of region, satellite investments include aggressive investment strategies with moderate-to-high excess return targets. Such investments generally have concentrated exposures. When combined, these investments complement and diversify each other, providing opportunity for more stable, high, risk-adjusted returns.

While passive mandates are routinely employed, the program maintains a moderate bias toward active management, particularly in portions of the equity universe where historical returns have been commensurate with active risk taken. This bias is examined on a periodic basis.

### Asset Class Benchmark

The objective of the program is to generate annualized total net returns that exceed the benchmark by approximately 100 basis points over a three- to five-year period. Performance is measured and evaluated relative to the MSCI All-Country World Investable Market Index (ACWI-IMI).

## Investment Summary - Global Public Equity

December 31, 2015 (unaudited)

### Global Public Equity

Manager	Investment Style	Market Exposure as of 12/31/15 <sup>4/</sup> (\$ millions)
<b>Global Mandates</b>		
1. Walter Scott & Partners Limited	Growth	\$658.2
<b>Total Global Mandates</b>		<b>658.2</b>
<b>U.S. Equity</b>		
2. Diamond Hill Concentrated	Large-cap concentrated	416.5
3. Emerald Advisers - PA Companies	Small-cap PA companies	431.9
4. Epoch Value	Large-cap value	380.0
5. Iridian Asset Management	Mid-cap private business value	386.9
6. Mellon Capital Management - PA Companies	Small-cap PA companies	243.1
Mellon Capital Management Russell 1000 Growth	Russell 1000 Growth	370.8
Mellon Capital Management Russell 1000 Index	Russell 1000 Index	2,829.5
<b>Total U.S. Equity</b>		<b>5,058.7</b>
<b>Non-U.S. Developed Markets Equity</b>		
7. Artisan Partners - Global ex U.S.	Global ex-U.S. growth	409.5
8. Harris Associates	Small-cap intrinsic value	474.8
Mellon Capital Management MSCI World ex U.S. Index	MSCI World ex-U.S. Index	1,760.0
9. Morgan Stanley Investment Management Limited-developed ex U.S.	EAFE value	397.3
10. Templeton Investment Counsel - Global ex U.S.	Global ex-U.S. value	562.1
<b>Total Non-U.S. Developed Markets Equity</b>		<b>3,603.7</b>
<b>Emerging Markets Equity</b>		
11. Ashmore EMM	Small-cap value	112.0
12. BlackRock/Emerging Markets Index Non-Lendable Fund	MSCI Emerging Markets Index	121.8
13. Delaware Investment Advisers	Mid/large cap value	218.2
14. GlobeFlex Capital	Small-cap - GARP	70.7
15. Martin Currie Investment Management	All-cap	203.4
<b>Total Emerging Markets Equity</b>		<b>726.1</b>
<b>Total Global Public Equity</b>		<b>\$10,046.7</b>

<sup>4/</sup>Includes securities and cash, which the manager had available for investment.

# INVESTMENT SECTION

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## Investment Summary - Real Assets

December 31, 2015 (unaudited)

### Asset Class Description

Real Assets include SERS Fund investments that predominantly own or develop physical assets and are more correlated to inflation than most other asset classes. There are two categories of investments in this class:

#### Private Real Assets

- *Private, closed-end, commingled funds and/or limited partnerships* with long-term capital commitments and limited liquidity, including: real estate, energy, infrastructure assets, agriculture, timber, mining, water, and other natural resources
- *Investments through separate account relationships* with reasonable levels of liquidity over a 12- to 18-month period
- *Private, open-ended funds* with investor redemption rights with reasonable levels of liquidity over a six- to 12-month period

#### Public Real Assets

- *REITs* are publicly traded real estate investment trusts.
- *Commodities, listed infrastructure, and master limited partnerships* provide exposure to oil and gas, natural resources, and infrastructure projects.

### Role in the SERS Fund

The program is intended to generate competitive long-term returns through capital appreciation and current income. Real Assets generally offer lower volatility than the equity markets and provide at least moderate protection against inflation. The asset class provides significant diversification benefits due to its relatively low correlation to stocks and bonds.

### Program Structure

The Real Assets portfolio contains both public and private investments, direct and indirect investments, and investments across a variety of sub-asset classes; however, it is currently dominated by exposure to real estate and commodities. Focus during the plan period is to diversify into other real assets sectors.

### Asset Class Benchmark

Performance is measured and evaluated over a three- to five-year period relative to a custom stylized benchmark including market-based sub-asset class indices where available (such as real estate, timber, agriculture), or CPI + 3% where not available, with the various components weighted according to long-term allocation targets within the class.

## Investment Summary - Real Assets

December 31, 2015 (unaudited)

### Real Assets

Manager	Vintage Year	Asset Type	Investment Structure	Fair Value as of 12/31/15 (\$ millions)
<b>Private Energy</b>				
1. Carlyle Energy Mezz Opp Fund	2012	Energy	Limited Partnership	\$28.9
2. Denham Commodity VI	2012	Energy	Limited Partnership	16.9
3. Energy Spectrum Partners V	2007	Energy	Limited Partnership	0.3
4. First Reserve Fund X	2004	Energy	Limited Partnership	0.2
First Reserve Fund XI	2006	Energy	Limited Partnership	7.3
First Reserve Fund XII	2008	Energy	Limited Partnership	16.1
5. Lime Rock Partners III	2004	Energy	Limited Partnership	0.7
Lime Rock Resources	2005	Energy	Limited Partnership	0.6
Lime Rock Partners IV	2006	Energy	Limited Partnership	36.8
Lime Rock Partners V	2008	Energy	Limited Partnership	16.5
6. OCM/GFI Power Opportunities Fund II	2005	Energy	Limited Partnership	0.2
Oaktree Power Opportunities Fund III	2010	Energy	Limited Partnership	13.6
7. SFC Energy Partners I	2007	Energy	Limited Partnership	3.6
SFC Energy Partners II	2011	Energy	Limited Partnership	2.8
<b>Total Private Energy</b>				<b>144.5</b>
<b>Non-Core Real Estate</b>				
8. AG Asia Realty Fund	2007	Diversified	Limited Partnership	7.6
9. Apollo Real Estate Fund III	1998	Diversified	Limited Partnership	0.1
10. Berwind Investment Partnership V <sup>1/</sup>	1999	Diversified	Limited Partnership	1.4
Berwind Investment Partnership VI <sup>1/</sup>	2002	Diversified	Limited Partnership	6.3
Berwind Investment Partnership VII <sup>1/</sup>	2005	Diversified	Limited Partnership	17.3
Berwind Investment Partnership VIII <sup>1/</sup>	2007	Diversified	Limited Partnership	8.2
Berwind Investment Partnership IX <sup>1/</sup>	2012	Diversified	Limited Partnership	20.0
11. Blackstone Real Estate Partners IV	2003	Diversified	Limited Partnership	8.6
Blackstone Real Estate Partners V	2006	Diversified	Limited Partnership	36.1
Blackstone Real Estate Partners VI	2007	Diversified	Limited Partnership	46.1
Blackstone Real Estate Partners VII	2011	Diversified	Limited Partnership	80.3
12. Clerestory Small Cap Fund I	2007	Diversified	Limited Partnership	8.7
13. Colony Investors VIII	2007	Diversified	Limited Partnership	5.1
14. Fillmore West Fund	2008	Debt	Limited Partnership	19.3
15. Hawkeye Scout Fund I	2006	Diversified	Limited Partnership	8.1
16. LEM Real Estate High-Yield Debt Fund III	2012	Debt	Limited Partnership	31.8

# INVESTMENT SECTION

## Investment Summary - Real Assets

December 31, 2015 (unaudited)

### Real Assets (continued)

	Manager	Vintage Year	Asset Type	Investment Structure	Fair Value as of 12/31/15 (\$ millions)
<b>Non-Core Real Estate (continued)</b>					
17.	Lubert Adler Fund III	2000	Diversified	Limited Partnership	\$0.1
	Lubert Adler Fund IV	2004	Diversified	Limited Partnership	1.9
	Lubert Adler Fund V	2006	Diversified	Limited Partnership	9.4
	Lubert Adler Fund VI	2008	Diversified	Limited Partnership	9.5
	Lubert Adler Fund VII	2014	Diversified	Limited Partnership	9.5
18.	OCM Real Estate Opp Fund III	2003	Diversified	Limited Partnership	1.5
19.	Oxford GSA Fund	2006	Diversified	Limited Partnership	1.8
20.	Prudential Latin America Retail Fund I	2006	Retail	Limited Partnership	0.9
	Prudential Senior Housing Fund III	2006	Senior housing	Limited Partnership	0.2
	Prudential Latin America Residential Fund III	2007	Residential	Limited Partnership	11.8
	Prudential Senior Housing Fund IV	2011	Senior housing	Limited Partnership	22.6
	Prudential Senior Housing Fund V	2015	Senior housing	Limited Partnership	5.1
21.	Rockpoint Real Estate Fund I	2004	Diversified	Limited Partnership	0.1
	Rockpoint Real Estate Fund II	2005	Diversified	Limited Partnership	9.2
	Rockpoint Finance Fund I	2006	Diversified	Limited Partnership	1.1
	Rockpoint Real Estate Fund III	2007	Diversified	Limited Partnership	7.0
22.	Starwood Fund IV	1997	Diversified	Limited Partnership	0.1
	Starwood Fund VI	2001	Diversified	Limited Partnership	14.1
	Starwood Fund VII	2005	Diversified	Limited Partnership	13.7
	Starwood Fund VIII	2007	Diversified	Limited Partnership	23.8
23.	ValStone Opportunity Fund V	2014	Diversified	Limited Partnership	14.9
24.	Westbrook Fund V	2004	Diversified	Limited Partnership	5.7
	Westbrook Fund VI	2005	Diversified	Limited Partnership	14.3
	Westbrook Fund VII	2006	Diversified	Limited Partnership	23.0
	Westbrook Fund VIII	2009	Diversified	Limited Partnership	13.3
<b>Total Non-Core Real Estate</b>					<b>519.6</b>
<b>Core Real Estate</b>					
25.	Fidelity Real Estate Opportunistic Income Fund	2007	Debt	Limited Partnership	63.9
26.	Forest I.M.A.	1992	Timber	Separate Account	153.7
27.	Heitman I.M.A.	1988	Diversified	Separate Account	85.4
	Heitman America Real Estate Trust	2007	Diversified	Limited Partnership	176.5
28.	LaSalle I.M.A.	1994	Diversified	Separate Account	413.7
29.	Lowe I.M.A.	1994	Diversified	Separate Account	484.0
	Lowe GTO	2012	Diversified	Separate Account	261.4

## Investment Summary - Real Assets

December 31, 2015 (unaudited)

### Real Assets (continued)

Manager	Vintage Year	Asset Type	Investment Structure	Fair Value as of 12/31/15 (\$ millions)
<b>Core Real Estate (continued)</b>				
30. UBS Trumbull Property Fund	1988	Diversified	Open-Ended Fund	\$69.2
UBS Trumbull Property Income Fund	1988	Diversified	Open-Ended Fund	61.0
<b>Total Core Real Estate</b>				<b>1,768.8</b>
<b>REITs</b>				
31. CBRE Clarion Real Estate Securities	1996	REITs	Separate Account	280.0
32. CenterSquare Real Estate Securities	2002	REITs	Separate Account	66.4
<b>Total REITs</b>				<b>346.4</b>
<b>Commodities and Infrastructure</b>				
33. BAAM Commodities	2007	Commodities	Open-Ended Fund	325.6
34. Harvest Fund MLP	2013	MLPs	Separate Account	125.2
35. Kayne Anderson MLP	2013	MLPs	Separate Account	107.4
36. Wellington DIH	2004	Commodities	Open-Ended Fund	253.2
<b>Total Commodities and Infrastructure</b>				<b>811.4</b>
<b>Total Real Assets</b>				<b>\$3,590.7</b>

<sup>4/</sup> Fair values for these managers have not been received as of year-end. The values are third quarter fair values adjusted by fourth quarter cash flows.

# INVESTMENT SECTION

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## Investment Summary - Diversifying Assets

December 31, 2015 (unaudited)

### Asset Class Description

The Diversifying Assets program includes investments designed to provide total returns comparable to the total SERS Fund return but with less volatility and lower correlation to other asset classes.

### Role in the SERS Fund

The program seeks to provide competitive returns and protect capital in all market conditions by investing 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 targets a liquidity profile less than that of public equities but significantly more than private equity.

### Program Structure

The program contains both direct and fund-of-funds investments, which invest across a wide variety of strategies.

### Asset Class Benchmark

Performance is measured and evaluated over a three-to five-year period relative to the HFRI Fund-of-Funds Strategic Index.



## Investment Summary - Diversifying Assets

December 31, 2015 (unaudited)

### Diversifying Assets

Manager	Investment Style	Market Exposure as of 12/31/15 <sup>1/</sup> (\$ millions)
<b>Absolute Return Strategies</b>		
1. Arden	Fund of Funds	\$22.5
2. Blackstone - Stable Alpha	Fund of Funds	27.5
3. Mesirow Financial	Fund of Funds	31.3
4. Morgan Stanley Alternative Investment Partners	Fund of Funds	10.5
5. PAAMCO	Fund of Funds	9.8
6. Robeco Investment	Fund of Funds	0.3
7. Rock Creek	Fund of Funds	3.5
<b>Total Absolute Return Strategies</b>		<b>105.4</b>
<b>Hedged Strategies</b>		
Arden Keystone	Fund of Funds	145.1
Blackstone Keystone	Fund of Funds	1,016.9
8. Entrust Keystone	Fund of Funds	302.8
<b>Total Hedged Strategies</b>		<b>1,464.8</b>
<b>Direct Investments</b>		
9. Hoplite Partners	Direct Hedge Fund	22.5
10. Luxor Capital Partners	Direct Hedge Fund	14.6
11. MKP Opportunity Fund	Direct Hedge Fund	14.8
12. Pine River Fund	Direct Hedge Fund	20.5
13. Samlyn Onshore Fund	Direct Hedge Fund	15.7
14. Stelliam Fund	Direct Hedge Fund	15.0
<b>Total Direct Investments</b>		<b>103.1</b>
<b>Total Diversifying Assets</b>		<b>\$1,673.3</b>

<sup>1/</sup>Includes securities and cash, which the manager had available for investment.

# INVESTMENT SECTION

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## Investment Summary - Fixed Income/Liquidity Reserve

December 31, 2015 (unaudited)

### Asset Class Description

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. Fixed income investments have substantially lower volatility than equities and most fixed income investments are significantly uncorrelated with equity returns.

The Liquidity Reserve has a distinct mandate to support regular disbursement of SERS Fund obligations and is invested in liquid and short-term instruments either directly or through a fund structure.

### Role in the SERS Fund

The program is structured to generate income to pay benefits, provide liquidity to minimize capital impairment risk, reduce volatility in SERS Fund, protect SERS Fund against deflation (via Treasuries) and inflation (via TIPS), and contribute to SERS Fund return when market conditions permit.

### Program Structure

There are four key components to the Fixed Income program. The size of each is based on SERS Fund's liabilities and expected cash flows, general liquidity conditions in the capital markets, inflation and economic growth expectations, the risk level of SERS Fund, and current valuations of various fixed income strategies. Components of the program include:

- *Core and Core Plus Fixed Income* provide excess return when performance conditions are favorable, offer varying potential return with a corresponding variance in expected risk, provide capital protection in difficult market conditions, and offer risk mitigation due to low correlation with equity depending on the mix of core and core plus exposures in the composite.
- *Inflation Protection Securities* preserve purchasing power due to high positive correlation to inflation and predominantly includes U.S. Treasury Inflation Protection Securities (TIPS) and some foreign inflation protection securities.
- *Nominal U.S. Treasuries* provide SERS Fund with a deflation hedge and a ready source of liquidity to pay benefits.
- The *Liquidity Reserve* includes cash equivalents and short-duration notes that mature within five years.

### Asset Class Benchmarks

Performance is evaluated over a five-year period relative to the following benchmarks:

- Fixed Income – Barclays U.S. Aggregate Bond Index
- Liquidity Reserve – BofA ML 3 Month U.S. T-Bill Index

## Investment Summary - Fixed Income/Liquidity Reserve

December 31, 2015 (unaudited)

### Fixed Income

Manager	Investment Style	Market Exposure as of 12/31/15 <sup>1/</sup> (\$ millions)
<b>Core Plus</b>		
1. Brandywine Global	Global Sovereign Credit	\$173.9
2. PIMCO EMD	Emerging Market Debt (liquidating)	0.1
3. Pyramis Global Advisors	Commercial Mortgage-Backed Securities	298.4
4. SEI Structured Credit Fund	High Yield Bank Loans	226.6
5. Stone Harbor	Emerging Market Debt	117.9
Stone Harbor	Global High Yield	176.3
6. W.R. Huff	High Yield (liquidating)	11.7
7. Waterfall Asset Management	Asset-Backed Securities	173.8
<b>Total Core Plus</b>		<b>1,178.7</b>
<b>Core</b>		
8. Mellon Capital Management	Barclays Aggregate	1,117.6
9. MacKay Shields Core	Barclays Aggregate	192.7
PIMCO Core	Barclays Aggregate ex. Treasuries	243.1
10. Taplin, Canida & Habacht (TCH)	U.S. Credit	166.9
11. UBS Core Bond	Barclays Aggregate	101.0
<b>Total Core</b>		<b>1,821.3</b>
<b>Global Treasury Inflation Protected Securities (TIPS)</b>		
12. Brown Brothers Harriman	Global TIPS	200.6
13. New Century Advisors	Global TIPS	102.2
14. NISA Investment Advisors	U.S. TIPS	451.5
<b>Total Global Treasury Inflation Protected Securities (TIPS)</b>		<b>754.3</b>
<b>Nominal U.S. Treasuries</b>		
PIMCO U.S. Treasuries	Domestic Treasuries	266.9
15. Wellington U.S. Treasuries	Domestic Treasuries	264.0
<b>Total Nominal U.S. Treasuries</b>		<b>530.9</b>
<b>Total Fixed Income</b>		<b>\$4,285.2</b>

<sup>1/</sup>Includes securities and cash, which the manager had available for investment.

# INVESTMENT SECTION

## Investment Summary - Fixed Income/Liquidity Reserve

December 31, 2015 (unaudited)

### Liquidity Reserve<sup>1/</sup>

Manager	Investment Style	Market Exposure as of 12/31/15 <sup>2/</sup> (\$ millions)
<b>Short-Term Notes</b>		
1. PNC Short Duration	Short Duration Government Credit	\$233.9
2. StoneRidge Short Duration	Short Duration Government Credit	117.6
<b>Total Short-Term Notes</b>		<b>351.5</b>
<b>Cash Equivalent</b>		
3. PA State Treasury (STIF)	Cash	1,348.0
PA Treasury Overnight Cash	Cash	4.3
<b>Total Cash Equivalent</b>		<b>1,352.3</b>
<b>Liquidate Holdings</b>		
Liquidate Holdings	Securities to be Liquidated	0.1
<b>Total Liquidate Holdings</b>		<b>0.1</b>
<b>Total Liquidity Reserve</b>		<b>\$1,703.9</b>

<sup>1/</sup> The SERS Liquidity Reserve is jointly managed by SERS Fixed Income investment staff and the Pennsylvania Treasury.

<sup>2/</sup> Includes securities and cash, which the manager had available for investment.

**2015**

**Actuarial Section**



May 16, 2016

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, 2015 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, 2016:

- (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 first 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 first 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 16, 2016

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 employer groups 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, 2015 actuarial funding valuation, with the exception of the investment return assumption, was adopted by the State Employees' Retirement Board (the Board) based upon actual experience of SERS during the years 2011 through 2015. Based upon an annual review of SERS investment data and results, the Board approved a reduction in the assumed annual investment return from 8.0% to 7.5% effective as of the December 31, 2011 actuarial funding valuation and the Board has retained the 7.5% assumption every year since then. 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, 2015 actuarial funding valuation and are included herein.





Mr. David E. Durbin

May 16, 2016

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 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, 2015 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.

As actuaries for SERS, Hay Group considers it important to note that the Act 120 contribution collars continue to result in employer funding at levels below the otherwise applicable pre-collared contribution levels. This is not to say that required employer contributions will never be made; rather, Act 120 provides that they will be deferred and paid in future years. It is therefore essential to the long-term funding of the system that the Commonwealth adhere not only to the short-term collars provided by Act 120 but also to the long-term funding obligations that the statute established.

We expect this December 31, 2015 actuarial funding valuation to be the last annual valuation under which the contribution collars will govern employer contribution levels. That is, we expect required employer contributions determined in our December 31, 2016 actuarial funding valuation to be below the collared contribution level, thereby making the Act 120 collars no longer applicable (for FY2018 or beyond). While Hay Group would prefer that SERS funding in FY2017 be based upon the pre-collared contribution levels, we recognize that the contribution collars continue to provide, as they have for many years, an important and necessary funding



Mr. David E. Durbin  
May 16, 2016

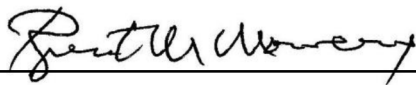
deferral mechanism. Following the collared contribution level in FY2017, we anticipate that annual funding on an actuarial basis will resume in FY2018.

### **Actuarial Certification**

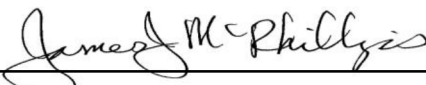
To the best of our knowledge, this report is complete and accurate and all costs and liabilities have been determined in conformance with generally accepted actuarial principles and on the basis of actuarial assumptions and methods which are reasonable (taking into account the past experience of SERS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

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

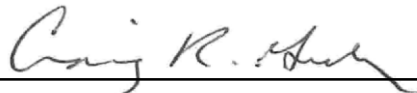
Respectfully submitted,  
Hay Group, Inc.

By 

Brent M. Mowery, F.S.A.  
Member American Academy of Actuaries  
Enrolled Actuary No. 14-3885

By 

James J. McPhillips, F.S.A.  
Member American Academy of Actuaries  
Enrolled Actuary No. 14-4992

By 

Craig R. Graby  
Member American Academy of Actuaries  
Enrolled Actuary No. 14-7319

## Summary of Actuarial Assumptions and Methods

December 31, 2015 (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 of Trustees. 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 approach is used as the asset valuation method compared to fair (market) 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 7.5% per year is based on an underlying rate of inflation of 2.75% per year.
- For current and future non-disabled retirees, beneficiaries, and survivors, SERS uses the RP-2000 Male and Female Combined Healthy Mortality Tables projected (using Projection Scale AA) to 2016 for males and to 2020 for females, and then further adjusted to ensure sufficient margin for improvement in certain age ranges. For current and future disabled retirees, SERS uses the RP-2000 Male and Female Disabled Retiree Mortality Tables projected (using Projection Scale AA) to 2021 for males and to 2017 for females. For all pre-retirement active members, the mortality is based on actual SERS experience.
- 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**.

# ACTUARIAL SECTION

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## Summary of Actuarial Assumptions and Methods

December 31, 2015 (unaudited)

- The projected average salary increase of 5.70% with a range of 3.85% to 9.05%. This increase includes an underlying assumption of 2.75% for inflation. The annual rate of salary increase for promotions and longevity for members is presented in the **Schedules of Active Member Valuation Data**.
- No cost-of-living adjustments were used in the determination of actuarial valuations.

SERS periodically prepares a study using actual experience in order to develop assumptions for use in

its actuarial valuations. The latest study dated March 9, 2016 was completed for the period January 1, 2011 through December 31, 2015.

The most recent valuations were based on members of SERS as of December 31, 2015. 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, 2015 (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, 2015 (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, 2015 (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	26	NA	NA	NA	NA	NA	NA	26	\$25,243
20 - 24	1,156	5	NA	NA	NA	NA	NA	1,161	33,099
25 - 29	3,720	621	10	NA	NA	NA	NA	4,351	43,942
30 - 34	2,674	2,513	723	9	NA	NA	NA	5,919	52,849
35 - 39	1,886	1,905	1,972	533	8	NA	NA	6,304	58,226
40 - 44	1,586	1,526	1,762	1,697	624	16	NA	7,211	63,715
45 - 49	1,451	1,410	1,588	1,826	2,487	821	21	9,604	70,011
50 - 54	1,439	1,207	1,446	1,221	1,511	1,591	592	9,007	66,395
55 - 59	1,191	1,174	1,316	1,152	1,028	1,238	1,216	8,315	64,141
60 - 64	824	919	1,063	869	591	490	597	5,353	63,970
65+	405	495	568	391	241	172	321	2,593	66,693
<b>Total</b>	<b>16,358</b>	<b>11,775</b>	<b>10,448</b>	<b>7,698</b>	<b>6,490</b>	<b>4,328</b>	<b>2,747</b>	<b>59,844</b>	<b>\$61,639</b>

Average Age: 46.33

Average Service: 11.94

### 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	36	NA	NA	NA	NA	NA	NA	36	\$23,630
20 - 24	1,102	7	NA	NA	NA	NA	NA	1,109	30,026
25 - 29	2,566	494	23	NA	NA	NA	NA	3,083	37,828
30 - 34	2,058	1,550	515	31	NA	NA	NA	4,154	44,295
35 - 39	1,691	1,363	1,301	408	19	NA	NA	4,782	49,119
40 - 44	1,470	1,241	1,158	823	385	27	NA	5,104	51,038
45 - 49	1,481	1,297	1,247	918	899	602	43	6,487	53,152
50 - 54	1,340	1,347	1,205	908	842	890	712	7,244	54,071
55 - 59	1,168	1,236	1,326	962	916	841	958	7,407	54,459
60 - 64	594	823	914	685	447	390	428	4,281	53,844
65+	197	297	343	265	128	96	168	1,494	55,051
<b>Total</b>	<b>13,703</b>	<b>9,655</b>	<b>8,032</b>	<b>5,000</b>	<b>3,636</b>	<b>2,846</b>	<b>2,309</b>	<b>45,181</b>	<b>\$50,525</b>

Average Age: 46.57

Average Service: 11.11



# ACTUARIAL SECTION

## Schedules of Active Member Valuation Data

December 31, 2015 (unaudited)

### Aggregate Active Member Valuation Data

Valuation Year Ended Dec 31	Number of Employers	Number of Active Members	Covered Employee Payroll	Annual Average Pay	% Increase in Average Pay
2015	104 <sup>1/</sup>	105,025	\$5,972,000,000	\$56,858	3.7%
2014	104 <sup>1/</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
2006	108	110,972	5,118,000,000	46,118	2.9

<sup>1/</sup>The membership includes 39 employers and the commonwealth is classified as its largest employer. The commonwealth is comprised of 66 agencies and when everything is evaluated separately, SERS has a total of 104 participating employers/agencies.

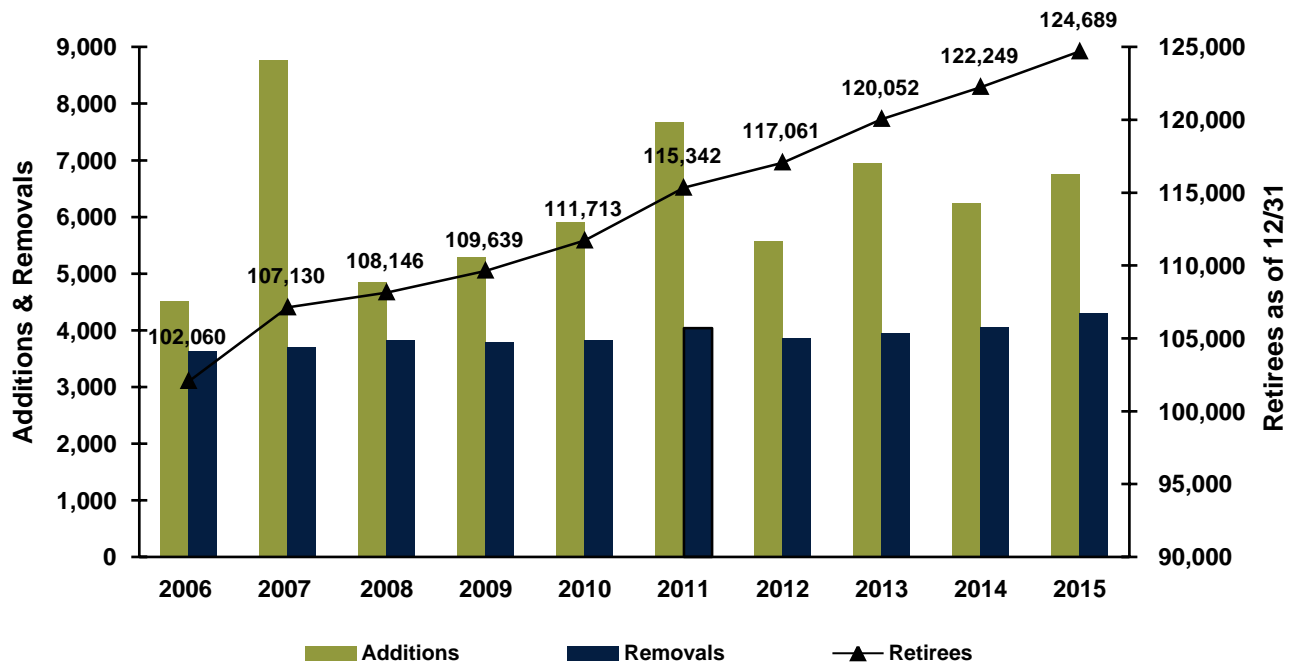
## Schedule of Retirees and Beneficiaries Added to and Removed from Rolls

December 31, 2015 (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
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
2006	4,514	96,324,336	3,633	40,351,097	102,060	1,655,881,296	0.9	3.4

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



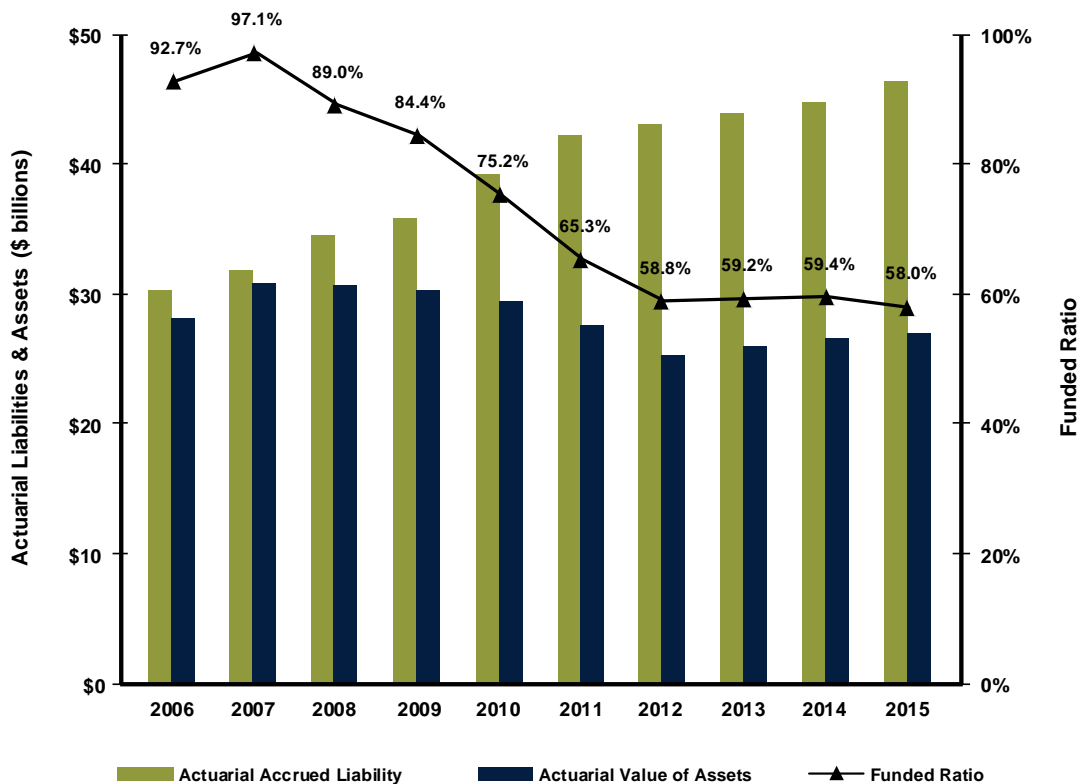
# ACTUARIAL SECTION

## Solvency Test

December 31, 2015 (unaudited)

### Fund Solvency<sup>1/</sup> (\$ thousands)

Valuation Year Ended Dec 31	Actuarial Accrued Liabilities For			Total Actuarial 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)						
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
2006	3,916,841	14,474,525	11,973,631	30,364,997	28,148,834	100.0	100.0	81.5	92.7



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

## Analysis of Financial Experience

December 31, 2015 (unaudited)

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

Type of Activity	2015	2014	2013	2012
(Loss)/gain from investment earnings <sup>2/</sup>	\$(279,734)	\$237,982	\$559,502	\$(2,541,098)
Changes in demographics of new entrants	(6,055)	(31,582)	(6,131)	(54,250)
Pay increases different than assumptions	(253,176)	86,914	248,583	383,003
Differences between actual and expected demographic experience	(81,547)	(35,152)	(160,323)	(90,631)
<b>(Loss)/gain during year from financial experience</b>	<b>(620,512)</b>	<b>258,162</b>	<b>641,631</b>	<b>(2,302,976)</b>
Non recurring items				
Changes in assumptions	(366,637)	-	-	-
Loss due to collar restrictions <sup>3/</sup>	(535,701)	(740,401)	(985,902)	(941,267)
<b>Composite loss</b>	<b>\$(1,522,850)</b>	<b>\$(482,239)</b>	<b>\$(344,271)</b>	<b>\$(3,244,243)</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>Act 2010-120 capped the growth of employer contributions to 3% for commonwealth FY 11/12, 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, 2015 (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
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
2006	28,148,834	30,364,997	92.7	2,216,163	5,117,807	43.3

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

**Schedule of Contributions Under Previous Reporting Standards**

December 31, 2015 (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
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
2006	548,745	195,407	35.6

<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.

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, 2015 (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
2006 <sup>6/</sup>	\$5,661,675	6.25%	8.21%	-6.30%	1.91%	4.00%	92.7%
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>7/</sup>	5,935,988	6.25	9.53	-3.89	5.64	5.00	84.4
2010 <sup>8/</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
<b>2015</b>	<b>6,255,189</b>	<b>6.25</b>	<b>4.52</b>	<b>27.62</b>	<b>32.14</b>	<b>29.50</b>	<b>58.0</b>
2016 <sup>9/,10/</sup>	6,445,972	6.25	4.52	27.18	31.70	31.70	59.0
2017	6,642,574	6.25	4.52	26.69	31.21	31.21	60.1
2018	6,845,173	6.25	4.52	26.59	31.11	31.11	60.3
2019	7,053,951	6.25	4.52	26.37	30.89	30.89	60.7
2020	7,269,096	6.25	4.52	25.72	30.24	30.24	61.9
2021	7,490,804	6.25	4.52	25.07	29.59	29.59	63.1
2022	7,719,273	6.25	4.52	24.43	28.95	28.95	64.4
2023	7,954,711	6.25	4.52	23.79	28.31	28.31	65.6
2024	8,197,330	6.25	4.52	23.16	27.68	27.68	66.9
2025	8,447,348	6.25	4.52	22.55	27.07	27.07	68.2
2026	8,704,992	6.25	4.52	21.96	26.48	26.48	69.5

<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>Member contribution rate is 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 2007-8 amended the Retirement Code to place a permanent floor of 4.00% on the employer contribution rate.

<sup>7/</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>8/</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>9/</sup>Numbers are projected from 2016 - 2026 based on 2015 actuarial funding valuation.

<sup>10/</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, 2015 (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, 2015 (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 three-year average salary; with 25 or more years of service, the benefit is 75% of the highest three-year average 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.

**2015**

**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, 2015. 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, 2015. 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, 2015. 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, 2015. 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, 2015.

### **Revenue Capacity**

The **Schedule of Investment Income** presents the details of the total net investment income/loss for the 10 years ended December 31, 2015. 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, 2015.

# STATISTICAL SECTION

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## Statistical Section Narrative

December 31, 2015 (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, 2015.

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, 2015.

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, 2015.

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, 2015.

The **Schedule of Employer 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, 2015, as well as a listing of additional employers/agencies participating with SERS as of December 31, 2015.

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, 2015 (unaudited)

Trend Data<sup>1/</sup>

	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006
<b>Year End Contribution Rates</b>										
Employer <sup>2/3/4/</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>	4.02% <sup>10/</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>	\$1,360,431	\$1,084,104	\$794,911	\$565,621	\$391,749	\$273,083	\$253,250	\$235,288	\$243,936	\$196,420
Member	\$371,624	\$365,923	\$351,968	\$347,937	\$350,852	\$349,049	\$348,805	\$336,833	\$333,818	\$317,790
Average Annual Compensation	\$56,858	\$54,769	\$53,224	\$52,230	\$52,159	\$51,228	\$50,813	\$48,957	\$48,345	\$46,118
Fiduciary Net Position (FNP)	\$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	\$32,052,830
Total Pension Liability (TPL) <sup>5/</sup>	\$44,238,721	\$42,195,186	\$41,057,541	NA	NA	NA	NA	NA	NA	NA
FNP as % of TPL <sup>5/</sup>	58.9%	64.8%	66.7%	NA	NA	NA	NA	NA	NA	NA
Net Pension Liability <sup>5/</sup>	\$18,183,831	\$14,857,408	\$13,663,385	NA	NA	NA	NA	NA	NA	NA
Actuarial Value of Assets <sup>4/</sup>	\$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	\$28,148,834
Actuarial Accrued Liability <sup>4/</sup>	\$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	\$30,364,997
Funded Ratio <sup>4/</sup>	58.0%	59.4%	59.2%	58.8%	65.3%	75.2%	84.4%	89.0%	97.1%	92.7%
Total Benefits and Refunds	\$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	\$1,919,426
Average Pension <sup>6/</sup>	\$27,042	\$26,426	\$25,839	\$25,083	\$24,448	\$23,491	\$22,695	\$21,965	\$21,326	\$20,025
Annuity and Beneficiaries	124,689	122,249	120,052	117,061	115,342	111,713	109,639	108,146	107,130	102,060
Active Members	105,025	104,431	105,186	106,048	107,021	109,255	110,107	110,866	109,610	110,972

<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>Average pension amount 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%.

<sup>10/</sup>Act 2003-40 established a minimum employer contribution rate of 4% effective July 1, 2006.

Source: State Employees' Retirement System

# STATISTICAL SECTION

## Schedule of Additions to Fiduciary Net Position

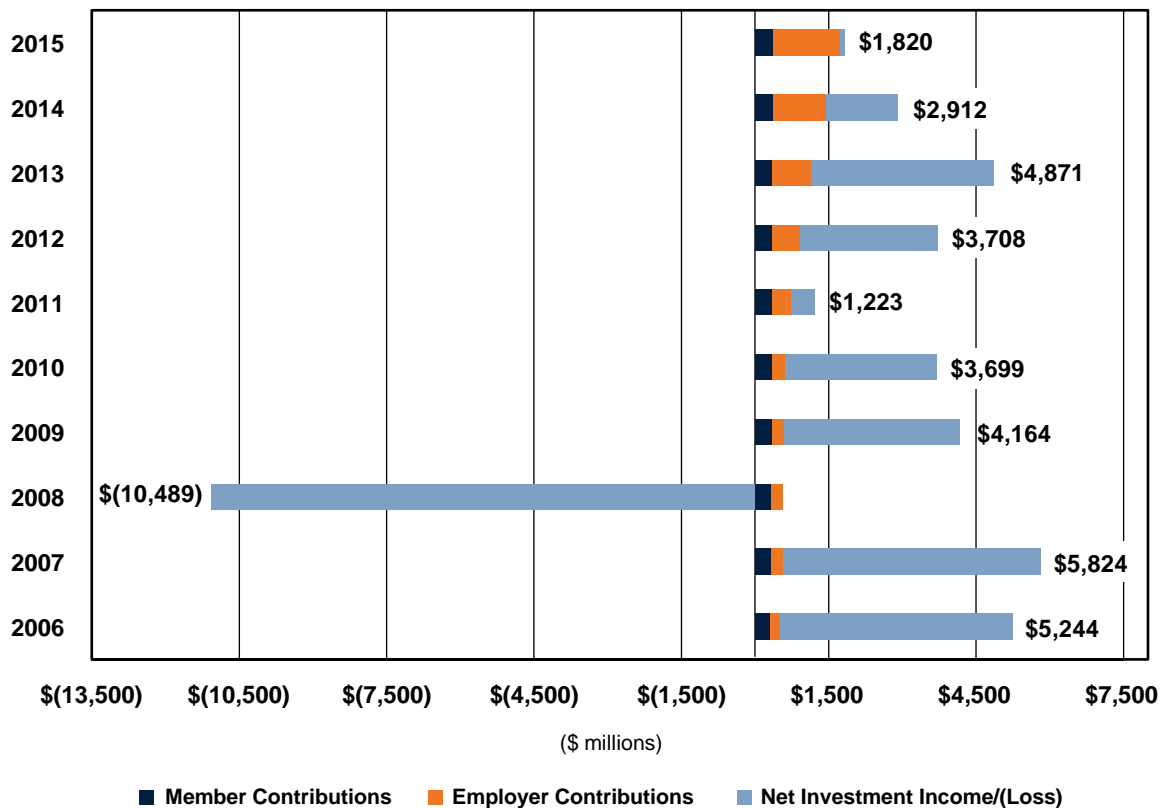
December 31, 2015 (unaudited)

### 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>		
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
2006	317,790	196,420	3.8	4,730,043	5,244,253

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



Source: State Employees' Retirement System



**Schedule of Deductions from Fiduciary Net Position**

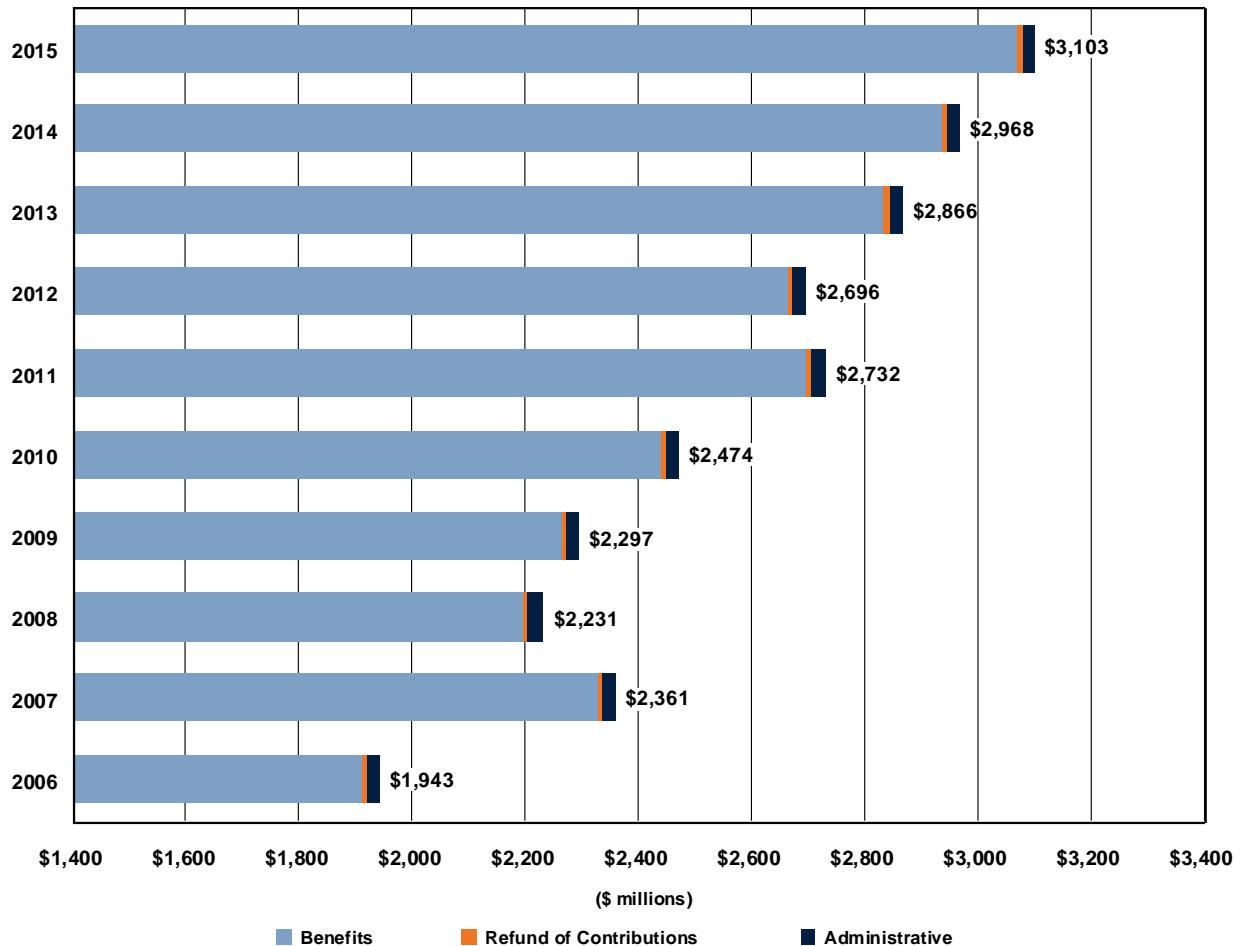
December 31, 2015 (unaudited)

**Deductions from Fiduciary Net Position**

(\$ thousands)

Year Ended	Benefits	Refund of Contributions	Administrative Expenses	Total
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 <sup>1/</sup>	8,183	24,748	2,361,116
2006	1,911,330	8,096	23,868	1,943,294

<sup>1/</sup>22% increase from prior year is due to large number of employees retiring as a result of changes in health care benefits.



Source: State Employees' Retirement System

# STATISTICAL SECTION

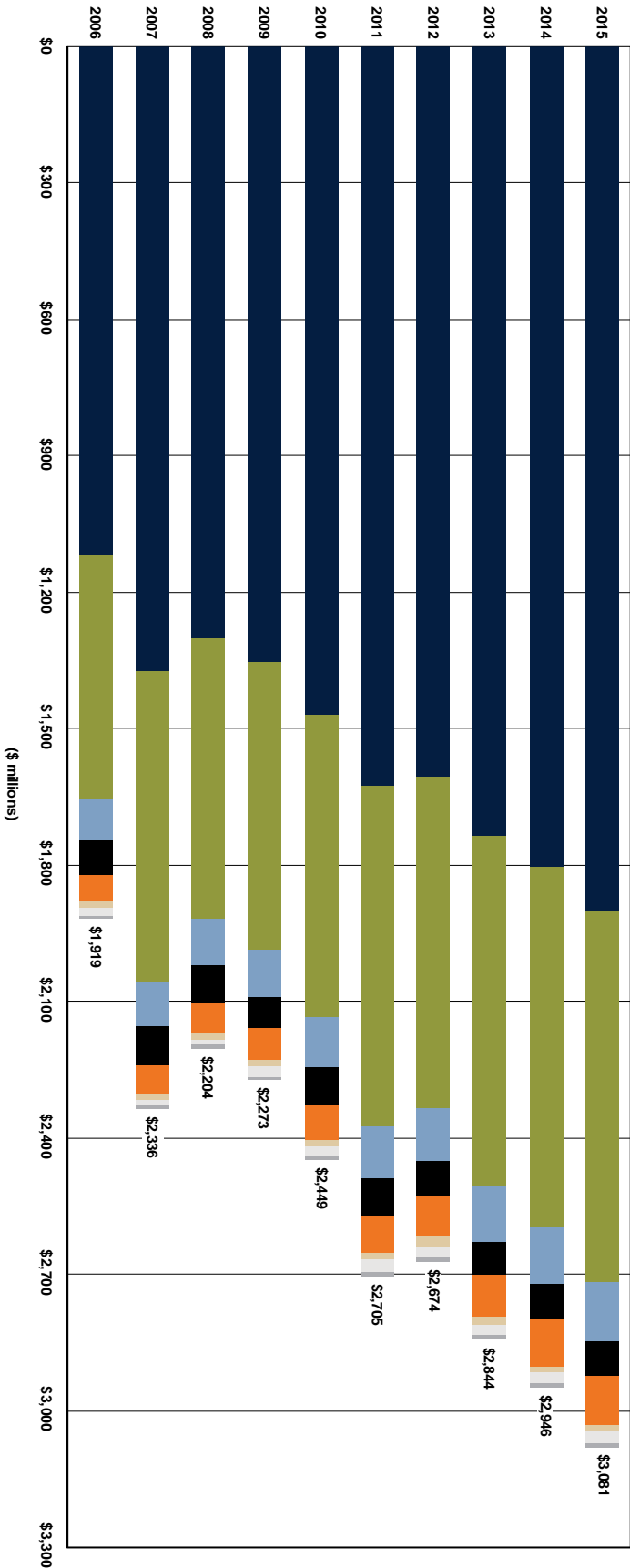
## Schedule of Benefit and Refund Deductions from Fiduciary Net Position by Type

December 31, 2015 (unaudited)

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

Year Ended	Retirement										Refunds		
	Normal	Early	Disability	Death	Survivor	Beneficiary	Transfers & Other	Total Benefit Deductions	Separation of Service	Death	Total Refunds		
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		
2006	1,117,801	535,156	93,358	73,885	58,038	14,988	18,104	1,911,330	7,971	125	8,096		

<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: State Employees' Retirement System

Schedule of Total Changes in Fiduciary Net Position

December 31, 2015 (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	Investment Income/ (Loss)	Total Additions	Benefits	Refund of Contributions	Administrative Expenses	Total Deductions	
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
2006	317,790	196,420	4,730,043	5,244,253	1,911,330	8,096	23,868	1,943,294	3,300,959

Source: State Employees' Retirement System

# STATISTICAL SECTION

## Schedule of Investment Income

December 31, 2015 (unaudited)

	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006
<b>Investment Income</b>										
(\$ thousands)										
Investment income/(loss) From investing activities										
Net (depreciation)/appreciation in fair value of investments <sup>1/</sup>	\$(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	\$3,723,160
Commingled funds appreciation/ (depreciation) and income <sup>1/</sup>	NA	NA	NA	275,103	(267,177)	810,147	1,063,673	(1,377,568)	798,941	641,718
Interest	130,616	142,434	120,815	144,431	165,082	146,995	149,040	342,163	347,507	350,783
Dividends	223,927	246,528	204,214	190,733	78,823	61,964	69,400	154,779	149,488	152,690
Real estate income	108,844	93,167	99,314	97,641	82,707	73,355	73,561	109,523	112,148	145,871
Miscellaneous income	3,426	1,799	668	4,583	2,316	6,471	3,499	5,969	6,149	3,519
Total investing activities income/(loss)	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	5,017,741
Investment expenses	(166,610)	(186,527)	(181,042)	(189,722)	(197,505)	(235,826)	(260,376)	(310,454)	(344,707)	(298,204)
Net income/(loss) from investing activities	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	4,719,537
From securities lending activities										
Securities lending income	5,105	9,917	4,326	3,953	2,376	2,511	7,092	41,319	155,067	170,675
Securities lending expenses	(501)	(568)	(606)	(512)	(294)	(272)	(572)	(47,253)	(142,094)	(160,169)
Net income/(loss) from securities lending activities	4,604	9,349	3,720	3,441	2,082	2,239	6,520	(5,934)	12,973	10,506
<b>Net investment income/(loss)</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>	<b>\$4,730,043</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: State Employees' Retirement System

**Schedule of Active Member Statistics**

December 31, 2015 (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	
2015	46.33	11.94	\$61,639	46.57	11.11	\$50,525	105,025
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
2006	46.39	12.80	49,455	46.20	12.49	41,616	110,972

Source: State Employees' Retirement System

# STATISTICAL SECTION

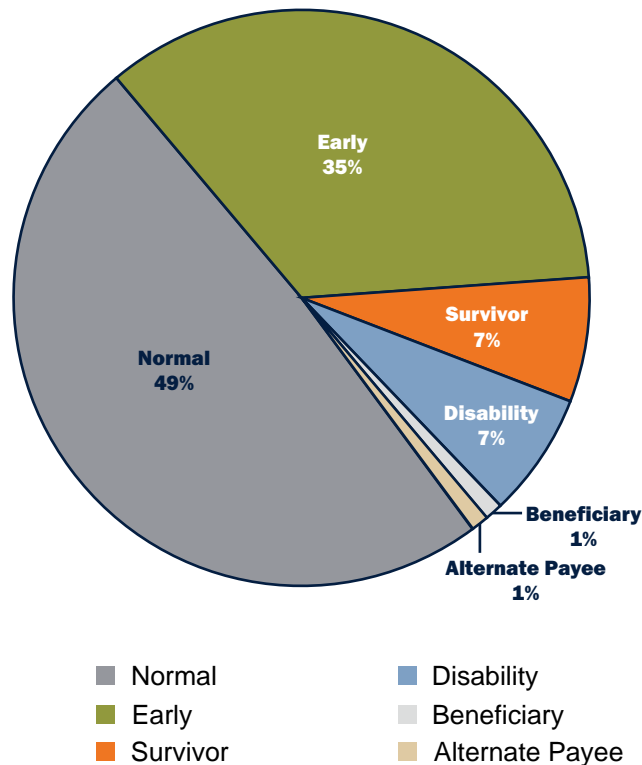
## Schedule of Retired Members by Type of Benefit

December 31, 2015 (unaudited)

### Retired Members by Type of Benefit

Amount of Monthly Benefits	Total Monthly Benefits <sup>1/</sup>	Total Number of Retirees	Type of Benefit					
			Normal	Disability	Early	Beneficiary	Survivor	Alternate Payee
≤ \$500	\$6,757,133	27,808	6,126	561	16,991	453	3,231	446
> 500 to 1,000	16,314,899	21,963	10,249	3,617	5,022	304	2,400	371
> 1,000 to 1,500	21,386,996	17,298	9,186	2,044	4,323	134	1,364	247
> 1,500 to 2,000	23,710,355	13,600	7,299	1,053	4,377	71	706	94
> 2,000 to 2,500	25,178,297	11,233	6,384	568	3,743	42	465	31
> 2,500 to 3,000	23,981,393	8,753	5,367	335	2,766	25	249	11
> 3,000	104,705,824	24,034	17,142	332	6,052	60	437	11
<b>Totals</b>	<b>\$222,034,897</b>	<b>124,689</b>	<b>61,753</b>	<b>8,510</b>	<b>43,274</b>	<b>1,089</b>	<b>8,852</b>	<b>1,211</b>

<sup>1/</sup>Does not include supplemental payments and transfers.



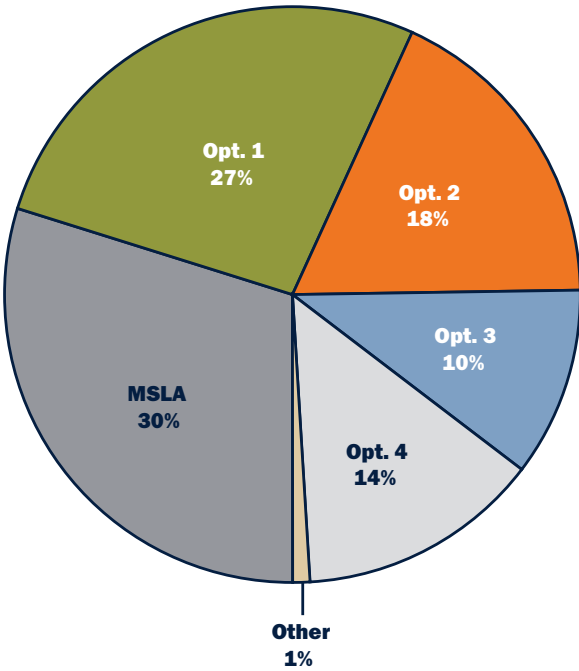
Source: State Employees' Retirement System

**Schedule of Retired Members by Option**

December 31, 2015 (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	\$6,757,133	27,808	6,395	11,319	5,967	1,785	1,857	485
> 500 to 1,000	16,314,899	21,963	7,505	5,604	4,342	2,118	2,053	341
> 1,000 to 1,500	21,386,996	17,298	5,257	4,301	3,461	1,848	2,279	152
> 1,500 to 2,000	23,710,355	13,600	4,154	3,296	2,360	1,628	2,077	85
> 2,000 to 2,500	25,178,297	11,233	3,297	2,565	1,871	1,428	2,024	48
> 2,500 to 3,000	23,981,393	8,753	2,642	1,911	1,359	1,143	1,666	32
> 3,000	104,705,824	24,034	7,948	4,651	3,010	3,286	5,075	64
<b>Totals</b>	<b>\$222,034,897</b>	<b>124,689</b>	<b>37,198</b>	<b>33,647</b>	<b>22,370</b>	<b>13,236</b>	<b>17,031</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: State Employees' Retirement System



# STATISTICAL SECTION

## Schedule of Average Monthly Benefit Payments

December 31, 2015 (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 1/1/2015 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
<b>Period 1/1/2006 to 12/31/2006</b>							
Average monthly benefit	\$174	\$316	\$690	\$1,171	\$1,878	\$2,487	\$3,489
Average final average salary	\$27,898	\$35,283	\$42,358	\$45,225	\$53,513	\$58,031	\$60,582
Number of retired members	51	584	491	667	471	627	1,205

<sup>1/</sup> Includes normal retirement, early retirement, and disability benefits for new retirees in the years listed.

Source: State Employees' Retirement System

**Schedule of Average Annual Benefit Payments**

December 31, 2015 (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	\$8,050	\$8,506
25-29	NA	NA	\$790	\$692	\$13,761	\$11,088	10,160	5,968
30-34	NA	NA	1,099	909	14,727	11,238	16,586	7,960
35-39	NA	NA	1,625	1,262	13,570	13,581	14,140	15,786
40-44	NA	NA	3,483	2,068	15,329	12,326	15,342	8,722
45-49	NA	NA	20,447	4,418	17,975	15,040	10,300	9,884
50-54	\$40,724	\$34,807	26,596	9,644	18,998	16,043	6,368	12,193
55-59	40,759	40,622	22,260	14,494	19,087	17,014	9,971	12,257
60-64	35,531	33,222	22,740	17,651	17,618	16,172	11,346	13,562
65-69	31,357	26,991	23,132	16,339	15,263	14,294	11,195	14,644
70-74	30,999	22,853	21,248	14,262	11,808	11,599	12,305	15,290
75-79	28,264	19,029	15,763	10,809	9,771	9,114	9,214	13,571
80-84	23,638	14,405	15,301	9,291	8,841	8,071	9,273	11,337
85-89	20,380	11,737	14,545	8,490	9,950	7,306	8,633	10,111
90 and over	17,364	9,659	13,388	7,521	8,915	7,833	8,366	7,973
<b>Total Average</b>	<b>\$30,019</b>	<b>\$22,974</b>	<b>\$20,457</b>	<b>\$13,207</b>	<b>\$15,904</b>	<b>\$14,211</b>	<b>\$10,373</b>	<b>\$12,213</b>

	Normal	Early	Disability	Beneficiary and Survivor
<b>Average Pension</b>	\$27,042	\$16,937	\$15,020	\$12,007
<b>Average Age</b>	72.3	64.0	63.0	74.6

Source: State Employees' Retirement System

## Schedule of Employer Participation - 20 Largest

December 31, 2015 (unaudited)

# - Number of active members  
% - Percentage of total active members

Employer/Agency Name	2015 <sup>1/</sup>		2014 <sup>1/</sup>		2013		2012		2011		2010		2009		2008		2007		2006	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Dept of Human Services	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	19,355	17.44
Dept of Corrections	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	15,151	13.65
Dept of Transportation	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	12,484	11.25
Pennsylvania State Police	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	6,172	5.56
Pennsylvania State University	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	6,265	5.65
State System of Higher Education	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	5,344	4.82
Dept of Labor and Industry	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	5,692	5.13
Liquor Control Board	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	4,102	3.70
PA Higher Education Assistance Agency	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	2,524	2.27
Dept of Military and Veterans Affairs	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	2,540	2.29
Dept of Environmental Protection	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	2,921	2.63
Dept of Conservation and Natural Resources	2,110	2.01	2,100	2.01	2,063	1.96	2,037	1.92	1,909	1.78	1,913	1.75	2,031	1.84	2,111	1.90	2,080	1.90	2,093	1.89
PA Turnpike Commission	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	2,276	2.05
Dept of Revenue	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	2,319	2.09
Administrative Office of PA Courts	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	1,989	1.79
Executive Offices	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	2,247	2.02
House of Representatives	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	1,701	1.53
Board of Probation and Parole	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	974	0.88
Dept of Health	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	1,479	1.33
Dept of General Services	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	1,340	1.21
Active members for 20 largest employers/agencies	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	98,968	89.18
Total number of active members	105,025		104,431		105,186		106,048		107,021		109,255		110,107		110,866		109,610		110,972	

Numbers may not add due to rounding.

<sup>1/</sup>The membership includes 39 employers and the commonwealth is classified as its largest employer. The commonwealth is comprised of 66 agencies and when everything is evaluated separately, SERS has a total of 104 participating employers/agencies.

Source: State Employees' Retirement System

**Schedule of Employers/Agencies Participation**

As of December 31, 2015 (unaudited)

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

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

<sup>1/</sup>The membership includes 39 employers and the commonwealth is classified as its largest employer. The commonwealth is comprised of 66 agencies and when everything is evaluated separately, SERS has a total of 104 participating employers/agencies.

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