

2018

# Comprehensive Annual Financial Report

With Independent Auditors' Report for Fiscal Years Ended  
December 31, 2018 and 2017

Commonwealth of Pennsylvania  
State Employees' Retirement System

A Component Unit of the Commonwealth of Pennsylvania



2018

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With Independent Auditors' Report for Fiscal Years Ended  
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State Employees' Retirement System

A Component Unit of the Commonwealth of Pennsylvania

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

**Terrill J. Sanchez**

Executive Director

**Sara E. McSurdy**

Acting Chief Financial Officer

**State Employees' Retirement System**

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**December 31, 2017**

*Christopher P. Morrill*

Executive Director/CEO



Public Pension Coordinating Council

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In recognition of meeting professional standards for  
plan funding and administration as  
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*Presented by the Public Pension Coordinating Council, a confederation of*

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

A handwritten signature in black ink that reads "Alan H. Winkle". The signature is written in a cursive, flowing style.

Alan H. Winkle  
Program Administrator

June 1, 2019

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

Dear Chairman Fillman,

The Pennsylvania State Employees' Retirement System (SERS) is pleased to present you with the 2018 calendar year Comprehensive Annual Financial Report (CAFR). The purpose of this report is to provide the governor, legislature, system members and annuitants, as well as the public with a clear accounting of SERS operations and financial position. We hope you will find this financial, investment, actuarial, and statistical material produced by SERS management to be both interesting and useful.

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

SERS administers two mandatory-participation retirement plans defined by the Internal Revenue Code: 1) the Defined Benefit Plan, for which assets are held in the State Employee Retirement Fund (pension fund); and, 2) the Defined Contribution Plan (investment plan) established by Act 2017-5, for which assets are held in individual member investment accounts. It is important to note that during the period covered by this report, SERS incurred expenses for and received funding from the Commonwealth of Pennsylvania only for the startup costs associated with the new investment plan, which first opened to participants on January 1, 2019. As a result, the remainder of the financial information in this letter is for the pension fund only.

For 2018, KPMG LLP has conducted an independent audit of SERS financial statements, which are prepared in accordance with U.S. generally accepted accounting principles. Because the cost of a control should not exceed the benefits to be derived, the objective is to provide reasonable, rather than absolute, assurance that SERS financial statements are free of any material misstatements and fairly presented. As is our standard practice, independent auditors have full and unrestricted access to you and the board to discuss their findings regarding the adequacy of SERS internal controls and the integrity of SERS financial reporting.

SERS again received an unmodified opinion in 2018.

Members and the SERS Board can be assured that their retirement system is administered well, and that staff carefully manages the funds entrusted to the board. As of December 31, 2018, SERS had approximately \$26.9 billion after paying out approximately \$3.4 billion in retirement benefits to more than 131,000 retirees and beneficiaries; \$3.1 billion – roughly 91% – was paid to people living in Pennsylvania, stimulating local economies.

In 2018, SERS served 102 agencies/employers and approximately 240,000 total members. In mature pension plans such as SERS, newly retired members entering the pension rolls tend to have higher benefits than those who die and are removed from rolls. SERS' experience reflects that trend. Last year, approximately 5,800 SERS

members retired with an average annual benefit of about \$28,500, while approximately 4,300 retirees with average annual benefits of about \$16,400 were removed from the rolls.

Last year, SERS experienced an investment loss of approximately 4.6%, due primarily to the high level of market volatility that took place throughout 2018, particularly during the fourth quarter.

Based on the actuarial methods used for financial reporting purposes, as of December 31, 2018, the resulting net pension liability was \$20.8 billion. SERS plan fiduciary net position as a percentage of the total pension liability was 56.4%. Based on the actuarial methods used for funding purposes, as of December 31, 2018, the unfunded actuarial accrued liability was \$22.8 billion. SERS funded ratio was 56.0%.

Last year's volatility also led to an unanticipated delay in the pace of employer contribution reductions. In fiscal year 2019-20, employers will contribute 33.5% of payroll, which is estimated to generate \$2.1 billion. SERS employer contribution rate is now expected to peak at about 34.9% in FY 2022-23, but remain above 20% until FY 2040-41.

Act 2017-5, which was signed into law by Governor Wolf on June 12, 2017, included a "savings plow-back" provision requiring that the annual savings achieved through SERS benefit changes flow back into the system rather than to other non-pension commonwealth budget obligations. The 33.5% employer contribution rate for FY 2019-20 reflects a savings return of 0.71%. Without the plow-back provision, the employer rate would have been lower than the 32.9% employers are paying this fiscal year (FY 2018-19). The plow-back contributions, ranging from 0.10% to 0.93% of payroll, are expected in 13 of the next 23 fiscal years and will work to accelerate the system's return to fully funded status.

While future contribution rates depend on future returns and experience, current projections indicate the funded ratio will reach the 80% threshold generally accepted by pension experts as "healthy" in a little over a decade. To give you some context, Pennsylvania is among nearly three-fourths of public pension plans currently below the 80% funding threshold.

At the same time, the annual cost of the plan continues to drop as the number of members in the newer classes of service, including the A-3 and A-4 classes and the new A-5, A-6, and defined contribution classes that opened January 1, 2019, increases. At the end of 2018, approximately 41% of the active membership was in the A-3 and A-4 classes of service.

SERS implemented the requirements of Governmental Accounting Standards Board (GASB) Statement No. 75, *Accounting and Financial Reporting for Postemployment Benefits Other Than Pensions (OPEB)* (GASB 75) for the year ended December 31, 2018, which required SERS to restate its beginning net position restricted for pensions. GASB 75 is discussed in greater detail in the Notes to the Basic Financial Statements.

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 2008, we have steadily reduced fees and expenses for our investment program by approximately \$177 million (57%). Investment strategies seek the highest-conviction vehicles within an acceptable level of risk. To be more responsive to our members and reduce transaction costs, we continue to increase the volume of electronic funds transfers for benefit payments. This initiative has reduced waiting periods for benefit payments and increased the security of delivery of our members' money. Improving

customer service to our members remains a top priority for the plan. We continue to enhance our member materials, striving to make the information contained within more understandable and accessible to a range of employees. We increasingly leverage technology to deliver many of these materials electronically, allowing the plan to reduce administrative costs and employ data-driven results to help guide future communication initiatives. SERS also continues its multi-year benefits processing system upgrade that is expected to further improve how we interact with our members, their account-related transactions, and payment processing.

In addition, the SERS Board is in the midst of reviewing and deciding on a course of action in regard to more than 100 recommendations that were part of a report issued in December 2018 by the Public Pension Management and Asset Investment Review Commission after a six-month review of the commonwealth's state retirement systems. The recommendations relate to a range of topics including: full funding, stress testing, transparency, portfolio implementation, performance and asset allocation, cost-savings options and analysis, consolidation of pension investment operations, procurement, and diversity.

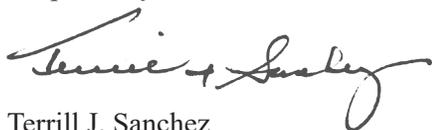
Act 2017-5, which also created the pension review commission, continues to have a major impact on SERS planning and administrative activities. "Act 5" established two new side-by-side hybrid defined benefit/defined contribution benefit options and a new defined contribution only option for state employees (excluding most hazardous duty employees), who first enter SERS membership on or after January 1, 2019. State employees starting on or after January 1, 2019, also will have a 10% cap on voluntary overtime that is includable for retirement covered earnings.

In addition, all current SERS members were provided a one-time, irrevocable option to select one of the three new retirement benefit options between January 1, 2019, and March 31, 2019. The newly elected option takes effect July 1, 2019, and generally will apply to all future service.

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

The commitment of the agency's 200+ employees ensures that we maintain effective internal controls to assure that assets are safeguarded, transactions are properly executed, and financial statements conform to U.S. generally accepted accounting principles – all while providing effective, high-quality member services. SERS remains dedicated to providing the highest level of service to commonwealth employers, policymakers, employees, retirees, and the SERS Board. Staff at all levels strive to provide exceptional service to those who have dedicated their careers to the citizens of Pennsylvania and maintain careful stewardship of public dollars.

Respectfully submitted,



Terrill J. Sanchez  
Executive Director



Sara E. McSurdy, CPA  
Acting Chief Financial Officer

## SERS Mission, Vision, and Organizational Chart

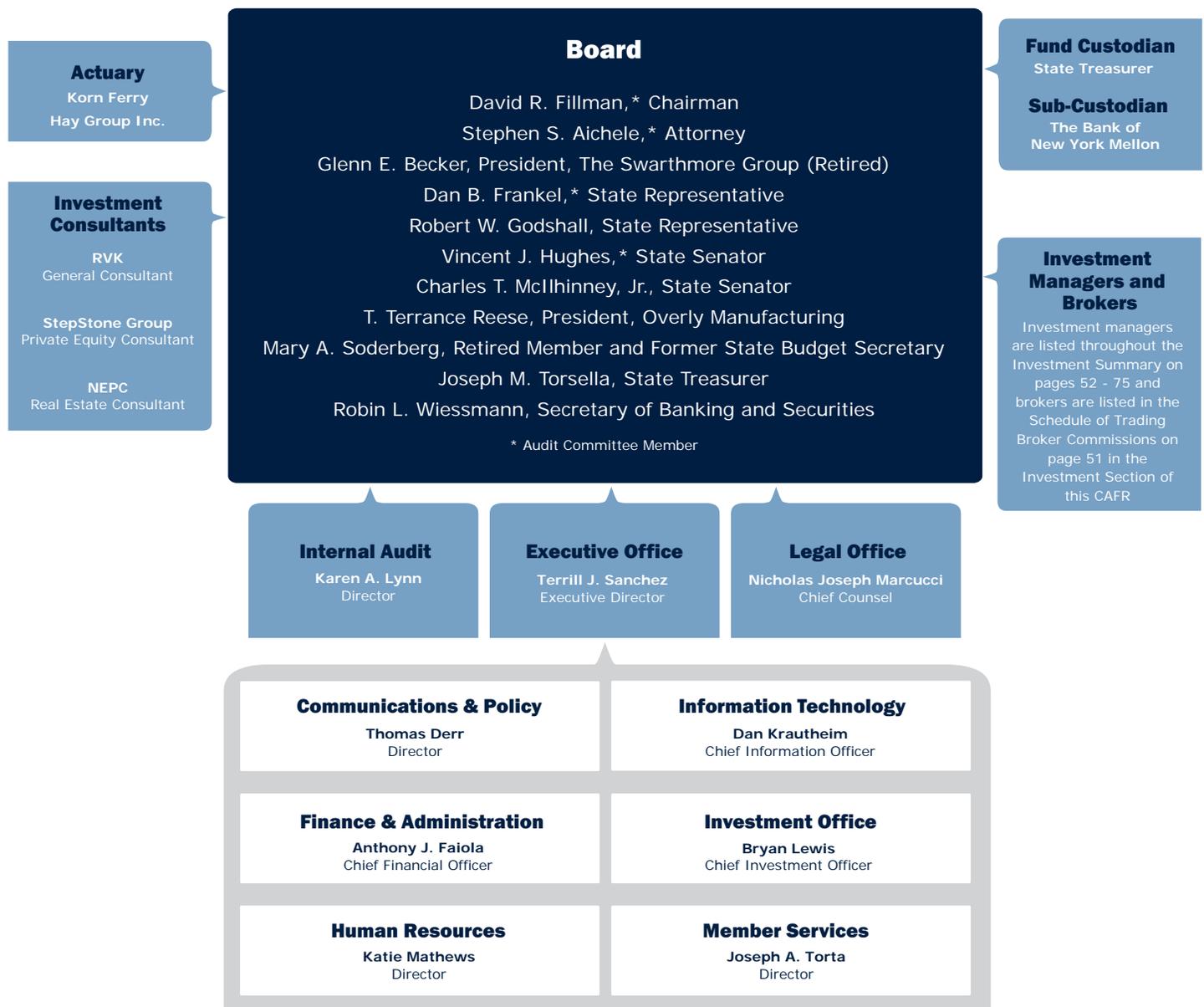
### Mission

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

### Vision

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

### Organizational Chart



# INTRODUCTORY SECTION

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## SERS Board

December 31, 2018

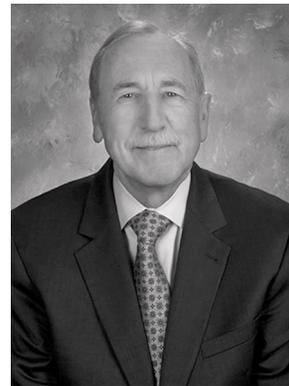
**Mr. David R. Fillman**  
Chairman  
Executive Director, AFSCME Council 13



**Mr. Stephen S. Aichele**  
Attorney



**Mr. Glenn E. Becker**  
President, The Swarthmore Group (Retired)



**Honorable Dan B. Frankel**  
State Representative



**Honorable Robert W. Godshall**  
State Representative



# INTRODUCTORY SECTION

## SERS Board

December 31, 2018

**Honorable Vincent J. Hughes**  
State Senator



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



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



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



**Honorable Joseph M. Torsella**  
State Treasurer



**Honorable Robin L. Wiessmann**  
Secretary of Banking and Securities



**2018**

**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, 2018 and 2017, 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, 2018 and 2017, and the changes in its fiduciary net position for the years then ended in accordance with U.S. generally accepted accounting principles.

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



## Other Matters

### *Required Supplementary Information*

U.S. generally accepted accounting principles require that the management's discussion and analysis on pages 3–10 and the required supplementary information in schedules 1 through 3 on pages 38–39 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 40-41, and the other information in the introductory section, investment section, actuarial section, and statistical section as listed in the table of contents, are presented for purposes of additional analysis and are not a required part of the basic financial statements.

The supplementary information in schedules 4 and 5 is the responsibility of management and was derived from and relates directly to the underlying accounting and other records used to prepare the basic financial statements for the year ended December 31, 2018. 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 31, 2019

## Management's Discussion and Analysis

December 31, 2018 and 2017 (unaudited)

This section presents Management's Discussion and Analysis of the Pennsylvania State Employees' Retirement System's (SERS) basic financial statements, as well as the significant events and conditions that affected the operations and performance of SERS during the years ended December 31, 2018, 2017, and 2016.

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

### Overview of the Basic Financial Statements and Accompanying Information

- (1) **Basic Financial Statements.** SERS presents Statements of Fiduciary Net Position as of December 31, 2018 and 2017 as well as Statements of Changes in Fiduciary Net Position for the years then ended. These statements reflect resources available for the payment of benefits as of year end, and the sources and uses of those funds during the year.
- (2) **Notes to Basic Financial Statements.** The notes to basic financial statements are an integral part of the statements. SERS encourages readers to review them because the additional detail will provide a more complete understanding of the basic financial statements. The notes provide information about SERS organization, benefits, and contributions; determination of asset values; limited use of derivatives; contingencies and commitments; actuarial methods; assumptions; and funding.

- (3) **Required Supplementary Information.** The Required Supplementary Information (RSI) consists of:

- This Management's Discussion and Analysis (MD&A)
- A schedule of changes in net pension liability and related ratio
- A schedule of employer contributions
- A schedule of investment returns

- (4) **Other Supplementary Information Schedules.** Other schedules provide details of SERS administrative, investment, and consultant expenses.

### Financial Analysis

SERS administers two mandatory-participation retirement plans defined by the Internal Revenue Code: the Defined Benefit Plan, for which assets are held in the State Employees' Retirement Fund (pension fund); and the Defined Contribution Plan (investment plan) established by Act 2017-5, for which assets are held in individual member investment accounts. During the period covered by this report, SERS only incurred expenses for and received funding from the Commonwealth of Pennsylvania (commonwealth) for the startup costs associated with the investment plan, which didn't open to participants until January 1, 2019. As a result, the remainder of the financial analysis is for the pension fund only.

SERS benefits are funded through member and employer contributions as well as investment income.

SERS net position decreased approximately \$2.4 billion for the year ended December 31, 2018, compared to an increase of approximately \$3.0 billion for the year ended December 31, 2017, as reflected in the table on page 10.

# FINANCIAL SECTION

## Management's Discussion and Analysis

December 31, 2018 and 2017 (unaudited)

### Member Contributions

Member contributions were approximately \$394 million for the year ended December 31, 2018, \$383 million for the year ended December 31, 2017, and \$375 million for the year ended December 31, 2016. There was a slight increase in gross salaries, which were approximately \$6.1 billion for 2018 and \$6.0 billion for 2017. In addition to across the board salary increases, approximately 1,100 more employees elected Class A-4 that contribute at a higher 9.3% of gross salary, compared to a decrease of approximately 300 employees that were contributing at a lower 5.0% of gross salary. The member contribution rate of 6.25% of gross salary for most members is set by statute and has remained unchanged for the years presented.

### Employer Contributions

Employer contributions were approximately \$2.0 billion, \$1.9 billion, and \$1.6 billion for the years ended December 31, 2018, 2017, and 2016, respectively. The 2018 contributions represented an increase of \$150 million – or 8% – compared to 2017. The growth was due to salaries increasing, despite a slight decrease in the composite employer rate to 32.90% from 33.22% on July 1, 2018, (excluding the Benefits Completion Plan (BCP) as described in note 3 to the basic financial statements). The \$275 million – or 17% – contribution growth in 2017 from 2016 was due to an increase in the employer rate to 33.22% from 29.5% on July 1, 2017.

Since 2005, Pennsylvania law statutorily suppressed employer contribution rates, primarily through Acts 2003-40 and 2010-120. Act 2010-120 limited the rate at which employer contributions increase in any given year after FY 11/12, up to a maximum of 4.5% each year, until no longer needed. According to this schedule, commonwealth FY 17/18 was the first year since legislatively mandated contribution rates were enacted through Act 2010-120 that collars were no longer needed and employers paid the uncollared actuarially required rate. The FY 19/20 composite

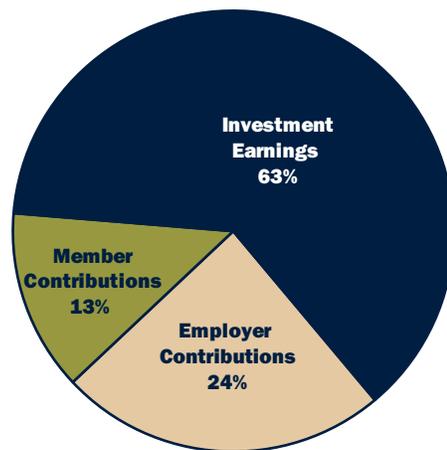
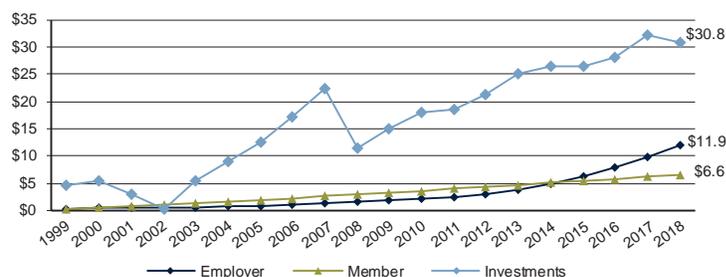
employer contribution rate including the BCP is going to be 33.59% of payroll.

Suppressed employer contributions have provided budgetary relief to commonwealth agencies and the taxpayers of Pennsylvania. The short-term benefit, however, will 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.

From 1999 through 2018, employer contributions totaled \$11.9 billion – or 24% – of total additions to fiduciary net position, compared to \$6.6 billion – or 13% – of total additions attributed to member contributions, and \$30.8 billion – or 63% – of total additions attributed to investment earnings, as illustrated in the following charts.

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

(\$ billions)



**Management's Discussion and Analysis**

December 31, 2018 and 2017 (unaudited)

**Net Investment Income**

SERS utilizes two methodologies when analyzing investment returns. The two approaches may vary from each other in any given period based on the underlying methodology used. For GASB 67 accounting valuation purposes, a money-weighted return is used. A money-weighted rate of return calculates the investment performance accounting for all cash flows (contributions and withdrawals) occurring during the performance measurement period. Conversely, for investment performance reporting purposes, SERS and its investment consultants rely on a time-weighted approach. A time-weighted rate of return minimizes the impact of cash flows occurring throughout the measurement period. SERS investment returns, net of manager fees, on a money-weighted basis, were -4.5%, 15.1%, and 6.4% for the years 2018, 2017, and 2016, respectively. SERS investment returns, net of manager fees, on a time-weighted basis, were -4.6%, 15.1%, and 6.5% for the years 2018, 2017, and 2016, respectively.

Negative investment performance contributed to a net investment loss of approximately \$1.4 billion in 2018, and positive investment performance contributed approximately \$4.1 billion, and \$1.6 million to net investment income for the years 2017, and 2016, respectively. Strong performance in the Global Public Equity asset class helped the overall SERS pension fund performance for 2017, but in 2018 domestic equity performance was responsible for the largest losses.

Biennially, SERS reviews and modifies its strategic investment plan, as necessary. The ultimate objective of SERS *2018-2019 Investment Plan* and *2016-2017 Strategic Investment Plan* was to formulate an asset allocation policy that provides a high expected probability of achieving SERS long-term actuarially assumed rate of return. The plan emphasized liquidity, reduction of cash flow volatility, and pursuit of capital protection strategies to ensure that SERS assets are

best positioned to meet the pension fund's continuing obligations to its beneficiaries.

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

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

Investment expenses, which include fees paid to managers, were \$133 million and \$135 million for the years ended December 31, 2018 and 2017, respectively.

**Benefits, Refunds, and Expenses**

Benefit payments to annuitants are the most significant recurring deductions from fiduciary net position. During 2018 and 2017, SERS paid out approximately \$3.4 billion and \$3.3 billion in benefits and refunds, respectively.

There were approximately 5,800 new retirees added to the annuity payroll in 2018, with an average annual benefit of \$28,500. There were approximately 6,300 new retirees added to the annuity payroll in 2017, with an average annual benefit of \$28,100. There were more than 4,300 and 4,200 retirees removed from the rolls with an average annual benefit of \$16,400 and \$15,100 in 2018 and 2017, respectively. As is typical in mature pension plans, new retirees in 2018 received a much higher annual benefit than those removed from the annuity payroll.

# FINANCIAL SECTION

## Management's Discussion and Analysis

December 31, 2018 and 2017 (unaudited)

The benefits expense on the basic financial statements consists of two primary components: monthly annuity payments and supplemental payments. Most of the supplemental payments were paid to retiring members who joined SERS before January 1, 2011, and chose to withdraw their contributions and interest at retirement. Such withdrawals reduce the retirees' payments over their remaining life. Supplemental payments were \$418 million and \$438 million for 2018 and 2017, respectively.

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

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

SERS was established in 1923, but did not pay more than \$1 billion in annual benefits until 1997. SERS' annual benefit payments reached \$2 billion in 2007 and \$3 billion in 2015. Based on recent actuarial projections, SERS' annual benefit payments will reach \$4 billion by 2023.

### Growth in Annuity Payroll

	December		
	2018	2017	2016
Monthly annuity payroll (\$ millions)	\$250	\$242	\$233
Retirees	131,007	129,473	127,338

SERS' administrative expenses represented 0.1% of fiduciary net position in 2018 and 2017. All expenses were within budget.

### SERS' Assets

Investments are the most significant component of SERS' assets. The fair value of investments decreased to \$27.2 billion in 2018 from \$29.7 billion in 2017. The decrease is related to the fact that the benefit payments along with net investment loss exceeded contributions for the year. SERS reports assets at fair value as discussed in accounting policies note 2(c) to the basic financial statements. Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date.

The total investment portfolio fair value was \$27.2 billion for 2018, as compared to \$29.7 billion for 2017. Equity values decreased to \$14.7 billion for 2018, from \$16.4 billion for 2017. The decrease in equity values is attributable to declining broad market returns. Fixed income values decreased to \$4.5 billion for 2018, from \$4.6 billion in 2017. Private equity values decreased to \$3.9 billion for 2018, from \$4.0 billion in 2017. Real estate values decreased to \$2.0 billion for 2018, from \$2.2 billion in 2017. The decrease in real estate values was mostly attributable to distributions exceeding contributions. Hedge funds values decreased to \$0.9 billion for 2018, from \$1.1 billion in 2017. The decrease in hedge funds values is primarily due to continued wind down of the hedge fund program. Short-term investments values decreased to \$1.2 billion for 2018, from \$1.4 billion in 2017.

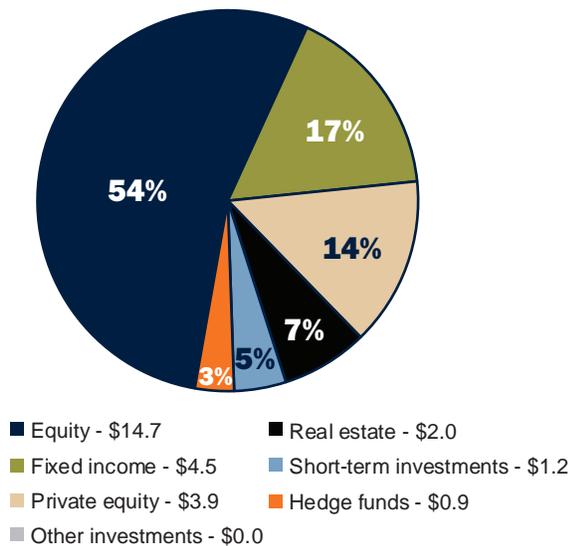
## Management’s Discussion and Analysis

December 31, 2018 and 2017 (unaudited)

The total investment portfolio fair value of \$27.2 billion for 2018 was composed as shown by the chart below:

### Investments at Fair Value (2018)

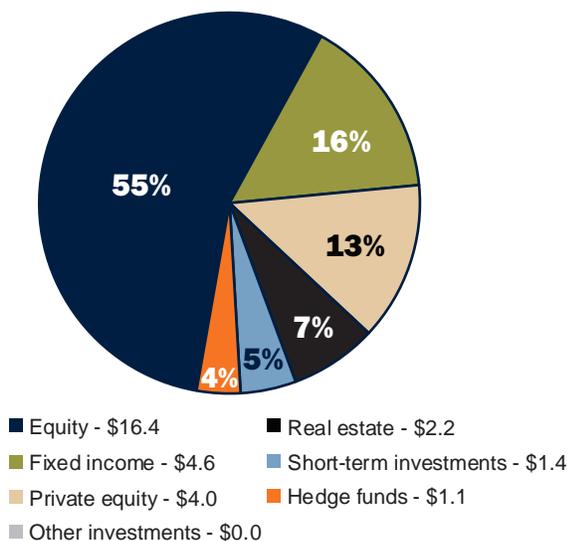
(\$ billions)



The total investment portfolio fair value of \$29.7 billion for 2017 was composed as shown by the chart below:

### Investments at Fair Value (2017)

(\$ billions)



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 approximately \$44 million through securities lending over the last 10 years. The program’s guidelines provide for investment of cash collateral in highly liquid, highly-rated securities.

As of December 31, 2018 and 2017, the fair value of loaned securities was \$274 million and \$620 million, respectively. The fair value of the associated collateral was \$285 million and \$639 million, respectively, of which \$163 million and \$391 million was cash, respectively.

### Derivatives

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

### Liquidity

SERS’ 2018-2019 Investment Plan and 2016-2017 Strategic Investment Plan used Cash as an asset class that serves as the primary source of short-term liquidity for the pension fund. In periods of market

# FINANCIAL SECTION

## Management's Discussion and Analysis

December 31, 2018 and 2017 (unaudited)

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, 2018 and 2017, the pension fund held approximately \$0.8 billion and \$1.0 billion in Cash, respectively, which is included in short-term investments on the Statements of Fiduciary Net Position.

### Actuarial Valuations

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

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

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

Key valuation results for the accounting valuation compared to the funding valuation for the years ended December 31, 2018 and 2017 are as shown in the following tables:

### As of December 31, 2018

(\$ millions)

GASB 67 - Accounting Valuation		Funding Valuation	
Total Pension Liability (TPL)	\$47,768	Actuarial Accrued Liability (AAL)	\$51,782
Fiduciary Net Position	26,937	Actuarial Value of Assets	28,989
<b>Net Pension Liability (NPL)</b>	<b>\$20,831</b>	<b>Unfunded AAL</b>	<b>\$22,793</b>
Ratio - Fiduciary Net Position/TPL	56.4%	Funded Ratio	56.0%

### As of December 31, 2017

(\$ millions)

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

**Management's Discussion and Analysis**

December 31, 2018 and 2017 (unaudited)

Under the accounting valuation, the net pension liability increased to \$20.8 billion in 2018 from \$17.3 billion in 2017. This was due to a \$2.5 billion decrease in the fiduciary net position mostly due to investment losses compounded by benefit payments exceeding contributions. In addition, there was a \$1.0 billion increase in the total pension liability mostly due to benefits earned and differences between expected and actual experience. Under the funding valuation, the unfunded actuarial accrued liability increased to \$22.8 billion in 2018 from \$19.7 billion in 2017 due mostly to the same factors as discussed above, except the effect of current year investment returns, which are not as impactful because of asset smoothing in addition to a reduction to employer normal cost.

The unfunded actuarial accrued liability under the funding valuation was \$2.0 billion and \$2.4 billion higher than the net pension liability under the accounting valuation in 2018 and 2017, respectively. The more favorable result under the accounting valuation can be specifically attributed to the actuarial cost method required under GASB 67. The entry-age actuarial cost method apportioned more of the pension costs of certain members to the normal cost and therefore lowered the amount apportioned to the unfunded liability. In 2018, the benefit from using the actuarial cost method was offset by the fact that current year losses, which fell below the assumed rate, were recognized immediately in the fiduciary net position balance as opposed to being deferred and smoothed into assets over five years under the funding valuation. In 2017, the benefit from using the actuarial cost method was compounded by the fact that current year returns, which were above the assumed rate, were recognized immediately in the fiduciary net position balance as opposed to being deferred and smoothed into assets over five years under the funding valuation.

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

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

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

In addition to the five-year experience study, SERS reviews its investment return assumption in light of economic conditions every year. The next SERS review will occur in July 2019, and will be used for its 2019 annual valuation.

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## Management's Discussion and Analysis

December 31, 2018 and 2017 (unaudited)

### Pennsylvania Act 2017-5

On June 12, 2017, Governor Wolf signed Act 2017-5 into law. The law established two new side-by-side hybrid defined benefit/defined contribution benefit options and a new defined contribution only option for all state employees, excluding most hazardous duty employees, who first enter SERS membership on or after January 1, 2019. While most hazardous employees are exempt, those starting on or after January 1, 2019, will have a 10% cap on voluntary overtime that is includable for retirement covered earnings. Additionally, all current SERS members will have a one-time, irrevocable option to select one of the three new retirement benefit options between January 1, 2019, and March 31, 2019. The newly elected option will be effective July 1, 2019, and generally will apply to all future service.

### Adoption of Accounting Standard

The Governmental Accounting Standards Board (GASB) issued GASB Statement No. 75, *Accounting and Financial Reporting for Postemployment Benefits Other Than Pensions (OPEB)* (GASB 75), the provisions of which are reflected in these financial statements. GASB 75 replaces GASB 45, *Accounting and Financial Reporting by Employers for Postemployment Benefits Other Than Pensions*, as amended, and GASB 57, *OPEB Measurements by Agent Employers and Agent Multiple-Employer Plans*, for OPEB. Since the requirements of GASB 75 were effective for financial statements for fiscal years beginning after June 15, 2017, the first year that GASB 75 was applicable to SERS was 2018. The adoption of GASB 75 requires SERS to recognize its proportionate share of net OPEB liability, which restated its net position restricted for pensions as of January 1, 2018.

### Pension Fund Condensed Financial Information

(\$ millions)

#### Fiduciary Net Position

	2018	(Decrease)/ Increase	2017	Increase/ (Decrease)	2016
Total investments	\$27,195	\$(2,506)	\$29,701	\$3,246	\$26,455
Net other assets, liabilities, and deferrals	(258)	38	(296)	(229)	(67)
<b>Net position restricted for pensions</b>	<b>\$26,937</b>	<b>\$(2,468)</b>	<b>\$29,405</b>	<b>\$3,017</b>	<b>\$26,388</b>

#### Changes in Fiduciary Net Position

	2018	Increase/ (Decrease)	2017	Increase	2016
Contributions	\$2,443	\$162	\$2,281	\$284	\$1,997
Net investment (loss)/income	(1,442)	(5,508)	4,066	2,479	1,587
Benefit, refunds, and administrative expenses	3,421	91	3,330	79	3,251
Cumulative effect of change in accounting principle	(48)	(48)	-	-	-
<b>Net (decrease)/increase in position restricted for pensions</b>	<b>\$(2,468)</b>	<b>\$(5,485)</b>	<b>\$3,017</b>	<b>\$2,684</b>	<b>\$333</b>

## Statements of Fiduciary Net Position

### Statements of Fiduciary Net Position

December 31, 2018 and 2017

(\$ thousands)

	2018			2017
	Pension Fund	Investment Plan	Total	
<b>Assets</b>				
Receivables				
Plan members	\$697	\$ -	\$697	\$608
Employers	109,491	-	109,491	154,806
Investment income	62,415	-	62,415	60,381
Investment proceeds and other receivables	58,136	-	58,136	292,823
Miscellaneous	4,176	-	4,176	4,067
Total receivables	234,915	-	234,915	512,685
Investments				
Short-term investments	1,145,805	4,460	1,150,265	1,403,112
Fixed income	4,533,934	-	4,533,934	4,593,143
Common and preferred stocks	14,727,326	-	14,727,326	16,411,156
Hedge funds	921,498	-	921,498	1,066,699
Real estate	1,967,097	-	1,967,097	2,204,129
Private equity	3,899,599	-	3,899,599	4,023,563
Other investments	(420)	-	(420)	(597)
Total investments	27,194,839	4,460	27,199,299	29,701,205
Securities lending collateral pool	163,955	-	163,955	391,449
Total assets	27,593,709	4,460	27,598,169	30,605,339
Total deferred outflows - OPEB	646	-	646	-
Total assets and deferred outflows	27,594,355	4,460	27,598,815	30,605,339
<b>Liabilities</b>				
Accounts payable and accrued expenses	48,988	291	49,279	47,669
Investment purchases and other liabilities	398,069	-	398,069	761,179
Obligations under securities lending	163,955	-	163,955	391,449
Net OPEB liability	31,221	-	31,221	-
Total liabilities	642,233	291	642,524	1,200,297
Total deferred inflows - OPEB	15,132	-	15,132	-
Total liabilities and deferred inflows	657,365	291	657,656	1,200,297
<b>Net position restricted for pensions</b>	<b>\$26,936,990</b>	<b>\$4,169</b>	<b>\$26,941,159</b>	<b>\$29,405,042</b>

See accompanying notes to basic financial statements.

# FINANCIAL SECTION

## Statements of Changes in Fiduciary Net Position

### Statements of Changes in Fiduciary Net Position

Years Ended December 31, 2018 and 2017

(\$ thousands)

	2018			2017
	Pension Fund	Investment Plan	Total	
<b>Additions</b>				
Contributions				
Plan members	\$393,925	\$ -	\$393,925	\$383,359
Employers	2,048,594	-	2,048,594	1,897,404
Total contributions	2,442,519	-	2,442,519	2,280,763
Commonwealth appropriation	-	4,901	4,901	-
Investment income				
From investing activities				
Net (depreciation)/appreciation in fair value of investments	(1,733,999)	-	(1,733,999)	3,710,739
Interest	142,918	-	142,918	126,728
Dividends	203,533	-	203,533	260,013
Real estate income	74,115	-	74,115	95,533
Miscellaneous income	889	-	889	3,713
Total investing activities (loss)/income	(1,312,544)	-	(1,312,544)	4,196,726
Investment expenses	(133,146)	-	(133,146)	(135,079)
Net (loss)/income from investing activities	(1,445,690)	-	(1,445,690)	4,061,647
From securities lending activities				
Securities lending income	3,771	-	3,771	4,883
Securities lending expenses	(372)	-	(372)	(475)
Net income from securities lending activities	3,399	-	3,399	4,408
Net investment (loss)/income	(1,442,291)	-	(1,442,291)	4,066,055
Total additions	1,000,228	4,901	1,005,129	6,346,818
<b>Deductions</b>				
Benefits	3,375,394	-	3,375,394	3,287,923
Refunds of contributions	19,242	-	19,242	15,620
Administrative expenses	25,950	732	26,682	26,122
Total deductions	3,420,586	732	3,421,318	3,329,665
Net (decrease)/increase	(2,420,358)	4,169	(2,416,189)	3,017,153
Net position restricted for pensions				
Balance, beginning of year	29,405,042	-	29,405,042	26,387,889
Cumulative effect of change in accounting principle	(47,694)	-	(47,694)	-
Balance, beginning of year, as restated	29,357,348	-	29,357,348	26,387,889
<b>Balance, end of year</b>	<b>\$26,936,990</b>	<b>\$4,169</b>	<b>\$26,941,159</b>	<b>\$29,405,042</b>

See accompanying notes to basic financial statements.

**Notes to Basic Financial Statements**

December 31, 2018 and 2017

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

**(a) Organization**

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

SERS is the administrator of the State Employees Retirement Fund (pension fund), which is a cost-sharing multiple-employer defined benefit pension plan. SERS is also the administrator of the State Employees Defined Contribution Plan (investment plan), which was established as part of Act 2017-5. The investment plan will be open for enrollment starting January 1, 2019. Both the pension fund and investment plan were established by the Commonwealth of Pennsylvania (commonwealth) to provide retirement 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.

Membership in SERS is mandatory for most state employees. Members and employees of the General Assembly, certain elected or appointed officials in the executive branch, department heads, and certain employees in the field of education are not required

but are given the option to participate. The membership includes 38 employers and the commonwealth is classified as its largest employer. The commonwealth comprises 65 agencies and when everything is evaluated separately, SERS has a total of 102 participating employers/agencies. At December 31, 2018 and 2017, SERS’ membership consisted of the following:

**SERS Membership**

	2018	2017
Inactive plan members or beneficiaries currently receiving benefits	131,007	129,473
Inactive plan members entitled to but not yet receiving benefits	7,030	6,815
Active plan members	103,007	102,978
<b>Total members</b>	<b>241,044</b>	<b>239,266</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 the final average salary multiplied by 2% multiplied by the class of service multiplier.

Most employees who entered SERS membership prior to January 1, 2011, and who retire at age 60 with three years of service, or at any age with 35 years of service, are entitled to a full retirement benefit. Members of the General Assembly and certain employees classified in hazardous duty positions can retire with full benefits at age 50, with at least three years of service. Act 2010-120 preserved all benefits in place for members but mandated a number of benefit reductions for new members effective January 1, 2011. The Act created a new class of service in

# FINANCIAL SECTION

## Notes to Basic Financial Statements

December 31, 2018 and 2017

which members earn a benefit that accrues at 2% of the member's final average salary instead of 2.5% each year and vests in 10 years instead of five. The Act also eliminated the option for members to withdraw their contributions and interest in a lump sum at retirement in exchange for lower pension payments. The new full retirement age is 65 for most employees who entered SERS membership after January 1, 2011, and age 55 for members of the General Assembly and certain employees classified in hazardous duty positions.

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

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

Act 2010-120 created a new A-3 class of service and an optional A-4 class for most employees who enter SERS membership for the first time on or after January 1, 2011, and December 1, 2010, for legislators newly elected in November 2010. Employees who enter SERS membership after the effective date of Act 2010-120 enter as members of the A-3 class with a 45-day window to elect membership in the optional A-4 class. The general annual benefit for Class A-3 members is 2% of the member's highest three-year average salary multiplied by years of service, while the Class A-4 benefit accrual rate is 2.5%.

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

### (c) Contributions

Section 5507 of the retirement code (71 Pa. C.S.) requires that all SERS-participating employers make contributions to the pension 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 SERB, 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. In FY 17/18, the commonwealth paid the full actuarially required rate after being collared in previous years due to Act 2010-120. At December 31, 2018 and 2017, the actuarially determined rate including the Benefits Completion Plan (BCP) was 32.93% and 33.24%, respectively.

Employer rates are computed based on SERS' fiscal year end of December 31 and applied to the commonwealth based on its fiscal year end of June 30; therefore, the employer contribution rates, in effect for SERS full year ended December 31, reflect a blended average of calculated rates. As of December 31, 2018 and 2017, the blended contribution rates, which include the BCP, were 33.09% and 31.38%, respectively.

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

## **(2) Summary of Significant Accounting Policies**

### **(a) Basis of Accounting**

SERS' basic financial statements are prepared using the accrual basis of accounting and economic resources measurement focus. Plan member contributions are recognized in the period in which the contributions are due. Employer contributions are recognized when due and the employer has a legal requirement to provide the contributions. Benefits and refunds are recognized when due and payable in accordance with the terms of the plan. Investment purchases and sales are recorded on a trade-date basis.

### **(b) Use of Estimates**

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

### **(c) Valuation of Investments**

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

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

Unsettled investment sales are reported as investment proceeds receivable and unsettled investment purchases are reported as investment purchases payable. Investment expenses consist of investment

# FINANCIAL SECTION

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## Notes to Basic Financial Statements

December 31, 2018 and 2017

managers' fees and those expenses directly related to SERS' investment operations.

### (d) Commitments

As of December 31, 2018 and 2017, SERS had contractual commitments totaling approximately \$3.6 billion and \$2.8 billion, respectively, to fund future private equity and real estate investments over the next several years.

### (e) Federal Income Taxes

The Internal Revenue Service (IRS) issued a favorable tax determination letter on May 19, 2017, qualifying the pension fund as a Governmental Plan under the Internal Revenue Code (IRC). Therefore, SERS is exempt from federal income taxes.

### (f) Risk Management

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

### (g) Newly Adopted Accounting Pronouncements

SERS implemented the requirements of Governmental Accounting Standards Board (GASB) Statement No. 75, *Accounting and Financial Reporting for Postemployment Benefits Other Than Pensions (OPEB)* (GASB 75). GASB 75 replaces GASB 45, *Accounting and Financial Reporting by Employers for Postemployment Benefits Other Than Pensions*, as amended, and GASB 57, *OPEB Measurements by Agent Employers and Agent Multiple-Employer Plans*, for OPEB. GASB specifies

the required approach to measuring the OPEB liability for employers for benefits provided through the commonwealth Retired Employees Health Program (REHP). This required SERS to record its proportionate share of net OPEB liability, as of a determined date, and restate its net position restricted for pensions as of January 1, 2018. Please see note 7 for further information.

### (3) Legally Required Reserves

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

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

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

The **Directed Commissions Reserve Account** accumulates the income from the commission recapture program less any administrative expenses. SERS utilizes brokers to rebate a percentage of trade commissions directly to SERS. During the years ended December 31, 2018 and 2017, SERS earned approximately \$158,000 and \$132,000 of income resulting from the commission recapture program, respectively. During 2018, no administrative expenditures were made from the program. As of December 31, 2017, SERS used the program to pay approximately \$155,000 of administrative expenses. At December 31, 2018 and 2017, SERS

## Notes to Basic Financial Statements

December 31, 2018 and 2017

had accumulated commission reserves of \$3.4 million and \$3.3 million, respectively. These commission reserves can be used to pay for future administrative 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 pension fund. In addition, all administrative and investment expenses incurred by the pension 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 pension fund less any benefits paid out of the pension fund. Act 2002-234 amended the retirement code that directs the SERB to establish and serve as trustee of a retirement benefit plan that is in conformity with IRC Section 415(m), the BCP. The BCP is a separate trust fund established to provide benefits to all annuitants of SERS defined benefit plan and their survivor annuitants and beneficiaries whose retirement benefit exceeds the IRC Section 415(b) limits. A monthly annuity or death benefit is paid under the BCP only if a corresponding monthly annuity or death benefit is paid from the defined benefit plan to the extent permitted by IRC Section 415(b) and the retirement code. There were 32 and 33 individuals receiving benefits from the BCP at December 31, 2018 and 2017, respectively.

Account balances at December 31, 2018 and 2017 are as follows:

### Account Balances

(\$ thousands)

	2018	2017
Members' savings account	\$5,074,760	\$4,965,765
State accumulation and interest reserve accounts	(6,701,765)	(3,364,341)
Directed commissions reserve account	3,455	3,297
Annuity reserve accounts		
Annuitants and beneficiaries	25,465,859	24,884,576
State police	3,027,671	2,867,311
Enforcement officers	64,753	46,158
Benefit completion plan reserve account	2,257	2,276
<b>Total</b>	<b>\$26,936,990</b>	<b>\$29,405,042</b>

The **State Employees' Defined Contribution Trust** accumulates investment plan participant and agency contributions, investment earnings, and investment plan expenses. The trust is comprised of individual investment accounts, all assets and money in those accounts, and any assets and money held by the SERB as part of the investment plan that are not allocated to individual participant investment accounts. The assets of the investment plan held in trust for the exclusive benefit of the participants and their beneficiaries may be used for the payment of the fees, costs, and expenses related to the administration and investment of the investment plan and trust.

#### (4) Investments

As provided by statute, the SERB has exclusive control and management responsibility of the pension fund and full power to invest. In exercising its fiduciary responsibility to SERS' membership, the SERB 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

# FINANCIAL SECTION

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## Notes to Basic Financial Statements

December 31, 2018 and 2017

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 SERB has adopted its *Statement of Investment Policy* to formally document investment objectives and responsibilities. This policy, as well as applicable state law, establishes guidelines for permissible investments of SERS.

### Fair Value Hierarchy

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

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

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

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

## Notes to Basic Financial Statements

December 31, 2018 and 2017

At December 31, 2018 and 2017, SERS investments measured at fair value are shown in the following tables:

### Investment Measured at Fair Value (2018)

(\$ thousands)

	Fair Value	Level 1	Level 2	Level 3
<b>Fixed income</b>				
Government	\$1,835,364	\$ -	\$1,835,364	\$ -
Corporates	765,602	-	738,860	26,742
Asset- and mortgage-backed securities	673,339	-	672,623	716
Private placements	451,575	-	440,317	11,258
Sovereign debt	234,120	-	234,120	-
Agencies	51,666	-	51,666	-
<b>Total fixed income</b>	<b>4,011,666</b>	<b>-</b>	<b>3,972,950</b>	<b>38,716</b>
<b>Equity</b>				
Domestic common and preferred stocks	7,655,607	7,649,738	5,869	-
Commingled equity funds	5,345,989	5,345,989	-	-
Foreign common and preferred stocks	1,725,585	1,725,585	-	-
<b>Total equity</b>	<b>14,727,181</b>	<b>14,721,312</b>	<b>5,869</b>	<b>-</b>
<b>Real estate</b>				
Value add/opportunistic SMA	746,256	-	-	746,256
Real estate securities	221,138	221,138	-	-
<b>Total real estate</b>	<b>967,394</b>	<b>221,138</b>	<b>-</b>	<b>746,256</b>
<b>Other investments</b>				
Other investments	(422)	(183)	(305)	66
<b>Total</b>	<b>\$19,705,819</b>	<b>\$14,942,267</b>	<b>\$3,978,514</b>	<b>\$785,038</b>

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## Notes to Basic Financial Statements

December 31, 2018 and 2017

### Investment Measured at Fair Value (2017)

(\$ thousands)

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

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

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

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

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

## Notes to Basic Financial Statements

December 31, 2018 and 2017

- **Legacy Private Equity** is characterized chiefly by consolidating legacy assets from various Private Equity core sub asset-classes (Buyouts, Venture Capital, Special Situations) that are being managed by a third-party administrator which provides day-to-day oversight of operations.
- **Private Credit Funds** is characterized chiefly by closed-end (drawdown) limited partnership structures with liquidity events in five years or more, which may include investment strategies such as direct lending, specialty lending, mezzanine, and distressed investing.

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

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

- **Core/Core Plus** are a long-term investment in high-quality real estate that generates

returns primarily from stable income producing properties. These are open-end funds.

- **Value Add/Oppportunistic Funds** utilize greater leverage and development strategies relative to core strategies, thereby taking higher risks but demand higher returns. Returns are primarily generated from capital appreciation from opportunistic investments. Strategies for this category of investing can include niche opportunities that are typically not available in core-style investing. These are closed-end funds.
- **Natural Resources/Infrastructure** differ from real estate in that they focus on other real assets other than real estate but maintain the characteristics of collateralization by hard assets and income-producing potential.

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

# FINANCIAL SECTION

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## Notes to Basic Financial Statements

December 31, 2018 and 2017

Hedge fund investments are categorized into the following specific strategies:

- **Credit-Focused Strategies** are investments that include directional and relative value investments through various structures, excluding closed-end funds, that may include debt securities, credit derivatives and related instruments, and/or multi-sector fixed income funds.
- **Funds-of-Hedge-Funds** were investments in funds with investment managers who invest in hedge funds. Funds-of-Hedge Funds provided an additional layer of fiduciary oversight (investment, legal, compliance, and monitoring) with similar all-in fees as direct investments in hedge funds. SERS was the only limited partner and was able to make larger allocations, which lowered fees and improved liquidity terms. The assets are to be sold in an orderly fashion as market conditions dictate.
- **Direct Investments** were investments where SERS and other institutional investors pool their funds with a manager tasked with incorporating hedge strategies. The assets are to be sold in orderly fashion as market conditions dictate.
- **Absolute Return Strategies** were investments intended to produce uncorrelated diversified return streams in the portfolio to help preserve and enhance the real value of the pension fund over long periods of time. The assets are to be sold in orderly fashion as market conditions dictate.

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

## Notes to Basic Financial Statements

December 31, 2018 and 2017

At December 31, 2018 and 2017, SERS investments measured at NAV are shown in the following tables:

### Investment Measured at NAV (2018)

(\$ thousands)

	NAV	Unfunded Commitments	Redemption Frequency	Redemption Notice Period
<b>Private equity</b>				
Buyouts	\$1,773,423	\$1,741,014	NA	NA
Legacy private equity	\$983,302	\$199,463	NA	NA
Special situations	543,658	268,566	NA	NA
Venture capital	506,141	235,797	NA	NA
Private credit funds	93,075	802,561	NA	NA
<b>Total private equity</b>	<b>3,899,599</b>	<b>3,247,401</b>		
<b>Real estate</b>				
Core/core plus	591,351	-	Quarterly	60 - 90 days
Value add/opportunistic funds	402,795	382,861	NA	NA
Natural resources/infrastructure	5,557	-	Daily	None
<b>Total real estate</b>	<b>999,703</b>	<b>382,861</b>		
<b>Hedge funds</b>				
Credit-focused strategies	872,594	-	Quarterly	95 days
Funds-of-hedge funds	10,185	-	See note (1)	See note (1)
Direct investments	3,806	-	See note (1)	See note (1)
Absolute return strategies	3,768	-	See note (1)	See note (1)
<b>Total hedge funds</b>	<b>890,353</b>	<b>-</b>		
<b>Commingled fixed income funds</b>				
Commingled fixed income funds	521,474	-	Quarterly	30 days
<b>Total</b>	<b>\$6,311,129</b>	<b>\$3,630,262</b>		

<sup>4</sup>The assets are to be sold in an orderly fashion as market conditions dictate.

# FINANCIAL SECTION

## Notes to Basic Financial Statements

December 31, 2018 and 2017

### Investment Measured at NAV (2017)

(\$ thousands)

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

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

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

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

At December 31, 2018 and 2017, SERS investments not measured at fair value or NAV are shown in the following tables:

### Investment Not Measured at Fair Value or NAV

(\$ thousands)

	2018	2017
Short-term investments	\$1,145,805	\$1,403,112
Hedge funds	31,145	49,057
Fixed income	794	1,647
Equity	145	659
Real estate	-	1
Other investments	2	2
<b>Total</b>	<b>\$1,177,891</b>	<b>\$1,454,478</b>

## Notes to Basic Financial Statements

December 31, 2018 and 2017

At December 31, 2018, SERS held approximately \$4.5 million in cash appropriated from the commonwealth to fund start up costs of the defined contribution plan.

For the years ended December 31, 2018 and 2017, the money-weighted rate of return for SERS, net of manager fees, was -4.5% and 15.1% respectively. A money-weighted rate of return expresses investment performance, net of manager fees, adjusted for the changing amounts actually invested.

SERS' investment office, in consultation with the board and its investment consultants, updates the SERS strategic investment plan every two years. In April 2018, the board approved the SERS *2018-2019 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.

Fixed Income and Cash are structured to generate income to pay benefits; provide liquidity to minimize capital impairment risk; reduce volatility in the total fund; protect the fund against deflation (and inflation via inflation protection securities); and contribute to total fund return when market conditions permit. The target asset allocation was based on a 7.25% assumed investment rate of return.

In December 2016, the SERB approved the SERS *2016-2017 Strategic Investment Plan*. The target asset allocation was based on a 7.5% assumed investment rate of return.

At its April 2017 meeting, the SERB approved a reduction in the assumed investment rate of return to 7.25%, which is not reflected in the 2017 table below as targets were subsequently updated to reflect the new assumed investment rate of return in the *2018-2019 Investment Plan*. Additionally, as a result of the

portfolio examination, several changes were made to the asset allocation during the fourth quarter of 2017. The portfolio was restructured to add Multi-Strategy as a new asset class, which is reflected in the 2017 table.

The following table shows long-term 10-year strategic target asset allocation as of December 31, 2018 and 2017:

### Target Asset Allocation

Asset Class	2018	2017
Private Equity	16%	16%
Global Public Equity	48	43
Real Estate	12	12
Multi-Strategy	10	12
Legacy Hedge Funds	0	0
Fixed Income	11	14
Cash	3	3
<b>Total</b>	<b>100%</b>	<b>100%</b>

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

Concentration of credit risk is the risk of loss attributed to the magnitude of investment in a single issuer. As of December 31, 2018 and 2017, 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 the retirement code (71 Pa. C.S. §5931(c)), the State Treasurer serves as custodian of the pension fund.

# FINANCIAL SECTION

## Notes to Basic Financial Statements

December 31, 2018 and 2017

In accordance with a contractual relationship between the commonwealth's Treasury Department and its custodial agent, substantially all investments, where securities are used as evidence of the investment, are held by the custodian in book-entry form in SERS' name. Those investments are defined as insured or registered investments for which the securities are held by SERS or its agent and, therefore, have a very minimal level of custodial credit risk losses. All remaining investments do not have securities that are used as evidence of the investments. These investments are primarily in commingled funds, hedge funds, and limited partnerships, which include real estate and private equity.

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

For securities exposed to credit risk in the Fixed Income portfolio, the following tables disclose aggregate fair value, by the least favorable credit rating issued using Moody's, S&P, and Fitch credit ratings at December 31, 2018 and 2017 by debt sector:

### Debt Securities Exposed to Credit Risk (2018)

(\$ 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>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$1,144,614	\$1,144,614
Asset- and mortgage-backed securities	248,800	315,671	16,979	457	358,533	2,094	-	942,534
Corporates	18,480	34,921	205,808	384,338	118,842	3,213	-	765,602
Private placements <sup>4/</sup>	4,501	24,165	24,712	152,805	212,365	35,013	-	453,561
Sovereign debt	15,500	53,058	27,850	62,595	260,633	3,810	-	423,446
Agencies	8,255	43,411	-	-	-	-	-	51,666
Government	164	13,783	5,666	3,851	313	-	-	23,777
<b>Total</b>	<b>\$295,700</b>	<b>\$485,009</b>	<b>\$281,015</b>	<b>\$604,046</b>	<b>\$950,686</b>	<b>\$44,130</b>	<b>\$1,144,614</b>	<b>\$3,805,200</b>

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

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

<sup>3/</sup>Debt securities exposed to credit risk and U.S. government guaranteed securities, as noted in the subsequent paragraph, comprised short-term investments and fixed income 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.

## Notes to Basic Financial Statements

December 31, 2018 and 2017

### Debt Securities Exposed to Credit Risk (2017)

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

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

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

<sup>3/</sup>Debt securities exposed to credit risk and U.S. government guaranteed securities, as noted in the subsequent paragraph, comprised short-term investments and fixed income 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, 2018 and 2017, which were not included in the previous tables because they are not subject to credit risk.

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

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

# FINANCIAL SECTION

## Notes to Basic Financial Statements

December 31, 2018 and 2017

At December 31, 2018 and 2017, SERS' Fixed Income portfolio had the following option-adjusted durations by debt sector:

### Debt Option-Adjusted Durations

(\$ thousands)

	2018		2017	
	Fair Value	Option-Adjusted Duration	Fair Value	Option-Adjusted Duration
Sovereign debt	\$234,120	7.6	\$258,701	7.5
Government	1,835,363	6.5	1,855,214	6.6
Corporates	765,602	5.7	896,679	5.9
Agencies	51,666	4.5	66,718	4.7
Private placements <sup>1/</sup>	453,561	4.4	451,270	4.5
Asset- and mortgage-backed securities	673,339	4.1	757,763	3.9
Commingled investment funds	521,474	3.5	307,545	3.8
Short-term investments - (STIF)	995,057	0.1	1,177,299	0.1
Short-term investments	149,557	0.0	225,066	0.0
<b>Total<sup>2/</sup></b>	<b>\$5,679,739</b>		<b>\$5,996,255</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>Total pension fund fair values exposed to interest rate risk comprised short-term investments, and fixed income from the Statements of Fiduciary Net Position.

## Notes to Basic Financial Statements

December 31, 2018 and 2017

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, 2018 and 2017, SERS had the following currency exposures:

### Foreign Currency Exposures (2018)

(\$ thousands)

Currency	Short-Term Investments <sup>1/</sup>	Fixed Income	Common and Preferred Stocks	Other Investments	Real Estate	Private Equity	Total
European Euro	\$7,459	\$33,856	\$220,471	\$(14,237)	\$ -	\$109,899	\$357,448
British Pound Sterling	1,678	42,314	146,841	6,332	-	-	197,165
Hong Kong Dollar	1	-	156,730	(1)	-	-	156,730
South Korean Won	2,037	-	133,635	-	-	-	135,672
Japanese Yen	369	-	100,767	24,634	-	-	125,770
Swiss Franc	8,546	-	93,544	(7,746)	-	-	94,344
Australian Dollar	150	11,093	43,920	4,961	-	-	60,124
New Taiwan Dollar	86	-	53,415	-	-	-	53,501
Swedish Krona	(3)	-	-	28,699	-	24,177	52,873
Mexican Peso	209	23,489	23,266	-	412	-	47,376
Canadian Dollar	233	2,023	29,251	9,742	-	-	41,249
Danish Krone	1,140	-	30,645	278	-	-	32,063
South African Rand	374	11,826	21,268	(1,812)	-	-	31,656
Indonesian Rupiah	198	8,230	22,771	-	-	-	31,199
Brazilian Real	468	8,558	21,652	-	-	-	30,678
Norwegian Krone	124	-	10,914	7,348	-	-	18,386
Malaysian Ringgit	127	12,417	3,981	-	-	-	16,525
New Zealand Dollar	50	-	11,891	416	-	-	12,357
Polish Zloty	91	12,214	1,042	(1,342)	-	-	12,005
Thai Baht	5	-	11,205	36	-	-	11,246
Hungarian Forint	-	-	10,059	-	-	-	10,059
Colombian Peso	200	4,733	-	3,491	-	-	8,424
Other currencies (9)	1,692	4,623	10,610	727	-	-	17,652
<b>Total</b>	<b>\$25,234</b>	<b>\$175,376</b>	<b>\$1,157,878</b>	<b>\$61,526</b>	<b>\$412</b>	<b>\$134,076</b>	<b>\$1,554,502</b>

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

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## Notes to Basic Financial Statements

December 31, 2018 and 2017

### Foreign Currency Exposures (2017)

(\$ thousands)

Currency	Short-Term Investments <sup>1/</sup>	Fixed Income	Common and Preferred Stocks	Other Investments	Real Estate	Private Equity	Total
European Euro	\$6,797	\$34,674	\$252,259	\$(11,306)	\$ -	\$273,071	\$555,495
British Pound Sterling	1,703	47,699	177,538	10,163	-	10,406	247,509
Hong Kong Dollar	-	-	206,105	-	-	-	206,105
South Korean Won	1,502	-	161,969	-	-	-	163,471
Japanese Yen	99	460	125,265	17,776	-	-	143,600
Swiss Franc	7,814	-	93,974	(8,600)	-	-	93,188
Australian Dollar	132	12,542	63,652	262	-	-	76,588
Swedish Krona	-	-	6,158	17,747	-	50,248	74,153
New Taiwan Dollar	20	-	57,277	-	-	-	57,297
Mexican Peso	203	26,084	26,619	1,404	539	-	54,849
South African Rand	401	12,145	37,643	(6,621)	-	-	43,568
Indonesian Rupiah	184	8,869	29,348	-	-	-	38,401
Canadian Dollar	286	3,541	33,833	(810)	-	-	36,850
Brazilian Real	458	7,939	21,599	5,925	-	-	35,921
Turkish Lira	120	2,321	25,415	5,600	-	-	33,456
Danish Krone	1,041	-	29,016	292	-	-	30,349
Norwegian Krone	146	-	15,731	12,782	-	-	28,659
New Zealand Dollar	53	-	13,501	10,412	-	-	23,966
Malaysian Ringgit	112	12,763	9,282	-	-	-	22,157
Polish Zloty	287	13,102	1,080	2,967	-	-	17,436
Hungarian Forint	-	-	10,833	-	-	-	10,833
Thai Baht	18	-	10,027	-	-	-	10,045
Other currencies (7)	881	16,049	4,030	626	-	-	21,586
<b>Total</b>	<b>\$22,257</b>	<b>\$198,188</b>	<b>\$1,412,154</b>	<b>\$58,619</b>	<b>\$539</b>	<b>\$333,725</b>	<b>\$2,025,482</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, 2018 and 2017, SERS' credit exposure to individual borrowers was limited because the amounts SERS owed the borrowers exceeded the amounts the borrowers owed SERS. The treasurer's contract with the lending agent requires the agent to

**Notes to Basic Financial Statements**

December 31, 2018 and 2017

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, 2018 and 2017 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, 2018 and 2017 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, 2018 and 2017, the fair value of loaned securities was \$274 million and \$620 million, respectively; the fair value of the associated collateral was \$285 million and \$639 million, of which \$164 million and \$391 million was cash, respectively. As of December 31, 2018 and 2017, noncash collateral of \$121 million and \$248 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, 2018 and 2017, SERS counterparty credit risk was not significant. SERS mitigates its legal risk on investment holdings including derivatives by ensuring that all of our legal requirements (indemnification, sovereign immunity, jurisdiction, etc.) are acknowledged and agreed to in all of the derivatives agreements to which they are subject.

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

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

At December 31, 2018 and 2017, SERS contracts to purchase and sell by foreign currencies are shown in the following tables:

# FINANCIAL SECTION

## Notes to Basic Financial Statements

December 31, 2018 and 2017

### Foreign Exchange Contracts (2018)

(\$ thousands)

Currency	Purchases	Unrealized Gain/(Loss)	Sales	Unrealized Gain/(Loss)
Swedish Krona	\$28,699	\$39	\$ -	\$ -
Japanese Yen	24,634	610	-	-
Norwegian Krone	10,422	(281)	3,074	144
Canadian Dollar	9,778	(492)	36	-
British Pound Sterling	8,197	34	1,864	(15)
European Euro	5,711	23	19,949	54
Australian Dollar	4,961	(126)	-	-
Colombian Peso	3,491	(95)	-	-
Argentina Peso	727	24	-	-
New Zealand Dollar	416	-	-	-
Danish Krone	278	-	-	-
Thai Baht	36	-	-	-
Swiss Franc	-	-	7,746	187
South African Rand	-	-	1,812	(6)
Polish Zloty	-	-	1,342	20
Hong Kong Dollar	-	-	1	-
<b>Total</b>	<b>\$97,350</b>	<b>\$(264)</b>	<b>\$35,824</b>	<b>\$384</b>

### Foreign Exchange Contracts (2017)

(\$ thousands)

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

**Notes to Basic Financial Statements**

December 31, 2018 and 2017

Swap agreements provide for periodic payments between parties based on the change in value of underlying assets, indexes, rates, and creditworthiness. SERS uses contracts with multiple counterparties as well as collateral posting requirements to manage its counterparty credit risk. Credit default swaps are agreements with counterparties to either purchase or sell credit protection. SERS' managers use credit default swaps to either increase or decrease credit exposure to certain credit markets. Interest rate swaps are over-the-counter contracts that allow counterparties to exchange a fixed rate liability for a floating rate liability or vice versa. SERS' managers use interest rate swaps as a cost-effective way of gaining exposure to certain sectors of the fixed income market. SERS' exposure to swap agreements was not significant at December 31, 2018 and 2017.

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

Employees of SERS participate in the Retired Employees Health Program (REHP), which is a single employer defined benefit Other Postemployment Benefit (OPEB) plan that includes commonwealth agencies and some component units. The REHP is established as a trust equivalent arrangement. The REHP is administered by the Pennsylvania Employees Benefit Trust Fund (PEBTF), which acts as a third-party administrator under an administrative agreement with the commonwealth. The REHP is provided as a part of collective bargaining agreements with most commonwealth labor unions. All policy decisions and types and levels of benefits for the REHP fall under the purview of the commonwealth's Executive Board, and the Secretary of Administration. The REHP does not have a governing board.

Detailed information about the REHP is reported in the commonwealth's Comprehensive Annual

Financial Report (CAFR) as an other employee benefit trust fund. The REHP is reported using the economic resources measurement focus and the accrual basis of accounting. The commonwealth's CAFR is an audited financial statement and is available at [www.budget.pa.us](http://www.budget.pa.us).

**(b) Benefits Provided**

Eligible employees who retire from the state and meet one of the following eligibility criteria are eligible to receive REHP benefits:

- 25 or more years of service
- 20 or more years of service and superannuation age – Age 50 for Park Rangers, Capitol Police and certain enforcement officers or 60 for general employees (age 55 or 65 for employees subject to Act 2010-120)
- Disability retirement – requires five years of service (no service requirement for enforcement officers)

Spouses and dependents are eligible for subsidized postemployment medical coverage while the retiree is alive. The Patient Protection and Affordable Care Act (PPACA), signed into law on March 23, 2010, increased the dependent child age limit to age 26 and applied to the commonwealth effective January 1, 2011.

**(c) Contributions**

Employer contributions for retiree healthcare benefits are charged as a component of payroll expenditures on a "pay as you go" basis. During 2018 and 2017, SERS funded REHP benefits by paying \$188 and \$362 (actual dollars) per pay period from January 1 to June 30, respectively, and \$300 (actual dollars) per pay period from July 1 to December 31 for both years for each active SERS employee.

# FINANCIAL SECTION

## Notes to Basic Financial Statements

December 31, 2018 and 2017

Retiree contributions ranged from 0 – 3% of final average salary, which varies depending on retirement date. In addition to the retiree contributions for those hired on or after August 1, 2003, non-Medicare retirees who elect the Choice PPO plan are required to pay the incremental cost between the Choice PPO plan and the least expensive plan in county of residence through monthly pension deductions (PPO buy-up). Surviving spouses of deceased retirees may continue to participate in the plan if they pay the full cost of the coverage.

### (d) Proportionate Share of OPEB Liabilities, OPEB Expense, and Deferred Outflows of Resources and Deferred Inflows of Resources Related to OPEB

At December 31, 2018, SERS reported a liability of \$31.2 million for its proportionate share of the net OPEB liability, which was a decrease of \$13 million. The net OPEB liability was measured as of June 30, 2018, and the total OPEB liability used to calculate the net OPEB liability was determined by an actuarial valuation as of that measurement date. SERS' proportion of the net OPEB liability was based on actual contributions made to the REHP. At June 30, 2018, SERS' proportion was 0.212649%.

For the year ended December 31, 2018, SERS recognized OPEB expense of \$2 million as a reduction of administrative expenses.

At December 31, 2018, SERS reported deferred outflows of resources and deferred inflows of resources related to OPEB from the following sources:

### Schedule of Deferred Outflows and Inflows (2018)

(\$ thousands)

	Deferred Outflows of Resources	Deferred Inflows of Resources
Changes in assumptions or other inputs as of measurement date	\$ -	\$4,104
Change in proportionate share and differences between actual and proportionate share employer contributions	-	1,418
Contributions subsequent to measurement date	646	-
Differences between expected and actual experience in total OPEB liability	-	9,562
Net differences between projected and actual earnings on plan investments	-	48
<b>Total</b>	<b>\$646</b>	<b>\$15,132</b>

### (e) Actuarial Assumptions

The total OPEB liability was determined by an actuarial valuation as of June 30, 2018 and 2017, using the following actuarial assumptions:

- Investment rate of return: 5%
- Inflation: 2.60%

**Notes to Basic Financial Statements**

December 31, 2018 and 2017

- Projected salary increases: average salary growth of 2.65% and salary schedule growth of 2.90% with range of 3.70%–8.90%
- Healthcare cost trend rates: 6.2% for 2018 and 6.0% for 2017, decreasing to an ultimate rate of 4.1% based on 2018 valuation and 3.9% based on 2017 valuation
- Mortality rate for healthy participants: projected RP-2000 Mortality Tables adjusted for an improvement in certain age ranges and future improvement in life expectancy
- Mortality rate for disabled participants: projected RP-2000 Mortality Tables adjusted for future improvement in life expectancy

Assumptions mentioned above are based on SERS’ experience study covering the periods 2011–2015, which was released in March 2016.

The assets of the REHP are managed by the commonwealth’s Treasury Department in an investment pool. The REHP investments are made based upon an interagency agreement, dated June 17, 2008, and the prudent investor standard set forth in the commonwealth’s fiscal code 72P.S. §30.1, amendment to the fiscal code, the principles of Prudent Investors Standards.

The long-term expected rate of return on REHP plan investments is determined using a risk premium review. This review compares the current relationship between fixed income and equity and their relationship over long periods of time to come up with an expected rate of return. Other variables considered in the expected rates of return are a reversion to the mean for each asset class.

Best estimates of arithmetic real rates of return for each major asset class included in the target asset allocation are summarized in the following table:

**Long-Term Expected Real Rate of Return (2018)**

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return
Domestic equity	47%	6.6%
Fixed income	25	3.0
International equity	20	8.6
Real estate	8	6.9
Cash and cash equivalents	0	1.0
<b>Total</b>	<b>100%</b>	

Since REHP has insufficient assets to meet next year’s projected benefit payments, the discount rate was based on the index rate for 20-year tax-exempt general obligation municipal bond index rate with an average rating of AA/Aa or higher as of the measurement date. The commonwealth elected to determine the discount rate using the Bond Buyer 20-Bond General Obligation Index. As of June 30, 2018, the discount rate was 3.87%.

**(f) Sensitivity Analysis**

Sensitivity of SERS’ proportionate share of the net OPEB liability to changes in the discount rate and healthcare cost trend rates of 1% lower or higher is not significant. More detail regarding this at the REHP plan level can be found in the commonwealth’s CAFR, which is an audited financial statement and is available at [www.budget.pa.us](http://www.budget.pa.us).

# FINANCIAL SECTION

## Notes to Basic Financial Statements

December 31, 2018 and 2017

### (g) Required Supplementary Information (RSI) for OPEB

Schedule of SERS' proportionate share of the net OPEB liability and SERS' contributions is not significant and the related RSI is not included within these financial statements. More detail regarding this at the REHP plan level can be found in the commonwealth's CAFR, which is an audited financial statement and is available at [www.budget.pa.us](http://www.budget.pa.us).

### (8) Litigation and Contingencies

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

### (9) Net Pension Liability

The components of the net pension liability of participating employers at December 31, 2018 and 2017, were as follows:

#### Net Pension Liability

(\$ thousands)

	2018	2017
Total pension liability	\$47,768,011	\$46,696,751
Plan fiduciary net position	26,936,990	29,405,042
<b>Net pension liability</b>	<b>\$20,831,021</b>	<b>\$17,291,709</b>
Plan fiduciary net position as a percentage of the total pension liability	56.4%	63.0%

The total pension liability was determined by an actuarial valuation for financial reporting purposes as of December 31, 2018 and 2017, using some of the following actuarial methods and assumptions:

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

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

The long-term expected real rate of return on pension plan investments are determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of manager fees and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation. Best estimates of arithmetic real rates of return for each major asset class included in the pension plan's target asset allocation in note 4 as of December 31, 2018 and 2017 (see the discussion of the pension plan's investment policy) are summarized in the following tables:

**Notes to Basic Financial Statements**

December 31, 2018 and 2017

**Long-Term Expected Real Rate of Return (2018)**

Asset Class	Long-Term Expected Real Rate of Return
Private Equity	7.25%
Global Public Equity	5.15
Real Estate	5.26
Multi-Strategy	4.44
Fixed Income	1.26
Legacy Hedge Funds	0.00
Cash	0.00

**Long-Term Expected Real Rate of Return (2017)**

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

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

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

**Sensitivity of the Net Pension Liability to Change in the Discount Rate (2018)**

(\$ thousands)

	1% Decrease to 6.25%	Current Discount Rate of 7.25%	1% Increase to 8.25%
Net pension liability	\$25,578,794	\$20,831,021	\$16,762,440

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

(\$ thousands)

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

# FINANCIAL SECTION

## Required Supplementary Information

December 31, 2018 (unaudited)

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

	2018	2017	2016	2015	2014	2013
<b>Total pension liability</b>						
Service cost	\$965	\$961	\$953	\$955	\$944	\$943
Interest	3,334	3,262	3,271	3,123	3,042	2,975
Changes of benefit terms	-	-	-	-	-	-
Differences between expected and actual experience	167	130	(534)	378	98	(143)
Changes of assumptions	-	-	947	669	-	-
Benefit payments, including refunds of member contributions	(3,395)	(3,304)	(3,228)	(3,081)	(2,946)	(2,844)
Net change in total pension liability	1,071	1,049	1,409	2,044	1,138	931
Total pension liability - beginning	46,697	45,648	44,239	42,195	41,057	40,126
<b>Total pension liability - ending (a)</b>	<b>\$47,768</b>	<b>\$46,697</b>	<b>\$45,648</b>	<b>\$44,239</b>	<b>\$42,195</b>	<b>\$41,057</b>
<b>Plan fiduciary net position</b>						
Contributions - employer	\$2,049	\$1,898	\$1,622	\$1,360	\$1,084	\$795
Contributions - member	394	383	375	372	366	352
Net investment (loss)/income	(1,442)	4,066	1,587	88	1,462	3,724
Benefit payments, including refunds of member contributions	(3,395)	(3,304)	(3,228)	(3,081)	(2,946)	(2,844)
Administrative expense	(26)	(26)	(23)	(22)	(22)	(22)
Net change in plan fiduciary net position	(2,420)	3,017	333	(1,283)	(56)	2,005
Plan fiduciary net position - beginning	29,405	26,388	26,055	27,338	27,394	25,389
Cummulative effect of change in accounting principle	(48)	NA	NA	NA	NA	NA
Beginning balance restated	29,357	NA	NA	NA	NA	NA
Plan fiduciary net position - ending (b)	26,937	29,405	26,388	26,055	27,338	27,394
<b>Net pension liability - ending (a) - (b)</b>	<b>\$20,831</b>	<b>\$17,292</b>	<b>\$19,260</b>	<b>\$18,184</b>	<b>\$14,857</b>	<b>\$13,663</b>
Plan fiduciary net position as a percentage of the total pension liability	56.4%	63.0%	57.8%	58.9%	64.8%	66.7%
Covered payroll	\$6,179	\$5,984	\$5,912	\$5,972	\$5,720	\$5,598
Net pension liability as percentage of covered payroll	337.1%	288.9%	325.8%	304.5%	259.7%	244.1%

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

See accompanying independent auditors' report.

**Required Supplementary Information**

December 31, 2018 (unaudited)

**Schedule 2  
Schedule of Employer Contributions**

(\$ millions)

Year <sup>1/</sup>	Actuarially Determined Contribution (ADC)	Contributions in Relation to the ADC	Contribution Deficiency (Excess)	Covered Payroll	Contributions as a Percentage of Covered Payroll
2018 <sup>3/</sup>	\$2,040	\$2,040	\$ -	\$6,179	33.02%
2017 <sup>3/</sup>	1,884 <sup>2/</sup>	1,884	-	5,984	31.47
2016 <sup>3/</sup>	1,614 <sup>2/</sup>	1,614	-	5,912	27.30
2015	1,360 <sup>2/</sup>	1,360	-	5,972	22.78
2014	1,084 <sup>2/</sup>	1,084	-	5,720	18.95
2013	795 <sup>2/</sup>	795	-	5,598	14.20
2012	566 <sup>2/</sup>	566	-	5,539	10.22
2011	392 <sup>2/</sup>	392	-	5,582	7.02
2010	273 <sup>2/</sup>	273	-	5,597	4.88
2009	253 <sup>2/</sup>	253	-	5,595	4.52

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

- Actuarial cost method: variation of entry-age cost method (all years)
- Asset valuation method: five-year smoothing (all years)
- Inflation: 3.0% for valuation year 2009, 2.75% from valuation years 2010 - 2015, and 2.6% from valuation years 2016 - 2018
- Projected average salary increases: 7.1% for valuation year 2009, 6.2% from valuation years 2010 - 2012, 6.1% from valuation years 2013 - 2014, 5.7% for valuation year 2015, and 5.6% from valuation years 2016 - 2018
- Investment rate of return (net of manager fees including inflation): 8.0% from valuation years 2009 - 2010, 7.50% from valuation years 2011 - 2015, and 7.25% from valuation years 2016 - 2018

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

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

**Schedule 3  
Schedule of Investment Returns**

	2018	2017	2016	2015	2014	2013
Annual money-weighted rate of return, net of investment expense	-4.5%	15.1%	6.4%	0.4%	6.4%	13.6%

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

See accompanying independent auditors’ report.

# FINANCIAL SECTION

## Supplementary Information

December 31, 2018

### Schedule 4 Schedule of Administrative Expenses<sup>1/</sup>

(\$ thousands)

Personnel services	
Salaries	\$8,683
Benefits	6,412
Temporary personnel wages, overtime, and out-service training	132
Total personnel services	15,227
Professional services	
Information technology services	6,386
Treasury department services	876
Other commonwealth services	619
Consultant fees	388
Total professional services	8,269
Rentals	
Real estate rent	1,526
Other equipment rental	116
Total rentals	1,642
Communication	
Postage	473
Telephone	366
Printing and advertising	102
Total communication	941
Other expenses	
Maintenance	982
Office equipment	667
Supplies	107
Subscriptions and memberships	60
Travel and conferences	42
Total other expenses	1,858
Total administrative expenses before OPEB expense	27,937
OPEB expense	(1,987)
<b>Total administrative expenses</b>	<b>\$25,950</b>

<sup>1/</sup>Administrative expenses of \$732 for Defined Contribution Plan are not included.

See accompanying independent auditors' report.

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

(\$ thousands)

**Investment Expenses**

Expense Category	Expenses
Manager investment expenses	
Private Equity	\$65,638
Global Public Equity	21,592
Real Estate	19,187
Multi-Strategy	10,240
Fixed Income	7,688
Legacy Hedge Funds	83
Total manager investment expenses	124,428
Investment consultants	3,831
Investment professional personnel	3,122
Custodian	1,362
Subscriptions and memberships	258
Operational	142
Legal	3
<b>Total investment expenses</b>	<b>\$133,146</b>

**Consultant Expenses<sup>1/</sup>**

Firm	Service Type	Expenses
Investment consultant expenses		
StepStone Group	Private equity investments	\$1,975
RVK	General investments	621
NEPC	Real estate investments	506
Fairview Capital Partners	Investment portfolio management	359
STP	Data warehouse hosting	172
Institutional Shareholder Services	Proxy services	93
GCM Customized Investment Group	Investment portfolio management	54
Abel/Noser	Transaction cost analysis	51
Total investment consultant expenses		3,831
Administrative consultant expenses		
Korn Ferry Hay Group	Actuary	355
Other	Miscellaneous	33
Total administrative consultant expenses		388
<b>Total consultant expenses</b>		<b>\$4,219</b>

<sup>1/</sup>Consultant expenses of \$95 for Defined Contribution Plan are not included.

See accompanying independent auditors' report

**2018**

**Investment Section**

May 20, 2019

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

On behalf of SERS' investment office, I am pleased to present the investment section of the Pennsylvania State Employees' Retirement System (SERS) Comprehensive Annual Financial Report for calendar year 2018. The SERS Board administers and advises a public defined benefit investment program with approximately \$27 billion in assets and a voluntary Deferred Compensation Plan offered to members with over \$3.3 billion in assets.

SERS' investment performance for calendar year ended December 31, 2018, was -4.6%, net of investment management fees. This compares to a 2017 calendar year return of 15.1%. While year-to-year returns are important, as long-term investors a longer time horizon is a more appropriate view of SERS' returns. The end of 2018 marks 20, 25, and 30-year periods of returns of 6.0%, 7.7%, and 8.4% (net of fees), respectively.

SERS' funded status as a percentage of total pension liability is approximately 56% or \$20.8 billion of net pension liability as of December 31, 2018. Based on this data, SERS prioritizes an asset allocation and efficient deployment of investments to meet the long-term actuarial assumed rate of return and the shorter-term liquidity needs of its members.

A number of key accomplishments were achieved in 2018, several of which are documented below. The investment section of this report provides further information regarding the investment program.

- Maintained low annual investment manager expenses paid to external firms of only 43 basis points or 0.43% of total plan assets.
- Established a relationship with a third party to reduce the number of Private Equity relationships and restructure the historically highest performing asset class to reduce investment management fees without sacrificing performance.
- Established the investment policy statement and investment options for the newly created Defined Contribution Plan.
- Recommended emerging managers for multiple asset classes to gain access to value enhancing, minority and/or woman-owned firms.
- Enhanced the level of experience of the investment office by adding key personnel to manage the defined benefit and defined contribution plans.
- Promoted an increase in manager reporting transparency by encouraging the use of industry standard formats.

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

Sincerely,



Bryan Lewis  
Chief Investment Officer

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

## Investment Policy and Objectives

December 31, 2018 (unaudited)

The Investment Section presents detailed information related to the State Employees' Retirement Fund (pension fund/SERS Fund). This section does not include the Defined Contribution Plan (investment plan) since it only became active after the year ended December 31, 2018.

### Investment Policy

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

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

The major elements of the policy are:

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

# INVESTMENT SECTION

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## Investment Policy and Objectives

December 31, 2018 (unaudited)

to conduct business on behalf of SERS in accordance with the mandate for which they were retained.

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

### Investment Objectives

As indicated in SERS *Statement of Investment Policy*, the objectives of the SERS Fund are to provide benefit payments to participants and beneficiaries at the lowest cost to the commonwealth and to fund the

program through a carefully planned and executed investment program.

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

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

## Investment Returns

December 31, 2018 (unaudited)

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

Asset Class	1-Year Total Return	3-Year Total Return	5-Year Total Return	10-Year Total Return
Private Equity <sup>2/,5/</sup>	11.4%	10.3%	10.1%	9.4%
<i>Burgiss All Private Equity Custom Index<sup>3/,5/</sup></i>	16.6	13.8	13.4	11.1
<i>Russell 3000 Index+3%<sup>4/,5/</sup></i>	21.1	20.6	16.9	15.4
Global Public Equity	-10.4	6.4	4.1	10.2
<i>MSCI ACWI IM Index (Net)</i>	-10.1	6.5	4.2	9.7
Real Estate <sup>5/</sup>	-2.3	0.9	4.6	2.3
<i>Real Estate Custom Benchmark<sup>5/,6/</sup></i>	7.2	7.6	9.4	5.1
<i>Consumer Price Index+3%<sup>5/</sup></i>	5.3	5.0	4.6	4.5
Multi-Strategy	-1.2	NA	NA	NA
<i>Russell 3000 Index</i>	-5.2	9.0	7.9	13.2
<i>S&amp;P/LSTA Leveraged Loan Index</i>	0.4	4.8	3.1	8.6
Legacy Hedge Funds	-13.7	-1.9	-1.9	2.1
<i>HF Custom Index<sup>7/</sup></i>	-6.7	1.2	1.4	4.5
Fixed Income	-1.0	3.1	2.5	6.7
<i>Bloomberg Barclays U.S. Aggregate Bond Index</i>	0.0	2.1	2.5	3.5
Cash	2.1	1.4	1.1	0.7
<i>BofA ML 3 Month U.S. T-Bill Index</i>	1.9	1.0	0.6	0.4
<b>Total Fund</b>	<b>-4.6%</b>	<b>5.4%</b>	<b>4.5%</b>	<b>7.1%</b>
<i>Total Fund Custom Benchmark</i>	<i>-2.2%</i>	<i>6.3%</i>	<i>5.3%</i>	<i>8.4%</i>
<i>Total Fund Custom Public Market Equivalent Benchmark</i>	<i>-1.0%</i>	<i>7.6%</i>	<i>6.2%</i>	<i>9.2%</i>

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

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

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

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

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

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

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

# INVESTMENT SECTION

## Investment Returns

December 31, 2018 (unaudited)

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

For the period ending June 30, 2018

Asset Class	1-Year Total Return	3-Year Total Return	5-Year Total Return	10-Year Total Return
Private Equity <sup>2/5/</sup>	13.0%	9.3%	10.3%	7.7%
<i>Burgiss All Private Equity Custom Index<sup>3/5/</sup></i>	17.8	12.5	13.6	9.2
<i>Russell 3000 Index+3%<sup>4/5/</sup></i>	17.2	13.5	16.4	12.9
Global Public Equity	11.2	8.5	9.8	5.5
<i>MSCI ACWIM Index (Net)</i>	11.1	8.3	9.6	6.1
Real Estate <sup>5/</sup>	5.2	4.6	7.5	2.0
<i>Real Estate Custom Benchmark<sup>5/6/</sup></i>	6.1	7.9	9.7	4.3
<i>Consumer Price Index+3%<sup>5/</sup></i>	5.4	4.9	4.4	4.6
Multi-Strategy <sup>7/</sup>	NA	NA	NA	NA
<i>S&amp;P/LSTA Leveraged Loan Index</i>	4.4	4.2	4.0	5.2
<i>Russell 3000 Index</i>	14.8	11.6	13.3	10.2
Legacy Hedge Funds	-2.3	-1.5	0.9	0.8
<i>HF Custom Index<sup>8/</sup></i>	5.8	2.2	5.2	5.5
Fixed Income	0.1	1.9	2.6	4.7
<i>Bloomberg Barclays U.S. Aggregate Bond Index</i>	-0.4	1.7	2.3	3.7
Cash	1.6	1.1	0.9	0.7
<i>BofA ML 3 Month U.S. T-Bill Index</i>	1.4	0.7	0.4	0.4
<b>Total Fund</b>	<b>8.6%</b>	<b>6.6%</b>	<b>7.6%</b>	<b>4.5%</b>
<i>Total Fund Custom Benchmark</i>	<i>8.4%</i>	<i>6.9%</i>	<i>7.8%</i>	<i>5.9%</i>
<i>Total Fund Custom Public Market Equivalent Benchmark</i>	<i>9.0%</i>	<i>7.4%</i>	<i>8.6%</i>	<i>6.6%</i>

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

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

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

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

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

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

<sup>7/</sup>The Multi-Strategy asset class has an inception date of October 1, 2017. Performance returns of one year or greater are unavailable as of June 30, 2018.

<sup>8/</sup>Beginning April 2014, the HF Custom Index is comprised of the HFRI Fund-of-Funds Strategic Index consistent with board approval of the 2014-15 *Strategic Investment Plan*, which establishes this index as the appropriate benchmark for Hedge Funds with regard to its composition and objectives.

## Pension Fund Values and Annual Returns

December 31, 2018 (unaudited)

### Pension Fund Values and Annual Returns

(\$ millions)

Year Ended	Pension Fund Fair Value	Annual Total Pension Fund Rate of Return <sup>1/</sup>
1989	\$9,785	17.8%
1990	9,886	1.0
1991	11,940	22.6
1992	12,453	7.4
1993	13,701	13.2
1994	13,330	-1.1
1995	16,343	25.2
1996	18,492	15.4
1997	21,312	18.5
1998	24,123	16.3
1999	28,093	19.9
2000	27,880	2.2
2001	24,706	-7.9
2002	20,880	-10.9
2003	24,536	24.3
2004	26,641	15.1
2005	28,752	14.5
2006	32,053	16.4
2007	35,516	17.2
2008	22,796	-28.7
2009	24,662	9.1
2010	25,886	11.9
2011	24,377	2.7
2012	25,389	12.0
2013	27,394	13.6
2014	27,338	6.4
2015	26,055	0.4
2016	26,388	6.5
2017	29,405	15.1
2018	26,937	-4.6

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

# INVESTMENT SECTION

## Largest Assets Held

December 31, 2018 (unaudited)

### U.S. Equity

Holding	Fair Value
Microsoft Corp	\$207,413,151
Apple Inc	179,905,467
Amazon.com Inc	146,652,351
Johnson and Johnson	99,826,498
Berkshire Hathaway Inc	95,023,534
Alphabet Inc Class C	92,588,712
Facebook Inc	86,043,281
JPMorgan Chase and Co	77,618,931
Alphabet Inc Class A	77,151,487
Exxon Mobil Corp	69,262,288

### Non-U.S. Equity

Holding	Fair Value
Taiwan Semiconductor Manufacturing Corp	\$42,785,334
Linde PLC	38,158,178
Samsung Electronics Co Ltd	36,360,590
Tencent Holdings Ltd	33,034,901
AIA Group Ltd	30,921,980
Medtronic PLC	29,514,428
Alibaba Group Holding Ltd	27,468,828
LVMH Moet Hennessy Louis Vuitton	22,225,648
Reliance Industries Ltd	22,178,174
iShares MSCI India ETF	21,959,624

### Non-U.S. Fixed Income

Holding	Fair Value
United Kingdom Gilt 1.750% July 22, 2019	\$11,140,265
United Mexican States, 7.750% November 13, 2042	7,527,888
Republic of South Africa Government, 8.750% February 28, 2048	6,899,593
United Mexican States, 8.500% November 18, 2038	6,109,045
United Mexican States, 8.500% May 31, 2029	5,242,641
Republic of Poland Government, 0.000% April 25, 2019	4,869,049
Colombian Tes, 6.000% April 28, 2028	4,732,662
Bank of Nova Scotia, 1.650% June 14, 2019	4,633,578
Argentine Republic Government, 7.820% December 31, 2033	4,558,385
Petroleos Mexicanos SA de CV, 5.350% February 12, 2028	4,528,275

Note: A detailed list of SERS investment holdings at December 31, 2018, may be viewed at [www.SERS.pa.gov](http://www.SERS.pa.gov).

## Largest Assets Held

December 31, 2018 (unaudited)

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

Holding	Fair Value
U.S. Treasury Note, 2.250% November 15, 2027	\$168,442,763
U.S. Treasury Note, 2.125% May 15, 2025	100,465,941
U.S. Treasury Note, 1.500% August 15, 2026	97,844,963
U.S. Treasury Inflation Index Note, 2.375% January 15, 2025	56,930,847
U.S. Treasury Bond, 5.250% November 15, 2028	50,911,146
U.S. Treasury Inflation Index Note, 0.125% April 15, 2020	46,886,424
U.S. Treasury Note, 2.250% August 15, 2027	44,822,268
U.S. Treasury Inflation Index Note, 0.125% January 15, 2022	37,788,404
U.S. Treasury Inflation Index Note, 0.125% July 15, 2022	36,211,903
U.S. Treasury Inflation Index Note, 0.375% July 15, 2023	35,150,261

### U.S. Corporate Fixed Income

Holding	Fair Value
Goldman Sachs Group Inc, 5.750% January 24, 2022	\$5,811,017
Goldman Sachs Group Inc, Variable Rate February 23, 2023	5,600,636
Morgan Stanley, 5.750%, January 25, 2021	4,691,925
Bank of America Corp, Variable Rate December 20, 2028	4,563,323
JP Morgan Chase & Co, Variable Rate February 01, 2028	4,368,240
Verizon Communications Inc, 3.376%, February 15, 2025	4,066,018
General Motors Commercial Mortgage, Variable Rate September 15, 2033	3,668,756
Dell International LLC, 5.450% June 15, 2023	3,632,975
General Motors Financial Corp, Variable Rate April 13, 2020	3,587,438
NBC Universal Enterprise, Variable Rate April 01, 2021	3,520,197

Note: A detailed list of SERS investment holdings at December 31, 2018, may be viewed at [www.SERS.pa.gov](http://www.SERS.pa.gov).

# INVESTMENT SECTION

## Schedule of Trading Broker Commissions

December 31, 2018 (unaudited)

Broker commissions on equity and fixed income investment transactions for the year ended December 31, 2018 were \$2.5 million. Below is a list of brokers receiving commissions in excess of \$20,000 during the year.

Broker	Commissions	Broker	Commissions
Merrill Lynch	\$364,409	Sturdivant	\$51,379
Goldman Sachs	194,245	Stifel Nicolaus	44,741
JP Morgan Chase	128,461	SG Cowen	38,896
UBS	115,780	Investment Technology Group	34,892
CITIC	114,995	Bloomberg Tradebook	34,195
Liquidnet	108,103	KeyCorp	33,534
ISI Group Inc	96,365	Deutsche Bank	33,170
Nomura Group	89,349	HSBC Securities	31,760
Morgan Stanley Smith Barney	87,332	Baird	31,372
Citigroup	72,054	Barclays	25,844
Jefferies and Company	63,289	Piper Jaffray	25,459
Credit Suisse First Boston	59,538	Raymond James & Associates	24,749
RBC Dominion Securities	59,072	Mirae Asset Securities (USA) Inc	24,712
Wells Fargo and Company	54,370	CL King & Associates	22,531
Pershing	52,506	Needham	22,136

## Investment Summary

December 31, 2018 (unaudited)

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

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

### Asset Allocation

(\$ millions)

Asset Class	Market Exposure	% of Total Fund	Long-Term 10-Year Strategic Target
Private Equity	\$3,883.0	14.5%	16.0%
Global Public Equity	13,894.3	51.6	48.0
Real Estate	1,969.8	7.3	12.0
Multi-Strategy	2,364.0	8.8	10.0
Legacy Hedge Funds	48.9	0.2	*
Fixed Income	3,995.2	14.8	11.0
Cash	757.0	2.8	3.0
<b>Total Fund</b>	<b>\$26,912.2</b>	<b>100.0%</b>	<b>100.0%</b>

\*Legacy Hedge Funds asset class is in liquidation.

### Number of Investment Managers

Asset Class	Investment Managers
Private Equity	62
Global Public Equity	15
Real Estate	30
Multi-Strategy	11
Legacy Hedge Funds	10
Fixed Income	11
Cash	1
<b>Total Managers</b>	<b>140</b>

### Number of Investment Portfolios

Asset Class	Investment Portfolios
Private Equity	176
Global Public Equity	19
Real Estate	61
Multi-Strategy	13
Legacy Hedge Funds	10
Fixed Income	13
Cash	1
<b>Total Portfolios</b>	<b>293</b>

# INVESTMENT SECTION

## Investment Summary - Private Equity

December 31, 2018 (unaudited)

### Role in the SERS Fund

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

### Program Structure

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

### Objective

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

Performance is measured relative to the following benchmarks:

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

### Private Equity

(\$ millions)

	Unfunded Commitments	Fair Value	% of Total Fund
<b>Core Sub-Asset Classes</b>			
Buyout	\$1,741.0	\$1,773.4	6.6%
Special Situations	268.6	543.6	2.0
Venture Capital	235.8	582.7	2.2
<b>Total Core-Sub Asset Classes</b>	<b>2,245.4</b>	<b>2,899.7</b>	<b>10.8</b>
<b>Non-Core Holdings<sup>1/</sup></b>			
Keystone Legacy Fund	199.5	983.3	3.7
<b>Total Private Equity</b>	<b>\$2,444.9</b>	<b>\$3,883.0</b>	<b>14.5%</b>

<sup>1/</sup>A total of 163 legacy holdings from the Private Equity core sub-asset classes (Buyouts, Special Situations, and Venture Capital) have been consolidated and are managed by a third-party administrator through a special purpose vehicle, Keystone Legacy Fund.

## Investment Summary - Private Equity

December 31, 2018 (unaudited)

### Portfolio Exposure

The Private Equity program is well diversified by sub-sector, geography, and industry focus. As of September 30, 2018, based on fair value, the program's exposure was:

<b>By Fund Sub-Sector</b>		<b>By Geography<sup>2/</sup></b>		<b>By Industry<sup>2/</sup></b>	
U.S. Private Equity	38.9%	United States	68.3%	Information Technology	30.5%
Non-U.S. <sup>1/</sup>	26.7	China	7.8	Financials	29.9
U.S. Venture Capital	16.5	United Kingdom	3.3	Consumer Discretionary	13.0
Distressed/Oppportunistic	12.6	South Korea	2.3	Industrials	9.0
Pennsylvania-Related	5.3	India	2.1	Health Care	7.8
		Germany	2.0	Energy	3.4
		Brazil	1.5	Materials	2.8
		Rest of World	12.7	Consumer Staples	2.0
				Telecommunication Services	1.0
				Utilities	0.6

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

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

# INVESTMENT SECTION

## Investment Summary - Private Equity

December 31, 2018 (unaudited)

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

### Buyouts Committed, Drawn, and Distributed

Active Buyout Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions <sup>2/</sup>
1. ABRY Partners IV	Middle	3/30/2001	\$35,000,000	\$25,497,290	\$74,633,973
ABRY Partners V	Middle	7/29/2005	45,000,000	41,735,010	83,070,227
ABRY Partners VI	Middle	3/26/2008	50,000,000	59,957,644	107,565,315
ABRY Partners VII	Middle	8/10/2011	30,000,000	37,036,196	48,564,738
ABRY Partners VIII	Middle	5/5/2015	25,000,000	23,018,013	7,648,750
2. Advent Latin American Private Equity Fund IV	Middle	8/2/2007	30,000,000	30,797,073	39,725,921
Advent International GPE VI-A	Large	7/7/2008	35,000,000	35,146,325	65,520,372
Advent Latin American Private Equity Fund V	Middle	5/17/2010	15,000,000	14,430,000	5,287,500
Advent International GPE VII-B	Large	12/6/2012	40,000,000	37,600,000	27,840,639
Advent Latin American Private Equity Fund VI	Middle	5/11/2015	25,000,000	14,900,000	5,000,000
Advent International GPE VIII-B	Large	9/26/2016	50,000,000	32,450,000	0
3. Apollo Investment Fund IV	Mega	9/30/1998	75,000,000	74,838,620	124,814,033
Apollo Investment Fund V	Mega	8/23/2001	50,000,000	44,972,146	122,447,998
Apollo Investment Fund VI	Mega	7/19/2006	40,000,000	38,911,805	56,634,320
Apollo Investment Fund IX	Mega	*	85,400,000	0	0
4. Asia Alternatives Capital Partners	Fund of Funds	6/26/2007	50,000,000	25,175,064	39,839,925
Asia Alternatives Capital Partners II	Fund of Funds	3/7/2008	50,000,000	28,716,277	34,110,627
Asia Alternatives Korea Buyout Investors (Hahn & Co)	Small	7/22/2011	7,000,000	8,409,401	7,785,068
Asia Alternatives Capital Partners III	Fund of Funds	8/3/2012	50,000,000	52,143,408	30,087,985
Penn Asia Investors	Fund of Funds	9/28/2012	133,000,000	72,121,076	29,232,874
Asia Alternatives Capital Partners V	Fund of Funds	10/5/2017	50,000,000	3,091,094	79,869
5. Audax Private Equity Fund VI	Middle	*	75,000,000	0	0
Audax Private Equity Fund	Middle	5/25/2000	35,000,000	36,839,098	56,057,910
Audax Private Equity Fund II	Middle	6/17/2005	25,000,000	25,517,152	45,240,610
Audax Private Equity Fund III	Middle	11/7/2007	37,000,000	42,498,691	75,668,400
Audax Private Equity Fund V	Middle	1/25/2016	50,000,000	27,841,604	3,687,612
6. Berkshire Fund VI	Middle	7/11/2002	20,000,000	18,828,770	50,433,676
Berkshire Fund VII	Middle	11/15/2006	32,000,000	32,612,736	59,036,527
Berkshire Fund VIII	Middle	8/25/2011	30,000,000	29,081,458	28,336,796
7. Blackstone Communications Partners I	Mega	8/29/2000	25,000,000	25,114,042	30,998,189
Blackstone Capital IV	Mega	2/26/2003	75,000,000	69,055,278	187,102,881
Blackstone Capital Partners V	Mega	5/30/2006	150,000,000	149,911,432	234,220,011
Blackstone Capital Partners VII	Mega	10/21/2016	50,000,000	21,080,759	1,046,910

## Investment Summary - Private Equity

December 31, 2018 (unaudited)

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

	Active Buyout Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions <sup>2/</sup>
8.	Capvis Equity IV	Middle	1/30/2014	\$49,855,591	\$41,764,846	\$29,023,875
9.	Carlyle Energy Mezzanine Opportunities Fund	Small	9/5/2012	50,000,000	60,664,539	25,597,737
	Horizon Strategic Fund - Carlyle Group	Small	1/23/2014	100,000,000	86,075,971	16,934,926
10.	CVC Capital Partners VII	Mega	*	91,202,040	0	0
11.	Energy Spectrum Partners V	Small	7/9/2007	28,326,735	27,637,356	51,487,729
12.	Eureka II	Growth Equity	1/30/2006	20,000,000	21,807,603	20,777,356
	Eureka Growth Capital III	Growth Equity	10/21/2013	20,000,000	12,849,982	10,514,420
13.	Francisco Partners	Middle	7/27/2000	50,000,000	47,769,948	61,464,903
	Francisco Partners II	Middle	7/10/2006	30,000,000	29,383,916	41,240,515
	Francisco Partners III	Middle	10/17/2011	20,000,000	20,046,401	27,949,721
	Francisco Partners IV	Middle	4/15/2015	25,000,000	24,597,173	2,822,173
14.	FSN Capital IV	Middle	12/19/2013	46,049,703	37,755,593	35,577,736
	FSN Capital V	Middle	1/4/2017	77,189,328	20,495,041	7,103,931
15.	GTCR VIII	Middle	7/7/2003	75,000,000	69,393,599	120,471,948
	GTCR IX	Middle	12/1/2006	50,000,000	47,916,718	86,149,702
	GTCR Fund XI	Middle	9/2/2014	25,000,000	21,649,585	11,061,321
	GTCR Fund XII	Large	3/31/2018	32,500,000	1,677,000	286,544
16.	Great Hill Equity Partners III	Middle	3/7/2006	35,000,000	35,000,000	41,373,122
	Great Hill Equity Partners IV	Middle	9/8/2008	25,000,000	25,125,662	43,569,581
17.	H.I.G. Growth Buyouts & Equity Fund II	Growth Equity	7/20/2011	15,000,000	12,635,329	4,086,778
	H.I.G. Europe Capital Partners II	Small	1/10/2014	27,544,596	16,364,744	542,327
	H.I.G. Brazil and Latin America Partners	Middle	8/12/2015	50,000,000	16,619,177	9,139
18.	Hahn & Company II	Middle	5/29/2015	50,000,000	39,771,304	4,640,962
	Hahn & Company III	Middle	*	56,250,000	0	0
	Hahn & Company III - Supplemental Fund	Middle	*	18,750,000	0	0
19.	HarbourVest IPEP III	Fund of Funds	6/30/1998	40,000,000	39,400,000	61,092,165
	HarbourVest Partners VI	Fund of Funds	5/7/1999	200,000,000	196,586,055	249,916,050
	HarbourVest Partners VII	Fund of Funds	3/24/2003	75,000,000	73,687,500	103,049,718
	HIPEP V-Asia Pacific & Rest of World	Fund of Funds	5/9/2006	30,000,000	28,245,316	34,025,749
	HarbourVest Partners VIII	Fund of Funds	10/5/2006	100,000,000	98,000,000	120,879,011
	Horizon Impact Fund	Small	10/24/2014	50,000,000	39,004,802	10,399,736
	Horizon Impact Fund B	Small	5/31/2017	100,000,000	17,250,000	0
20.	Hellman & Friedman Capital Partners IX	Buyout	*	90,000,000	0	0
	Hellman & Friedman Capital Partners V	Large	12/20/2004	80,000,000	71,563,406	192,198,376
	Hellman & Friedman Capital Partners VI	Large	6/5/2007	125,000,000	119,913,412	217,035,494
	Hellman & Friedman Capital Partners VIII	Large	9/1/2016	50,000,000	34,486,364	3,530,532
21.	Incline Equity Partners III	Small	1/14/2013	15,000,000	15,637,582	13,568,696

# INVESTMENT SECTION

## Investment Summary - Private Equity

December 31, 2018 (unaudited)

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

	Active Buyout Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions <sup>2/</sup>
22.	JMI Equity Fund V	Growth Equity	6/7/2005	\$24,000,000	\$24,009,205	\$128,903,788
	JMI Equity Fund VI	Growth Equity	6/27/2007	40,000,000	40,000,246	67,630,800
	JMI Equity Fund VII	Growth Equity	2/14/2011	10,000,000	9,780,000	10,289,532
	JMI Equity Fund VIII	Growth Equity	10/1/2015	25,000,000	18,025,000	5,700,223
23.	Kelso VII	Middle	10/18/2004	40,000,000	41,169,937	65,700,625
	Kelso VIII	Middle	11/29/2007	150,000,000	146,004,916	127,302,885
24.	LLR Equity Partners II	Middle	1/29/2004	25,000,000	25,000,000	44,945,591
	LLR Equity Partners III	Middle	7/24/2008	30,000,000	29,108,722	38,837,202
	LLR Equity Partners IV	Middle	3/14/2014	50,000,000	45,485,764	26,526,316
	LLR Equity Partners V	Middle	3/21/2018	75,000,000	14,710,417	2,706,267
25.	Madison Dearborn Capital Partners IV	Middle	4/2/2001	90,000,000	90,365,390	169,072,775
	Madison Dearborn Capital Partners V	Middle	10/20/2006	75,000,000	71,558,278	113,628,059
	Madison Dearborn Capital Partners VI	Middle	5/27/2008	50,000,000	51,070,609	74,156,247
26.	NGP Keystone	Large	*	25,000,000	0	0
	NGP XII	Large	*	75,000,000	0	0
27.	Newbridge Asia IV	Middle	9/27/2005	40,000,000	38,903,378	85,754,593
28.	NewSpring Growth Capital II	Growth Equity	12/5/2006	10,000,000	9,850,000	13,962,639
	NewSpring Growth Capital III	Growth Equity	7/27/2012	25,000,000	22,397,102	2,218,985
29.	OCM/GFI Power Opportunities Fund II	Small	5/9/2005	25,000,000	13,470,852	41,644,215
	Oaktree Power Opportunities Fund III	Middle	10/18/2010	25,000,000	17,464,459	22,150,923
30.	Permira European Fund II	Large	6/7/2000	48,000,000	45,672,612	91,464,087
	Permira European Fund III	Large	1/12/2004	115,960,000	127,340,454	217,778,356
	Permira IV	Large	12/14/2006	127,779,198	137,230,712	203,511,684
	Permira VI	Large	1/10/2017	56,202,000	25,473,614	0
31.	Primavera Capital Fund II	Large	11/17/2015	50,000,000	49,733,659	3,601,127
32.	Providence Equity Partners IV	Large	11/27/2000	25,000,000	23,420,840	56,065,270
	Providence Equity Partners V	Large	4/4/2005	45,000,000	42,692,171	51,743,883
	Providence Equity Partners VI	Large	3/16/2007	50,000,000	53,854,821	56,559,060
	Providence Strategic Growth II	Small	12/7/2016	60,000,000	47,789,012	18,335,697
	Providence Strategic Growth III	Small	3/31/2018	75,000,000	13,325,397	7,852
33.	Ridgmont Equity Partners II	Small	11/30/2015	50,000,000	38,267,743	8,709,714
34.	Sentinel Capital Partners V	Middle	7/15/2014	10,000,000	8,671,252	4,324,736
35.	Silver Lake Partners V	Large	3/31/2018	78,000,000	15,452,880	0
36.	Sterling Group Partners IV	Middle	6/15/2016	20,000,000	7,906,532	342,813
37.	TA X	Middle	4/25/2006	70,000,000	69,732,009	90,382,009
38.	TDR Capital IV	Middle	*	83,638,400	0	0
39.	Thoma Bravo Fund XIII	Mega	*	75,000,000	0	0

## Investment Summary - Private Equity

December 31, 2018 (unaudited)

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

Active Buyout Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions <sup>2/</sup>
40. TPG Partners III	Mega	1/13/2000	\$75,000,000	\$64,119,169	\$165,990,273
TPG Partners IV	Mega	12/29/2003	30,000,000	27,981,463	57,884,226
TPG Partners V	Mega	6/27/2006	88,831,038	92,531,812	116,367,518
TPG Asia V	Large	2/19/2008	22,500,000	21,964,311	21,268,474
TPG Partners VI	Mega	5/22/2008	44,294,641	50,104,252	57,470,348
41. TSG8	Middle	*	100,000,000	0	0
42. Vista Equity Partners Fund VII	Large	*	75,000,000	0	0
Vista Equity Partners Fund VI	Large	12/29/2016	150,000,000	138,018,382	2,489,894
43. Wind Point Partners VIII	Small	9/14/2017	100,000,000	44,872,788	3,870,252
<b>Total Active Buyouts</b>			<b>\$6,231,273,270</b>	<b>\$4,484,633,546</b>	<b>\$5,599,400,567</b>

Cash flows as of September 30, 2018.

\*Not funded as of September 30, 2018.

<sup>1/</sup>Commitments as of December 31, 2018.

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

# INVESTMENT SECTION

## Investment Summary - Private Equity

December 31, 2018 (unaudited)

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

### Special Situations Committed, Drawn, and Distributed

Active Special Situations Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions <sup>2/</sup>
1. ABRY Mezzanine Partners	Mezzanine	3/15/2002	\$30,000,000	\$26,731,187	\$49,707,116
ABRY Senior Equity II	Mezzanine	7/27/2006	30,000,000	28,237,194	44,861,146
ABRY Advanced Securities Fund	Distressed/ Restructuring	8/1/2008	25,000,000	23,430,048	38,682,209
2. ADV Opportunities Fund I	Distressed/ Restructuring	10/5/2015	50,000,000	52,830,992	5,047,634
3. AXA Secondary Fund III	Secondaries	11/19/2004	26,000,000	21,737,894	37,244,706
AXA Secondary Fund III-2	Secondaries	11/24/2004	14,000,000	11,677,210	19,062,764
AXA Secondary Fund IV	Secondaries	2/26/2007	80,000,000	70,134,752	98,638,689
AXA Secondary Fund V B	Secondaries	6/19/2012	75,000,000	61,318,230	83,447,664
ASF VII B LP	Secondaries	2/19/2016	100,000,000	30,768,276	303,544
ASF VII PA Co-Invest	Secondaries	5/18/2016	50,000,000	19,897,216	0
4. Avenue Asia Special Situations Fund IV	Distressed/ Restructuring	6/30/2006	50,000,000	31,897,973	34,473,134
Avenue Special Situations Fund VI	Distressed/ Restructuring	11/2/2010	20,000,000	20,068,464	20,720,289
5. Centerbridge Capital Partners I	Distressed/ Restructuring	2/27/2007	50,000,000	57,244,781	109,750,572
Centerbridge Capital Partners III	Distressed/ Restructuring	5/21/2015	30,000,000	16,341,078	4,455,977
6. Clearlake Capital Partners IV	Distressed/ Restructuring	9/1/2015	15,000,000	15,993,263	9,262,748
Clearlake Capital Partners V	Distressed/ Restructuring	2/1/2018	55,000,000	12,105,324	13,248
7. Dover Street VII	Secondaries	7/2/2008	30,000,000	28,696,128	37,014,173
8. H.I.G. Bayside Debt & LBO Fund II	Distressed/ Restructuring	6/17/2008	30,000,000	30,982,191	36,627,337
H.I.G. Bayside Loan Opp. Fund III	Distressed/ Restructuring	6/12/2013	50,000,000	40,418,122	19,171,731
H.I.G. Bayside Loan Opp. Fund IV	Distressed/ Restructuring	1/16/2015	25,000,000	12,742,811	6,923,518
9. KPS Special Situations Fund IV	Distressed/ Restructuring	5/8/2014	25,000,000	12,311,512	7,148,620
10. LBC Credit Partners III	Mezzanine	3/4/2013	50,000,000	46,770,412	38,902,404
11. Lexington Capital Partners III	Secondaries	1/26/1999	35,000,000	34,516,449	43,363,378
Lexington Capital Partners V	Secondaries	1/17/2002	75,000,000	74,623,418	124,262,980
Lexington Capital Partners VI	Secondaries	10/21/2005	50,000,000	53,066,325	67,778,343

## Investment Summary - Private Equity

December 31, 2018 (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>
12. OCM Opportunities Fund IV	Distressed/Restructuring	9/26/2001	\$70,000,000	\$70,000,000	\$115,676,649
Oaktree Capital Management	Distressed/Restructuring	5/28/2004	40,000,000	40,581,778	130,313,268
OCM Opportunities Fund V	Distressed/Restructuring	8/12/2004	40,000,000	40,003,507	65,384,725
OCM Opportunities Fund VI	Distressed/Restructuring	9/28/2005	40,000,000	40,000,000	63,171,009
OCM Principal Opportunities Fund IV	Distressed/Restructuring	1/24/2007	20,000,000	20,400,000	34,019,822
OCM Opportunities Fund VII	Distressed/Restructuring	5/16/2007	40,000,000	40,000,000	52,739,295
OCM Opportunities Fund VII b	Distressed/Restructuring	6/3/2008	40,000,000	36,000,000	60,255,994
OCM Opportunities Fund VIII	Distressed/Restructuring	9/20/2010	12,500,000	12,583,425	17,147,629
OCM Opportunities Fund VIII b	Distressed/Restructuring	8/22/2011	12,500,000	12,500,000	9,480,383
Oaktree Opportunities Fund IX	Distressed/Restructuring	3/26/2013	50,000,000	50,000,000	16,447,715
13. Platinum Equity Capital Partners III	Distressed/Restructuring	8/5/2013	50,000,000	45,366,112	47,710,334
14. RRJ Capital Master Fund III	Distressed/Restructuring	12/10/2015	50,000,000	35,290,365	2,254,306
<b>Total Active Special Situations</b>			<b>\$1,535,000,000</b>	<b>\$1,277,266,437</b>	<b>\$1,551,465,053</b>

Cash flows as of September 30, 2018.

<sup>1/</sup>Commitments as of December 31, 2018.

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

# INVESTMENT SECTION

## Investment Summary - Private Equity

December 31, 2018 (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. Battery Ventures VIII	Balanced	8/13/2007	\$25,000,000	\$25,050,751	\$52,255,913
Battery Ventures VIII Side Car Fund	Balanced	8/29/2008	9,000,000	6,803,790	17,412,210
2. Insight Venture Partners VI	Balanced	8/21/2007	30,000,000	32,244,176	73,211,458
Insight Venture Partners VII	Balanced	4/27/2011	20,000,000	21,320,103	20,375,609
Insight Venture Partners VIII	Balanced	7/10/2013	50,000,000	52,250,000	22,790,180
Insight Venture Partners IX	Balanced	3/24/2015	50,000,000	47,875,000	5,351,113
Insight Venture Partners X	Balanced	3/31/2018	100,000,000	21,000,000	0
3. Lightspeed Venture Partners VII	Early Stage	2/27/2006	18,000,000	18,000,000	48,795,961
Lightspeed Venture Partners VIII	Early Stage	6/27/2008	15,000,000	14,550,000	24,023,518
Lightspeed India Partners I	Early Stage	8/14/2015	15,000,000	11,175,000	0
4. Meritech Capital Partners II	Late Stage	1/2/2001	26,475,166	24,842,529	40,350,206
Meritech Capital Partners III	Late Stage	4/5/2006	35,000,000	35,000,000	187,689,525
Meritech Capital Partners IV	Late Stage	2/10/2011	20,000,000	19,100,000	21,729,175
Meritech Capital Partners V	Late Stage	9/3/2014	23,000,000	21,332,500	1,465,847
5. New Enterprise Associates IX	Early Stage	11/15/1999	20,000,000	19,600,000	7,721,519
New Enterprise Associates X	Early Stage	12/11/2000	35,000,000	35,028,000	32,493,542
New Enterprise Associates 11	Early Stage	3/1/2004	25,000,000	25,000,000	58,004,534
New Enterprise Associates 12	Early Stage	6/26/2006	35,000,000	35,631,130	42,164,278
6. T.Rowe Price Stock Distribution Account <sup>3/</sup>	Late Stage	1/3/2005	0	999,119,561	982,610,757
7. TCV X	Large	*	75,000,000	0	0
8. Weathergage Venture Capital	Fund of Funds	6/26/2007	25,000,000	22,875,000	27,361,174
Weathergage Venture Capital II	Fund of Funds	6/29/2010	25,000,000	23,250,000	8,991,238
<b>Total Active Venture Capital</b>			<b>\$676,475,166</b>	<b>\$1,511,047,540</b>	<b>\$1,674,797,757</b>

Cash flows as of September 30, 2018.

\*Not funded as of September 30, 2018.

<sup>1/</sup>Commitments as of December 31, 2018.

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

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

## Investment Summary - Private Equity

December 31, 2018 (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.

### Legacy Private Equity Committed, Drawn, and Distributed

Legacy Private Equity Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions <sup>2/</sup>
1. Keystone Legacy Fund <sup>3/</sup>	Various	7/1/2018	\$5,502,595,213	\$5,483,352,580	\$6,674,680,914
<b>Total Legacy Private Equity</b>			<b>\$5,502,595,213</b>	<b>\$5,483,352,580</b>	<b>\$6,674,680,914</b>

Cash flows as of September 30, 2018.

<sup>1/</sup>Commitments as of December 31, 2018.

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

<sup>3/</sup>A total of 163 legacy holdings from the Private Equity core sub-asset classes (Buyouts, Special Situations, and Venture Capital) have been consolidated and are managed by a third-party administrator through a special purpose vehicle, Keystone Legacy Fund.

# INVESTMENT SECTION

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## Investment Summary - Global Public Equity

December 31, 2018 (unaudited)

### Role in the SERS Fund

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

### Program Structure

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

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

### Objective

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

## Investment Summary - Global Public Equity

December 31, 2018 (unaudited)

### Global Public Equity

(\$ millions)

Manager	Investment Style	Market Exposure as of 12/31/18 <sup>4</sup>
<b>Global Mandates</b>		
1. Walter Scott & Partners Limited	Global Growth	\$865.9
<b>Total Global Mandates</b>		<b>865.9</b>
<b>U.S. Equity</b>		
2. Emerald Advisers	U.S. Small-cap growth	564.4
3. Iridian Asset Management	U.S. Mid-cap value	371.9
4. Mellon Capital Management Russell 1000 Index	Russell 1000 Index	4,804.8
Mellon Capital Management Russell 2000 Core Index	Russell 2000 Core	277.4
Mellon Capital Management Russell 2000 Value Index	Russell 2000 Value	508.0
<b>Total U.S. Equity</b>		<b>6,526.5</b>
<b>Non-U.S. Developed Markets Equity</b>		
5. Artisan Partners - Global ex U.S.	Global ex-U.S. growth	1.2
6. BlackRock MSCI World ex U.S. Index	Developed ex-U.S. Index	4,354.0
7. Harris Associates	Non-U.S. Small-cap value	479.1
Mellon Capital Management MSCI World ex U.S. Index	MSCI World ex-U.S. Index	6.3
8. Morgan Stanley Investment Management Limited-developed ex U.S.	EAFE value	1.4
9. Templeton Investment Counsel - Global ex U.S.	Global ex-U.S. value	1.4
10. FIS Group Inc.	International Small-cap	174.4
<b>Total Non-U.S. Developed Markets Equity</b>		<b>5,017.8</b>
<b>Emerging Markets Equity</b>		
BlackRock/Emerging Markets Index Fund	MSCI Emerging Markets Index	623.5
11. GlobeFlex Capital	Small-cap - GARP	83.9
12. Macquarie Emerging Markets	Mid/large cap value	296.2
13. Martin Currie Investment Management	All-cap	285.1
14. Leading Edge	Emerging Markets	194.1
<b>Total Emerging Markets Equity</b>		<b>1,482.8</b>
<b>Transition Assets</b>		
15. Northern Trust	Transition	1.3
<b>Total Transition Assets</b>		<b>1.3</b>
<b>Total Global Public Equity</b>		<b>\$13,894.3</b>

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

# INVESTMENT SECTION

## Investment Summary - Real Estate

December 31, 2018 (unaudited)

### Role in the SERS Fund

Real Estate has several roles within SERS overall investment portfolio, including enhancing returns and providing diversification, income, and an inflation hedge. As in the past, SERS has emphasized a balance between value-add/opportunistic real estate strategies which can provide competitive total returns through capital appreciation, with core/core plus strategies, which have a larger emphasis on income, and in many cases, increased liquidity. SERS will seek to achieve this balanced risk profile by focusing on top-tier managers in each aspect of Real Estate, which is expected to result in attractive, long-term risk-adjusted returns.

### Program Structure

Investments in Real Estate are categorized into four strategies: core/core plus, value-add and opportunistic, real estate securities, and natural resources/infrastructure related strategies and funds. SERS will build its Real Estate allocation towards its long-term target by steadily increasing investments in both relatively stable, core/core plus investments as well as value-add and opportunistic strategies.

New target allocations within the Real Estate program are designed to balance expected return, liquidity, diversification, and inflation hedging, while decreasing expected risk. SERS Real Estate program is subject to the investment pacing established by the investment plan to help manage the liquidity profile of the total fund to align with the projected increase in retirement benefit payments.

### Objective

The objective of the Real Estate program is to generate annualized net-of-fee returns that exceed a custom benchmark (NCREIF Fund Index - Open End Diversified Core Equity, FTSE NAREIT U.S. Real Estate Index for real estate securities, & CPI plus a 3% premium for natural resources/infrastructure, with the various components weighted according to long-term allocation targets within the asset class), over a seven- to 10-year period.

### Real Estate

(\$ millions)

Sub-Asset Class	Fair Value	% of Total Fund
Core/Core Plus <sup>1/</sup>	\$591.4	2.2%
Value Add/Opportunistic SMA	746.3	2.8
Value Add/Opportunistic Funds <sup>1/</sup>	402.8	1.5
Natural Resources/Infrastructure	5.6	0.0
Real Estate Securities (REITs)	223.7	0.8
<b>Total Real Estate</b>	<b>\$1,969.8</b>	<b>7.3%</b>

<sup>1/</sup>As of December 31, 2018, unfunded commitments are \$382.9 million.

# INVESTMENT SECTION

## Investment Summary - Real Estate

December 31, 2018 (unaudited)

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

### Real Estate

Fund/Manager	Asset Type	SERS Initial Funding	Capital Committed <sup>u</sup>	Accumulated Capital Drawn	Accumulated Distributions
<b>Core/Core Plus</b>					
1. Blackstone Property Partners	Diversified	2017	\$300,000,000	\$300,000,000	\$2,180,246
2. Heitman America Real Estate Trust	Diversified	2007	100,000,000	100,000,000	0
3. UBS Trumbull Property Fund	Diversified	1988	25,558,525	25,558,525	67,265,772
UBS Trumbull Property Income Fund	Diversified	1988	33,332,027	33,332,027	87,606,992
<b>Total Core/Core Plus</b>			<b>458,890,552</b>	<b>458,890,552</b>	<b>157,053,010</b>
<b>Value Add/Oppportunistic Funds</b>					
4. AG Asia Realty Fund	Diversified	2007	25,000,000	23,500,000	20,812,500
5. Apollo Real Estate Fund III	Diversified	1998	50,000,000	50,000,000	74,810,023
6. Berwind Investment Partnership V	Diversified	1999	25,000,000	24,136,964	43,926,194
Berwind Investment Partnership VI	Diversified	2002	25,000,000	24,543,712	41,584,267
Berwind Investment Partnership VII	Diversified	2005	25,000,000	25,000,000	9,095,711
Berwind Investment Partnership VIII	Diversified	2007	15,588,238	14,912,018	19,049,366
Berwind Investment Partnership IX	Diversified	2012	25,000,000	24,303,409	22,328,308
Blackstone Real Estate Partners IV	Diversified	2003	25,000,000	25,000,000	36,944,774
Blackstone Real Estate Partners V	Diversified	2006	50,000,000	47,912,974	92,970,654
Blackstone Real Estate Partners VI	Diversified	2007	75,000,000	71,319,075	145,326,608
Blackstone Real Estate Partners VII	Diversified	2011	75,000,000	63,677,499	65,529,067
7. C-III Recovery Fund III	Diversified	2017	100,000,000	19,671,122	0
8. Clerestory Small Cap Fund I	Diversified	2010	18,000,000	15,228,956	13,844,513
9. Colony Investors VIII	Diversified	2007	22,500,000	21,655,800	7,962,017
10. Fidelity Real Estate Opportunistic Income Fund	Debt	2007	35,000,000	35,000,000	75,242,679
11. Fillmore West Fund	Diversified	2008	30,000,000	29,342,336	31,763,691
12. Hawkeye Scout Fund I	Diversified	2009	75,000,000	75,000,000	116,323,890
Hawkeye Scout Fund II	Diversified	2016	30,000,000	27,630,079	0
13. LEM Real Estate High-Yield Debt Fund III	Debt	2013	25,000,000	6,795,058	20,772,914
14. Lubert Adler Fund III	Diversified	2000	30,000,000	28,729,020	44,171,118
Lubert Adler Fund IV	Diversified	2004	25,000,000	23,820,755	11,552,208
Lubert Adler Fund V	Diversified	2006	30,000,000	30,000,000	5,783,261
Lubert Adler Fund VI	Diversified	2008	20,927,116	19,200,031	15,763,543
Lubert Adler Fund VI-A	Diversified	2010	4,072,884	3,347,634	6,209,104
Lubert Adler Fund VII	Diversified	2014	25,000,000	22,925,725	6,211,006

# INVESTMENT SECTION

## Investment Summary - Real Estate

December 31, 2018 (unaudited)

### Real Estate (continued)

	Fund / Manager	Asset Type	SERS Initial Funding	Capital Committed <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions
<b>Value Add/Oppportunistic Funds (continued)</b>						
15.	Mesirow Financial Real Estate Value Fund III	Diversified	2018	\$25,000,000	\$7,405,659	\$74,261
16.	Oak Street Real Estate Fund IV	Diversified	2017	100,000,000	24,857,109	751,893
17.	OCM Real Estate Opp Fund III	Diversified	2003	25,000,000	25,000,000	42,218,554
18.	Oxford GSA Fund	Diversified	2006	30,000,000	21,369,627	18,384,338
19.	Prudential Latin America Retail Fund I	Retail	2006	25,000,000	2,271,117	8,162,626
	Prudential Latin America Residential Fund III	Multi-Family	2008	29,654,968	24,708,749	11,380,777
	Prudential Senior Housing Fund IV	Senior Housing	2011	25,000,000	20,799,516	16,718,852
	Prudential Senior Housing Fund V	Senior Housing	2015	50,000,000	30,958,534	1,782,081
20.	Rockpoint Finance Fund I	Residential Land	2007	50,000,000	2,527,500	1,899,395
	Rockpoint Real Estate Fund II	Diversified	2005	35,000,000	34,138,784	30,679,156
	Rockpoint Real Estate Fund III	Diversified	2007	50,000,000	46,391,722	65,247,824
	Rockpoint Real Estate Fund V	Diversified	2015	50,000,000	25,946,245	0
21.	Singerman III	Diversified	2017	50,000,000	2,000,000	0
	Singerman III Select	Diversified	*	50,000,000	0	0
22.	Starwood Fund IV	Diversified	1997	37,750,000	37,750,000	81,388,229
	Starwood Fund VI	Diversified	2001	50,000,000	50,000,000	51,299,808
	Starwood Fund VII	Diversified	2006	35,000,000	35,000,000	25,486,147
	Starwood Fund VIII	Diversified	2009	50,000,000	45,356,281	67,386,219
23.	ValStone Opportunity Fund V	Diversified	2014	14,663,402	14,663,402	3,209,834
24.	Westbrook Fund V	Diversified	2004	25,000,000	25,000,000	44,485,779
	Westbrook Fund VI	Diversified	2006	35,000,000	35,000,000	31,087,858
	Westbrook Fund VII	Diversified	2007	50,000,000	50,000,000	50,363,635
	Westbrook Fund VIII	Diversified	2009	50,000,000	50,000,000	62,318,055
<b>Total Value Add/Oppportunistic Funds</b>				<b>1,828,156,608</b>	<b>1,363,796,412</b>	<b>1,542,302,738</b>

### Value Add/Oppportunistic SMA<sup>2/</sup>

	Heitman I.M.A.	Diversified	1988	NA	813,635,039	1,092,759,873
25.	LaSalle I.M.A.	Diversified	1994	NA	444,715,936	527,795,686
	LaSalle Takeover I.M.A.	Diversified	2018	NA	204,196,078	0
26.	HotelAVE I.M.A.	Hotel	2018	NA	58,890,000	0
27.	Lowe I.M.A.	Diversified	1994	NA	715,229,496	1,069,043,541
	Lowe GTO	Diversified	2012	NA	349,069,212	343,848,419
<b>Total Value Add/Oppportunistic SMA</b>					<b>2,585,735,760</b>	<b>3,033,447,518</b>

## Investment Summary - Real Estate

December 31, 2018 (unaudited)

### Real Estate (continued)

	Fund / Manager	Asset Type	SERS Initial Funding	Capital Committed <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions
<b>Natural Resources/Infrastructure<sup>2/</sup></b>						
28.	Forest I.M.A.	Timberland	1992	NA	\$124,231,969	\$242,367,376
<b>Total Natural Resources/Infrastructure</b>					<b>124,231,969</b>	<b>242,367,376</b>
<b>REITs<sup>2/</sup></b>						
29.	CBRE Clarion Real Estate Securities	Diversified	1996	NA	210,848,120	669,514,323
30.	CenterSquare Real Estate Securities	Diversified	2002	NA	26,282,779	36,168,336
<b>Total REITs</b>					<b>237,130,899</b>	<b>705,682,659</b>
<b>Total Real Estate</b>				<b>\$2,287,047,160</b>	<b>\$4,769,785,592</b>	<b>\$5,680,853,301</b>

Cash flows as of September 30, 2018.

<sup>\*</sup>/Not funded as of September 30, 2018.

<sup>1/</sup>Commitments as of December 31, 2018.

<sup>2/</sup>Due to the nature of the investments, there are no capital commitments for value add/opportunistic SMA, natural resources/infrastructure, and real estate securities managers.

# INVESTMENT SECTION

## Investment Summary - Multi-Strategy

December 31, 2018 (unaudited)

### Role in the SERS Fund

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

### Program Structure

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

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

### Objective

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

### Multi-Strategy

(\$ millions)

Sub-Asset Class	Fair Value	% of Total Fund
Private Credit Funds <sup>1/</sup>	\$93.1	0.4%
Credit-Focused Strategies	872.6	3.2
Opportunistic Equity and Fixed Income	1,398.3	5.2
<b>Total Multi-Strategy</b>	<b>\$2,364.0</b>	<b>8.8%</b>

<sup>1/</sup>As of December 31, 2018, unfunded commitments are \$802.6 million.

## Investment Summary - Multi-Strategy

December 31, 2018 (unaudited)

### Private Markets

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

#### Private Credit Committed, Drawn, and Distributed

Active Private Credit Funds	Strategy/Stage	SERS Initial Funding	Capital Committed <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions <sup>2/</sup>
1. Apollo Hybrid Value Fund	Distressed and Credit	*	\$100,000,000	\$0	\$0
2. Audax Direct Lending Solutions Fund-A	Direct Lending	*	100,000,000	0	0
3. Brightwood Capital Fund IV	Direct Lending	4/24/2018	100,000,000	30,000,000	1,237,567
4. Glendon Opportunities Fund II	Distressed and Credit	*	150,000,000	0	0
5. ICG Europe Fund VII	Distressed and Credit	8/24/2018	91,522,400	6,261,492	0
ICG North American Private Debt Fund II	Distressed and Credit	*	50,000,000	0	0
6. TAO Global Contingent Fund	Distressed and Credit	*	150,000,000	0	0
7. TSSP Adjacent Opportunities Partners (B)	Distressed and Credit	11/9/2017	100,000,000	33,901,056	0
TSSP Opportunities Partners IV	Distressed and Credit	*	50,000,000	0	0
<b>Total Active Private Credit Funds</b>			<b>\$891,522,400</b>	<b>\$70,162,548</b>	<b>\$1,237,567</b>

### Public Markets

Manager	Investment Style	Market Exposure as of 12/31/18 <sup>2/</sup> (\$ millions)
<b>Credit-Focused Strategies</b>		
8. Blackstone Keystone	Fund-of-Funds	\$872.6
<b>Total Credit-Focused Strategies</b>		<b>872.6</b>
<b>Opportunistic Equity &amp; Fixed Income</b>		
9. Eaton Vance	Global Macro Strategy	189.3
10. Mellon Capital Management Russell 3000 Index	Russell 3000 Core	876.8
11. SEI Structured Credit Fund	High Yield Bank Loans	332.1
<b>Total Opportunistic Equity &amp; Fixed Income</b>		<b>1,398.2</b>
<b>Total Public Market Multi-Strategy</b>		<b>\$2,270.8</b>

Cash flows as of September 30, 2018.

\*Not funded as of September 30, 2018.

<sup>1/</sup>Commitments as of December 31, 2018.

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

# INVESTMENT SECTION

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## Investment Summary - Legacy Hedge Funds

December 31, 2018 (unaudited)

### Role in the SERS Fund

SERS legacy hedge fund program was historically designed to provide total returns comparable to the total fund return but with lower volatility and correlation to other asset classes. However, with the development of SERS' Multi-Strategy allocation SERS is no longer actively investing in this space.

### Program Structure

The current structure of this portfolio consists of legacy investments that will continue to decrease over time as investments are realized, liquidated, and redeemed.

### Objective

SERS will continue to work with existing legacy managers as well as explore options to work with strategic partners to expedite the redemption process in a thoughtful and cost effective way.

### Status

SERS legacy hedge fund portfolios are currently in liquidation. The remaining balance has continued to decrease as SERS has successfully redeemed assets from legacy managers.

## Investment Summary - Legacy Hedge Funds

December 31, 2018 (unaudited)

### Legacy Hedge Funds

(\$ millions)

Manager	Investment Style	Market Exposure as of 12/31/18 <sup>1/</sup>
<b>Funds-of-Hedge Funds</b>		
1. Entrust Keystone	Fund-of-Funds	\$10.2
<b>Total Funds-of-Hedge Funds</b>		<b>10.2</b>
<b>Absolute Return Strategies</b>		
2. Arden	Fund-of-Funds	13.5
3. Blackstone - Stable Alpha	Fund-of-Funds	7.8
4. Morgan Stanley Alternative Investment Partners	Fund-of-Funds	3.5
5. PAAMCO	Fund-of-Funds	5.5
6. Robeco Investment	Fund-of-Funds	0.2
7. Rock Creek	Fund-of-Funds	0.2
8. Legacy Hedge Funds	Fund-of-Funds	4.2
<b>Total Absolute Return Strategies</b>		<b>34.9</b>
<b>Direct Investments</b>		
9. Luxor Capital Partners	Direct Hedge Fund	2.6
10. Pine River Fund	Direct Hedge Fund	1.2
<b>Total Direct Investments</b>		<b>3.8</b>
<b>Total Legacy Hedge Funds</b>		<b>\$48.9</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

December 31, 2018 (unaudited)

### Role in the SERS Fund

SERS Fixed Income program is structured to:

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

### Program Structure

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

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

### Objective

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

# INVESTMENT SECTION

## Investment Summary - Fixed Income

December 31, 2018 (unaudited)

### Fixed Income

(\$ millions)

Manager	Investment Style	Market Exposure as of 12/31/18 <sup>4/</sup>
<b>Core Plus Fixed Income</b>		
1. Brandywine Global	Global Sovereign Credit	\$186.7
2. Pyramis Global Advisors	Commercial Mortgage-Backed Securities	315.3
3. Stone Harbor	Emerging Market Debt	160.6
Stone Harbor	Global High Yield	159.3
4. W.R. Huff	High Yield (liquidating)	0.2
5. Waterfall Asset Management	Asset-Backed Securities	0.2
<b>Total Core Plus</b>		<b>822.3</b>
<b>Core Fixed Income</b>		
6. Mellon Capital Management	Bloomberg Barclays U.S. Aggregate	1,028.9
7. PIMCO Core	Bloomberg Barclays U.S. Aggregate ex. Treasuries	611.0
8. Taplin, Canida & Habacht (TCH)	U.S. Credit	178.5
<b>Total Core</b>		<b>1,818.4</b>
<b>Global Treasury Inflation Protected Securities (TIPS)</b>		
9. Brown Brothers Harriman	Global TIPS	213.7
10. New Century Advisors	Global TIPS	110.9
11. NISA Investment Advisors	U.S. TIPS	481.1
<b>Total Global Treasury Inflation Protected Securities (TIPS)</b>		<b>805.7</b>
<b>Nominal U.S. Treasuries</b>		
PIMCO U.S. Treasuries	Domestic Treasuries	548.8
<b>Total Nominal U.S. Treasuries</b>		<b>548.8</b>
<b>Total Fixed Income</b>		<b>\$3,995.2</b>

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

# INVESTMENT SECTION

## Investment Summary - Cash

December 31, 2018 (unaudited)

### Role in the SERS Fund

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

### Program Structure

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

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

### Objective

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

<b>Cash</b>		
(\$ millions)		
Manager	Investment Style	Market Exposure as of 12/31/18 <sup>4/</sup>
<b>Cash</b>		
1. PA State Treasury (STIF)	Cash	\$757.0
<b>Total Cash</b>		<b>\$757.0</b>

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

**2018**

**Actuarial Section**



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May 10, 2019

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

Dear Ms. Sanchez:

The purpose of this letter is to certify the actuarial adequacy of the contributions being made by the Commonwealth of Pennsylvania and other participating agencies to the Pennsylvania State Employees' Retirement System (SERS), and to discuss the approach currently being taken toward meeting the financing objectives of the plan. The results provided herein are based upon the December 31, 2018 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, 2019:

- (1) The employer share of the normal cost.
- (2) The fresh start amortization of the December 31, 2009 unfunded liability over a 30-year period beginning July 1, 2010 and ending on June 30, 2040.
- (3) The amortization of the change in liability due to Act 2010-120 (Act 120) over a 30-year period beginning July 1, 2011 and ending on June 30, 2041.
- (4) The amortization of changes in liability due to actual experience differing from assumed experience after December 31, 2009 over 30-year periods beginning with the July following the actuarial funding valuation determining such changes.
- (5) The extra contribution to return Act 2017-5 savings.
- (6) The amortization of legislated benefit changes, including cost-of-living increases, over 10-year periods beginning with the July following the actuarial funding valuation determining such changes. (Note: There are currently no 10-year amortizations being funded.)

The amortization payments are level dollar amounts over the remaining applicable amortization periods. The employer cost is determined as a percent of retirement covered compensation. The total employer cost is the average contribution amount that needs to be received from the employer groups participating in the system. Some employer groups contribute a higher percent of compensation and others contribute a lower percent of compensation, depending on the benefits payable to each group's employees.



Ms. Terrill J. Sanchez

May 10, 2019

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, 2018 actuarial funding valuation, with the exception of the investment return and inflation assumptions, was adopted by the State Employees' Retirement Board (the Board) based upon actual experience of SERS during the years 2011 through 2015. To ensure that the investment return assumption remains up-to-date and appropriate for every actuarial valuation, we review it annually with the SERS Board. As a result of the review undertaken during March/April of 2017, the Board approved (i) a reduction in the annual investment return assumption from 7.50% to 7.25% and (ii) a reduction in the annual inflation assumption from 2.75% to 2.60%, and both changes became effective with the December 31, 2016 actuarial valuation. We believe these assumptions remain appropriate and reasonable, therefore, they have been retained for both the December 31, 2017 and the December 31, 2018 valuations. 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, 2018 actuarial funding valuation and are included herein.



Ms. Terrill J. Sanchez

May 10, 2019

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

The following schedules were prepared from the December 31, 2018 actuarial funding valuation: "Schedules of Active Member Valuation Data", "Solvency Test", "Analysis of Financial Experience", "Schedule of Funding Progress", "Schedule of Contributions Under Previous Reporting Standards", and "History and Projection of Contribution Rates and Funded Ratios".

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, and will continue to be, adequately funded, in accordance with generally accepted actuarial principles and procedures.

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

### **Actuarial Certification**

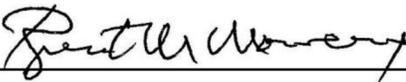
To the best of our knowledge, this report is complete and accurate and all costs and liabilities have been determined in accordance with the parameters set by actuarial standards of practice and on the basis of actuarial assumptions and methods which are reasonable (taking into account the past experience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



Ms. Terrill J. Sanchez  
May 10, 2019

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

Respectfully submitted,  
Korn Ferry

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

By   
Kristopher E. Seets, F.S.A.  
Member American Academy of Actuaries  
Enrolled Actuary No. 17-8055

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

**Summary of Actuarial Assumptions and Methods**

December 31, 2018 (unaudited)

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

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

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

- (1) Act 2010-120 established a fresh start amortization of the December 31, 2009 unfunded liability over a 30-year period beginning July 1, 2010, and ending June 30, 2040.
- (2) The amortization of the change in liability due to Act 2010-120 over a 30-year period beginning July 1, 2011, and ending on June 30, 2041.
- (3) The amortization of changes in liability due to actual experience differing from assumed experience after December 31, 2009, over 30-year periods beginning with the July 1 following the actuarial valuation determining such changes.
- (4) The extra contribution to return Act 2017-5 savings.

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

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

# ACTUARIAL SECTION

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## Summary of Actuarial Assumptions and Methods

December 31, 2018 (unaudited)

- The rates for probability of retirement and the probabilities of withdrawal from active service, including death, before age and service retirements, which are presented in the **Schedules of Active Member Valuation Data**.
- The projected average salary increases of 5.6% with a range of 3.7% to 8.9%. This increase includes an underlying assumption of 2.6% for inflation. The annual rate of salary increase for promotions and longevity for members is presented in the **Schedules of Active Member Valuation Data**.
- No cost-of-living adjustments were used in the determination of actuarial valuations. SERS periodically prepares a study using actual experience in order to develop assumptions for use in its actuarial valuations. The latest study dated March 9, 2016 was completed for the period January 1, 2011 through December 31, 2015.

The most recent valuations were based on members of SERS as of December 31, 2018. 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, 2018 (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, 2018 (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, 2018 (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	45	NA	NA	NA	NA	NA	NA	45	\$28,412
20 - 24	1,337	5	NA	NA	NA	NA	NA	1,342	36,371
25 - 29	3,829	572	8	NA	NA	NA	NA	4,409	47,780
30 - 34	3,117	2,339	713	13	NA	NA	NA	6,182	55,673
35 - 39	2,027	1,771	2,358	598	7	NA	NA	6,761	62,332
40 - 44	1,514	1,245	1,856	1,626	501	8	NA	6,750	66,696
45 - 49	1,449	1,178	1,631	1,664	1,896	723	13	8,554	72,239
50 - 54	1,292	1,100	1,272	1,399	1,389	1,387	542	8,381	71,194
55 - 59	1,200	967	1,216	1,209	948	1,015	1,266	7,821	68,275
60 - 64	799	848	1,025	962	522	480	629	5,265	66,990
65+	508	506	556	541	246	194	316	2,867	69,799
<b>Total</b>	<b>17,117</b>	<b>10,531</b>	<b>10,635</b>	<b>8,012</b>	<b>5,509</b>	<b>3,807</b>	<b>2,766</b>	<b>58,377</b>	<b>\$64,716</b>

Average Age: 46.06  
Average Service: 11.65

### 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	31	NA	NA	NA	NA	NA	NA	31	\$27,015
20 - 24	1,029	12	NA	NA	NA	NA	NA	1,041	32,254
25 - 29	2,642	417	12	NA	NA	NA	NA	3,071	40,841
30 - 34	2,392	1,270	480	13	NA	NA	NA	4,155	47,002
35 - 39	1,931	1,196	1,460	424	17	NA	NA	5,028	51,771
40 - 44	1,674	1,008	1,275	997	297	29	NA	5,280	54,985
45 - 49	1,536	967	1,307	1,047	748	459	40	6,104	57,061
50 - 54	1,385	1,017	1,262	987	676	800	548	6,675	57,960
55 - 59	1,173	972	1,266	1,086	722	738	924	6,881	58,072
60 - 64	703	771	977	888	430	321	399	4,489	56,145
65+	250	333	433	360	182	120	197	1,875	57,732
<b>Total</b>	<b>14,746</b>	<b>7,963</b>	<b>8,472</b>	<b>5,802</b>	<b>3,072</b>	<b>2,467</b>	<b>2,108</b>	<b>44,630</b>	<b>\$53,794</b>

Average Age: 46.62  
Average Service: 10.83

# ACTUARIAL SECTION

## Schedules of Active Member Valuation Data

December 31, 2018 (unaudited)

### Aggregate Active Member Valuation Data

Valuation Year Ended Dec 31	Number of Employers	Number of Active Members	Covered Payroll	Annual Average Pay	% Increase/(Decrease) in Average Pay
2018	102 <sup>1/</sup>	103,007	\$6,178,000,000	\$59,984	6.2%
2017	102 <sup>1/</sup>	102,978	5,984,000,000	58,113	2.9
2016	103 <sup>2/</sup>	104,632	5,912,000,000	56,499	-0.6
2015	104 <sup>3/</sup>	105,025	5,972,000,000	56,858	3.7
2014	104 <sup>3/</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

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

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

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

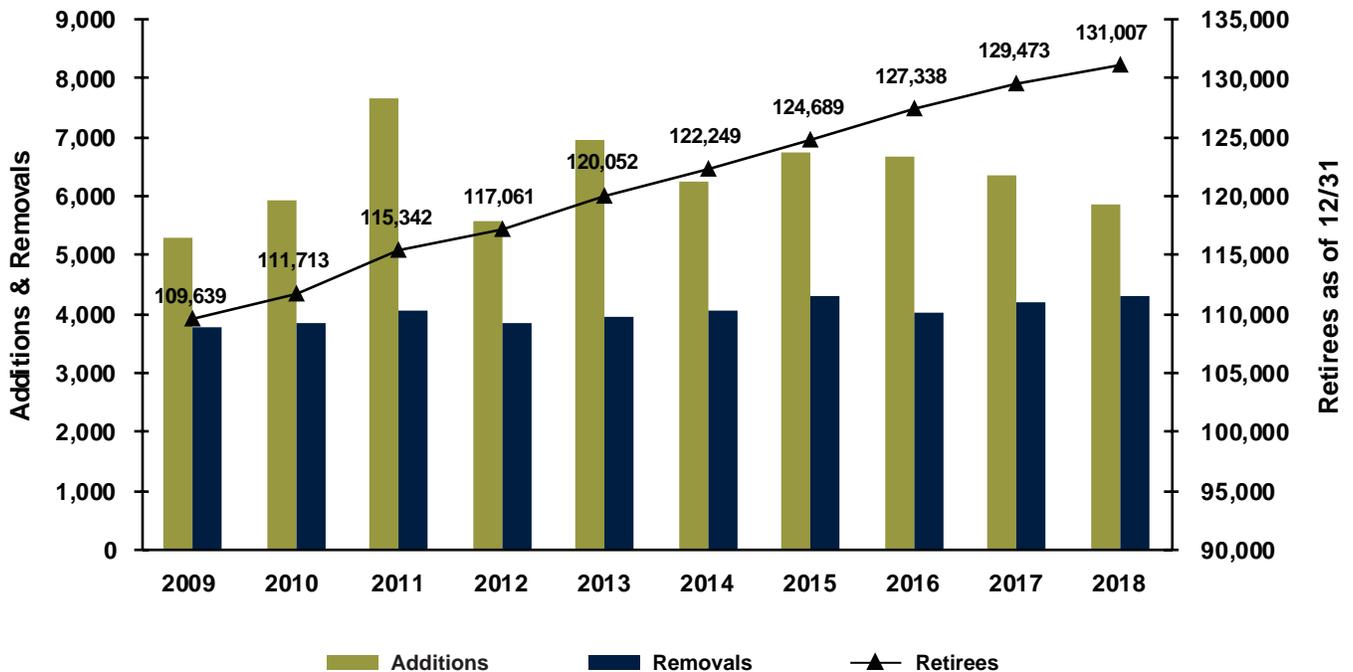
**Schedule of Retirees and Beneficiaries Added to and Removed from Rolls**

December 31, 2018 (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
2018	5,847	\$166,594,854	4,313	\$70,862,628	131,007	\$3,004,855,159	1.2%	3.3%
2017	6,338	178,317,205	4,203	63,576,892	129,473	2,909,267,596	1.7	4.1
2016	6,658	191,327,122	4,009	60,165,549	127,338	2,794,984,868	2.1	4.9
2015	6,743	175,810,502	4,303	63,027,188	124,689	2,664,418,763	2.0	4.4
2014	6,245	157,593,809	4,048	59,524,055	122,249	2,552,077,530	1.8	4.0
2013	6,944	178,392,487	3,953	53,186,262	120,052	2,454,388,693	2.6	5.4
2012	5,572	138,363,766	3,853	50,453,118	117,061	2,329,489,208	1.5	3.9
2011	7,669	205,521,876	4,040	50,132,667	115,342	2,241,716,566	3.3	7.4
2010	5,906	148,169,231	3,832	48,182,212	111,713	2,086,701,831	1.9	5.0
2009	5,278	125,610,303	3,785	45,195,072	109,639	1,987,109,540	1.4	4.2

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



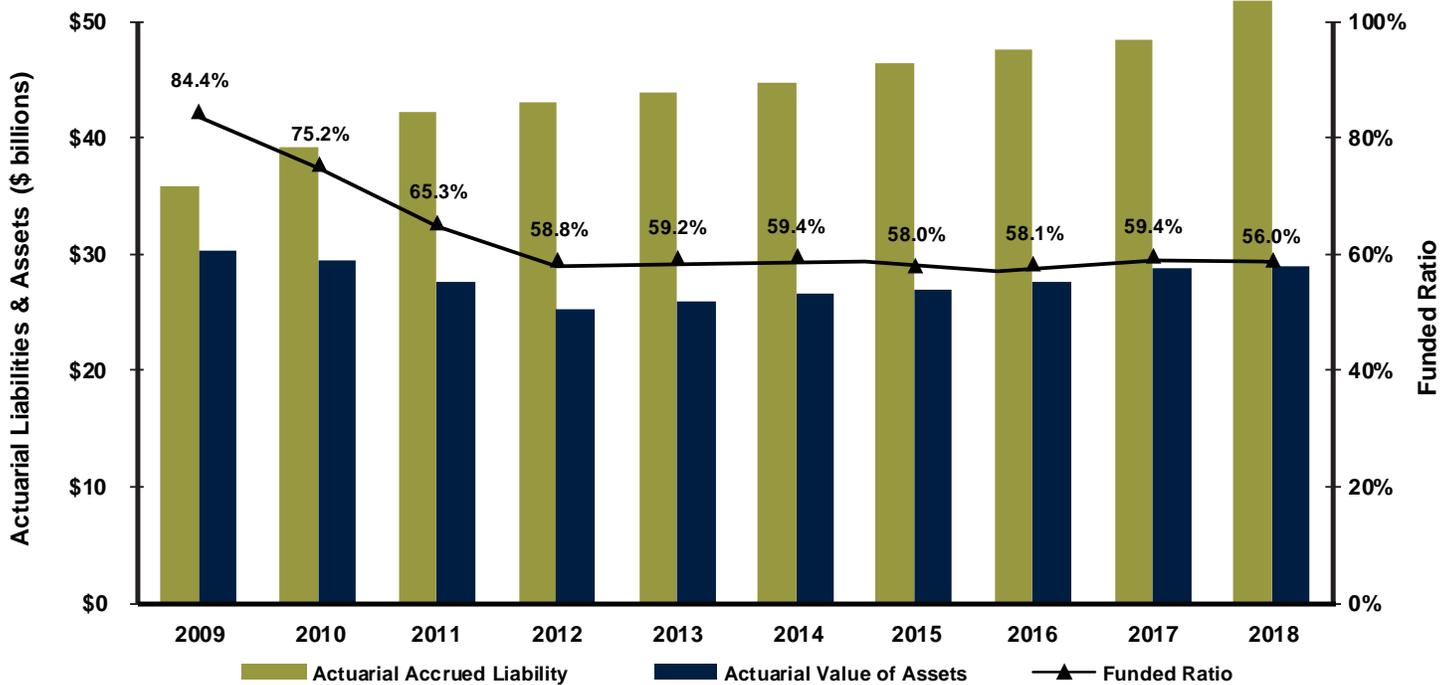
# ACTUARIAL SECTION

## Solvency Test

December 31, 2018 (unaudited)

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

Valuation Year Ended Dec 31	Actuarial Accrued Liabilities For			Total Actuarial Accrued Liability (AAL)	Actuarial Value of Assets	Portion of Accrued Liabilities Covered by Reported Assets			Funded Ratio
	(1)	(2)	(3)			(1)	(2)	(3)	
	Active Member Contributions	Retirees and Beneficiaries	Active Members (Employer Financed Portion)						
2018	\$5,074,760	\$28,558,283	\$18,149,162	\$51,782,205	\$28,989,607	100.0%	83.7%	0.0%	56.0%
2017	4,965,765	27,798,045	15,675,593	48,439,403	28,776,939	100.0	85.7	0.0	59.4
2016	4,869,229	26,824,306	15,825,429	47,518,964	27,596,048	100.0	84.7	0.0	58.1
2015	4,816,121	25,156,125	16,356,683	46,328,929	26,877,127	100.0	87.7	0.0	58.0
2014	4,733,833	23,872,658	16,144,179	44,750,670	26,584,948	100.0	91.5	0.0	59.4
2013	4,636,219	23,046,717	16,191,644	43,874,580	25,975,185	100.0	92.6	0.0	59.2
2012	4,551,507	22,095,052	16,409,005	43,055,564	25,302,688	100.0	93.9	0.0	58.8
2011	4,406,306	21,222,075	16,653,481	42,281,862	27,618,461	100.0	100.0	11.9	65.3
2010	4,409,444	18,995,355	15,774,795	39,179,594	29,443,945	100.0	100.0	38.3	75.2
2009	4,280,680	17,962,741	13,553,596	35,797,017	30,204,693	100.0	100.0	58.7	84.4



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

## Analysis of Financial Experience

December 31, 2018 (unaudited)

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

Type of Activity	2018	2017	2016	2015
(Loss)/gain from investment earnings <sup>2/</sup>	\$(810,749)	\$265,709	\$2,982	\$(279,734)
Changes in demographics of new entrants	-	(18,681)	6,113	(6,055)
Pay increases different than assumptions	(141,271)	(9,426)	613,858	(253,176)
Differences between actual and expected demographic experience	(134,609)	(144,105)	33,565	(81,547)
<b>(Loss)/gain during year from financial experience</b>	<b>(1,086,629)</b>	<b>93,497</b>	<b>656,518</b>	<b>(620,512)</b>
Non-recurring items				
Changes in assumptions <sup>3/</sup>	-	-	(1,021,315)	(366,637)
Loss due to collar restrictions <sup>4/</sup>	-	(140,438)	(375,572)	(535,701)
Benefit changes under Act 2017-5 <sup>5/</sup>	(2,373,657)	-	-	-
<b>Composite loss</b>	<b>\$(3,460,286)</b>	<b>\$(46,941)</b>	<b>\$(740,369)</b>	<b>\$(1,522,850)</b>

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

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

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

<sup>4/</sup>Act 2010-120 capped the growth of employer contributions at 4.5% for commonwealth FY 14/15 and each subsequent year until no longer needed.

<sup>5/</sup>2018 change primarily due to decrease in normal cost to 1.25% from 4.88% due primarily to Act 2017-5 per actuarial valuation, which was approved by SERS Board at its April 2019 meeting.

# ACTUARIAL SECTION

## Schedule of Funding Progress

December 31, 2018 (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 Payroll	UAAL as a Percentage of Covered Payroll
2018	\$28,989,607	\$51,782,205	56.0%	\$22,792,598	\$6,178,772	368.9%
2017	28,776,939	48,439,403	59.4	19,662,464	5,984,361	328.6
2016	27,596,048	47,518,964	58.1	19,922,916	5,911,603	337.0
2015	26,877,127	46,328,929	58.0	19,451,802	5,971,511	325.7
2014	26,584,948	44,750,670	59.4	18,165,722	5,719,581	317.6
2013	25,975,185	43,874,580	59.2	17,899,395	5,598,420	319.7
2012	25,302,688	43,055,564	58.8	17,752,876	5,538,887	320.5
2011	27,618,461	42,281,862	65.3	14,663,401	5,582,108	262.7
2010	29,443,945	39,179,594	75.2	9,735,649	5,596,915	173.9
2009	30,204,693	35,797,017	84.4	5,592,324	5,594,867	100.0

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

**Schedule of Contributions Under Previous Reporting Standards**

December 31, 2018 (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	Actual Contribution as a Percentage of ARC
2018 <sup>2/</sup>	\$2,040,434	\$2,040,434	100.0%
2017 <sup>2/</sup>	1,883,541	1,883,541	100.0
2016 <sup>2/</sup>	1,613,626	1,613,626	100.0
2015	1,469,116	1,359,246	92.5
2014	1,407,361	1,081,826	76.9
2013	1,314,925	790,996	60.2
2012	1,044,632	562,883	53.9
2011	913,778	391,189	42.8
2010	866,822	272,525	31.4
2009	643,861	251,870	39.1

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

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

For developing the ARC, GASB 25 established a range of actuarial cost and amortization methods for the unfunded actuarial accrued liability. The scheduled contributions for the years shown above have been below the amount required to meet the GASB minimum under previous standards. Underfunding of the ARC in 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, 2018 (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
2009 <sup>6/</sup>	\$5,935,988	6.25%	9.53%	-3.89%	5.64%	5.00%	84.4%
2010 <sup>7/</sup>	5,851,704	6.25	4.08	14.85	18.93	8.00	75.2
2011	5,890,704	6.25	5.10	21.29	26.39	11.50	65.3
2012	5,836,402	6.25	5.01	26.21	31.22	16.00	58.8
2013	5,897,627	6.25	5.00	26.41	31.41	20.50	59.2
2014	6,021,688	6.25	4.95	26.56	31.51	25.00	59.4
2015	6,255,189	6.25	4.52	27.62	32.14	29.50	58.0
2016	6,187,427	6.25	4.91	28.31	33.22	33.22	58.1
2017 <sup>8/</sup>	6,265,071	6.25	4.88	28.02	32.90	32.90	59.4
<b>2018</b>	<b>6,469,401</b>	<b>6.25</b>	<b>1.25</b>	<b>32.28</b>	<b>33.53</b>	<b>33.53</b>	<b>56.0</b>
2019 <sup>9,10/</sup>	6,657,014	6.25	1.25	32.35	33.60	33.60	55.7
2020	6,850,067	6.25	1.25	31.97	33.22	33.22	56.2
2021 <sup>11/</sup>	7,048,719	6.25	8.79	26.11	34.90	34.90	61.5
2022	7,253,132	6.25	8.54	26.24	34.78	34.78	61.3
2023	7,463,473	6.25	8.30	25.59	33.89	33.89	62.5
2024	7,679,913	6.25	8.06	24.94	33.00	33.00	63.8
2025	7,902,631	6.25	7.84	24.27	32.11	32.11	65.2
2026	8,131,807	6.25	7.63	23.60	31.23	31.23	66.6
2027	8,367,630	6.25	7.43	22.94	30.37	30.37	68.0
2028	8,610,291	6.25	7.24	22.29	29.53	29.53	69.5
2029	8,859,989	6.25	7.06	21.66	28.72	28.72	71.0

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

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

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

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

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

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

<sup>7/</sup>Act 2010-120 amended the Retirement Code to collar increases to the employer contribution rate at 3.00% and 3.50% for fiscal years beginning July 1, 2011 and 2012, respectively. The employer contribution rate is collared at 4.50% for fiscal years beginning July 1, 2013, and thereafter until collar becomes unnecessary.

<sup>8/</sup>Act 2010-120 amended the Retirement Code to place a permanent floor at employer normal cost after collars expire.

<sup>9/</sup>Numbers are projected from 2019 – 2029 based on 2018 actuarial funding valuation.

<sup>10/</sup>Act 2017-5 amended the Retirement Code to add two hybrid Defined Benefit (DB)/Defined Contribution (DC) plans and a DC-only plan effective January 1, 2019.

<sup>11/</sup>Act 2017-5 amended the Retirement Code to change the funding method to traditional entry age.

**Summary of Plan Provisions**

December 31, 2018 (unaudited)

**Benefit and Contribution Provisions**

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

**Eligible Employees****Class A**

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

**Class AA**

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

**Class A-3**

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

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

**Class A-4**

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

**Class D-4**

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

**Class E-1**

Judges who elect class E-1.

**Class E-2**

Magisterial District Judges who elect class E-2.

**Age and Service Requirements for Superannuation (Normal Retirement)**

(Full Formula Benefit)

**Class AA/A**

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

# ACTUARIAL SECTION

## Summary of Plan Provisions

December 31, 2018 (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 <sup>1/</sup>	1.00	
AA	1.25	
A-3 <sup>1/</sup>	1.00	
A-4 <sup>1/</sup>	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.

<sup>1/</sup>For state police with 20 – 24.99 years of service, the benefit is 50% of the highest annual salary; with 25 or more years of service, the benefit is 75% of the highest annual salary.

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.

**2018**

**Statistical Section**

The Statistical Section presents detailed information related to the State Employees' Retirement Fund (pension fund) financial statements, as well as highlights of actuarial valuations. This section does not include the Defined Contribution Plan (investment plan) because it only became active after the year ended December 31, 2018. 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, 2018. This data includes items such as employer and member contribution rates; contributions received and benefits paid; 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, 2018. 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, 2018. Of these three categories, 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, 2018. 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, 2018.

### Revenue Capacity

The **Schedule of Investment Income** presents the details of the total net investment income/loss for the 10 years ended December 31, 2018. The pension fund 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 its own-source revenue. Since investment income/loss has the greatest impact, 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, 2018.

# STATISTICAL SECTION

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## Statistical Section Narrative

December 31, 2018 (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, 2018.

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, 2018.

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, 2018.

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, 2018.

The **Schedule of Employer/Agency Participation** provides the number of covered members and the corresponding percentage of participation for the five largest employers/agencies for the 10 years ended December 31, 2018, as well as a listing of additional employers/agencies participating as of December 31, 2018.

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, which excludes the investment plan.

**Schedule of Trend Data**

December 31, 2018 (unaudited)

**Trend Data<sup>1/</sup>**

	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
Employer <sup>2/3/4/</sup>	32.93%	33.24%	29.51% <sup>7/</sup>	25.01% <sup>7/</sup>	20.53% <sup>7/</sup>	16.05% <sup>7/</sup>	11.59% <sup>7/</sup>	8.01% <sup>7/</sup>	5.01% <sup>8/</sup>	4.01% <sup>9/</sup>
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>	\$2,048,594	\$1,897,404	\$1,622,123	\$1,360,431	\$1,084,104	\$794,911	\$565,621	\$391,749	\$273,083	\$253,250
Member	\$393,925	\$383,359	\$374,570	\$371,624	\$365,923	\$351,968	\$347,937	\$350,852	\$349,049	\$348,805
Average Annual Compensation	\$59,984	\$58,113	\$56,499	\$56,858	\$54,769	\$53,224	\$52,230	\$52,159	\$51,228	\$50,813
Fiduciary Net Position (FNP)	\$26,936,990	\$29,405,042	\$26,387,889	\$26,054,890	\$27,337,778	\$27,394,156	\$25,389,335	\$24,377,179	\$25,886,102	\$24,661,949
Total Pension Liability (TPL) <sup>5/</sup>	\$47,768,011	\$46,696,751	\$45,648,214	\$44,238,721	\$42,195,186	\$41,057,541	NA	NA	NA	NA
FNP as % of TPL <sup>5/</sup>	56.4%	63.0%	57.8%	58.9%	64.8%	66.7%	NA	NA	NA	NA
Net Pension Liability <sup>5/</sup>	\$20,831,021	\$17,291,709	\$19,260,325	\$18,183,831	\$14,857,408	\$13,663,385	NA	NA	NA	NA
Actuarial Value of Assets <sup>4/</sup>	\$28,989,607	\$28,776,939	\$27,596,048	\$26,877,127	\$26,584,948	\$25,975,185	\$25,302,688	\$27,618,461	\$29,443,945	\$30,204,693
Actuarial Accrued Liability <sup>4/</sup>	\$51,782,205	\$48,439,403	\$47,518,964	\$46,328,929	\$44,750,670	\$43,874,580	\$43,055,564	\$42,281,862	\$39,179,594	\$35,797,017
Funded Ratio <sup>4/</sup>	56.0%	59.4%	58.1%	58.0%	59.4%	59.2%	58.8%	65.3%	75.2%	84.4%
Total Benefits and Refunds	\$3,394,636	\$3,303,543	\$3,227,548	\$3,080,861	\$2,946,465	\$2,844,285	\$2,674,133	\$2,705,263	\$2,449,253	\$2,273,372
Average Pension <sup>6/</sup>	\$28,880	\$28,352	\$27,722	\$27,042	\$26,426	\$25,839	\$25,083	\$24,448	\$23,491	\$22,695
Annuityants and Beneficiaries	131,007	129,473	127,338	124,689	122,249	120,052	117,061	115,342	111,713	109,639
Active Members	103,007	102,978	104,632	105,025	104,431	105,186	106,048	107,021	109,255	110,107

<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 payroll at December 31.

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

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

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

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

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

<sup>9/</sup>Act 2007-8 established a permanent minimum employer contribution rate floor of 4%.

Source: Pennsylvania State Employees' Retirement System

# STATISTICAL SECTION

## Schedule of Additions to Fiduciary Net Position

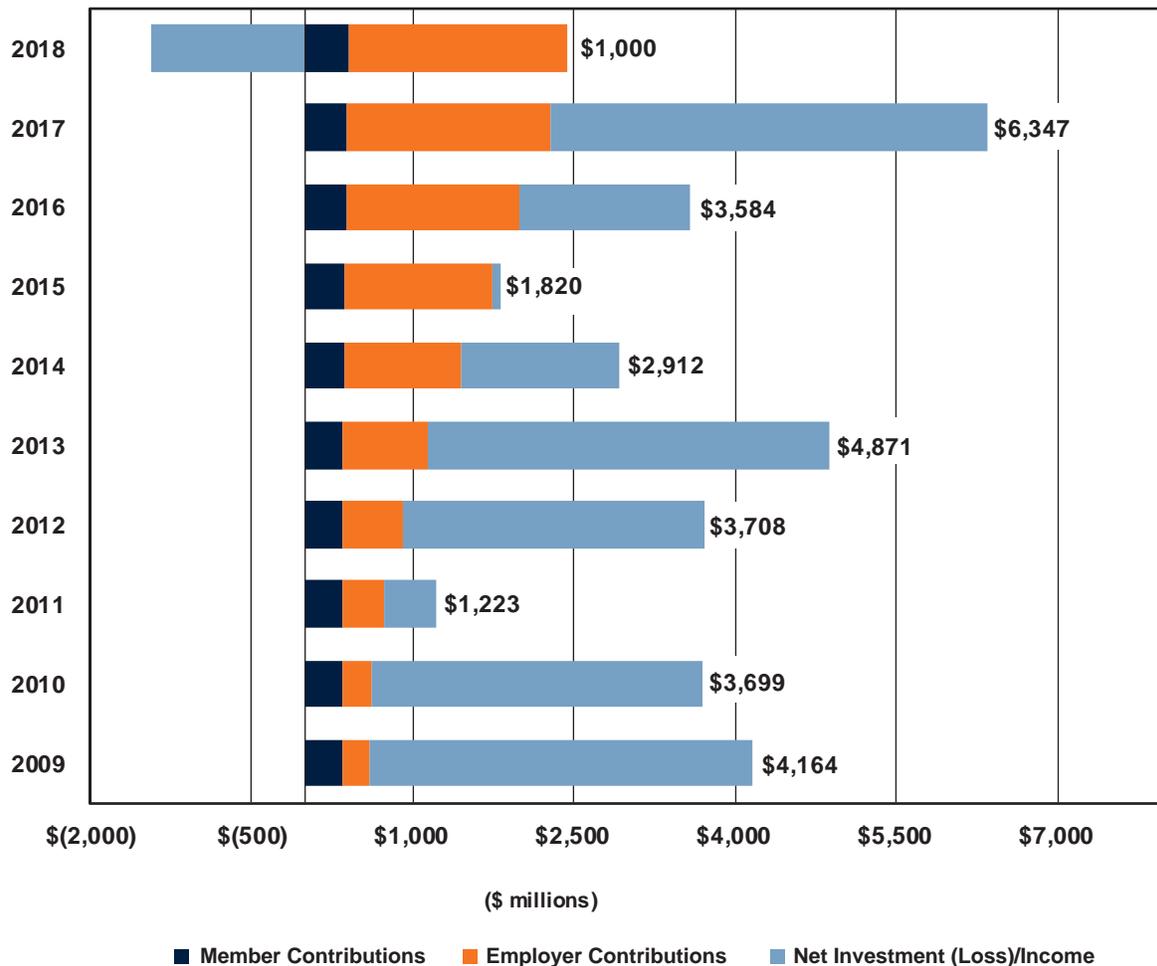
December 31, 2018 (unaudited)

### Additions to Fiduciary Net Position

(\$ thousands)

Year Ended	Member Contributions	Employer Contributions		Net Investment (Loss)/Income	Total
		Dollar Amount	% of Covered Payroll <sup>1/</sup>		
2018	\$393,925	\$2,048,594	33.2%	\$(1,442,291)	\$1,000,228
2017	383,359	1,897,404	31.7	4,066,055	6,346,818
2016	374,570	1,622,123	27.4	1,586,853	3,583,546
2015	371,624	1,360,431	22.8	87,990	1,820,045
2014	365,923	1,084,104	19.0	1,462,051	2,912,078
2013	351,968	794,911	14.2	3,724,038	4,870,917
2012	347,937	565,621	10.2	2,794,940	3,708,498
2011	350,852	391,749	7.0	480,445	1,223,046
2010	349,049	273,083	4.9	3,076,410	3,698,542
2009	348,805	253,250	4.5	3,561,526	4,163,581

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



Source: Pennsylvania State Employees' Retirement System

**Schedule of Deductions from Fiduciary Net Position**

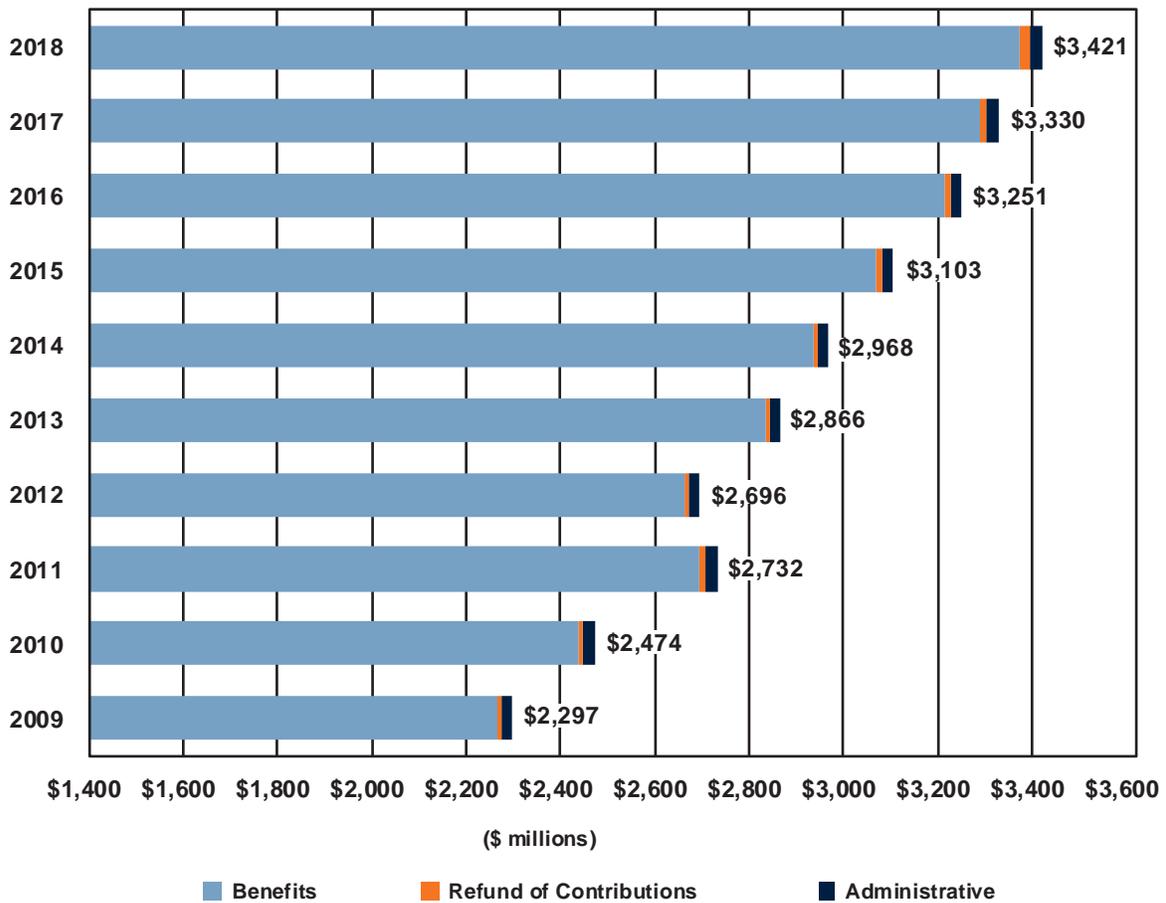
December 31, 2018 (unaudited)

**Deductions from Fiduciary Net Position**

(\$ thousands)

Year Ended	Benefits	Refund of Contributions	Administrative Expenses	Total
2018	\$3,375,394	\$19,242	\$25,950 <sup>1/</sup>	\$3,420,586
2017	3,287,923	15,620	26,122	3,329,665
2016	3,214,440	13,108	22,999	3,250,547
2015	3,069,328	11,533	22,072	3,102,933
2014	2,936,591	9,874	21,991	2,968,456
2013	2,833,676	10,609	21,811	2,866,096
2012	2,664,242	9,891	22,209	2,696,342
2011	2,695,732	9,531	26,706	2,731,969
2010	2,440,246	9,007	25,136	2,474,389
2009	2,265,404	7,968	24,073	2,297,445

<sup>1/</sup>Administrative expenses of \$732 for Defined Contribution Plan are not included.



Source: Pennsylvania State Employees' Retirement System

# STATISTICAL SECTION

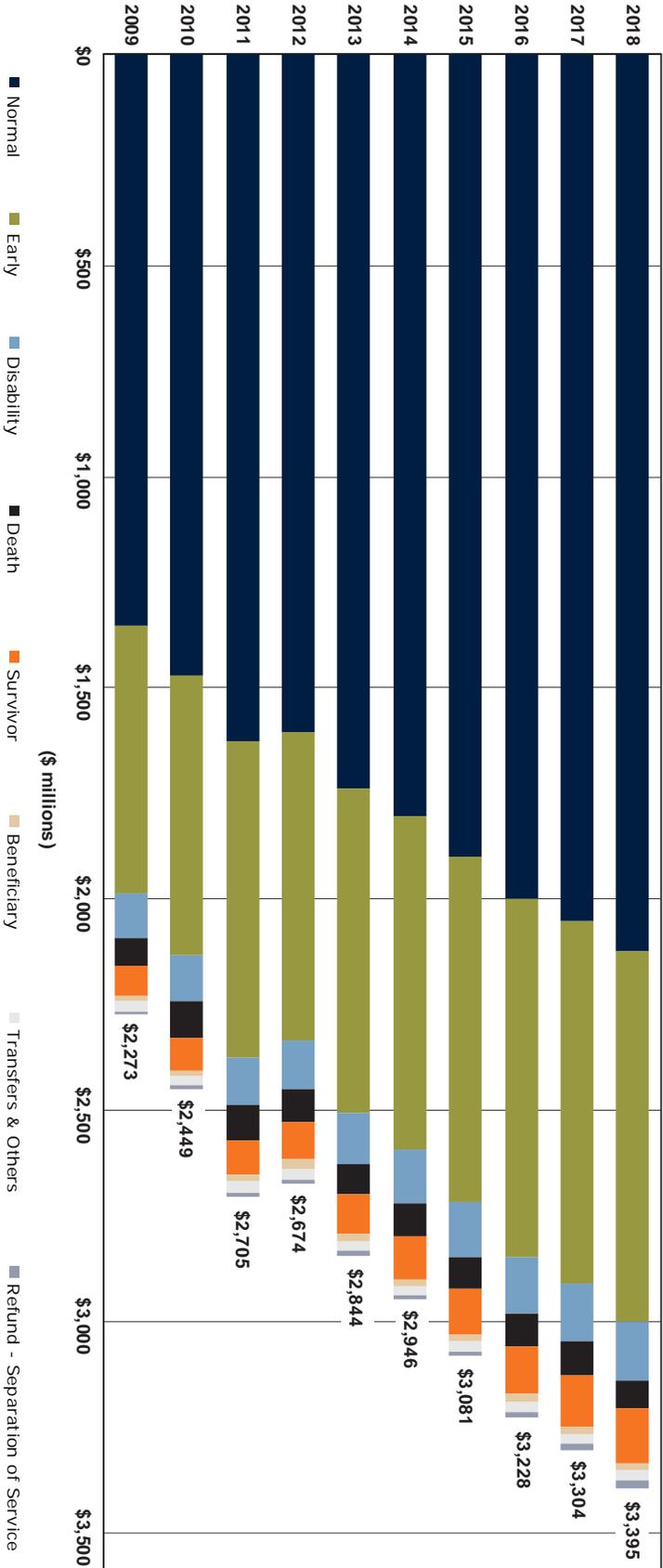
## Schedule of Benefit and Refund Deductions from Fiduciary Net Position by Type

December 31, 2018 (unaudited)

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

(\$ thousands)

Year Ended	Retirement										Refunds			Total Refunds
	Normal	Early	Disability	Death	Survivor	Beneficiary	Transfers & Other	Total Benefit Deductions	Separation of Service	Death				
2018	\$2,122,512	\$877,579	\$137,616	\$66,408	\$129,533	\$15,581	\$26,165	\$3,375,394	\$19,009	\$233	\$19,242			
2017	2,051,059	859,554	135,707	80,322	121,511	16,510	23,260	3,287,923	15,372	248	15,620			
2016	1,997,704	851,302	132,833	76,455	114,465	15,976	25,705	3,214,440	12,861	247	13,108			
2015	1,900,468	816,595	129,810	75,845	106,748	16,066	23,796	3,069,328	11,302	231	11,533			
2014	1,803,669	789,723	126,457	78,580	100,527	15,510	22,125	2,996,591	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			



Source: Pennsylvania State Employees' Retirement System

Schedule of Total Changes in Fiduciary Net Position

December 31, 2018 (unaudited)

Total Changes in Fiduciary Net Position

(\$ thousands)

Year Ended	Additions to Fiduciary Net Position				Deductions from Fiduciary Net Position				Net (Decrease)/ Increase
	Member Contributions	Employer Contributions	Net Investment (Loss)/ Income	Total Additions	Benefits	Refund of Contributions	Administrative Expenses	Total Deductions	
2018	\$393,925	\$2,048,594	\$(1,442,291)	\$1,000,228	\$3,375,394	\$19,242	\$25,950 <sup>1/</sup>	\$3,420,586	\$(2,420,358)
2017	383,359	1,897,404	4,066,055	6,346,818	3,287,923	15,620	26,122	3,329,665	3,017,153
2016	374,570	1,622,123	1,586,853	3,583,546	3,214,440	13,108	22,999	3,250,547	332,999
2015	371,624	1,360,431	87,990	1,820,045	3,069,328	11,533	22,072	3,102,933	(1,282,888)
2014	365,923	1,084,104	1,462,051	2,912,078	2,936,591	9,874	21,991	2,968,456	(56,378)
2013	351,968	794,911	3,724,038	4,870,917	2,833,676	10,609	21,811	2,866,096	2,004,821
2012	347,937	565,621	2,794,940	3,708,498	2,664,242	9,891	22,209	2,696,342	1,012,156
2011	350,852	391,749	480,445	1,223,046	2,695,732	9,531	26,706	2,731,969	(1,508,923)
2010	349,049	273,083	3,076,410	3,698,542	2,440,246	9,007	25,136	2,474,389	1,224,153
2009	348,805	253,250	3,561,526	4,163,581	2,265,404	7,968	24,073	2,297,445	1,866,136

<sup>1/</sup>Administrative expenses of \$732 for Defined Contribution Plan are not included.

Source: Pennsylvania State Employees' Retirement System

# STATISTICAL SECTION

## Schedule of Investment Income

December 31, 2018 (unaudited)

### Investment Income (\$ thousands)

	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
Investment (loss)/income										
From investing activities										
Net (depreciation)/appreciation in fair value of investments <sup>1/</sup>	\$(1,733,999)	\$3,710,739	\$1,233,501	\$(216,817)	\$1,155,301	\$3,476,349	\$2,268,730	\$614,117	\$2,211,065	\$2,456,209
Commingled funds appreciation/(depreciation) and income <sup>1/</sup>	NA	NA	NA	NA	NA	NA	275,103	(267,177)	810,147	1,063,673
Interest	142,918	126,728	126,219	130,616	142,434	120,815	144,431	165,082	146,995	149,040
Dividends	203,533	260,013	273,733	223,927	246,528	204,214	190,733	78,823	61,964	69,400
Real estate income	74,115	95,533	89,327	108,844	93,167	99,314	97,641	82,707	73,355	73,561
Miscellaneous income	889	3,713	27,381	3,426	1,799	668	4,583	2,316	6,471	3,499
Total investing activities (loss)/income	(1,312,544)	4,196,726	1,750,161	249,996	1,639,229	3,901,360	2,981,221	675,868	3,309,997	3,815,382
Investment expenses	(133,146)	(135,079)	(167,712)	(166,610)	(186,527)	(181,042)	(189,722)	(197,505)	(235,826)	(260,376)
Net (loss)/income from investing activities	(1,445,690)	4,061,647	1,582,449	83,386	1,452,702	3,720,318	2,791,499	478,363	3,074,171	3,555,006
From securities lending activities										
Securities lending income	3,771	4,883	4,893	5,105	9,917	4,326	3,953	2,376	2,511	7,092
Securities lending expenses	(372)	(475)	(489)	(501)	(568)	(606)	(512)	(294)	(272)	(572)
Net income from securities lending activities	3,399	4,408	4,404	4,604	9,349	3,720	3,441	2,082	2,239	6,520
<b>Net investment (loss)/income</b>	<b>\$(1,442,291)</b>	<b>\$4,066,055</b>	<b>\$1,586,853</b>	<b>\$87,990</b>	<b>\$1,462,051</b>	<b>\$3,724,038</b>	<b>\$2,794,940</b>	<b>\$480,445</b>	<b>\$3,076,410</b>	<b>\$3,561,526</b>

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

Source: Pennsylvania State Employees' Retirement System

**Schedule of Active Member Statistics**

December 31, 2018 (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	
2018	46.06	11.65	\$64,716	46.62	10.83	\$53,794	103,007
2017	46.23	11.79	62,739	46.61	10.97	52,049	102,978
2016	46.15	11.73	60,965	46.51	10.95	50,629	104,632
2015	46.33	11.94	61,639	46.57	11.11	50,525	105,205
2014	46.55	12.12	59,228	46.77	11.44	48,825	104,431
2013	46.63	12.19	57,416	46.92	11.64	47,583	105,186
2012	46.64	12.23	56,118	46.90	11.79	46,981	106,048
2011	46.55	12.17	56,008	46.70	11.70	46,992	107,021
2010	46.58	12.36	54,983	46.71	11.91	46,206	109,255
2009	46.50	12.35	54,414	46.52	12.00	45,987	110,107

Source: Pennsylvania State Employees' Retirement System

# STATISTICAL SECTION

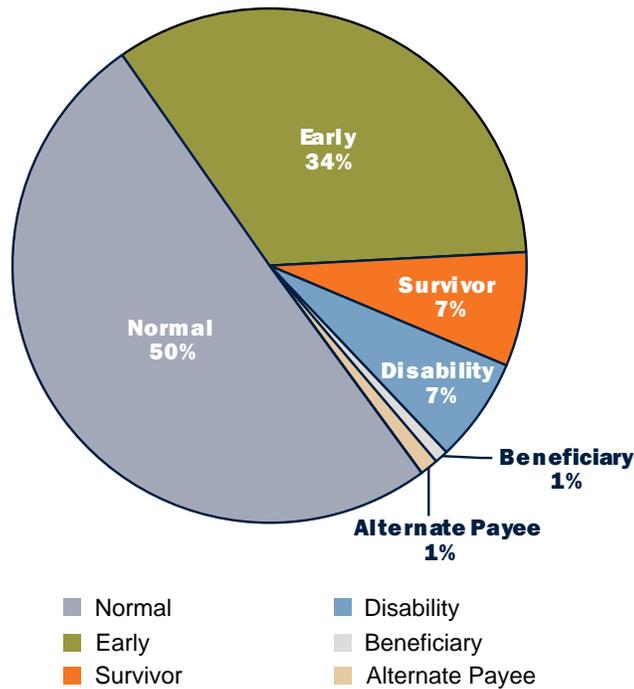
## Schedule of Retired Members by Type of Benefit

December 31, 2018 (unaudited)

### Retired Members by Type of Benefit

Amount of Monthly Benefits	Total Monthly Benefits <sup>4/</sup>	Total Number of Retirees	Type of Benefit					
			Normal	Disability	Early	Beneficiary	Survivor	Alternate Payee
≤ \$500	\$6,554,512	27,214	5,735	478	17,081	447	2,946	527
> 500 to 1,000	15,905,478	21,353	9,764	3,409	4,926	312	2,485	457
> 1,000 to 1,500	21,839,368	17,647	9,286	2,178	4,166	131	1,578	308
> 1,500 to 2,000	25,037,944	14,359	7,734	1,145	4,399	81	872	128
> 2,000 to 2,500	27,303,463	12,182	6,984	652	3,863	52	587	44
> 2,500 to 3,000	26,659,420	9,724	6,072	358	2,910	30	337	17
> 3,000 to 3,500	26,717,980	8,244	5,476	196	2,317	18	225	12
> 3,500 to 4,000	21,886,235	5,863	4,191	102	1,436	14	118	2
> 4,000 to 4,500	17,996,827	4,254	3,210	54	902	12	76	NA
> 4,500 to 5,000	13,571,901	2,867	2,223	24	560	5	52	3
> 5,000 to 5,500	11,313,688	2,159	1,513	13	566	6	60	1
> 5,500 to 6,000	9,159,256	1,596	1,084	7	475	3	27	NA
> 6,000	26,458,525	3,545	2,696	4	788	5	51	1
<b>Totals</b>	<b>\$250,404,597</b>	<b>131,007</b>	<b>65,968</b>	<b>8,620</b>	<b>44,389</b>	<b>1,116</b>	<b>9,414</b>	<b>1,500</b>

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



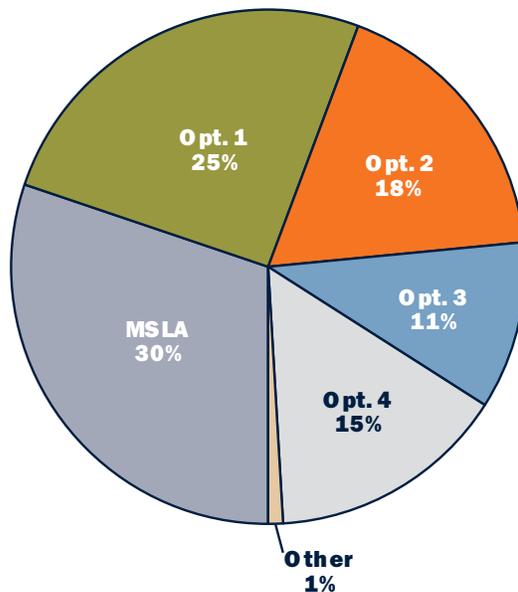
Source: Pennsylvania State Employees' Retirement System

**Schedule of Retired Members by Option**

December 31, 2018 (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	\$6,554,512	27,214	6,261	11,073	5,746	1,562	2,097	475
> 500 to 1,000	15,905,478	21,353	7,340	5,082	4,265	2,091	2,232	343
> 1,000 to 1,500	21,839,368	17,647	5,477	4,090	3,563	1,887	2,484	146
> 1,500 to 2,000	25,037,944	14,359	4,459	3,297	2,508	1,710	2,290	95
> 2,000 to 2,500	27,303,463	12,182	3,616	2,648	2,052	1,507	2,303	56
> 2,500 to 3,000	26,659,420	9,724	3,002	2,027	1,514	1,233	1,913	35
> 3,000 to 3,500	26,717,980	8,244	2,509	1,781	1,180	1,079	1,676	19
> 3,500 to 4,000	21,886,235	5,863	2,023	1,141	734	817	1,132	16
> 4,000 to 4,500	17,996,827	4,254	1,443	762	535	568	933	13
> 4,500 to 5,000	13,571,901	2,867	927	474	361	407	693	5
> 5,000 to 5,500	11,313,688	2,159	688	337	259	253	616	6
> 5,500 to 6,000	9,159,256	1,596	528	245	173	209	438	3
> 6,000	26,458,525	3,545	1,269	475	393	513	890	5
<b>Totals</b>	<b>\$250,404,597</b>	<b>131,007</b>	<b>39,542</b>	<b>33,432</b>	<b>23,283</b>	<b>13,836</b>	<b>19,697</b>	<b>1,217</b>



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

Source: Pennsylvania State Employees' Retirement System

# STATISTICAL SECTION

## Schedule of Average Monthly Benefit Payments

December 31, 2018 (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 1/1/2018 to 12/31/2018</b>							
Average monthly benefit	\$284	\$531	\$1,018	\$1,556	\$2,467	\$3,937	\$4,466
Average final average salary	\$39,834	\$46,591	\$54,260	\$58,668	\$68,305	\$84,510	\$78,312
Number of retired members	51	586	808	578	799	1,008	1,093
<b>Period 1/1/2017 to 12/31/2017</b>							
Average monthly benefit	\$226	\$488	\$928	\$1,490	\$2,352	\$3,853	\$4,495
Average final average salary	\$36,612	\$43,755	\$51,691	\$56,721	\$65,980	\$83,170	\$78,194
Number of retired members	46	681	820	526	788	1,033	1,166
<b>Period 1/1/2016 to 12/31/2016</b>							
Average monthly benefit	\$331	\$472	\$987	\$1,574	\$2,259	\$4,116	\$4,349
Average final average salary	\$48,086	\$45,428	\$51,515	\$57,976	\$63,844	\$85,896	\$75,240
Number of retired members	53	777	786	528	845	1,209	1,332
<b>Period 1/1/2015 to 12/31/2015</b>							
Average monthly benefit	\$308	\$433	\$896	\$1,369	\$2,279	\$3,396	\$4,214
Average final average salary	\$43,955	\$44,272	\$48,934	\$53,496	\$64,173	\$75,168	\$72,142
Number of retired members	71	924	744	515	772	1,036	1,454
<b>Period 1/1/2014 to 12/31/2014</b>							
Average monthly benefit	\$300	\$453	\$892	\$1,462	\$2,177	\$3,256	\$4,061
Average final average salary	\$43,879	\$43,513	\$48,310	\$55,258	\$61,462	\$72,587	\$70,590
Number of retired members	91	963	814	473	912	1,018	1,344
<b>Period 1/1/2013 to 12/31/2013</b>							
Average monthly benefit	\$262	\$399	\$845	\$1,466	\$2,178	\$3,408	\$4,036
Average final average salary	\$40,035	\$42,368	\$47,413	\$55,071	\$61,526	\$74,649	\$69,812
Number of retired members	68	947	779	496	814	1,049	1,451
<b>Period 1/1/2012 to 12/31/2012</b>							
Average monthly benefit	\$261	\$406	\$823	\$1,495	\$2,101	\$3,464	\$4,073
Average final average salary	\$38,197	\$42,106	\$46,477	\$54,120	\$58,807	\$74,455	\$70,238
Number of retired members	94	899	724	535	680	908	1,184
<b>Period 1/1/2011 to 12/31/2011</b>							
Average monthly benefit	\$263	\$445	\$843	\$1,430	\$2,095	\$2,994	\$3,829
Average final average salary	\$36,895	\$44,808	\$46,588	\$52,687	\$58,928	\$67,793	\$66,989
Number of retired members	103	851	716	769	856	1,134	2,276
<b>Period 1/1/2010 to 12/31/2010</b>							
Average monthly benefit	\$254	\$398	\$788	\$1,332	\$2,109	\$2,938	\$3,818
Average final average salary	\$39,114	\$41,128	\$44,562	\$50,607	\$57,784	\$66,053	\$65,579
Number of retired members	75	755	505	646	712	846	1,662
<b>Period 1/1/2009 to 12/31/2009</b>							
Average monthly benefit	\$209	\$374	\$740	\$1,337	\$1,936	\$2,919	\$3,767
Average final average salary	\$32,925	\$38,184	\$43,520	\$50,161	\$55,113	\$65,193	\$64,685
Number of retired members	60	543	448	545	539	710	1,287

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

Source: Pennsylvania State Employees' Retirement System

**Schedule of Average Annual Benefit Payments**

December 31, 2018 (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	\$8,024	\$7,876
25-29	NA	NA	\$778	\$578	\$13,761	NA	10,482	7,044
30-34	NA	NA	1,406	965	15,967	\$13,092	9,120	8,458
35-39	NA	NA	1,818	1,397	15,445	13,938	8,106	9,219
40-44	NA	NA	2,657	2,022	17,817	14,471	10,822	9,120
45-49	NA	NA	22,396	4,553	19,141	15,476	8,563	11,041
50-54	\$49,885	\$35,177	33,760	8,607	19,518	16,914	7,427	12,903
55-59	43,827	43,361	25,213	15,004	20,001	17,109	10,042	13,869
60-64	37,318	34,379	23,837	18,051	18,642	16,535	10,129	14,206
65-69	31,962	29,252	22,746	16,956	16,606	15,521	13,485	15,595
70-74	31,111	25,388	23,718	16,084	14,422	13,553	13,333	16,031
75-79	31,037	21,669	18,986	12,540	11,367	10,343	10,511	15,634
80-84	26,837	17,315	15,280	10,024	8,623	8,850	10,538	13,218
85-89	23,192	13,181	15,338	9,273	10,081	7,544	8,940	11,770
90 and over	19,423	10,677	14,079	7,828	10,794	7,306	9,655	9,587
<b>Total Average</b>	<b>\$31,719</b>	<b>\$24,971</b>	<b>\$22,187</b>	<b>\$13,764</b>	<b>\$16,815</b>	<b>\$14,784</b>	<b>\$10,905</b>	<b>\$13,675</b>

	Normal	Early	Disability	Beneficiary and Survivor
<b>Average Pension</b>	\$28,880	\$18,098	\$15,753	\$13,350
<b>Average Age</b>	72.4	65.1	64.1	74.6

Source: Pennsylvania State Employees' Retirement System

# STATISTICAL SECTION

## Schedule of Employer/Agency Participation

December 31, 2018 (unaudited)

### Schedule of Employer/Agency Participation - 5 Largest

# - Number of active members

% - Percentage of total active members

Year Ended	Department of Human Services		Department of Corrections		Department of Transportation		Pennsylvania State University		Pennsylvania State Police		Active Members for 5 Largest Employers/Agencies	
	#	%	#	%	#	%	#	%	#	%	#	%
2018 <sup>1/</sup>	16,396	15.92	15,610	15.15	12,088	11.74	6,772	6.57	6,353	6.17	57,219	55.55
2017	16,624	16.14	15,435	14.99	12,221	11.87	6,308	6.13	6,255	6.07	56,843	55.20
2016	17,205	16.44	15,752	15.05	12,312	11.77	6,367	6.09	6,219	5.94	57,855	55.29
2015	17,085	16.27	15,362	14.63	12,434	11.84	6,111	5.82	6,459	6.15	57,451	54.70
2014	16,870	16.15	14,916	14.28	12,325	11.80	6,123	5.86	6,323	6.05	56,557	54.16
2013	16,668	15.85	15,529	14.76	12,656	12.03	6,210	5.90	6,084	5.78	57,147	54.33
2012	16,764	15.81	15,682	14.79	12,729	12.00	6,368	6.00	6,012	5.67	57,555	54.27
2011	17,087	15.97	15,764	14.73	12,826	11.98	6,532	6.10	6,033	5.64	58,242	54.42
2010	18,007	16.48	16,133	14.77	12,427	11.37	6,653	6.09	6,084	5.57	59,304	54.28
2009	18,201	16.53	16,174	14.69	12,548	11.40	6,608	6.00	6,102	5.54	59,633	54.16

Numbers may not add due to rounding.

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

Source: Pennsylvania State Employees' Retirement System

**Schedule of Employer/Agency Participation**

As of December 31, 2018 (unaudited)

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

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

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

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