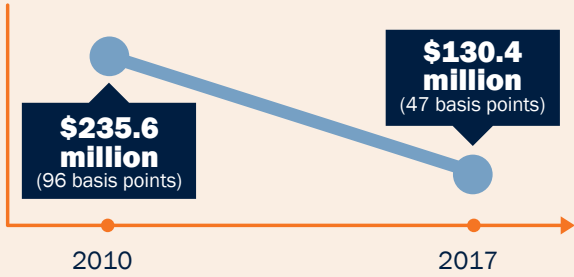


### SERS decreased investment fees



In 2017  
SERS retired  
**4,775**  
members  
and welcomed  
**9,901**  
new members

SERS paid nearly  
**\$3.3 billion**  
in benefits in 2017

**36%**   
of SERS active employees belong  
to post-Act 120 classes of service

### As of Dec 31, 2017 SERS had

**102,978**  
active members

**129,473**  
annuitants

### 2017 Contributions to the SERS Fund

**\$383 million**  
members  
contributed

**\$1.9 billion**  
employers  
contributed

**\$3.9 billion**  
investments  
contributed

**Approximate Total Contributions = \$6.2 billion**

### Total FY 18/19 Spending Request



**\$35.7 million**

\$1.5 million

directed commissions

**\$21.7 million**  
personnel

**\$15.2 million**  
operations

**\$0.3 million**  
fixed assets

Samples from operations =

- IT consulting-system upgrade **\$4.5 million**
- real estate **\$1.7 million**
- treasury services **\$1.3 million**
- postage **\$0.7 million**
- legal services **\$0.7 million**
- office equipment **\$0.2 million**

### SERS average active member

**46** years  
old

**12** years of  
service

### SERS average retired member

**72** years  
old

receives  
**\$28,352**  
per year

Global Public  
Equity  
**24.1%**

Private  
Equity  
**12.8%**

Cash  
**1.5%**

In 2017  
the SERS  
fund returned  
**15.1%**  
(unaudited)

Legacy Hedge  
Funds  
**4.9%**

Real  
Estate  
**2.0%**

Fixed  
Income  
**4.7%**

Data throughout is estimated/unaudited

# SERS 2018 Supplemental Budget Book

March 3, 2018

Honorable Stan Saylor  
Majority Chairman  
House Appropriations Committee  
245 Main Capitol  
Harrisburg, PA 17120

Honorable Joseph F. Markosek  
Minority Chairman  
House Appropriations Committee  
512 E. Main Capitol  
Harrisburg, PA 17120

Gentlemen and Members of the Appropriations Committee:

Enclosed please find detailed information about the Pennsylvania State Employees' Retirement System's operations, investments, and request for spending authority. For FY 2018-19, SERS proposes a \$30.8 million spending authority, which is drawn from SERS funds, not general government operating accounts and \$4.9 million, which will be appropriated from non-SERS funds, for the new 401(a) defined contribution plan. I trust this information will be useful in your deliberations related to the development and passage of the FY 2018-19 commonwealth budget.

This year SERS will serve approximately 240,000 active, inactive, vested, and retired members. The average retiree who has worked to full retirement age received an average annual annuity of \$28,352. The system paid out nearly \$3.3 billion dollars in 2017, of which approximately \$3.0 billion – more than 90% – was paid to members who live within Pennsylvania.

Our unaudited 2017 investment returns are estimated to be 15.1%, which is more than double the long-term actuarially assumed rate of return of 7.25%, producing projected commonwealth savings of approximately \$30 million in employer contributions for FY 2018-19 and savings of approximately \$530 million over the next five years. We continue to strive for operational efficiencies and maximize results for our members. Since 2010, we have reduced investment management fees by more than \$105 million.

The system's estimated funded ratio at the end of 2017 increased to 59.6%. For FY 2018-19, the employer contribution rate is estimated to drop to 32.3% of payroll, beginning the expected year-over-year decrease in employer contributions. In absolute contribution dollars, this represents approximately \$2.1 billion of which 45% originates from the general fund from employers under the Governor's jurisdiction.

The system's commitment to its members and the taxpayers of Pennsylvania remains to employ a prudent investment policy that will ensure that meaningful retirement benefits will be available to those employees who have given their careers to serving the people of Pennsylvania. It is our honor to do so with the help and support of the members of this committee, as well as the entire General Assembly.

If you have questions, comments, or concerns, please do not hesitate to contact Anthony J. Faiola, SERS Acting Executive Director, at 717.787.9657 or at [afaiola@pa.gov](mailto:afaiola@pa.gov).

Sincerely,



David R. Fillman  
Chairman

# SERS 2018 SUPPLEMENTAL BUDGET BOOK

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# SERS Organization

# SERS ORGANIZATION

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## Mission, Vision & Guiding Principles

Established in 1923, SERS is one of the nation's oldest and largest statewide retirement plans for public employees, with approximately 240,000 members. SERS is among the largest of public and corporate pension funds, with assets of approximately \$29.1 billion as of December 31, 2017.

SERS is responsible for administering the State Employees' Retirement Code in accordance with the expressed intent of the General Assembly and bears a fiduciary obligation to plan beneficiaries, including state employees and retirees.

State law provides that the administration of the SERS Fund and the fiduciary responsibility for its management be vested in an 11-member board. The management of SERS is the responsibility of the executive director who, with the approval of the board, contracts for professional services and employs the staff needed to operate the system.

### 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.

### Guiding Principles

- Demonstrate Integrity
- Develop and Empower Employees
- Focus on Customer Service
- Fulfill Fiduciary Obligations
- Lead Innovation and Improvement
- Learn from Mistakes
- Safeguard Information, Facilities, and Staff
- Share Knowledge
- Think Strategically

# SERS ORGANIZATION

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## Services & Operations

The approximately 200 employees who work for the State Employees' Retirement System share a singular focus: serving SERS members. Some SERS employees serve members by investing and overseeing approximately \$29.1 billion. Other SERS employees serve members by ensuring that every monthly payment is made correctly and on time. Still others audit and account for each penny, provide online information, or answer members' questions in person or over the phone.

Some work is behind-the-scenes, while other work touches members more directly. Examples of services offered to active and vested members include:

- Issuing annual statements of account
- Offering individual and group educational sessions about retirement benefits
- Helping with the purchase of service, change of beneficiaries, etc.
- Calculating retirement, disability, and vesting estimates
- Providing one-on-one counseling for those leaving state service
- Walking members step-by-step through their retirement experience

Examples of services offered to retired members include:

- Issuing annual statements of account and tax forms
- Providing income tax withholding, direct deposit, address change, and other forms, as requested, as well as assistance in filling out and submitting forms, as needed
- Processing changes to retiree health coverage
- Helping members understand implications of and, if necessary, effecting pension changes related to marriage, divorce, or death
- Tracking and reissuing payments, if necessary
- Assisting spouses, children, and other survivors upon the death of a SERS member

# SERS ORGANIZATION

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## Services & Operations

Approximately a quarter of SERS employees are wholly dedicated to direct member services through a network of field offices statewide, including:

**Bensalem Regional Counseling Center.** Serving retired members who live and active members who work in Berks, Bucks, Chester, Delaware, Lancaster, Montgomery, and Philadelphia counties.

**Harrisburg Regional Counseling Center.** Serving retired members who live and active members who work in Adams, Cumberland, Dauphin, Lebanon, Perry, and York counties.

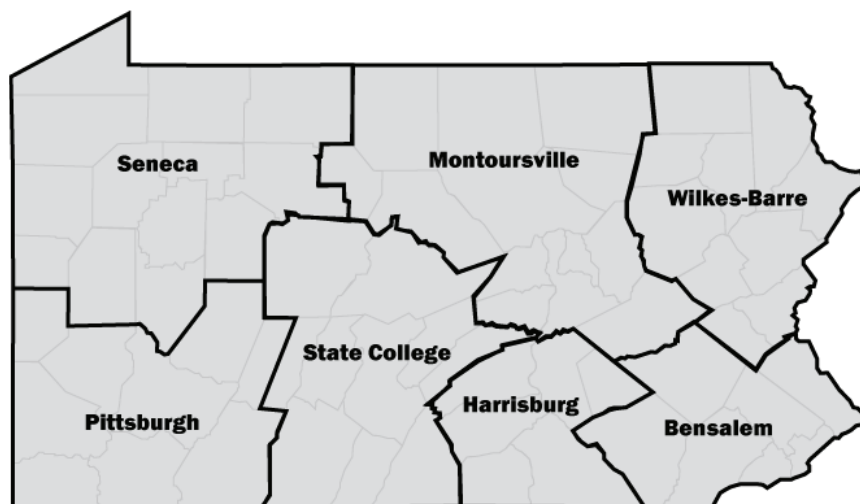
**Montoursville Regional Counseling Center.** Serving retired members who live and active members who work in Bradford, Cameron, Clinton, Columbia, Lycoming, Montour, Northumberland, Potter, Schuylkill, Snyder, Sullivan, Tioga, and Union counties.

**Pittsburgh Regional Counseling Center.** Serving retired members who live and active members who work in Allegheny, Beaver, Western Cambria, Fayette, Greene, Indiana, Somerset, Washington, and Westmoreland counties.

**Seneca Regional Counseling Center.** Serving retired members who live and active members who work in Armstrong, Butler, Clarion, Crawford, Elk, Erie, Forest, Jefferson, Lawrence, McKean, Mercer, Venango, and Warren counties.

**State College Regional Counseling Center.** Serving retired members who live and active members who work in Bedford, Blair, Eastern Cambria, Centre, Clearfield, Franklin, Fulton, Huntingdon, Juniata, and Mifflin counties.

**Wilkes-Barre Regional Counseling Center.** Serving retired members who live and active members who work in Carbon, Lackawanna, Lehigh, Luzerne, Monroe, Northampton, Pike, Susquehanna, Wayne, and Wyoming counties.



# SERS ORGANIZATION

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## Services & Operations

To achieve its mission overall, SERS is organized into the following business units.

The **executive office** provides strategic leadership and administrative oversight of agency operations. It directly serves the State Employees' Retirement Board, including facilitating communications, and managing meetings and documentation. The communications and policy office, a component of the executive office, works with the General Assembly on policy-related matters; administers the agency's right-to-know program; serves as liaison to the media; and offers an array of communications support to the agency.

The **office of member services** provides direct assistance to SERS active, vested, and retired members as well as their families. It conducts individual and group educational sessions statewide. The office also supports SERS employers and processes member enrollments, retirements, status changes, payments, and a host of other transactions.

The **investment office** works closely with the State Employees' Retirement Board to oversee investments in SERS defined benefit, 457 deferred compensation, and 401a defined contribution plans. The office establishes and implements investment policies; sets the strategic asset allocation; monitors fund cash flow, investment managers, fund risks, and performance; and researches and recommends investment opportunities. The office also maintains deep and current expertise related to the analysis of capital and global markets.

The **office of finance and administration** maintains accounting controls and oversees all SERS funds. It administers all transactions including, for example, member payments; member and employer contributions; investment purchases and sales; and operational expenses. The office also manages facilities and procurement, and oversees the 457 and 401a plans.

The **internal audit division** tests business processes and internal controls to confirm that they are adequate and operating properly to ensure vigilant stewardship of SERS funds. It performs on-site audits of investment consultants and managers, as deemed necessary. The division also coordinates independent, external audits of SERS on an annual basis and performs special projects at the direction of the State Employees' Retirement Board and audit committee.

The **legal office** advises the State Employees' Retirement Board on matters related to member appeals and administrative hearings, securities actions and litigation matters, and other general legal issues for which the board requests advice. In addition, the office reviews, negotiates, assists in drafting, and finalizes all investment contracts, as well as other general business contracts. The office also provides legal support related to legislative drafting, right-to-know requests, and member transactions.



# SERS ORGANIZATION

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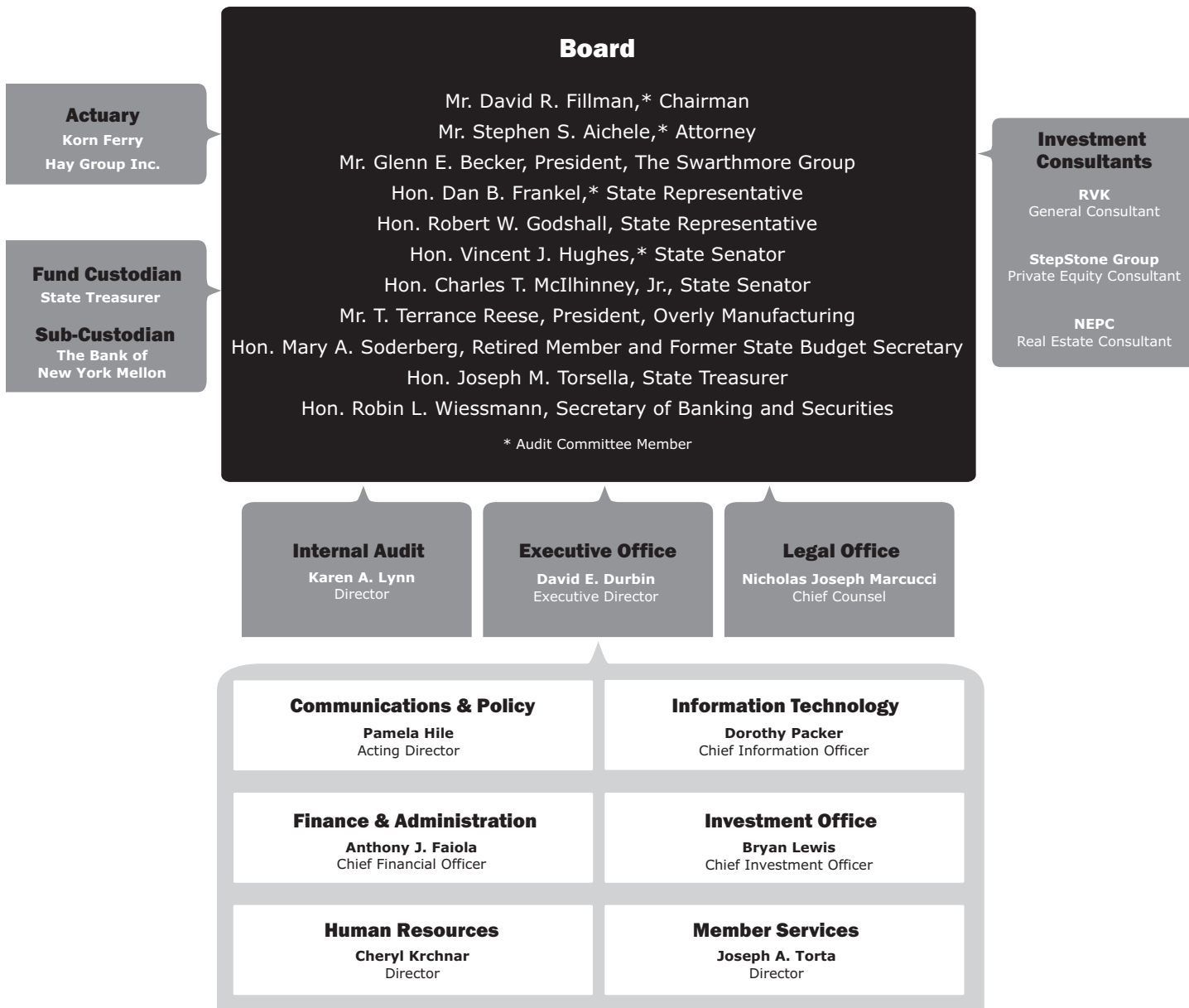
## Services & Operations

The **office of information technology** administers the agency's computing infrastructure. It ensures the performance and security of complex databases, which contain sensitive personal and financial information and are relied upon to track investments, process payments, and account for funds. The office also links the regional field offices, develops applications to provide members with online access to SERS information, and provides user support.

The **human resources division** recruits, hires, trains, supports, and assesses the performance of SERS employees. It offers workforce planning, professional development programs, and labor relations services. The division also facilitates annual financial disclosure and ethics processes for SERS board members and staff.

# SERS ORGANIZATION

## Services & Operations



As of 12/31/17

# SERS ORGANIZATION

## Proposed FY 2018-2019 Administrative Budget

	Rebudget 2014-2015	Rebudget 2015-2016	Rebudget 2016-2017	Rebudget 2017-2018	Budget Request
<b>Personnel Services</b>	\$15,909,014	\$16,934,000	\$16,548,700	\$18,560,500 <sup>1/</sup>	\$18,949,000 <sup>1/</sup>
<b>Operational</b>					
Travel	50,050	56,400	54,300	55,800	65,800
Training	153,258	116,950	125,600	79,500	138,550
Communication Services	428,200	418,400	472,500	481,400	471,500 <sup>1/</sup>
Consultants - Non EDP	385,600	401,600	349,700	811,000 <sup>1/</sup>	820,000 <sup>1/</sup>
Legal Services/Fees	282,500	386,000	280,000	641,000 <sup>1/</sup>	521,100 <sup>1/</sup>
Specialized Services	404,100	455,670	545,550	630,350 <sup>1/</sup>	629,800 <sup>1/</sup>
Advertising	20,000	5,000	8,000	10,000	8,000
IT Consulting	964,600	1,200,000	1,620,100	6,150,500 <sup>1/</sup>	4,353,000 <sup>1/</sup>
Contracted Maintenance Non-IT	39,300	41,300	49,300	58,900	68,100
Hardware/Software and Maintenance	1,334,900	1,071,160	1,518,500	2,123,600 <sup>1/</sup>	1,610,250
Real Estate	1,842,789	1,680,091	1,710,100	1,727,390	1,731,250 <sup>1/</sup>
Vehicles	31,700	25,600	23,000	25,800	25,000
Office Equipment	68,100	94,600	95,300	146,250 <sup>1/</sup>	112,000 <sup>1/</sup>
Other Rentals/Leases	3,600	3,600	3,600	3,600	3,600
Office Supplies	86,800	107,000	139,200	122,500	117,050 <sup>1/</sup>
Educational Supplies	500	3,140	2,200	153,100 <sup>1/</sup>	82,000 <sup>1/</sup>
Motorized Equipment Maintenance	8,500	3,500	3,500	3,500	4,000
Postage	196,500	352,100	471,960	646,500 <sup>1/</sup>	610,500 <sup>1/</sup>
Freight	3,600	3,500	3,500	3,200	3,200
Printing	226,439	157,100	226,400	217,450 <sup>1/</sup>	199,600 <sup>1/</sup>
Subscriptions & Licensing	65,250	35,590	59,350	39,150	43,900
Membership Dues	23,900	26,000	26,540	25,300	27,900
Conference Expenses	9,700	8,400	8,600	14,300	16,500
Insurance, Surety, & Fidelity Bonds	13,000	13,000	13,000	13,000	13,000
Treasury Services	1,000,000	1,190,000	1,255,000	1,145,360	1,271,400
Other Operational	1,100	203,299	203,300	119,900	120,000
<b>Total Operational</b>	<b>7,643,986</b>	<b>8,059,000</b>	<b>9,268,100</b>	<b>15,448,350</b>	<b>13,067,000</b>
<b>Fixed Assets</b>	<b>250,000</b>	<b>250,000</b>	<b>250,000</b>	<b>110,000</b>	<b>250,000</b>
<b>Less Directed Commissions</b>	<b>1,500,000</b>	<b>1,500,000</b>	<b>1,500,000</b>	<b>1,500,000</b>	<b>1,500,000</b>
<b>Total Annual Budget</b>	<b>\$22,303,000</b>	<b>\$23,743,000</b>	<b>\$24,566,800</b>	<b>\$32,618,850</b>	<b>\$30,766,000</b>

<sup>1/</sup>Figures include amounts needed to implement the defined benefit portion of Act 2017-5.

# SERS ORGANIZATION

## Proposed FY 2018-2019 Administrative Budget

### Directed Commission Revenue & Expense

	FY 2017-18 Budget	FY 2018-19 Budget
<b>Beginning Balance</b>	<b>\$3,219,240</b>	<b>\$1,819,240</b>
Directed Commission Revenue	100,000	100,000
<b>Total Available</b>	<b>3,319,240</b>	<b>1,919,240</b>
Directed Commission Expense	1,500,000	1,500,000
<b>Ending Balance</b>	<b>\$1,819,240</b>	<b>\$419,240</b>

Directed commissions are reimbursements to the system for a portion of the fee paid to a broker for executing a trade.

### Proposed FY 2018-2019 401a Defined Contribution Budget<sup>4/</sup>

	Rebudget 2017-2018	Budget Request
<b>Personnel Services</b>	<b>\$1,891,000</b>	<b>\$2,782,000</b>
<b>Operational</b>		
Consultants - Non EDP	250,000	250,000
Legal Services/Fees	279,000	193,000
Specialized Services	1,890,000	1,267,500
IT Consulting	400,000	100,000
Hardware/Software and Maintenance	50,000	0
Facilities and Equipment	58,750	58,750
Educational Supplies	150,000	80,000
Postage	200,000	110,000
Printing	100,000	60,000
<b>Total Operational</b>	<b>3,377,750</b>	<b>2,119,250</b>
<b>Total Annual Budget</b>	<b>\$5,268,750</b>	<b>\$4,901,250</b>

<sup>4/</sup>Figures include amounts needed to implement the 401a defined contribution portion of Act 2017-5.

# SERS ORGANIZATION

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## Legislation

### Legislation Enacted During 2017

#### Act 2017-5

##### Overview

On June 12, 2017, Governor Wolf signed Senate Bill 1, which became Act 2017-5. The law established two new side-by-side hybrid defined benefit (DB)/defined contribution (DC) benefit options and a new DC-only option for all state employees, excluding most hazardous duty employees, who first enter SERS membership on or after January 1, 2019. While most hazardous employees are exempt, those starting on or after January 1, 2019, will have a 10% cap on voluntary overtime that is includable for retirement covered earnings.

Additionally, all current SERS members will have a one-time, irrevocable option to select one of the three new retirement benefit options between January 1, 2019, and March 31, 2019. The newly elected option will be effective July 1, 2019, and generally will apply to all future service.

Funding for FY 2017/18 expenditures to implement the new 401a defined contribution plan was established in Act 2017-44, signed into law on October 30, 2017.

#### **Benefit Enhancements for Members Who Joined SERS Under Act 2010-120 (on or after January 1, 2011)**

While currently ineligible to do so, those who entered SERS membership on or after January 1, 2011, will be eligible to withdraw their contributions and interest at retirement beginning on July 1, 2019. The law also provides a shared-gain provision to balance the current shared-risk requirement that could change the amount these members contribute toward their retirement benefit.

#### **Changes to Financing Provisions**

Effective with SERS' December 31, 2021 actuarial valuation, the actuarial funding method to determine the normal cost of benefits each year will change. The normal cost, currently based on the benefits and contributions for the average new employee, will be based on the benefits and contributions for all covered employees from their date of entry.

Any change in SERS' unfunded accrued liability as a result of the legislation will be funded using a 30-year, level dollar amortization, (rather than the current 10-year, level dollar amortization) beginning July 1, 2019. Moreover, any savings that result from Act 2017-5 will be paid back to SERS as additional contributions to pay down the unfunded accrued liability.

#### **Independent Legal Counsel**

Act 2017-5 provides the SERS Board with the authority to hire legal counsel, for the board and agency, that is independent of the Office of General Counsel.

#### **Pension Investment Review and Other Operational Provisions**

Act 2017-5 also established the Public Pension and Asset Investment Review Commission to study and make recommendations to the General Assembly and the Governor regarding investment performance and investment strategies. The legislation adds the Secretary of Banking and Securities as an ex-officio member of the board and requires board members to obtain eight hours of relevant training annually.

# SERS Members

# SERS MEMBERS

## Demographics as of December 31

### Total Active & Annuitant Members

Year Ending December 31	Total Members <sup>1/</sup>	Active Members	Annuitants & Beneficiaries
2017	232,451	102,978	129,473
2016	231,970	104,632	127,338
2015	229,714	105,025	124,689
2014	226,680	104,431	122,249
2013	225,238	105,186	120,052
2012	223,109	106,048	117,061
2011	222,363	107,021	115,342
2010	220,968	109,255	111,713
2009	219,746	110,107	109,639
2008	219,012	110,866	108,146

<sup>1/</sup>Totals do not include inactive members.

### Active Members: Age & Service

Average Age	46.4
Average Years of Service	11.9

### Total Annuitants & Beneficiaries: By Category

	2014	2015	2016	2017
Normal	60,228	61,753	63,315	64,796
Early	42,683	43,272	43,974	44,284
Disability	8,417	8,512	8,578	8,593
Beneficiary/Survivor	10,921	11,152	11,471	11,800

### Annuitants & Beneficiaries: Average Age

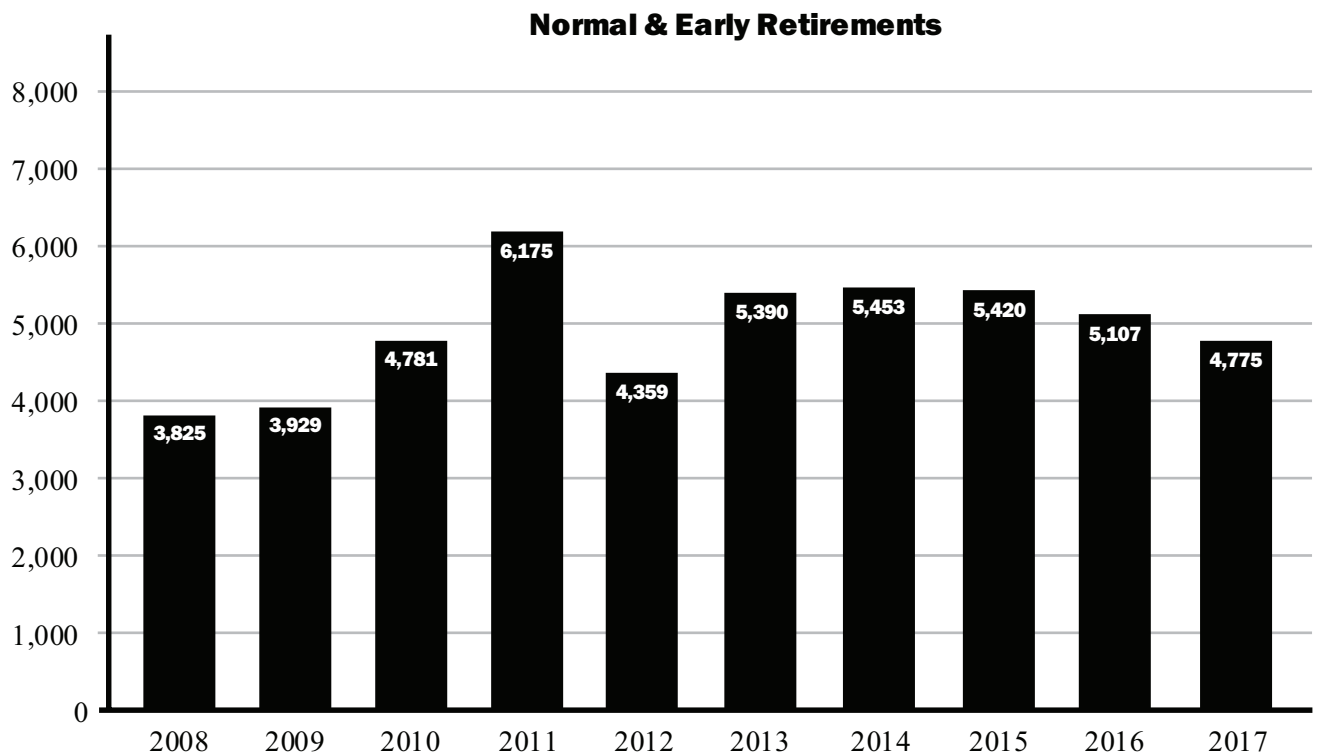
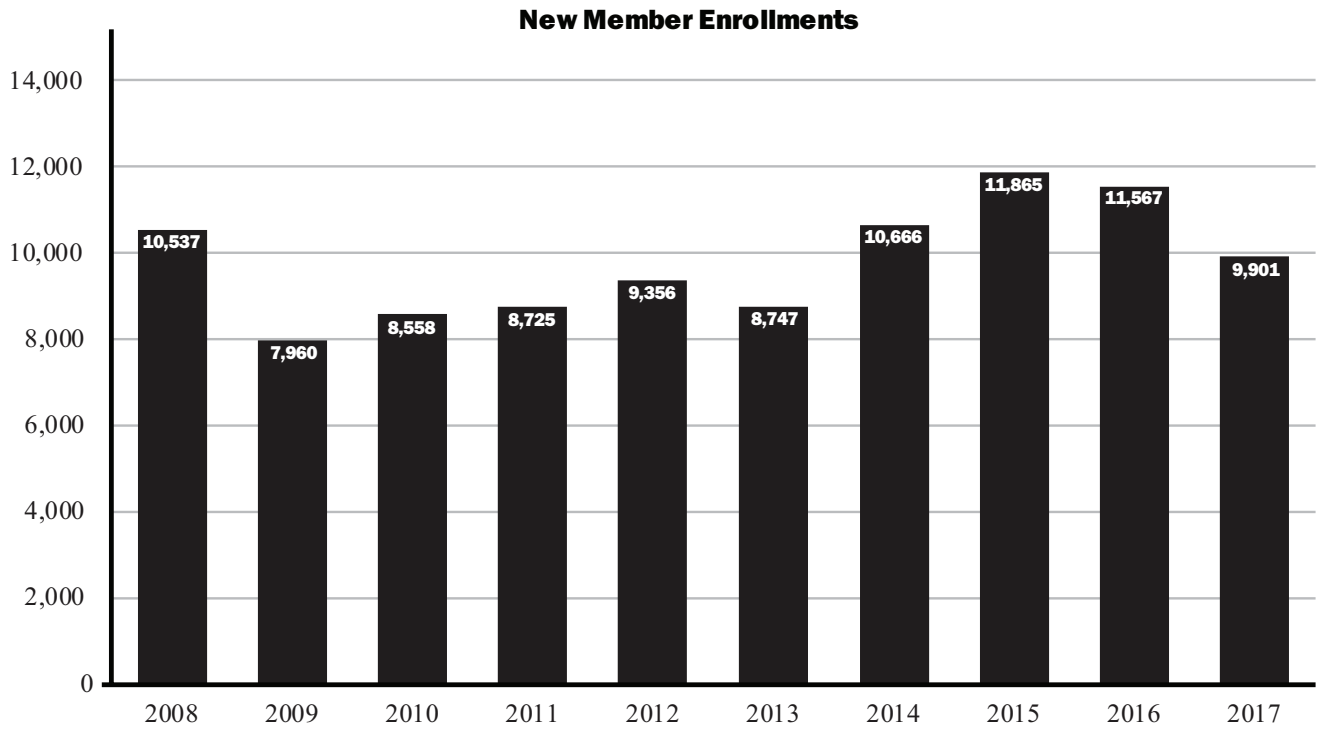
	2014	2015	2016	2017
Normal	72.4	72.3	72.3	72.3
Early	63.7	64.0	64.3	64.7
Disability	62.7	63.0	63.4	63.7
Beneficiary/Survivor	74.7	74.6	74.5	74.6

### Annuitants & Beneficiaries: Average Annual Pension

	2014	2015	2016	2017
Normal	\$26,426	\$27,042	\$27,722	\$28,352
Early	16,604	16,934	17,412	17,749
Disability	14,797	15,020	15,245	15,521
Beneficiary/Survivor	11,651	12,007	12,505	12,947

# SERS MEMBERS

## Demographics as of December 31





# SERS Fund

# SERS FUND

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## Funding Process

### Defined Benefit Plan

The Pennsylvania State Employees' Retirement System currently administers two retirement plans that contribute to the financial security of the commonwealth's public workforce in its retirement years. Most state employees are required to participate in Pennsylvania's defined benefit plan. Employees who are eligible to participate in the defined benefit plan may choose to supplement their retirement savings by also voluntarily participating in the 457 deferred compensation plan.

The economic engine of the defined benefit plan is the SERS Fund, which is reviewed in depth in this section. Details about the 457 deferred compensation plan are provided in the last section of this book. In addition to administering the two current plans, the system is working to implement a new plan for most new members beginning in 2019. That new plan is discussed in the Legislation section.

In the defined benefit plan, both the employer and the member pay a certain percentage of the member's salary to the SERS Fund for as long as the member works for the commonwealth. For FY 2017/18, employers are contributing 33.2% of payroll and most members are paying 6.25%. SERS invests this money to achieve returns to help ensure sufficient funds are available to make payments to current and future retirees. In 2017, SERS earned an estimated 15.1% return on its investments.

When members meet certain milestones—working a specific number of years to achieve vesting, for example—they become eligible to receive monthly retirement payments for the rest of their lives. The payment amount is based on a formula that includes the member's length of service, age, compensation over a period of time, and an accrual rate, or multiplier that is determined by the General Assembly.

In 2017, SERS made approximately \$3.3 billion in benefit payments, approximately \$3.0 billion of which stayed in Pennsylvania. The average annual pension paid to a retired member who worked to full retirement age was \$28,352.

### Determining Adequate Funding for a Defined Benefit Plan

Defined benefit plans are long-term propositions. When underlying principles remain intact, defined benefit plans offer efficient, stable, and sustainable models for growing assets and delivering benefits through complete economic cycles. A standard feature of these types of plans is that employee and employer contributions invested throughout the member's working career provide sufficient funding to pay for that particular member's expected lifetime retirement benefit.

Because a defined benefit plan guarantees a monthly payment to every retiree for life, it is impossible to develop precise, before-the-fact costs and cash flows for the plan. The number of people paying into the plan, the amount they earn, how long they work, the number of people retiring, the age at which each person retires, and how long each retiree lives are among the myriad factors that vary from day-to-day, month-to-month, and year-to-year.

# SERS FUND

## Funding Process

Actuarial science is used to develop accurate predictions. It applies available data to a number of interrelated mathematical and statistical methods and uses investment and financial practices to study uncertain future events.

SERS actuarial firm conducts an in-depth investigation and analysis—known as an experience study—of real-world economic and demographic data every five years. Economic assumptions include rates of investment return and salary growth, for example, which are significantly impacted by inflation. Demographic assumptions include workforce, disability, and mortality trends. In 2016, SERS delivered its most recent experience study. It is available at [SERS.pa.gov](http://SERS.pa.gov).

The selection of economic and demographic assumptions used is generally guided by the Actuarial Standards Board. In SERS' case, some very important assumptions—such as the length of time over which investment gains and losses are recognized—are set by Pennsylvania law.

### Current Key Actuarial Assumptions

7.25%  
long-term  
investment return

5.6%  
average salary growth

2.6%  
rate of inflation

Each year, SERS' actuarial firm uses the most recent active member and retiree demographic data to determine total expected future obligations. The actuary then compares those obligations to the expected value of the fund's assets, based on current audited financial statements and future economic assumptions.

This calculation is factored in with the statutorily set member contribution rate and the assumed investment rate of return as the basis for calculating how much employers need to contribute in order to fully fund their employees' retirement benefits.

### Funding Sources & Trends

Defined benefit plans are designed to remain stable by receiving three regular funding streams—member contributions, investment earnings, and employer contributions.

### What is an unfunded liability?

An unfunded liability—also commonly called an unfunded actuarial liability or UAL—is the degree to which the current and projected liabilities exceed the current and projected assets of a defined benefit plan.

In other words, it is the difference between what the commonwealth's defined benefit plan is legally obligated to pay and what assets have been set aside to make those payments.

### Member Contributions

Active members pay a certain percentage of their pay toward their retirement benefit. While different classes of membership pay different rates, most members currently pay 6.25% of their pay. The percentage is set by statute and the rate does not change from year to year. Members' contributions are

# SERS FUND

## Funding Process

withheld from their paychecks and sent directly from their employer to SERS. In 2017, member contributions to SERS totaled an estimated \$383 million.

Courts have ruled that public retirement benefits may not be retroactively changed in any way that may be a “net detriment” to employees. “Net detriment” has been interpreted as a reduction in benefits already earned, and/or as an increase in member contributions required to maintain such benefits.

There are some instances, however, in which member contributions can increase. For example, Pennsylvania’s Act 2010-120 introduced a “risk sharing” provision whereby if there is a multi-year period of investment returns below the assumed rate and if employers have met their contribution obligations to the pension system, the contributions paid by those who entered SERS membership on or after January 1, 2011, could increase. The additional contribution cannot increase by more than 0.5% in any three-year period and 2% in total. To date, the shared risk provision has not been triggered. It will be reviewed again in 2020, considering investment performance for calendar years 2011 through 2019.

### Investment Earnings

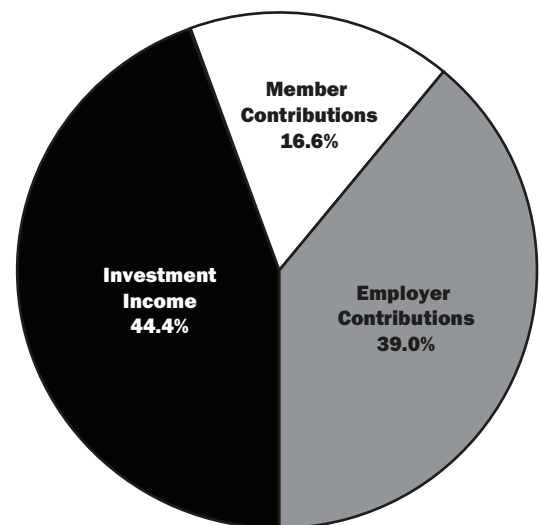
SERS overall investment objective is to assure adequate fund reserves at the least cost to commonwealth citizens and to protect against the erosion of principal by inflation. SERS seeks to provide investment earnings that meet, or preferably exceed, the assumed rate of return over complete economic cycles. SERS strives to meet this objective by applying acceptable risk parameters and allocations to investments that are diversified by type, industry, quality, and geography.

Investment earnings can vary widely from year to year; the SERS Fund, for example, produced an approximate 25% return in 2003 and experienced more than a 28% loss in 2008’s worldwide downturn. For funding valuation purposes in order to minimize volatility, Pennsylvania law requires that the differences between actual performance and the assumed rate of return be recognized over a five-year period at a rate of 20% per year—a concept often referred to as “smoothing”.

SERS examines and sets its assumed rate of return each year based on global market dynamics, investment performance, and other considerations. For example, in 2009, SERS reduced its assumed rate of return from 8.5% to 8%, largely as a result of 2008’s global economic collapse.

As a result of SERS’ 90-plus years of operation and the trend of people living longer, the system now has more retired members than active members. In 2018, SERS is projected to pay out approximately \$90 million more each month than it takes in through member and employer contributions.

**SERS Funding**  
(10-Year History)



# SERS FUND

## Funding Process

As a normal outcome of a maturing pension system, the liquidity needs of its fund increase requiring ongoing rebalancing of assets. In recognition of this fact and in acknowledgement of continuing economic challenges, SERS again reduced its assumed rate of return in 2017; this time, from 7.5% to 7.25%. This change has implications for the employer contribution rate, as discussed below.

### Public Pension Fund Assumed Rates of Return

(National Association of State Retirement Administrators, February 2018)

Rate	# of Plans Using Rate
8.5%	1
8.0%	11
>7.5% - <8.0%	23
7.5%	31
>7.0% - <7.5%	30 (SERS)
7.0%	21
<7.0%	12

For 12 of the last 20 years, SERS has exceeded its assumed rate of return. Factoring in the unprecedented market volatility and the precipitous market decline of 2008, the fund has achieved a 20-year rate of return of 7.1%, a 25-year rate of return of 8.4%, and a 30-year return of 9.0%. SERS reports its returns net-of-fees. This demonstrates that the long-horizon approach to investing members' money continues to provide the fund with stable footing.

The "shared risk" provision of Act 2010-120, previously discussed, is designed to moderate the need for future employer rate increases that may be prompted by investment underperformance. To date, the shared risk provision has not been triggered. It will be reviewed again in 2020, considering investment performance for calendar years 2011 through 2019.

### Employer Contributions

Employer contributions make up the final portion of SERS overall funding. The employer contribution rate is calculated by an independent actuary, taking into account member contributions, demographic activity, investment earnings, and future liabilities. Because it is highly unlikely that every assumption could be correct, the Pennsylvania State Employees' Retirement Code requires SERS to adjust the employer contribution rate each year based on actual experience and investment performance.

The employer normal cost is expressed as a percentage of payroll and is the amount employers would contribute if all actuarial assumptions were precisely correct, including the fund earning exactly its assumed rate of return. The normal cost of benefits as of the 2016 actuarial valuation was 4.91%.

Based on the actuary's recommendation, the SERS Board annually certifies an employer contribution rate. The rate has fluctuated dramatically over the years: in 1981 the rate was approximately 18%, but from 2001-03 it was 0%.

# SERS FUND

## Funding Process

The total dollars contributed by employers has varied from year to year. In 1987, employer contributions totaled \$366 million, in 2017 that figure was approximately \$1.9 billion.

According to the Budget Office, SERS employers under the Governor’s jurisdiction paid less than half of the employers’ total—about 45%—from general funds. About 27% came from special funds; about 15% came from federal funds; and about 13% came from other sources.

The employer contribution rate has two parts: the cost of the benefit for new SERS members in the current year (as applied to all active members) and a contribution toward the unfunded liability. When SERS reduced its assumed rate of return from 7.5% to 7.25% in 2017, the change increased the unfunded liability by approximately \$1 billion.

FY 2017-18 was the first year since legislatively-mandated contribution rates were enacted through Act 2010-120 that rate collars were no longer needed and the commonwealth paid the full actuarially required rate. The FY 2018-19 employer contribution is currently projected to drop to 32.3% of payroll. Of that contribution rate, approximately 4.9% will go to fund the benefits of new SERS members in the current year (normal cost) and approximately 27.4% will go to pay toward the unfunded liability.

Looking at the relative sizes of the current-year and unfunded liability components of the employer rate listed above, it is clear that the unfunded liability is the driving factor in the employer contribution rate. The good news is that the employer rate is expected to drop about one percentage point in FY 2018-19, beginning an expected, slow, year-over-year decline.

There is a single-year exception to that decline. While the system makes use of a modified entry-age funding method, Act 2017-5 requires a traditional entry-age funding method starting in 2021 that results in a single-year increase in the FY 2022/23 rate.

### Long-Term Snapshot

	1987	2017
<b>Employer Rate</b>	13.40%	33.24%
<b>Employer Contributions</b>	\$366 million	\$1.9 billion
<b>Member Rate</b>	5.00%	6.25%
<b>Member Contributions</b>	\$147 million	\$383 million
<b>Active Members</b>	109,000	103,000
<b>Annuitants</b>	70,000	129,000

# SERS FUND

## Funding Process

### Projected Payout, Funding Status & Employer Contributions

Assuming entry-age funding method, traditional entry-age funding method starting in 2021, level-dollar amortization, five-year smoothing of assets, no FY 18 or later for Act 2010-120 collars, 5.6% salary growth, 2.6% inflation, 15.1% investment return in CY 2017 with 7.25% return thereafter, 6.25% pre Act 2017-5 employee contribution, 8.25% Act 2017-5 employee contribution for hybrid class A-5, 7.5% Act 2017-5 employee contribution for both hybrid class A-6 and 401a Defined Contribution only election.

Valuation Year Ended Dec 31	CY Payout		CY Funding Status		Fiscal Year	Expected FY Payroll (\$ millions)	FY Employer Contribution	
	Benefits & Expenses (\$ billions)	Funded Ratio	Unfunded Liability (\$ billions)	Employer Contribution Rate			Expected FY Contribution (\$ millions)	
2017	\$3.4	59.6%	\$19.52	2018/19	\$6,366.9	32.33%	\$2,058.5	
2018	3.5	57.9	21.53	2019/20	6,551.5	31.87	2,088.2	
2019	3.6	58.9	21.27	2020/21	6,741.5	31.21	2,103.8	
2020	3.7	60.7	20.58	2021/22	6,937.0	30.09	2,087.1	
2021	3.8	68.3	15.37	2022/23	7,138.2	30.77	2,196.6	
2022	4.0	69.6	14.90	2023/24	7,345.2	29.91	2,197.1	
2023	4.1	70.9	14.42	2024/25	7,558.2	29.11	2,200.1	
2024	4.2	72.1	13.93	2025/26	7,777.4	28.34	2,204.1	
2025	4.3	73.3	13.41	2026/27	8,002.9	27.61	2,209.5	
2026	4.4	74.6	12.86	2027/28	8,235.0	26.91	2,215.7	
2027	4.5	75.9	12.27	2028/29	8,473.8	26.23	2,222.3	
2028	4.6	77.2	11.64	2029/30	8,719.6	25.57	2,229.2	
2029	4.7	78.5	10.97	2030/31	8,972.4	24.92	2,236.2	
2030	4.8	79.9	10.25	2031/32	9,232.6	24.30	2,243.6	
2031	4.9	81.4	9.47	2032/33	9,500.4	23.80	2,261.3	
2032	5.0	83.0	8.63	2033/34	9,775.9	23.34	2,281.4	
2033	5.0	84.7	7.73	2034/35	10,059.4	22.87	2,300.5	
2034	5.1	86.6	6.74	2035/36	10,351.1	22.40	2,319.0	
2035	5.2	88.6	5.68	2036/37	10,651.3	21.95	2,337.7	
2036	5.3	90.9	4.53	2037/38	10,960.2	21.49	2,355.6	
2037	5.4	93.3	3.29	2038/39	11,278.0	21.05	2,374.0	
2038	5.5	96.0	1.95	2039/40	11,605.1	20.61	2,392.0	
2039	5.6	98.9	0.51	2040/41	11,941.6	16.29	1,945.1	
2040	5.7	101.2	(0.57)	2041/42	12,287.9	13.15	1,615.4	
2041	5.8	103.0	(1.39)	2042/43	12,644.3	7.77	982.5	
2042	5.9	104.0	(1.79)	2043/44	13,011.0	5.77	750.2	
2043	6.1	104.4	(1.89)	2044/45	13,388.3	5.69	761.8	
2044	6.2	104.7	(1.97)	2045/46	13,776.6	5.62	773.7	
2045	6.3	105.0	(2.01)	2046/47	14,176.1	5.55	786.6	
2046	6.5	105.1	(1.94)	2047/48	14,587.2	5.49	800.4	

<sup>4</sup>Figures are based on 2016 actuarial funding valuation



# SERS FUND

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## Actuarial Status

### Restoring SERS Defined Benefit Plan Funding

While the unfunded liability of the system has grown slower than it otherwise would have as a result of the benefit changes in Act 2010-120 and is expected to continue a slower growth as a result of the additional benefit changes that will go into effect in 2019 as a result of Act 2017-5, it will take a couple of years to realize benefits from the lower costs in terms of a decrease in the unfunded liability and an increase in the funded ratio.

The SERS funded ratio will improve as those who entered SERS membership before January 2011 retire and post-January 2011 members continue to grow in number. In 2017, SERS retired 4,775 members and added 9,901 new members. Currently, more than 36% of SERS' active members belong to the post Act 2010-120 classes of service.

Act 2010-120 projected savings of approximately \$1.5 billion over 30 years by reducing the retirement benefit accrual rate, increasing the normal retirement age, eliminating the lump sum withdrawal option, extending the vesting period from five years to 10 years and including other provisions for those who entered SERS membership on or after January 1, 2011. One aspect of Act 2010-20 is that retirement provisions for legislators elected after December 1, 2010, were reduced and made consistent with those of most rank-and-file employees.

Even more impactful, Act 2010-120 also recognized the need for greater rates of employer funding and allowed employer contributions to increase over time. To ensure predictability and to moderate overall budget impacts, the General Assembly set measured intervals for increased employer contribution rates. The good news is that SERS employers have already reached the peak employer contribution rate this year and the rate begins an expected year-over-year decline in FY 2018/19.

Because the employer rate was below actual cost for a number of years, the unfunded liability is expected to grow for a few more years before it begins to decline. As the employer rate has increased, its impact on paying down the liability is dramatic. Such funding is among the most crucial components of the overall, long-term stability of the pension system.

### Current Funded Position of SERS Defined Benefit Plan

The funded position of a defined benefit plan is measured by its funded ratio, which is the actuarially calculated value of assets divided by the actuarially calculated sum of retirement benefits earned by all existing SERS members—approximately 240,000 active, inactive, vested, and retired.

In general, a funding ratio of 80% or better is considered “healthy” for a pension system. Per a 2017 Wilshire report, Pennsylvania is among 74 out of 103 other state retirement systems that are currently below the 80% threshold. At the close of 2017, SERS' estimated funded ratio was 59.6% (actuarial value) or 60.6% (market value).



# SERS FUND

## Actuarial Status

SERS funded ratio has varied significantly over time. In 1984, it dipped below 60%, as it is now. By 2001, however, it had climbed back to well over 100%. Recent funded ratios include:

	<b>Funded Ratio</b>	
	<b>Actuarial Value</b>	<b>Fair (Market) Value</b>
<b>1996</b>	105.7%	116.0%
<b>2001</b>	116.3	104.4
<b>2006</b>	92.7	105.5
<b>2011</b>	65.3	57.6
<b>2017<sup>1/</sup></b>	59.6	60.6

<sup>1/</sup>2017 values are projected.

The 2017 estimated unfunded liability is \$19.5 billion. The liability will continue to grow for a few more years since employer contribution rates were suppressed by Pennsylvania law for a number of years.

Factors influencing the unfunded liability have been building over time, including but not limited to:

- Sustained periods of employer contributions below normal costs: 1992 through 2009
- Losses that neutralized past investment gains used to justify the low employer contributions: -10.9% in 2002 and -28.7% in 2008
- Benefit increases—including cost of living adjustments and increased accrual rates—without providing sufficiently off-setting funding streams: Act 2001-9 and Act 2002-38
- Legislatively mandated actuarial changes that extended the time over which liabilities be paid or artificially suppressed employer contribution rates: Act 2003-40 and Act 2010-120
- Cumulative negative impact of the above on the overall size of the fund and its ability to realize investment returns in positive-earning years

# SERS FUND

## Actuarial Status

### Additions and Deductions to Fiduciary Net Position<sup>1/</sup>

(\$ millions)

Calendar Year	Member Contributions	Investment Earnings	Employer Contributions	Benefits & Expenses	Fair (Market) Value
2008	\$337	(\$11,061)	\$235	(\$2,231)	\$22,796
2009	349	3,561	253	(2,297)	24,662
2010	349	3,076	273	(2,474)	25,886
2011	351	480	392	(2,732)	24,377
2012	348	2,794	566	(2,696)	25,389
2013	352	3,724	795	(2,866)	27,394
2014	366	1,462	1,084	(2,968)	27,338
2015	372	88	1,360	(3,103)	26,055
2016	375	1,587	1,622	(3,251)	26,388
2017 <sup>2/</sup>	383	3,883 <sup>3/</sup>	1,858	(3,364)	29,148
<b>10-Year Total</b>	<b>\$3,582</b>	<b>\$9,594</b>	<b>\$8,438</b>	<b>(\$27,982)</b>	

<sup>1/</sup>10-year net additions and deductions were (\$6,368).

<sup>2/</sup>2017 figures are unaudited

<sup>3/</sup>Figure does not include 4<sup>th</sup> quarter earnings for all Private Equity and Real Estate. Data not yet available.

# **SERS Fund**

## **Overview**

# SERS FUND

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## Investment Program | Overview

### Investment Policy

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

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

The major elements of the policy are:

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

# SERS FUND

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## Investment Program | Overview

- 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.

# SERS FUND

## Investment Program | Overview

### Asset Allocation Trend

#### *Prudent Investor Investment Standards*

The board's investment authority is governed by the prudent investor standard as set forth in Title 71, Pennsylvania Consolidated Statutes, Section 5931(a). Enactment of the prudent investor standard in Act 1994-29 and asset/liability studies completed by SERS general investment consultant and the SERS investment staff are the foundation of SERS investment strategy. With prudent investor investment authority, SERS is able to pursue a broader array of investment opportunities that enhance the ability to achieve reasonable rates of return while maintaining risk at acceptable levels. An asset/liability study demonstrated that the prudent application of this expanded authority should result in a more efficient portfolio that better serves the needs of SERS.

#### *Total Fund Asset Allocation*

SERS develops a biennial investment plan which provides direction for the SERS investment program. The *2016-2017 Strategic Investment Plan* will be implemented over a 10-year period. The fund's asset allocation strategy will evolve over this timeframe through a series of interim targets until the long-term target for each asset class is achieved. As a result of a portfolio examination, several changes were made to the asset allocation during the fourth quarter of 2017.

#### *Investment Program Summary*

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.

### Asset Allocation

(\$ millions as of December 31, 2017)

Asset Class	Market Exposure	% of Total Fund	Long-Term 10-Year Strategic Target
Private Equity	\$3,971.4	13.6%	16.0%
Global Public Equity	15,505.3	53.2	43.0
Real Estate	2,172.6	7.4	12.0
Multi-Strategy	2,121.4	7.3	*
Legacy Hedge Funds	191.0	0.7	12.0
Fixed Income	4,238.2	14.5	14.0
Cash	948.4	3.3	3.0
<b>Total Fund</b>	<b>\$29,148.3</b>	<b>100.0%</b>	<b>100.0%</b>

\*The portfolio was restructured effective Q4 2017 to add Multi-Strategy as a new asset class. A long-term 10-year strategic target for Multi-Strategy will be available in the *2018-2019 Strategic Investment Plan*.

# SERS FUND

## Investment Program | Overview

### Number of Investment Managers

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

### Number of Investment Portfolios

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

# SERS Fund

## Performance



# SERS FUND

## Investment Program | Performance

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

For the period ending December 31, 2017

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

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

<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 S&P Developed Market Property Index (Qtr Lag), and the Consumer Price Index+3% (Qtr Lag).

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

# SERS FUND

## Investment Program | Performance

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

For the period ending June 30, 2017

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

Asset Class	1-Year Total Return	3-Year Total Return	5-Year Total Return	10-Year Total Return
Private Equity <sup>2/5/</sup>	11.1%	7.2%	9.2%	8.4%
<i>Burgiss All Private Equity Custom Index<sup>3/5/</sup></i>	11.7	9.5	11.7	8.8
<i>Russell 3000 Index+3%<sup>4/5/</sup></i>	21.6	13.0	16.6	10.8
Global Public Equity	20.4	5.4	11.4	3.2
<i>MSCI ACWI IM Index (Net)</i>	19.0	4.9	10.7	3.9
Real Estate <sup>5/</sup>	1.2	6.5	8.4	2.1
<i>Real Estate Custom Benchmark<sup>5/6/</sup></i>	6.4	10.2	10.9	4.5
<i>Consumer Price Index+3%<sup>5/</sup></i>	5.5	4.1	4.3	4.8
Hedge Funds	6.4	-1.1	2.8	2.0
<i>HF Custom Index<sup>7/</sup></i>	9.4	1.8	6.9	5.4
Fixed Income	2.7	1.9	3.1	5.0
<i>Bloomberg Barclays U.S. Aggregate Bond Index</i>	-0.3	2.5	2.2	4.5
Cash	1.2	0.8	0.6	1.0
<i>BofA ML 3 Month U.S. T-Bill Index</i>	0.5	0.2	0.2	0.6
<b>Total Fund</b>	<b>12.0%</b>	<b>4.7%</b>	<b>7.9%</b>	<b>3.9%</b>
<i>Total Fund Custom Benchmark</i>	<i>11.7%</i>	<i>5.1%</i>	<i>8.1%</i>	<i>5.3%</i>
<i>Total Fund Custom Public Market Equivalent Benchmark</i>	<i>13.1%</i>	<i>5.9%</i>	<i>9.1%</i>	<i>5.8%</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 S&P Developed Market Property Index (Qtr Lag), and the Consumer Price Index+3% (Qtr Lag).

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

# SERS FUND

## Investment Program | Performance

### Fund Values and Annual Return

(\$ millions)

Year Ended	SERS Fund Fair Value	Annual Total Fund Rate of Return <sup>1/</sup>
1988	\$8,312	12.8%
1989	9,785	17.8
1990	9,886	1.0
1991	11,940	22.6
1992	12,453	7.4
1993	13,701	13.2
1994	13,330	-1.1
1995	16,343	25.2
1996	18,492	15.4
1997	21,312	18.5
1998	24,123	16.3
1999	28,093	19.9
2000	27,880	2.2
2001	24,706	-7.9
2002	20,880	-10.9
2003	24,536	24.3
2004	26,641	15.1
2005	28,752	14.5
2006	32,053	16.4
2007	35,516	17.2
2008	22,796	-28.7
2009	24,662	9.1
2010	25,886	11.9
2011	24,377	2.7
2012	25,389	12.0
2013	27,394	13.6
2014	27,338	6.4
2015	26,055	0.4
2016	26,388	6.5
2017 <sup>2/</sup>	29,148	15.1

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

<sup>2/</sup>2017 values are estimated and unaudited. Fund fair values for all Private Equity and Real Estate Investments are reported on a quarter lagged basis.

# **SERS Fund**

## **Expenses & Fees**

# SERS FUND

## Investment Program | Expenses & Fees

### Investment Expenses

Expense Category	Expenses
Manager	\$130,424,386
Consultant	3,597,247
Personnel	2,864,456
Custodian	1,301,812
Legal	368,569
Subscription and membership	295,618
Operational	109,779
<b>Total Investment Expenses</b>	<b>\$138,961,867</b>

### Consultant Expenses

Firm	Service Type	Expenses <sup>1/</sup>
StepStone Group	Private equity investments	\$1,975,000
RVK	General investments	707,468
NEPC	Real estate investments	291,209
The Townsend Group	Real estate investments	267,890
GCM Customized Investment Group	Investment portfolio management	210,000
Institutional Shareholders Services	Proxy services	92,680
Abel/Noser	Transaction cost analysis	53,000
<b>Total Consultant Expenses</b>		<b>\$3,597,247</b>

<sup>1/</sup>Korn Ferry Hay Group, SERS actuary, was paid \$442,500. These are not included in the table above because they are considered administrative expenses.

### Manager Investment Expenses

Asset Class	Fees/Expenses	Fees/Expenses <sup>2/</sup> (in basis points)
Private Equity	\$66,153,147	163.6
Global Public Equity	21,552,627	15.5
Real Estate	20,758,989	91.7
Multi-Strategy	9,432,622	54.8
Legacy Hedge Funds	3,351,387	56.7
Fixed Income	9,175,614	21.8
<b>Total Manager Fees and Expenses</b>	<b>\$130,424,386</b>	<b>47.1</b>

<sup>2/</sup>The fees/expenses were divided by SERS total fund and asset class quarterly average values during calendar year 2017 to arrive at the basis point calculations.

### History of Manager Investment Expenses

Calendar Year	Fees/Expenses	Fees/Expenses (in basis points)
2013	\$175,099,249	68.2
2014	177,383,430	64.8
2015	157,930,597	59.1
2016	159,447,442	61.3
2017	130,424,386	47.1

# SERS FUND

## Investment Program | Expenses & Fees

SERS employs outside investment managers for their investment expertise. The managers of the SERS investment portfolio are paid through non-budget appropriation. Their fees are treated as a reduction of the investment revenue of the SERS Fund, rather than as a direct administrative expense. Thus, when investment performance is reported, numbers are reported net-of-fees - that is, performance after all investment manager fees have been paid.

### 2017 Manager Investment Expenses Detail

Manager	City	State/Country	Fees/ Expenses
<b>Private Equity</b>			
Abingworth Bioventures V	London	United Kingdom	\$196,148
ABRY Partners VII	Boston	MA	101,103
ABRY Partners VIII	Boston	MA	450,366
ABRY Senior Equity II	Boston	MA	22,342
ABS Capital Partners V	Baltimore	MD	65,977
ABS Capital Partners VI	Baltimore	MD	300,036
ADV Opportunities Fund I	Hong Kong	China	801,116
Advent International GPE VI-A	Boston	MA	137,478
Advent International GPE VII-B	Boston	MA	290,631
Advent International GPE VIII-B	Boston	MA	750,018
Advent Latin American Private Equity Fund IV	Boston	MA	196,973
Advent Latin American Private Equity Fund V	Boston	MA	164,763
Advent Latin American Private Equity Fund VI	Boston	MA	500,000
Alloy Ventures 2005	Palo Alto	CA	240,940
APAX Europe VII	London	United Kingdom	14
Artiman Ventures II	Palo Alto	CA	148,133
Artiman Ventures III	Palo Alto	CA	303,859
ASF VII B	New York	NY	1,000,000
Asia Alternative Capital Partners V	San Francisco	CA	250,000
Asia Alternatives Capital Partners	San Francisco	CA	43,503
Asia Alternatives Capital Partners II	San Francisco	CA	110,528
Asia Alternatives Capital Partners III	San Francisco	CA	221,804
Audax Private Equity Fund V	Boston	MA	23,884
Avenue Special Situations Fund VI	New York	NY	23,385
AXA Secondary Fund IV	Paris	France	161,453
AXA Secondary Fund V B	Paris	France	330,257
Bain Capital Asia Fund	Boston	MA	153,766
Bain Capital Europe III	Boston	MA	587,446
Bain Capital Fund IX	Boston	MA	240,557
Bain Capital Fund VIII-E	Boston	MA	6,186
Bain Capital Fund X	Boston	MA	702,198
Bain Capital IX Coinvestment Fund	Boston	MA	31,814
Bain Capital X Coinvestment Fund	Boston	MA	17,113

# SERS FUND

## Investment Program | Expenses & Fees

### 2017 Manager Investment Expenses Detail (continued)

Manager	City	State/Country	Fees/ Expenses
<b>Private Equity (continued)</b>			
Baring India Private Equity Fund III Limited	Port Lewis	Mauritius	\$65,765
Baring Vostok Private Equity Fund IV	Guernsey	Channel Islands	396,817
Battery Ventures VIII	Waltham	MA	447,516
Battery Ventures VIII Side Car Fund	Waltham	MA	114,120
BC European Capital IX	London	United Kingdom	113,187
Berkshire Fund VII	Boston	MA	274,559
Berkshire Fund VIII	Boston	MA	554,174
Blackstone Capital Partners V	New York	NY	37,641
Blackstone Capital Partners VII	New York	NY	750,000
Brait IV	Grand Cayman	Cayman Islands	120,416
Brynwood Partners VI	Greenwich	CT	40,032
Capvis Equity IV	Baar	Switzerland	7,191
Care Capital Investments III	Princeton	NJ	120,422
Carlyle Energy Mezz Opp Fund	New York	NY	362,799
Centerbridge Capital Partners I	New York	NY	29,689
Centerbridge Capital Partners III	New York	NY	422,233
Cerberus Institutional Partners Series Four	New York	NY	71,424
Charterhouse Capital Partners IX	London	United Kingdom	281,639
Chequers Capital XV	Paris	France	77,139
CID Greater China Venture Capital Fund II	Taipei	Taiwan	184,935
Clearlake Capital Group	Santa Monica	CA	290,545
Clearstone Venture Partners III-A	Santa Monica	CA	53,042
Clessidra Capital Partners II	Milan	Italy	73,298
Cognetas Fund II	London	United Kingdom	28,468
Denham Commodity VI	Boston	MA	499,347
Devon Park Bioventures	Wayne	PA	17,180
Dover Street VII	Boston	MA	375,000
Draper Triangle Ventures III	Pittsburgh	PA	200,000
Energy Spectrum Partners V	Dallas	TX	31,150
Eureka II	Yardley	PA	105,964
Eureka III	Yardley	PA	400,000
Excelsior Capital Asia Partners III	Hong Kong	China	36,116
First Reserve Fund XII	Greenwich	CT	245,597
Francisco Partners II	San Francisco	CA	140,345
Francisco Partners III	San Francisco	CA	212,683
Francisco Partners IV	San Francisco	CA	224,210
FSN Capital IV	Oslo	Norway	554,146
FSN Capital V	Oslo	Norway	1,630,379
Great Hill Equity Partners IV	Boston	MA	333,186

# SERS FUND

## Investment Program | Expenses & Fees

### 2017 Manager Investment Expenses Detail (continued)

Manager	City	State/Country	Fees/ Expenses
<b>Private Equity (continued)</b>			
GTCR IX	Chicago	IL	\$213,616
GTCR XI	Chicago	IL	237,700
Guggenheim Technology Ventures I	King of Prussia	PA	1,041
H.I.G. Bayside Debt & LBO Fund II	London	United Kingdom	272,547
H.I.G. Bayside Loan Opportunity Fund III	London	United Kingdom	868,838
H.I.G. Bayside Loan Opportunity Fund IV	London	United Kingdom	362,799
H.I.G. Brazil and Latin America Partners	Rio de Janeiro	Brazil	1,250,000
H.I.G. Europe Capital Partners II	Miami	FL	586,004
H.I.G. Growth LBO & Equity Fund II	Miami	FL	224,600
Hahn & Company II	Seoul	Korea	1,007,921
HarbourVest Partners VII	Boston	MA	224,565
HarbourVest Partners VIII	Boston	MA	812,500
HarbourVest V-Asia Pacific & Rest of World	Boston	MA	207,360
Hellman & Friedman Capital Partners VI	San Francisco	CA	73,552
Hellman & Friedman Capital Partners VIII	San Francisco	CA	1,543,013
Highland Capital Partners VII	Lexington	MA	296,152
Highland Consumer Fund I	Lexington	MA	291,931
Horizon Impact Fund - HarbourVest	Boston	MA	298,761
Horizon Impact Fund B - HarbourVest	Boston	MA	212,499
Incline Equity Partners III	Pittsburgh	PA	65,725
Insight Venture Partners IX	New York	NY	864,855
Insight Venture Partners VI	New York	NY	34,858
Insight Venture Partners VII	New York	NY	217,905
Insight Venture Partners VIII	New York	NY	827,695
InterMedia Partners VII	New York	NY	36,283
InterWest Partners IX	Menlo Park	CA	30,730
InterWest Partners X	Menlo Park	CA	551,044
Invemed Catalyst Fund	New York	NY	11,647
IP III	Bellevue	WA	25,500
IP IV	Bellevue	WA	67,356
JMI Equity Fund V	Baltimore	MD	25,915
JMI Equity Fund VI	Baltimore	MD	383,940
JMI Equity Fund VII	Baltimore	MD	168,297
JMI Equity Fund VIII	Baltimore	MD	365,000
JP Morgan U.S. Corp Finance Investors II	New York	NY	184,026
JP Morgan Venture Capital Investors II	New York	NY	391,222
JP Morgan Venture Capital Investors III	New York	NY	693,241
Kelso VIII	New York	NY	686,076
Knightsbridge Venture Capital VI	Bartlesville	OK	96,039



# SERS FUND

## Investment Program | Expenses & Fees

### 2017 Manager Investment Expenses Detail (continued)

Manager	City	State/Country	Fees/ Expenses
<b>Private Equity (continued)</b>			
KPS Special Situations Fund IV	New York	NY	\$220,536
LBC Credit Partners III	Philadelphia	PA	639,517
Lexington Capital Partners VI	New York	NY	98,554
Lightspeed India Partners	New Delhi	India	378,104
Lightspeed Venture Partners VII	Menlo Park	CA	230,132
Lightspeed Venture Partners VIII	Menlo Park	CA	265,879
Lime Rock Partners IV	Westport	CT	117,355
Lime Rock Partners V	Westport	CT	266,736
LLR Equity Partners III	Philadelphia	PA	262,500
Madison Dearborn Capital Partners V	Chicago	IL	148
Madison Dearborn Capital Partners VI	Chicago	IL	95,833
Meridian Venture Partners II	Radnor	PA	24,681
Meritech Capital Partners III	Palo Alto	CA	43,750
Meritech Capital Partners IV	Palo Alto	CA	328,050
Meritech Capital Partners V	Palo Alto	CA	517,500
Morgenthaler Partners IX	Menlo Park	CA	373,172
Morgenthaler Partners VIII	Menlo Park	CA	28,427
New Enterprise Associates 12	Baltimore	MD	302,568
New York Life Capital Partners III	New York	NY	76,369
New York Life Capital Partners IV	New York	NY	133,001
Newbridge Asia IV	San Francisco	CA	37,355
NewSpring Growth Capital II	King of Prussia	PA	104,366
NewSpring Growth Capital III	King of Prussia	PA	307,306
Nordic Capital VII	Stockholm	Sweden	623,448
Oak Investment Partners XII	Westport	CT	139,106
Oaktree Opportunities Fund IX	Los Angeles	CA	779,783
Oaktree Opportunities Fund VIII	Los Angeles	CA	51,046
Oaktree Opportunities Fund VIIIb	Los Angeles	CA	144,607
OCM Opportunities Fund VII	Los Angeles	CA	103,236
OCM Opportunities Fund VIIb	Los Angeles	CA	47,877
OCM Power Opportunities Fund III	Los Angeles	CA	7,694
Patriot Financial Partners	Philadelphia	PA	60,842
Permira VI	London	United Kingdom	908,135
Pitango Venture Capital Fund V	Herzliya	Israel	362,907
Polaris Venture Partners V	Waltham	MA	683,710
Primavera Capital Fund II	Hong Kong	China	987,765
Providence Equity Partners VI	Providence	RI	68,975
Providence Strategic Growth II	Providence	RI	1,200,000
Quaker BioVentures II	Philadelphia	PA	166,571

# SERS FUND

## Investment Program | Expenses & Fees

### 2017 Manager Investment Expenses Detail (continued)

Manager	City	State/Country	Fees/ Expenses
<b>Private Equity (continued)</b>			
Ridgemont Equity II	Charlotte	NC	\$949,978
RRJ Capital Master Fund III	Hong Kong	China	811,569
Sankaty Credit Opportunities III	Boston	MA	156,413
Sankaty Credit Opportunities IV	Boston	MA	117,392
SCP Private Equity Partners II	Wayne	PA	79,880
Segulah IV	Jersey	Channel Islands	109,094
Sentinel Capital Partners V	New York	NY	7,359
SFC Energy Partners I	Denver	CO	28,507
SFC Energy Partners II	Denver	CO	103,611
ShoreView Capital Partners II	Minneapolis	MN	176,118
Siguler Guff BRIC Opportunities Fund	New York	NY	16,655
Siguler Guff BRIC Opportunities Fund II	New York	NY	77,983
Sterling Capital Partners II	Northbrook	IL	82,066
Sterling Capital Partners III	Northbrook	IL	123,192
Sterling Group Partners IV	Houston	TX	304,792
Summit Partners Venture Capital Fund II	Boston	MA	68,989
T. Rowe Price Stock Distribution Account	Baltimore	MD	300,000
Templeton Strategic Emerging Markets Fund III	Fort Lauderdale	FL	117,913
Thomas H. Lee Equity Fund VI	Boston	MA	227,617
TPG Asia V	Fort Worth	TX	54,989
TPG Partners V	Fort Worth	TX	12,226
TPG Partners VI	Fort Worth	TX	230,151
Versa Capital Partners	Philadelphia	PA	85,383
Versa Capital Partners II	Philadelphia	PA	367,556
Vestar Capital Partners V	New York	NY	118,579
Vista Equity Partners Fund VI	Oakland	CA	2,008,759
W Capital Partners II	New York	NY	171,354
Weathergage Venture Capital	Redwood City	CA	182,252
Weathergage Venture Capital II	Redwood City	CA	231,250
Wind Point VIII	Chicago	IL	2,956,276
Yucaipa American Alliance Fund II	Los Angeles	CA	207,686
<b>Private Equity Manager Fees</b>			<b>54,882,028</b>
<b>Private Equity Manager Expenses</b>			<b>11,271,119</b>
<b>Total Private Equity Manager Investment Expenses</b>			<b>66,153,147</b>
<b>Global Public Equity</b>			
Artisan Partners - Global ex U.S. <sup>1/</sup>	Milwaukee	WI	802,614
Ashmore Emerging Markets Small Cap <sup>1/</sup>	Arlington	VA	1,773,753
BlackRock/Emerging Markets Index Non-Lendable Fund <sup>1/</sup>	San Francisco	CA	60,358

# SERS FUND

## Investment Program | Expenses & Fees

### 2017 Manager Investment Expenses Detail (continued)

Manager	City	State/Country	Fees/ Expenses
<b>Global Public Equity (continued)</b>			
BlackRock MSCI World Ex U.S. Index	New York	NY	\$161,325
BlackRock MSCI Emerging Markets Index	New York	NY	52,719
Emerald U.S. Small Cap Growth	Lancaster	PA	2,608,876
Globeflex Emerging Markets Small Cap	San Diego	CA	602,154
Harris Associates	Chicago	IL	3,983,944
Iridian Asset Management	Westport	CT	2,159,371
Macquarie Emerging Markets	Philadelphia	PA	3,081,251
Martin Currie Emerging Markets All-Cap Concentrated	Edinburgh	United Kingdom	1,178,016
Mellon Capital Management MSCI World ex U.S. Index <sup>1/</sup>	Pittsburgh	PA	183,233
Mellon Capital Management Russell 1000 Index	Pittsburgh	PA	358,070
Mellon Capital Management Russell 2000 Core Index	Pittsburgh	PA	58,029
Mellon Capital Management Russell 2000 Value Index	Pittsburgh	PA	110,709
Morgan Stanley Investment Management Limited-developed ex U.S. <sup>1/</sup>	London	United Kingdom	569,529
Templeton Investment Counsel - Global ex U.S. <sup>1/</sup>	Fort Lauderdale	FL	617,716
Walter Scott & Partners Limited	Edinburgh	United Kingdom	3,159,918
<b>Global Public Equity Manager Fees</b>			<b>21,521,585</b>
<b>Global Public Equity Manager Expenses</b>			<b>31,042</b>
<b>Total Global Public Equity Manager Investment Expenses</b>			<b>21,552,627</b>
<b>Real Estate</b>			
Berwind Investment Partnership IX	Yardley	PA	318,728
Berwind Investment Partnership VI	Yardley	PA	6,057
Berwind Investment Partnership VII	Yardley	PA	83,363
Berwind Investment Partnership VIII	Yardley	PA	232,249
Blackstone Real Estate Partners VI	New York	NY	150,596
Blackstone Real Estate Partners VII	New York	NY	679,254
CBRE Clarion Real Estate	Radnor	PA	646,608
CenterSquare Real Estate Securities	Plymouth Meeting	PA	358,050
Clerestory Small Cap Fund I	New York	NY	56,596
Fidelity Real Estate Opportunistic Income Fund	Smithfield	RI	525,519
Fillmore West Fund	San Francisco	CA	26,559
Forest I.M.A.	Atlanta	GA	796,020
Hawkeye Scout Fund I	Austin	TX	13,965
Hawkeye Scout Fund II	Austin	TX	258,320
Heitman American Real Estate Trust	Chicago	IL	1,167,316
Heitman I.M.A.	Chicago	IL	766,980
LaSalle I.M.A.	Chicago	IL	3,826,244
LEM Real Estate High-Yield Debt Fund III	Philadelphia	PA	288,848

# SERS FUND

## Investment Program | Expenses & Fees

### 2017 Manager Investment Expenses Detail (continued)

Manager	City	State/Country	Fees/ Expenses
<b>Real Estate (continued)</b>			
Lowe GTO	Los Angeles	CA	\$2,311,208
Lowe I.M.A.	Los Angeles	CA	3,723,258
Lubert Adler Fund IV	Philadelphia	PA	3,397
Lubert Adler Fund V	Philadelphia	PA	32,101
Lubert Adler Fund VI	Philadelphia	PA	98,458
Lubert Adler Fund VII	Philadelphia	PA	152,695
Prudential Latin America Residential Fund III	Parsippany	NJ	57,338
Prudential Latin America Retail Fund I	Parsippany	NJ	36
Prudential Senior Housing IV	Parsippany	NJ	178,209
Prudential Senior Housing V	Parsippany	NJ	630,137
Rockpoint Finance Fund I	Dallas	TX	9,542
Rockpoint Real Estate Fund II	Dallas	TX	17,130
Rockpoint Real Estate Fund III	Dallas	TX	94,913
Rockpoint Real Estate Fund V	Dallas	TX	750,000
Starwood Fund VIII	Greenwich	CT	152,922
UBS Trumbull Property Fund	Stamford	CT	641,875
UBS Trumbull Property Income Fund	Stamford	CT	523,445
ValStone Opportunity Fund V	Birmingham	MI	220,554
Westbrook Fund V	Dallas	TX	47,001
Westbrook Fund VI	Dallas	TX	69,754
Westbrook Fund VII	Dallas	TX	182,947
Westbrook Fund VIII	Dallas	TX	105,674
<b>Real Estate Manager Fees</b>			<b>20,203,866</b>
<b>Real Estate Manager Expenses</b>			<b>555,123</b>
<b>Total Real Estate Manager Investment Expenses</b>			<b>20,758,989</b>
<b>Multi-Strategy</b>			
Blackstone Keystone	New York	NY	6,696,279
Mellon Capital Management Russell 3000 Index	Pittsburgh	PA	133,743
SEI Structured Credit Fund	Oaks	PA	2,602,600
<b>Total Multi-Strategy Manager Investment Expenses</b>			<b>9,432,622</b>
<b>Legacy Hedge Funds<sup>1/</sup></b>			
Arden Keystone	New York	NY	248,992
BAAM Commodities	New York	NY	893,752
Entrust Keystone	New York	NY	1,300,411
Hoplite Partners	New York	NY	80,366
Luxor Capital Partners	New York	NY	137,186
Mesirow Financial	Chicago	IL	29,527
MKP Opportunity Fund	New York	NY	56,200

# SERS FUND

## Investment Program | Expenses & Fees

### 2017 Manager Investment Expenses Detail (continued)

Manager	City	State/Country	Fees/ Expenses
<b>Legacy Hedge Funds<sup>1/</sup> (continued)</b>			
PAAMCO	Irvine	CA	\$56,609
Pine River Fund	Minnetonka	MN	221,181
Rock Creek	Washington	DC	24,130
Samlyn Onshore Fund	New York	NY	170,435
Stelliam Fund	New York	NY	132,598
<b>Total Legacy Hedge Funds Manager Investment Expenses</b>			<b>3,351,387</b>
<b>Fixed Income</b>			
Brandywine Global	Philadelphia	PA	741,986
Brown Brothers Harriman	New York	NY	264,035
Harvest Fund Advisors <sup>1/</sup>	Wayne	PA	574,547
Kayne Anderson Capital Advisors <sup>1/</sup>	Los Angeles	CA	706,605
MacKay Shields Core <sup>1/</sup>	New York	NY	118,835
Mellon Capital Management Bond Index	Pittsburgh	PA	219,850
New Century Advisors TIPS	Chevy Chase	MD	278,168
NISA Custom TIPS Intermediate	St. Louis	MO	481,138
PIMCO Core	Newport Beach	CA	640,412
PIMCO US Treasuries	Newport Beach	CA	424,275
PNC Short Duration <sup>1/</sup>	Pittsburgh	PA	208,482
Pyramis Global Advisors	Boston	MA	1,900,503
Stone Harbor Emerging Market Debt	New York	NY	566,379
Stone Harbor High Yield	New York	NY	777,920
Stoneridge Short Duration <sup>1/</sup>	Malvern	PA	121,304
Taplin Canida Habacht (TCH)	Miami	FL	460,342
UBS Core Bond <sup>1/</sup>	Chicago	IL	76,334
Waterfall Asset Management <sup>1/</sup>	New York	NY	528,380
Wellington US Treasuries <sup>1/</sup>	Boston	MA	86,119
<b>Total Fixed Income Manager Investment Expenses</b>			<b>9,175,614</b>
<b>Total Manager Investment Expenses</b>			<b>\$130,424,386</b>

<sup>1/</sup>Public market or hedge fund manager in liquidation or liquidated.

# **SERS Fund**

## **Portfolio Snapshots**

# SERS FUND

## Investment Program | Portfolio Snapshot | Private Equity

### 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 as of December 31, 2017

Sub-Asset Class	Unfunded Commitments (\$ millions)	Fair Value (\$ millions)	% of Total Fund
Buyouts	\$1,557.3	\$2,416.0	8.3%
Special Situations	326.3	608.7	2.1
Venture Capital	176.3	946.7	3.2
<b>Total Private Equity</b>	<b>\$2,059.9</b>	<b>\$3,971.4</b>	<b>13.6%</b>

# SERS FUND

## Investment Program | Portfolio Snapshot | Private Equity

### Portfolio Exposure

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

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

<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.



# SERS FUND

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

### Buyouts Committed, Drawn, and Distributed

Active Buyouts Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions <sup>2/</sup>
1. ABRY Partners IV	Middle	3/30/2001	\$35,000,000	\$25,497,290	\$74,633,973
ABRY Partners V	Middle	7/29/2005	45,000,000	41,718,374	82,909,286
ABRY Partners VI	Middle	3/26/2008	50,000,000	59,841,619	106,026,972
ABRY Partners VII	Middle	8/10/2011	30,000,000	36,654,815	39,158,084
ABRY Partners VIII	Middle	5/5/2015	25,000,000	22,477,919	3,599,240
2. ABS Capital Partners IV	Growth Equity	10/13/2000	35,000,000	30,984,280	68,253,149
ABS Capital Partners V	Growth Equity	11/14/2005	20,000,000	19,704,037	57,297,716
ABS Capital Partners VI	Growth Equity	3/13/2009	40,000,000	38,747,792	17,444,057
3. Advent International GPE VI-A	Large	7/7/2008	35,000,000	35,146,325	55,248,414
Advent International GPE VII-B	Large	12/6/2012	40,000,000	36,000,000	15,159,752
Advent International GPE VIII-B	Large	9/26/2016	50,000,000	22,575,000	0
Advent Latin American Private Equity Fund IV	Middle	8/2/2007	30,000,000	30,797,073	33,875,921
Advent Latin American Private Equity Fund V	Middle	5/17/2010	15,000,000	14,355,000	3,675,000
Advent Latin American Private Equity Fund VI	Middle	5/11/2015	25,000,000	9,037,500	5,000,000
4. Alpha Private Equity Fund 4	Small	5/15/2002	26,508,000	35,605,050	77,986,040
Alpha Private Equity Fund 5	Small	4/1/2006	57,796,800	65,860,056	94,043,299
5. APAX Europe V	Mega	4/27/2001	53,262,000	70,406,088	150,017,403
APAX Europe VI	Mega	5/19/2005	76,349,190	76,478,697	134,550,076
APAX Europe VII	Mega	6/27/2007	132,170,235	138,817,717	145,865,152
APAX Excelsior VI	Small	7/3/2000	35,000,000	34,151,324	56,569,467
6. Apollo Investment Fund IV	Mega	9/30/1998	75,000,000	74,838,620	124,814,033
Apollo Investment Fund IX	Mega	*	85,400,000	0	0
Apollo Investment Fund V	Mega	8/23/2001	50,000,000	44,972,146	122,268,807
Apollo Investment Fund VI	Mega	7/19/2006	40,000,000	38,911,805	53,622,539
7. Asia Alternatives Capital Partners	Fund of Funds	6/26/2007	50,000,000	25,129,085	36,260,022
Asia Alternatives Capital Partners II	Fund of Funds	3/7/2008	50,000,000	28,446,960	22,208,150
Asia Alternatives Capital Partners III	Fund of Funds	8/3/2012	50,000,000	50,469,728	20,975,634
Asia Alternatives Capital Partners V	Fund of Funds	10/5/2017	50,000,000	0	0
Asia Alternatives Korea Buyout Investors (Hahn & Co)	Small	7/22/2011	7,000,000	8,293,455	6,846,837
Penn Asia Investors	Fund of Funds	9/28/2012	133,000,000	62,390,350	21,590,297
8. Asia Pacific Growth Fund III	Growth Equity	9/28/1999	15,000,000	15,337,963	16,708,736

# SERS FUND

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

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

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

Active Buyouts Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions <sup>2/</sup>
23. Clessidra Capital Partners II	Middle	11/5/2008	\$25,631,168	\$17,760,173	\$20,490,598
24. Code Hennessy & Simmons V	Middle	11/10/2005	50,000,000	54,107,136	91,608,248
25. CVC Capital Partners VII	Mega	*	91,202,040	0	0
26. Denham Commodity VI	Large	4/20/2012	50,000,000	45,222,315	18,857,097
27. Elevation Partners	Middle	11/10/2005	35,000,000	31,212,376	50,013,176
28. Energy Spectrum Partners V	Small	7/9/2007	30,000,000	27,592,169	51,487,729
29. Eureka Growth Capital III	Growth Equity	10/21/2013	20,000,000	12,174,439	10,514,420
Eureka II	Growth Equity	1/30/2006	20,000,000	20,014,694	17,102,126
30. Excelsior Capital Asia Partners III	Small	8/17/2006	25,000,000	25,067,982	12,628,664
31. First Reserve Fund X	Large	10/28/2004	30,000,000	30,000,000	54,728,700
First Reserve Fund XI	Large	12/14/2006	60,000,000	63,939,423	40,018,579
First Reserve Fund XII	Mega	11/19/2008	50,000,000	54,203,739	24,077,391
32. Francisco Partners	Middle	7/27/2000	50,000,000	47,769,948	61,464,903
Francisco Partners II	Middle	7/10/2006	30,000,000	29,383,916	40,498,812
Francisco Partners III	Middle	10/17/2011	20,000,000	19,861,399	24,516,565
Francisco Partners IV	Middle	4/15/2015	25,000,000	17,687,500	0
33. FSN Capital IV	Middle	12/19/2013	46,049,703	37,724,308	16,898,189
FSN Capital V	Middle	1/4/2017	77,189,328	10,212,917	(32,659)
34. Great Hill Equity Partners III	Middle	3/7/2006	35,000,000	35,000,000	40,355,000
Great Hill Equity Partners IV	Middle	9/8/2008	25,000,000	24,869,412	40,092,185
35. Gryphon Partners II	Small	11/3/1999	35,000,000	34,700,788	41,953,023
Gryphon Partners III	Small	9/8/2004	30,000,000	37,599,444	51,691,321
36. GTCR IX	Middle	12/1/2006	50,000,000	47,916,718	79,736,269
GTCR VIII	Middle	7/7/2003	75,000,000	69,393,599	114,671,436
GTCR XI	Middle	9/2/2014	25,000,000	19,635,430	4,643,047
GTCR XII	Large	*	32,500,000	0	0
37. H.I.G. Brazil and Latin America Partners	Middle	8/12/2015	50,000,000	5,071,432	9,139
H.I.G. Europe Capital Partners II	Small	1/10/2014	27,544,596	6,975,472	0
H.I.G. Growth Buyouts & Equity Fund II	Growth Equity	7/20/2011	15,000,000	8,458,683	2,654,945
38. Hahn & Company II	Middle	5/29/2015	50,000,000	29,991,619	129
39. HarbourVest IPEP III	Fund of Funds	6/30/1998	40,000,000	39,400,000	61,020,829
HarbourVest IPEP IV	Fund of Funds	4/9/2001	40,000,000	39,000,000	67,144,292
HarbourVest Partners VI	Fund of Funds	5/7/1999	200,000,000	196,586,055	238,663,997
HarbourVest Partners VII	Fund of Funds	3/24/2003	75,000,000	73,687,500	91,346,062
HIPEP V-Asia Pacific & Rest of World	Fund of Funds	5/9/2006	30,000,000	28,245,316	32,034,370
HarbourVest Partners VIII	Fund of Funds	10/5/2006	100,000,000	98,000,000	98,290,049
Horizon Impact Fund - HarbourVest	Small	10/24/2014	50,000,000	25,504,802	2,444,290
Horizon Impact Fund B - HarbourVest	Small	5/31/2017	100,000,000	6,250,000	0

# SERS FUND

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

Active Buyouts Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions <sup>2/</sup>
40. Hellman & Friedman Capital Partners V	Large	12/20/2004	\$80,000,000	\$71,563,406	\$191,936,442
Hellman & Friedman Capital Partners VI	Large	6/5/2007	125,000,000	119,905,614	196,074,817
Hellman & Friedman Capital Partners VIII	Large	9/1/2016	50,000,000	13,828,595	997,958
41. Incline Equity Partners III	Small	1/14/2013	15,000,000	12,174,014	12,841,882
42. InterMedia Partners VII	Small	1/5/2007	15,000,000	17,789,220	16,403,677
43. Invemed Catalyst Fund	Small	10/19/1999	25,000,000	15,068,118	11,020,768
44. J.H. Whitney IV	Small	2/1/2000	20,000,000	17,964,926	7,543,844
J.H. Whitney VI	Small	1/5/2006	50,000,000	49,577,191	41,526,736
45. J.W. Childs Equity Partners III	Middle	8/20/2002	40,000,000	41,966,505	76,553,620
46. JMI Equity Fund V	Growth Equity	6/7/2005	24,000,000	24,009,205	122,661,437
JMI Equity Fund VI	Growth Equity	6/27/2007	40,000,000	40,000,246	66,053,810
JMI Equity Fund VII	Growth Equity	2/14/2011	10,000,000	9,780,000	6,364,735
JMI Equity Fund VIII	Growth Equity	10/1/2015	25,000,000	11,950,000	2,758,153
47. Kelso VII	Middle	10/18/2004	40,000,000	41,169,937	65,700,625
Kelso VIII	Middle	11/29/2007	150,000,000	145,503,127	111,747,910
48. Leeds Equity Partners IV	Small	11/12/2004	20,000,000	20,396,199	22,913,831
49. Lime Rock Partners III	Middle	3/7/2005	15,000,000	15,365,837	7,379,936
Lime Rock Partners IV	Middle	11/16/2006	25,000,000	27,690,239	19,382,889
Lime Rock Partners V	Middle	10/2/2008	42,500,000	46,542,069	23,057,932
50. LLR Equity Partners	Middle	2/4/2000	25,000,000	24,576,062	52,596,658
LLR Equity Partners II	Middle	1/29/2004	25,000,000	25,000,000	42,098,368
LLR Equity Partners III	Middle	7/24/2008	30,000,000	29,108,722	33,660,883
LLR Equity Partners IV	Middle	3/14/2014	50,000,000	40,485,764	12,263,158
51. Madison Dearborn Capital Partners IV	Middle	4/2/2001	90,000,000	90,365,390	167,519,294
Madison Dearborn Capital Partners V	Middle	10/20/2006	75,000,000	71,533,320	98,078,137
Madison Dearborn Capital Partners VI	Middle	5/27/2008	50,000,000	49,977,516	73,749,304
52. Meridian Venture Partners II	Small	2/11/2005	10,000,000	10,000,000	21,939,244
53. Motion II B	Middle	11/2/2005	48,204,998	47,742,247	38,726,742
54. New York Life Capital Partners III	Fund of Funds	6/30/2006	50,000,000	54,896,855	45,234,214
New York Life Capital Partners IV	Fund of Funds	4/4/2008	50,000,000	54,421,699	83,129,161
55. NewSpring Growth Capital II	Growth Equity	12/5/2006	10,000,000	9,850,000	13,815,193
NewSpring Growth Capital III	Growth Equity	7/27/2012	25,000,000	21,682,069	2,218,985
56. Nordic Capital V	Middle	5/7/2004	34,996,500	46,006,701	131,706,706
Nordic Capital VI	Middle	7/25/2006	54,369,000	64,480,850	95,047,724
Nordic Capital VII	Middle	5/2/2008	92,519,165	101,148,241	74,215,867
57. Oakhill Capital Partners	Middle	5/17/1999	50,000,000	53,718,802	93,999,577
58. Oaktree Power Opportunities Fund III	Middle	10/18/2010	25,000,000	16,537,030	13,173,469
OCM/GFI Power Opportunities Fund II	Small	5/9/2005	25,000,000	13,470,852	41,644,215

# SERS FUND

## Investment Program | Portfolio Snapshot | Private Equity

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

Active Buyouts Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions <sup>2/</sup>
59. Parthenon Investors II	Small	8/9/2001	\$20,000,000	\$22,177,965	\$35,780,448
60. Patriot Financial Partners	Small	6/12/2008	25,000,000	25,017,767	45,592,334
61. Permira European Fund	Large	9/30/1997	33,494,536	32,159,947	84,005,717
Permira European Fund II	Large	6/7/2000	48,000,000	45,672,612	91,464,087
Permira European Fund III	Large	1/12/2004	115,960,000	127,340,454	217,778,356
Permira IV	Large	12/14/2006	127,779,198	136,060,572	186,107,259
Permira VI	Large	1/10/2017	56,202,000	8,790,642	0
62. PNC Equity Partners II	Small	8/30/2007	15,000,000	13,375,562	26,013,377
63. Primavera Capital Fund II	Large	11/17/2015	50,000,000	41,716,988	820,321
64. Providence Equity Partners IV	Large	11/27/2000	25,000,000	23,420,710	56,040,748
Providence Equity Partners V	Large	4/4/2005	45,000,000	42,692,171	51,743,883
Providence Equity Partners VI	Large	3/16/2007	50,000,000	53,676,390	53,527,825
Providence Strategic Growth II	Small	12/7/2016	60,000,000	24,821,498	0
65. Ridgmont Equity Partners II	Small	11/30/2015	50,000,000	28,282,972	5,851,833
66. Segulah IV	Middle	9/25/2008	16,705,647	16,946,994	12,712,411
67. Sentinel Capital Partners V	Middle	7/15/2014	10,000,000	6,016,547	2,759,408
68. SFC Energy Partners I	Small	7/27/2007	25,000,000	24,921,811	22,641,255
SFC Energy Partners II	Small	12/19/2011	25,000,000	21,868,871	2,222,349
69. ShoreView Capital Partners	Small	6/16/2003	38,000,000	32,264,744	56,043,792
ShoreView Capital Partners II	Small	3/27/2008	40,000,000	38,622,228	59,637,977
70. Siguler Guff BRIC Opportunities Fund	Fund of Funds	5/8/2006	10,000,000	9,558,299	8,957,645
Siguler Guff BRIC Opportunities Fund II	Fund of Funds	4/9/2008	25,000,000	24,371,139	14,376,832
71. Silver Lake Partners V	Large	*	78,000,000	0	0
72. Sterling Capital Partners I	Middle	10/31/2002	15,000,000	14,979,168	30,923,365
Sterling Capital Partners II	Middle	8/18/2005	30,000,000	29,893,709	27,662,225
Sterling Capital Partners III	Middle	8/13/2007	32,000,000	32,502,101	30,703,208
73. Sterling Group Partners IV	Middle	6/15/2016	20,000,000	7,014,793	342,813
74. Summit Partners Private Equity Fund VII	Middle	2/9/2006	97,134,500	97,134,505	141,097,097
Summit V	Growth Equity	3/31/1998	37,500,000	36,187,500	49,997,247
Summit Ventures VI	Growth Equity	3/23/2001	62,000,000	63,914,751	134,008,940
75. TA X	Middle	4/25/2006	70,000,000	69,732,009	88,457,009
76. TDR Capital IV	Middle	*	93,047,720	0	0
77. Thomas H. Lee Equity Fund VI	Large	11/14/2006	50,000,000	53,710,483	54,596,921

# SERS FUND

## Investment Program | Portfolio Snapshot | Private Equity

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

	Active Buyouts Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions <sup>2/</sup>
78.	TPG Asia V	Large	2/19/2008	\$22,500,000	\$21,964,311	\$20,736,313
	TPG Partners III	Mega	1/13/2000	75,000,000	64,119,169	165,383,087
	TPG Partners IV	Mega	12/29/2003	30,000,000	27,981,463	56,716,528
	Newbridge Asia IV	Middle	9/27/2005	40,000,000	38,903,378	82,887,170
	TPG Partners V	Mega	6/27/2006	95,756,241	92,531,812	106,351,549
	TPG Partners VI	Mega	5/22/2008	45,000,000	49,708,200	51,121,614
79.	Vestar Capital Partners III	Middle	6/30/1997	25,000,000	24,362,534	27,746,687
	Vestar Capital Partners IV	Middle	1/25/2000	100,000,000	97,632,498	172,192,260
	Vestar Capital Partners V	Middle	1/25/2006	50,000,000	51,558,920	55,759,304
80.	Vista Equity Partners Fund VI	Large	12/29/2016	150,000,000	87,320,735	(1,099,211)
81.	Weston Presidio III	Growth Equity	12/31/1998	35,000,000	31,989,586	36,399,850
	Weston Presidio IV	Growth Equity	6/21/2000	35,000,000	34,451,015	39,417,544
	Weston Presidio V	Growth Equity	12/8/2005	50,000,000	49,821,364	109,759,888
82.	Wind Point Partners VIII	Small	9/14/2017	100,000,000	32,005,485	0
83.	Yucaipa American Alliance Fund II	Middle	1/13/2009	25,000,000	29,699,340	15,650,108
<b>Total Active Buyouts</b>				<b>\$8,836,817,739</b>	<b>\$7,501,150,375</b>	<b>\$9,695,768,328</b>

Cash flows as of September 30, 2017.

\*Not funded as of September 30, 2017.

<sup>1/</sup>Commitments as of December 31, 2017.

<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.



# SERS FUND

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

# SERS FUND

## Investment Program | Portfolio Snapshot | Private Equity

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



# SERS FUND

## Investment Program | Portfolio Snapshot | Private Equity

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

Cash flows as of September 30, 2017.

<sup>1/</sup>Commitments as of December 31, 2017.

<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.

# SERS FUND

## Investment Program | Portfolio Snapshot | Private Equity

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

### Venture Capital Committed, Drawn, and Distributed

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

# SERS FUND

## Investment Program | Portfolio Snapshot | Private Equity

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

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

# SERS FUND

## Investment Program | Portfolio Snapshot | Private Equity

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

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

# SERS FUND

## Investment Program | Portfolio Snapshot | Private Equity

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

Active Venture Capital Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions <sup>2/</sup>
50. Worldview Technology Partners IV	Balanced	1/31/2001	\$18,130,023	\$16,951,175	\$7,863,559
<b>Total Active Venture Capital</b>			<b>\$2,691,495,593</b>	<b>\$2,562,595,976</b>	<b>\$2,430,960,316</b>

Cash flows as of September 30, 2017.

\*Not funded as of September 30, 2017.

<sup>1/</sup>Commitments as of December 31, 2017.

<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.

# SERS FUND

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## Investment Program | Portfolio Snapshot | Global Public Equity

### 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.

# SERS FUND

## Investment Program | Portfolio Snapshot | Global Public Equity

### Global Public Equity

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

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

<sup>2/</sup>Manager in liquidation.

# SERS FUND

## Investment Program | Portfolio Snapshot | Real Estate

### Role in the SERS Fund

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

### Program Structure

SERS will diversify its Real Estate allocation by increasing investments in more stable, core-like investments, and by adding agriculture to the portfolio. New target allocations within the Real Estate program are designed to increase expected return, liquidity, diversification, and inflation hedging, while decreasing expected risk.

### Objective

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

### Real Estate

as of December 31, 2017

Sub-Asset Class	Fair Value (\$ millions)	% of Total Fund
Core/Core Plus	\$346.6	1.2%
Value Add/Opportunistic SMA	1,025.0	3.5
Value Add/Opportunistic Funds <sup>1/</sup>	465.9	1.6
Natural Resources/Infrastructure	96.4	0.3
Real Estate Securities	238.7	0.8
<b>Total Real Estate</b>	<b>\$2,172.6</b>	<b>7.4%</b>

<sup>1/</sup>As of September 30, 2017, unfunded commitments are \$727.3 million.



# SERS FUND

## Investment Program | Portfolio Snapshot | Real Estate

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

### Real Estate

Fund/Manager	Asset Type	SERS Initial Funding Year	Capital Committed <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions
<b>Core/Core Plus</b>					
1. Blackstone Property Partners	Diversified	*	\$300,000,000	\$0	\$0
2. Heitman America Real Estate Trust	Diversified	2007	100,000,000	100,000,000	0
3. UBS Trumbull Property Fund	Diversified	1988	25,558,525	25,558,525	67,265,772
UBS Trumbull Property Income Fund	Diversified	1988	33,332,027	33,332,027	87,606,992
<b>Total Core/Core Plus</b>			<b>458,890,552</b>	<b>158,890,552</b>	<b>154,872,764</b>

### Value Add/Oppportunistic Funds

4. AG Asia Realty Fund	Diversified	2007	25,000,000	23,500,000	20,812,500
5. Apollo Real Estate Fund III	Diversified	1998	50,000,000	50,000,000	74,810,023
6. Berwind Investment Partnership V	Diversified	1999	25,000,000	24,136,964	43,475,859
Berwind Investment Partnership VI	Diversified	2002	25,000,000	24,543,712	41,480,101
Berwind Investment Partnership VII	Diversified	2005	25,000,000	25,014,471	3,740,329
Berwind Investment Partnership VIII	Diversified	2007	15,588,238	14,912,018	10,394,221
Berwind Investment Partnership IX	Diversified	2012	25,000,000	24,303,409	18,642,614
Blackstone Real Estate Partners IV	Diversified	2003	25,000,000	25,000,000	36,171,714
Blackstone Real Estate Partners V	Diversified	2006	50,000,000	47,912,974	82,725,811
Blackstone Real Estate Partners VI	Diversified	2007	75,000,000	71,481,521	136,781,213
Blackstone Real Estate Partners VII	Diversified	2011	75,000,000	64,172,705	48,110,302
7. C-III Recovery Fund III	Diversified	*	100,000,000	0	0
8. Clerestory Small Cap Fund I	Diversified	2010	18,000,000	15,228,956	11,411,294
9. Colony Investors VIII	Diversified	2007	22,500,000	21,655,800	6,507,255
10. Fidelity Real Estate Opportunistic Income Fund <sup>2/</sup>	Debt	2007	35,000,000	35,000,000	0
11. Fillmore West Fund	Diversified	2008	30,000,000	29,342,336	24,261,423
12. Hawkeye Scout Fund I	Diversified	2009	75,000,000	75,000,000	116,323,890
Hawkeye Scout Fund II	Diversified	2016	30,000,000	23,031,210	0
13. LEM Real Estate High-Yield Debt Fund III	Debt	2013	25,000,000	16,960,208	14,682,298

# SERS FUND

## Investment Program | Portfolio Snapshot | Real Estate

### Real Estate (continued)

Fund/Manager	Asset Type	SERS Initial Funding Year	Capital Committed <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions
14. Lubert Adler Fund III	Diversified	2000	\$30,000,000	\$30,000,000	\$45,442,098
Lubert Adler Fund IV	Diversified	2004	25,000,000	23,820,755	11,363,529
Lubert Adler Fund V	Diversified	2006	30,000,000	30,000,000	5,783,261
Lubert Adler Fund VI	Diversified	2008	20,927,116	19,200,031	13,895,107
Lubert Adler Fund VI-A	Diversified	2010	4,072,884	2,329,415	4,534,231
Lubert Adler Fund VII	Diversified	2014	25,000,000	23,750,000	0
15. Oak Street Real Estate Fund IV	Diversified	*	100,000,000	0	0
16. OCM Real Estate Opp Fund III	Diversified	2003	25,000,000	25,000,000	41,978,732
17. Oxford GSA Fund	Diversified	2006	30,000,000	21,369,627	18,384,338
18. Prudential Latin America Retail Fund I	Retail	2006	25,000,000	2,271,117	8,162,626
Prudential Latin America Residential Fund III	Multi-Family	2008	29,654,968	24,708,749	10,712,768
Prudential Senior Housing Fund IV	Senior Housing	2011	25,000,000	20,799,516	9,359,577
Prudential Senior Housing Fund V	Senior Housing	2015	50,000,000	21,798,638	0
19. Rockpoint Finance Fund I	Residential Land	2007	50,000,000	4,409,628	1,566,309
Rockpoint Real Estate Fund II	Diversified	2005	35,000,000	37,403,546	29,091,713
Rockpoint Real Estate Fund III	Diversified	2007	50,000,000	50,390,292	63,912,781
Rockpoint Real Estate Fund V	Diversified	2015	50,000,000	15,763,370	0
20. Singerman Real Estate Fund III	Diversified	*	50,000,000	0	0
Singerman Real Estate Fund III Select	Diversified	*	50,000,000	0	0
21. Starwood Fund IV	Diversified	1997	37,750,000	37,750,000	81,363,491
Starwood Fund VI	Diversified	2001	50,000,000	50,000,000	50,176,283
Starwood Fund VII	Diversified	2006	35,000,000	35,000,000	24,181,672
Starwood Fund VIII	Diversified	2009	50,000,000	45,356,281	65,047,009
22. ValStone Opportunity Fund V	Diversified	2014	14,663,402	14,224,170	1,959,834
23. Westbrook Fund V	Diversified	2004	25,000,000	27,118,630	44,485,779
Westbrook Fund VI	Diversified	2006	35,000,000	38,579,242	30,012,504
Westbrook Fund VII	Diversified	2007	50,000,000	55,705,424	48,090,909
Westbrook Fund VIII	Diversified	2009	50,000,000	53,904,201	62,318,055
<b>Total Value Add/Opportunistic Funds</b>			<b>1,803,156,608</b>	<b>1,321,848,916</b>	<b>1,362,153,453</b>

### Value Add/Opportunistic SMA<sup>3/</sup>

Heitman I.M.A.	Diversified	1988	N/A	813,635,039	1,064,259,873
24. LaSalle I.M.A.	Diversified	1994	N/A	444,873,501	481,653,208
25. Lowe I.M.A.	Diversified	1994	N/A	706,229,496	849,781,978
Lowe GTO	Diversified	2012	N/A	349,069,212	220,770,000
<b>Total Value Add/Opportunistic SMA</b>				<b>2,313,807,248</b>	<b>2,616,465,059</b>

# SERS FUND

## Investment Program | Portfolio Snapshot | Real Estate

### Real Estate (continued)

Fund/Manager	Asset Type	SERS Initial Funding Year	Capital Committed <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions
<b>Natural Resources/Infrastructure<sup>3/</sup></b>					
26. Forest I.M.A.	Timberland	1992	N/A	\$124,231,969	\$124,263,725
<b>Total Natural Resources/Infrastructure</b>				<b>124,231,969</b>	<b>124,263,725</b>
<b>Real Estate Securities<sup>3/</sup></b>					
27. CBRE Clarion Real Estate Securities	Diversified	1996	N/A	210,848,120	669,514,323
28. CenterSquare Real Estate Securities	Diversified	2002	N/A	26,282,779	36,168,336
<b>Total Real Estate Securities</b>				<b>237,130,899</b>	<b>705,682,659</b>
<b>Total Real Estate</b>			<b>\$2,262,047,160</b>	<b>\$1,717,870,367</b>	<b>\$2,222,708,876</b>

Cash flows as of September 30, 2017.

\*Not funded as of September 30, 2017.

<sup>1/</sup>Commitments as of December 31, 2017.

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

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

# SERS FUND

## Investment Program | Portfolio Snapshot | Multi-Strategy

### 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

as of December 31, 2017

Sub-Asset Class	Fair Value (\$ millions)	% of Total Fund
Private Credit Funds <sup>1/</sup>	\$12.9	0.0%
Credit-Focused Strategies	875.7	3.0
Opportunistic Equity and Fixed Income	1,232.8	4.3
<b>Total Multi-Strategy</b>	<b>\$2,121.4</b>	<b>7.3%</b>

<sup>1/</sup>As of September 30, 2017, unfunded commitments are \$250 million.

# SERS FUND

## Investment Program | Portfolio Snapshot | Multi-Strategy

### 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
1.	Glendon Opportunities Fund II	Distressed and Credit	*	\$150,000,000	\$0	\$0
2.	TSSP Adjacent Opportunities Partners (B)	Distressed and Credit	*	100,000,000	0	0
<b>Total Active Private Credit Funds</b>				<b>\$250,000,000</b>	<b>\$0</b>	<b>\$0</b>

### Public Markets

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

Cash flows as of September 30, 2017.

\*Not funded as of September 30, 2017.

<sup>1/</sup>Commitments as of December 31, 2017.

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

# SERS FUND

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## Investment Program | Portfolio Snapshot | Legacy Hedge Funds

### Role in the SERS Fund

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

### Program Structure

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

### Objective

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

# SERS FUND

## Investment Program | Portfolio Snapshot | Legacy Hedge Funds

### Legacy Hedge Funds<sup>1/</sup>

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

<sup>1/</sup>Managers in liquidation.

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

# SERS FUND

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## Investment Program | Portfolio Snapshot | Fixed Income

### Role in the SERS Fund

SERS Fixed Income program is structured to:

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

### Program Structure

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

### Objective

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



# SERS FUND

## Investment Program | Portfolio Snapshot | Fixed Income

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

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

<sup>2/</sup>Manager in liquidation.

# SERS FUND

## Investment Program | Portfolio Snapshot | Cash

### 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>		
Manager	Investment Style	Market Exposure as of 12/31/17 <sup>4/</sup> (\$ millions)
<b>Cash</b>		
1. PA State Treasury (STIF)	Cash	\$984.4
<b>Total Cash</b>		<b>\$984.4</b>

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

**SERS Fund**

**Pennsylvania Investments**

# SERS FUND

## Investment Program | Pennsylvania Investments

### Pennsylvania Investments

The board, employees of SERS, and agents of the board stand in a fiduciary relationship to the members and beneficiaries of the system regarding the investments and disbursements of the SERS Fund. Subject to prudent investor investment responsibilities contained in the Retirement Code and the Fiscal Code, the board has exclusive control and management of the SERS Fund and full power to invest the assets of the SERS Fund.

The board adopted a formal *Statement of Investment Policy* in 1979, which was last revised March 2017. Where investment characteristics are equivalent, the board's policy favors investments that have a positive impact on the economy of Pennsylvania.

Although the board's fiduciary duty is to SERS members and beneficiaries, investments in Pennsylvania provide an ancillary and subordinate benefit to the state's economy. The investment policy acknowledges that such benefit, derived from investments in Pennsylvania-based companies or firms employing Pennsylvanians, should be considered after other primary fiduciary investment characteristics are satisfied.

Fair value of Pennsylvania investments as of December 31, 2017, was approximately \$802.6 million, or 2.8% of the SERS Fund.

### Pennsylvania Investments by Asset Class

(\$ millions)

Asset Class	Total PA Fair Value
Private Equity	\$89.0
Global Public Equity	365.7
Real Estate	319.1
Fixed Income	28.8
<b>Total Pennsylvania Investments</b>	<b>\$802.6</b>

### Private Equity

SERS Private Equity program dates back to 1985. Initially the program targeted a 1% allocation to venture capital with a focus to invest with managers located in Pennsylvania or with managers who had Pennsylvania investment mandates. Over its life, the program has grown to include national and international based private equity, special situation, and venture capital managers. Since inception, SERS Private Equity program has made commitments of over \$1.2 billion to 65 limited partnerships based in Pennsylvania. In addition, the number of non-Pennsylvania based managers investing in companies that impact the state comprises a meaningful portion of the program.

# SERS FUND

## Investment Program | Pennsylvania Investments

As of December 31, 2017, SERS active Private Equity managers held investments in 68 Pennsylvania-based companies. SERS pro-rata investment value in these companies is approximately \$89.0 million. This equates to 2.2% of the Private Equity program fair value and does not include investments headquartered outside of Pennsylvania that may have impactful operations within the state.

### Global Public Equity

SERS maintains a universe of institutionally investable Pennsylvania-based companies. The PA-based company universe is comprised of 308 institutionally investable publicly-traded corporations which:

- Name their headquarters as Pennsylvania and have Pennsylvania employees or operations
- Have Pennsylvania-based employment exceeding 25% of total corporate employment

SERS had approximately \$366 million invested in stocks of Pennsylvania-based companies, as of December 31, 2017. These securities are held in SERS various externally managed global public equity portfolios.

### Pennsylvania Investments - Global Public Equity

(\$ millions)

Manager	Fair Value
Emerald Advisers	\$92.7
Iridian Asset Management	27.9
Martin Currie Investment Management	6.2
Mellon Capital Management	238.9
<b>Total Pennsylvania Investments - Global Public Equity</b>	<b>\$365.7</b>

### Pennsylvania Based Companies

#### Top 10 Public Equity Positions

As of December 31, 2017

Allegheny Technologies, Inc.
Armstrong World Industries, Inc.
CNB Financial Corporation
Comcast Corporation
Epam Systems, Inc.
Five Below, Inc.
Kennametal, Inc.
Nutrisystem, Inc.
The Kraft Heinz Company
The PNC Financial Services Group, Inc.

# SERS FUND

## Investment Program | Pennsylvania Investments

### Fixed Income

SERS had approximately \$28.8 million invested in fixed income securities issued by Pennsylvania-based companies, as of December 31, 2017. These securities are held in SERS various externally managed bond portfolios.

SERS has approximately \$948.4 million invested in the Pennsylvania Treasury Department's short-term investment fund.

### Pennsylvania Investments - Fixed Income

(\$ millions)

Manager	Fair Value
Brandywine Global	\$3.6
Mellon Capital Management	11.2
PIMCO	7.0
Stone Harbor	1.9
Taplin, Canida & Habacht	5.1
<b>Total Pennsylvania Investments - Fixed Income</b>	<b>\$28.8</b>

### Real Estate

In 1987, SERS began investing directly in the Pennsylvania commercial real estate market and subsequently established two separate account real estate portfolios managed by Heitman Capital Management and Grosvenor Investment Management, whose portfolio is now managed by Lowe Enterprises Investment Management and reported as Lowe GTO. In addition, SERS has invested as a limited partner in several real estate funds, which have acquired, and currently hold, numerous properties in Pennsylvania. All of the above noted investments are reflected in the data below.

As of December 31, 2017, the SERS real estate portfolio contained 49 Pennsylvania investments totaling approximately 2.8 million square feet of office, retail, and warehouse space, as well as, 7,284 apartment, hotel, and senior housing units and 578,000 square feet of self-storage, representing 4,757 units.

The gross fair value of the Pennsylvania real estate portfolio investments totaled \$2.2 billion, of which SERS ownership share was \$312 million.

In addition to the above, SERS held \$7.1 million in PA based real estate investment trusts.

# **SERS Fund**

## **Minority/Woman-Owned Managers and Brokers**

# SERS FUND

## Investment Program | Minority/Woman-Owned Managers and Brokers

### Minority/Woman-Owned Investment Managers

The following firms classify themselves as minority and/or woman-owned firms and were under contract with SERS to provide investment management services within SERS Global Public Equity or Fixed Income portfolio as of December 31, 2017:

Firm	Status	SERS Assets Under Management
GlobeFlex Capital	Minority/Woman-Owned	\$103 million market value
New Century Advisors	Woman-Owned	\$116 million market value

The following firms were recognized by SERS consultants or self-reported as minority and/or woman-owned firms and were under contract with SERS to provide investment management services within SERS Private Equity or Real Estate portfolio as of December 31, 2017:

Firm	Status	SERS Committed Capital
Asia Alternatives Capital Partners	Minority/Woman-Owned	\$207 million
Avenue Capital Group	Woman-Owned	\$190 million
Clearlake Capital Partners	Minority-Owned	\$15 million
Fairview Capital Partners	Minority/Woman-Owned	\$10 million
Hawkeye Partners	Woman-Owned	\$105 million
Incline Equity Partners	Minority-Owned	\$15 million
Kline Hawkes & Co.	Minority-Owned	\$15 million
Vista Equity Partners	Minority-Owned	\$150 million
Weathergage Capital	Woman-Owned	\$50 million

### Minority/Woman-Owned Brokers Brokerage Commissions

The table to the right lists the minority/woman-owned brokerage firms utilized by SERS external investment managers during calendar year 2017.

The board seeks to have managers direct trades through minority/woman-owned firms and reserves the right to establish proposed trading targets. However, the responsibility for the selection and use of minority brokerage firms is delegated to the investment managers. Minority/woman-owned brokerage firms' commissions totaled \$263,782 for the year. It is estimated this year that SERS U.S. equity managers directed 4% of their trades through minority/woman-owned brokerage firms. Fixed Income managers traded a combined \$450.9 million of securities through minority/woman-owned brokerage firms.

Firm	Minority/ Woman-Owned Commissions
Castleoak Securities	\$4,016
C.L. King Directed	34,791
CV Brokerage	9,892
Drexel Hamilton	38,812
Greentree Brokerage	18,279
Loop Capital	16,040
Mischler Direct	34,368
North South Capital	1,923
Sturdivant & Company	49,136
Susquehanna Direct	153
Telsey Advisory	37,339
The Fig Group	19,033
<b>Total Minority/Woman-Owned Commissions</b>	<b>\$263,782</b>



# 457 Deferred Compensation Plan

# 457 DEFERRED COMPENSATION PLAN

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## History, Growth & Highlights

As indicated earlier in this book, the Pennsylvania State Employees' Retirement System administers two retirement plans to help safeguard the financial security of the commonwealth's public workforce in its retirement years. Most state employees are required to participate in Pennsylvania's defined benefit plan. Most employees who are eligible to participate in the defined benefit plan may choose to augment their retirement savings by also voluntarily participating in the 457 deferred compensation plan (457 plan).

The economic engine of the defined benefit plan is the SERS Fund, which is reviewed in-depth in the previous section. Details about 457 plan are provided here.

### 457 Plan History

Act 1987-81 charged the SERS Board with establishing and managing a 457 plan for the commonwealth's employees and officers. The 457 plan allows employees to voluntarily build retirement savings and achieve certain tax advantages by deferring a portion of their salaries to selected investment options.

The 457 plan was established as a trust and is administered in accordance with Internal Revenue Code Section 457(b). The array of investment options from which participants may choose is examined, selected, and overseen by the SERS Board.

SERS uses a competitive request-for-proposals process to retain a third-party administrator for the 457 plan. Responsibilities of the third-party administrator include, but are not limited to, marketing the 457 plan, maintaining participant records, and counseling participants with regard to the benefit offered. The most recent competitive process was conducted and a contract was awarded in 2013 to Great-West Life & Annuity Insurance Company, which has retained this role since 2003. Today, Empower Retirement is the brand name for the company's retirement services division, and Great-West Financial is the brand for its insurance, annuity, and investment businesses.

The cost of administering the 457 plan is extremely low and is borne solely by participants, using no commonwealth funds.

In 2012, the 457 plan began accepting deferrals into designated Roth accounts. Participants pay federal income tax on the amount of their Roth deferrals at the time of investment and then qualified distributions from their Roth accounts are tax-free in retirement.

In October 2014, the plan document was amended to allow in-plan conversions of assets to Roth assets.

In 2017, the SERS Board selected Invesco Advisers to take over the 457 plan's Stable Value Fund from Weaver C. Barksdale.

# 457 DEFERRED COMPENSATION PLAN

## History, Growth & Highlights

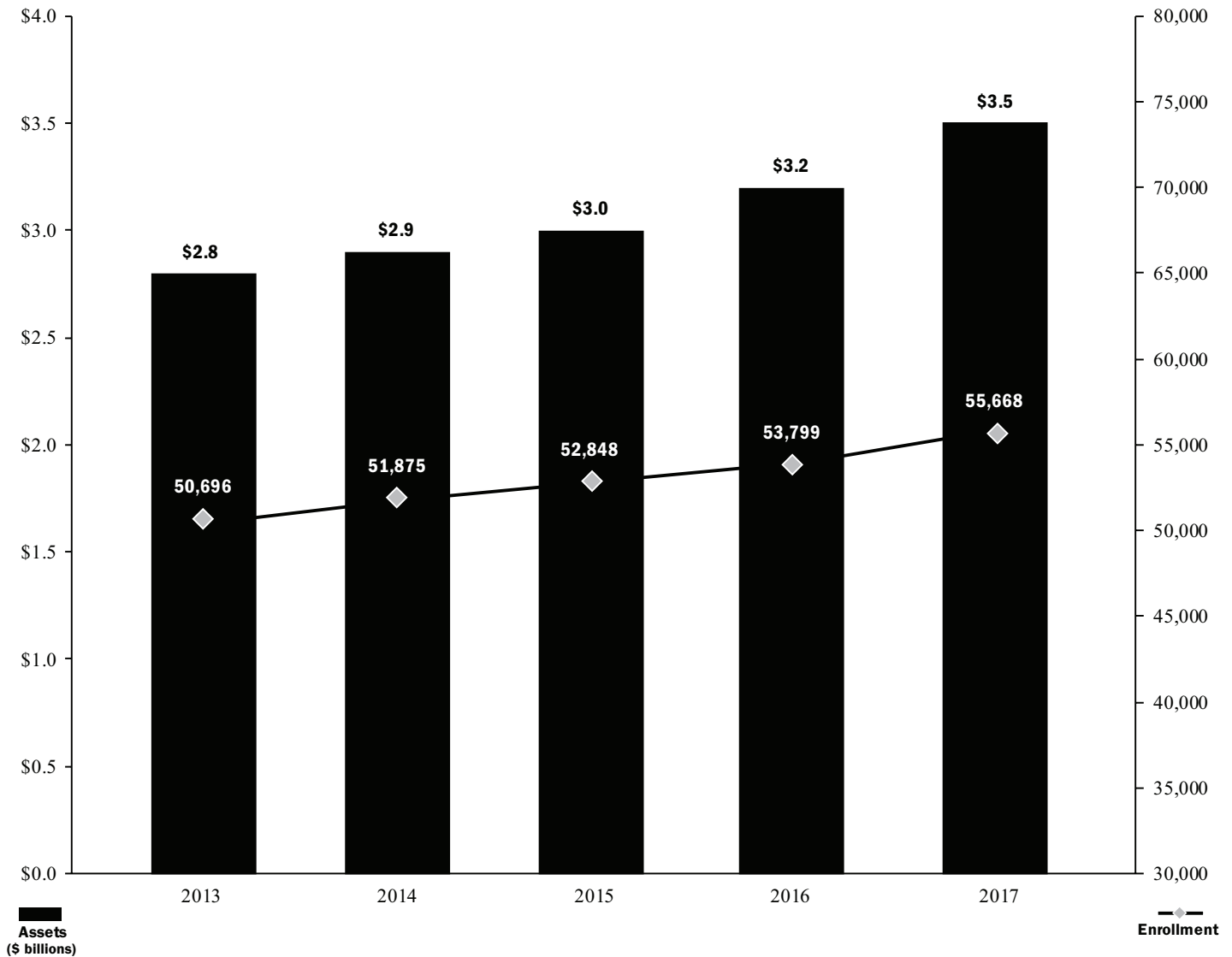
### Growth of 457 Plan

In 2017, nearly 56,000 participants had saved approximately \$3.5 billion in the 457 plan.

As of December 31, there were 35,827 active and 19,841 inactive participants in the 457 plan. From 2013 to 2017, annual deferrals have ranged from \$127 million to \$136 million per year and total fund value grew from approximately \$2.8 billion to approximately \$3.5 billion.

When employees leave state service, they gain access to the amount they have saved, including the earnings and/or losses on their investments. Benefit payments have grown from approximately \$68 million in 2013 to \$98 million in 2017.

### 457 Plan Assets & Enrollment



# 457 DEFERRED COMPENSATION PLAN

## History, Growth & Highlights

### 457 Plan Highlights

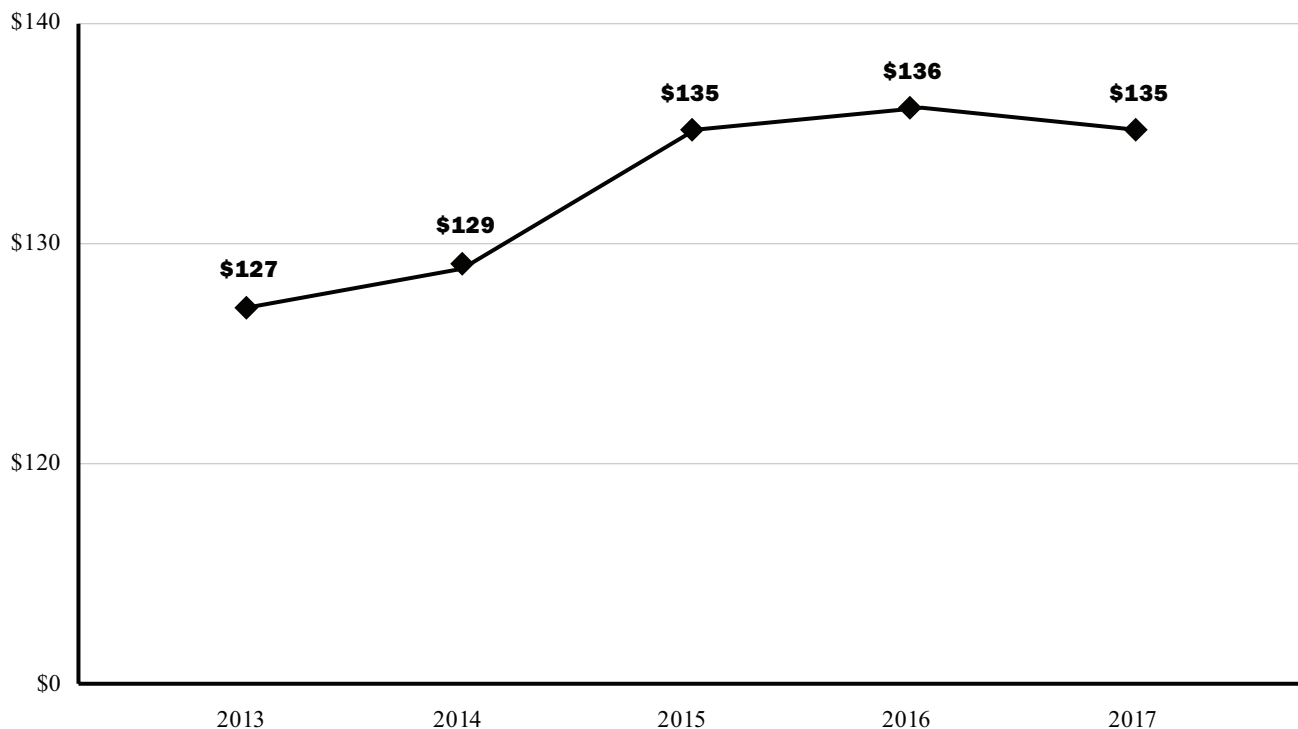
In the 457 plan, employees may elect to have any sum they choose—as little as \$5 or 0.5% per pay period up to IRS limits— withheld from their pay to save for retirement and achieve certain tax advantages. They may change the amount of their deferrals at any time and it is up to each 457 plan participant to allocate their investments among the options provided. Once money is invested in the 457 plan, it must remain until an employee leaves state service or an emergency exists that is within code parameters.

To assist 457 plan participants, Empower Retirement offers individual and group counseling sessions at worksites statewide as well as in their downtown Harrisburg walk-in office.

Counselors are also available via a toll-free telephone service. In addition to providing personal assistance, the toll-free line offers a host of automated selections including providing account balances and allowing participants to transfer funds among investment options.

Empower Retirement manages a website, [www.SERS457.com](http://www.SERS457.com), that allows participants to view their investment position, change their deferral amounts, transfer money among investment options, change their future allocation, update their beneficiaries, and more. Free educational videos are also available on financial, investment, and retirement topics.

**457 Plan Deferrals by Year**  
(\$ millions)



# 457 DEFERRED COMPENSATION PLAN

## Performance, Expenses & Fees

### Estimated Calendar Year, Net-of-Fees Returns

For the period ending December 31, 2017

Fund Name	Inception Date	1 Year	3 Year	5 Year	10 Year
Stable Value Fund	07-1995	1.85%	2.01%	2.16%	3.02%
Short-Term Investment Fund	10-1988	1.08	0.62	0.44	0.63
U.S. Bond Index Fund	02-1995	3.51	2.18	2.02	3.92
60/40 Balanced Stock & Bond Fund	05-2006	14.25	7.74	10.20	7.09
U.S. Large Company Stock Index Fund	12-1994	21.84	11.42	15.80	8.54
U.S. Small/Mid Company Stock Index Fund	08-1998	18.19	9.87	14.62	9.36
International Company Stock Index Fund	08-1998	25.51	8.32	7.95	2.22
Aggressive Portfolio Fund	10-2003	18.29	8.83	11.34	6.81
Moderate Portfolio Fund	10-2003	14.46	7.19	9.00	6.30
Conservative Portfolio Fund	10-2003	8.37	4.35	5.13	4.56

### Expenses and Fees

As of December 31, 2017

Fund Name	Investment Manager Fund Operating Expense	Annual Asset Fee <sup>1/</sup>	Annual Administrative Fee <sup>2/</sup>
Stable Value Fund	0.3050%	0.07%	\$24
Short-Term Investment Fund	0.0000	0.07	24
U.S. Bond Index Fund	0.0200	0.07	24
60/40 Balanced Stock & Bond Fund	0.0140	0.07	24
U.S. Large Company Stock Index Fund	0.0100	0.07	24
U.S. Small/Mid Company Stock Index Fund	0.0200	0.07	24
International Company Stock Index Fund	0.0200	0.07	24
Aggressive Portfolio Fund	0.0152	0.07	24
Moderate Portfolio Fund	0.0164	0.07	24
Conservative Portfolio Fund	0.0143	0.07	24

<sup>1/</sup>Assessed at 0.0058% monthly and prorated against all available core investment options. For those in the Self-Directed Brokerage Option (SDB), the asset fee is assessed against the balance in your SDB but the actual deduction will be prorated against your core investment options separately.

<sup>2/</sup>Deducted at \$2.00 monthly and also prorated against all available core investment options.