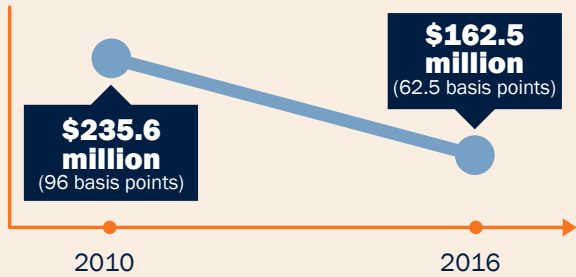


**SERS decreased investment fees**



In 2016  
SERS retired  
**5,107**  
members  
and welcomed  
**11,567**  
new members

SERS paid nearly  
**\$3.2 billion**  
in benefits in 2016

**32%** of SERS active employees belong to post-Act 120 classes of service

**As of Dec 31, 2016 SERS had**

**105,220**  
active members

**127,338**  
annuitants

**2016 contributions to the SERS Fund**

**\$374 million**  
employees contributed

**\$1.6 billion**  
employers contributed

**\$1.6 billion**  
investments contributed

**Approximate Total Contributions = \$3.6 billion**

**Total FY 17/18 Spending Request**



**\$26.2 million**

\$1.5 million

directed commissions

**\$17.4 million**  
personnel

**\$10.2 million**  
operations

**\$0.1 million**  
fixed assets

Samples from operations =

real estate **\$1.7 million**

IT hardware/software **\$1.6 million**

treasury services **\$1.1 million**

postage **\$0.4 million**

legal services **\$0.3 million**

office equipment **\$0.1 million**

**SERS average active member**

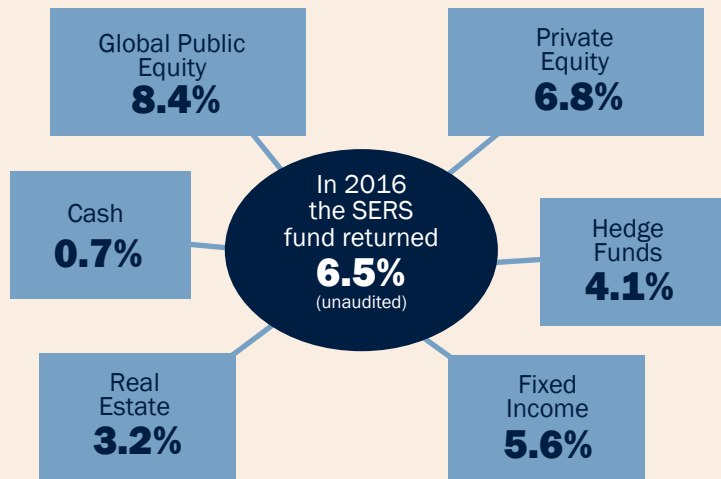
**46** years old

**12** years of service

**SERS average retired member**

**72** years old

receives  
**\$27,722**  
per year



*Data throughout is estimated/unaudited*

**SERS 2017 Supplemental Budget Book**

February 10, 2017

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 2017-18, SERS proposes a \$26.2 million spending authority, which is drawn from SERS funds, not general government operating accounts. I trust this information will be useful in your deliberations related to the development and passage of the FY 2017-18 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 \$27,722. The system paid out nearly \$3.2 billion dollars in 2016, of which approximately \$2.9 billion – more than 90% – was paid to members who live within Pennsylvania.

Our unaudited 2016 investment returns are estimated to be 6.5%, which helped reverse the previous two years' trend of lower returns due to volatile financial markets. We continue to strive for operational efficiencies and maximize results for our members, and since 2010, we have reduced investment management fees by more than \$73 million. SERS estimated funded ratio for 2016 was 58.7%.

For FY 2017-18, the employer contribution rate is estimated to be 31.8% of payroll, and will mark the first time since legislatively-mandated contribution rates were enacted that Pennsylvania will be paying uncollared contributions to the system. In absolute contribution dollars, this represents approximately \$2.0 billion of which 43% originates from the general fund from employers under the Governor's jurisdiction.

SERS 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 that 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.

SERS budget hearing before the House will be February 22 at 10:00 a.m. If you have questions, comments, or concerns before then, please do not hesitate to call David E. Durbin, SERS Executive Director, at 717.787.9657 or e-mail at [DDurbin@pa.gov](mailto:DDurbin@pa.gov).

Sincerely,



David R. Fillman  
Chairman

# SERS 2017 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 \$26.3 billion as of December 31, 2016.

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**

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 nearly 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 \$26.3 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:

- 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
- Issuing annual statements of account

Examples of services offered to retired members include:

- 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
- Issuing annual statements of account and tax forms

# 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.

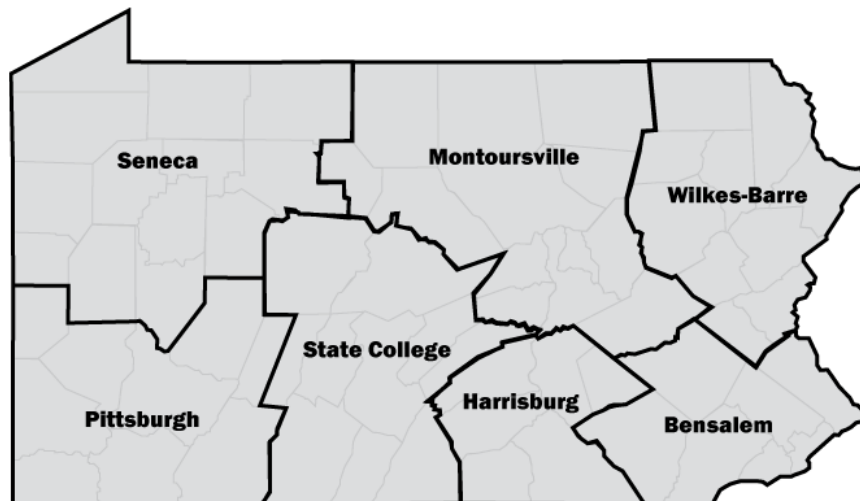
**Montoursville Regional Counseling Center.** Serving retired members who live and active members who work in Bradford, Cameron, Clinton, Columbia, Lycoming, Montour, Northumberland, Potter, Schuylkill, Snyder, Sullivan, Tioga, and Union counties.

**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 manage the SERS Fund. It establishes and implements investment policies; sets the strategic asset allocation; monitors fund cash flow, composition, and performance; and researches, recommends, and supervises investment managers, among other tasks. The office also maintains deep and current expertise related to the 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 deferred compensation program.

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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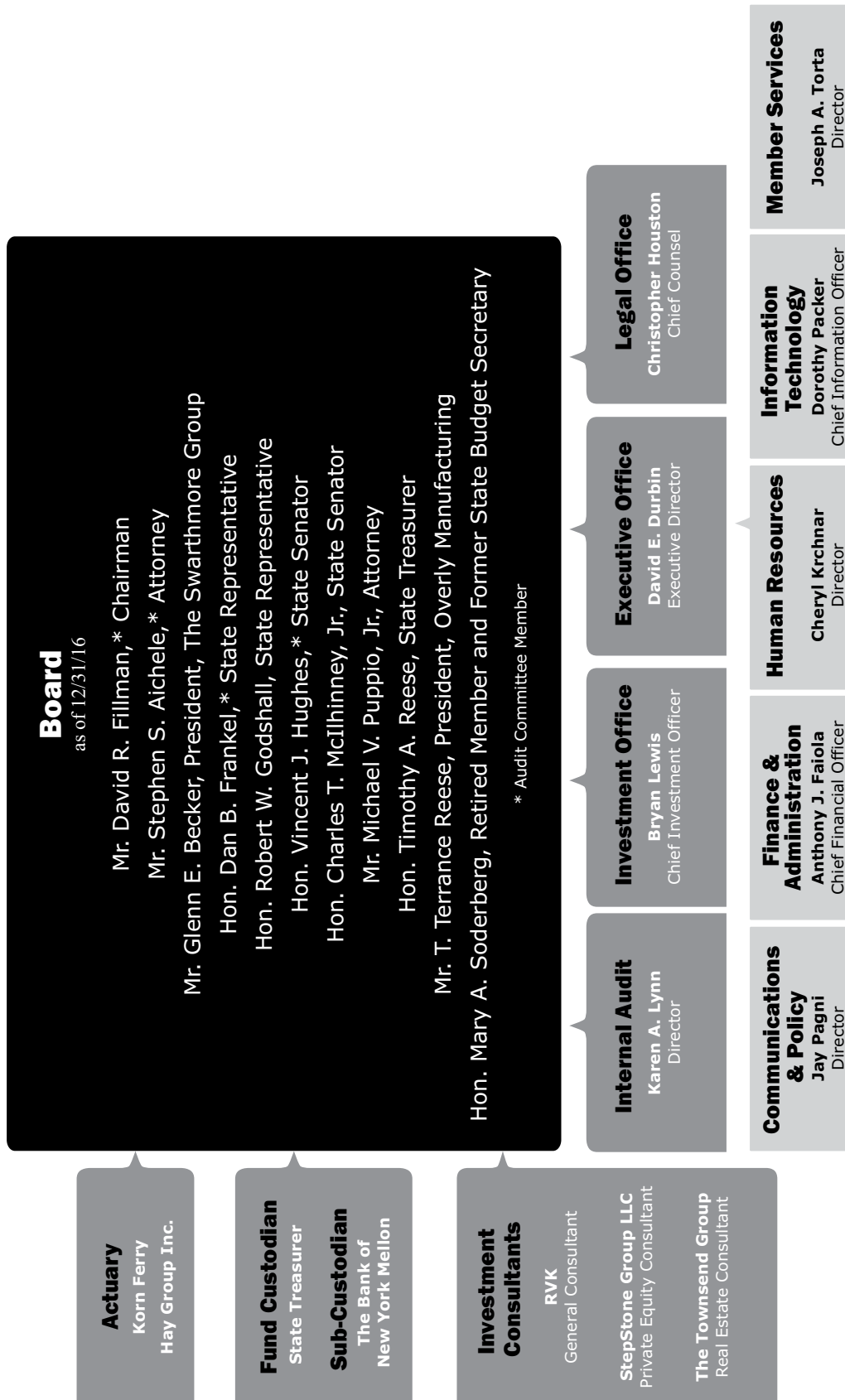
## Services & Operations

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



# SERS ORGANIZATION

## Proposed FY 2017-2018 Administrative Budget

	Rebudget 2013-2014	Rebudget 2014-2015	Rebudget 2015-2016	Rebudget 2016-2017	Budget Request
<b>Personnel Services</b>	\$14,368,800	\$15,909,014	\$16,934,000	\$16,548,700	\$17,414,060
<b>Operational</b>					
Travel	36,000	50,050	56,400	54,300	55,900
Training	66,600	153,258	116,950	125,600	79,800
Communication Services	353,500	428,200	418,400	472,500	481,400
Consultants - Non EDP	367,600	385,600	401,600	349,700	461,000
Legal Services/Fees	423,800	282,500	386,000	280,000	250,000
Specialized Services	304,200	404,100	455,670	545,550	595,350
Advertising	10,000	20,000	5,000	8,000	10,000
IT Consulting	1,138,200	964,600	1,200,000	1,620,100	2,650,500
Contracted Maintenance Non-IT	44,800	39,300	41,300	49,300	63,900
Hardware/Software and Maintenance	1,325,400	1,334,900	1,071,160	1,518,500	1,623,600
Real Estate	1,886,000	1,842,789	1,680,091	1,710,100	1,727,800
Vehicles	27,000	31,700	25,600	23,000	25,800
Office Equipment	75,500	68,100	94,600	95,300	97,900
Other Rentals/Leases	2,700	3,600	3,600	3,600	3,600
Office Supplies	86,900	86,800	107,000	139,200	123,500
Educational Supplies	5,800	500	3,140	2,200	3,100
Motorized Equipment Maintenance	2,600	8,500	3,500	3,500	3,500
Postage	500,000	196,500	352,100	471,960	446,500
Freight	3,000	3,600	3,500	3,500	3,200
Printing	118,600	226,439	157,100	226,400	117,350
Subscriptions & Licensing	114,500	65,250	35,590	59,350	39,150
Membership Dues	15,100	23,900	26,000	26,540	25,300
Conference Expenses	0	9,700	8,400	8,600	14,300
Insurance, Surety, & Fidelity Bonds	13,000	13,000	13,000	13,000	13,000
Treasury Services	1,000,000	1,000,000	1,190,000	1,255,000	1,133,000
Other Operational	62,200	1,100	203,299	203,300	119,900
<b>Total Operational</b>	<b>7,983,000</b>	<b>7,643,986</b>	<b>8,059,000</b>	<b>9,268,100</b>	<b>10,168,350</b>
<b>Fixed Assets</b>	<b>150,000</b>	<b>250,000</b>	<b>250,000</b>	<b>250,000</b>	<b>110,000</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>\$21,001,800</b>	<b>\$22,303,000</b>	<b>\$23,743,000</b>	<b>\$24,566,800</b>	<b>\$26,192,410</b>

# SERS ORGANIZATION

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## Proposed FY 2017-2018 Administrative Budget

### Directed Commission Revenue & Expense

	FY 2016-17 Budget	FY 2017-18 Budget
<b>Beginning Balance</b>	\$3,240,582	\$1,840,582
Directed Commission Revenue	100,000	100,000
<b>Total Available</b>	<b>3,340,582</b>	<b>1,940,582</b>
Directed Commission Expense	1,500,000	1,500,000
<b>Ending Balance</b>	<b>\$1,840,582</b>	<b>\$440,582</b>

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

### Legislation

No legislation that affected SERS operations was enacted in 2016.

# 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
2016	232,558	105,220	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
2007	216,740	109,610	107,130

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

### Active Members: Age & Service

Average Age	46.3
Average Years of Service	11.9

### Total Annuitants & Beneficiaries: By Category

	2013	2014	2015	2016
Normal	59,020	60,228	61,753	63,315
Early	42,078	42,683	43,272	43,974
Disability	8,258	8,417	8,512	8,578
Beneficiary/Survivor	10,696	10,921	11,152	11,471

### Annuitants & Beneficiaries: Average Age

	2013	2014	2015	2016
Normal	72.4	72.4	72.3	72.3
Early	63.4	63.7	64.0	64.3
Disability	62.4	62.7	63.0	63.4
Beneficiary/Survivor	74.7	74.7	74.6	74.5

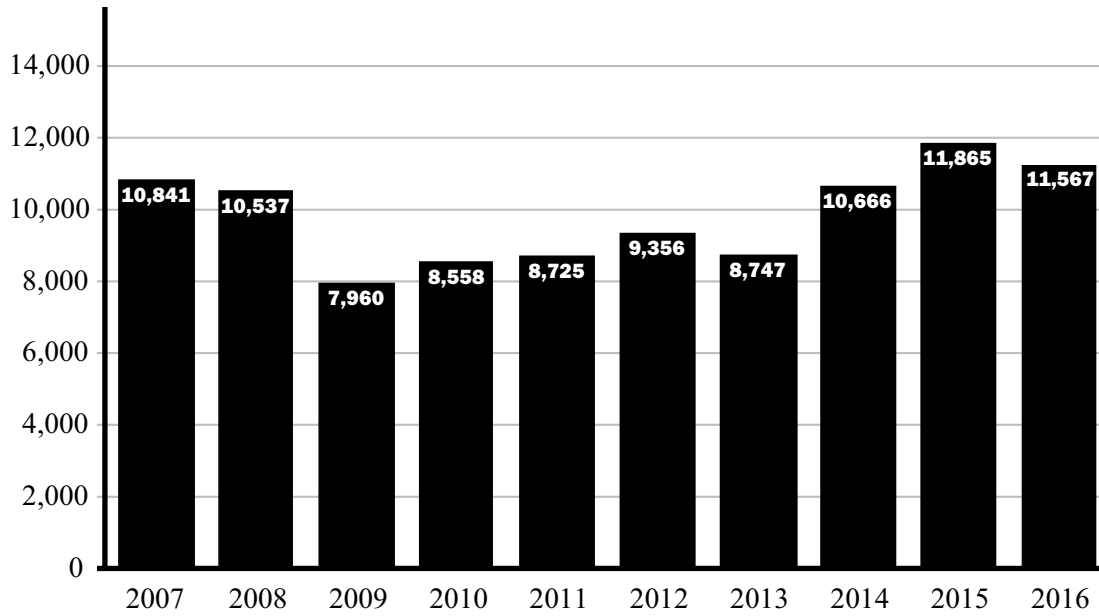
### Annuitants & Beneficiaries: Average Annual Pension

	2013	2014	2015	2016
Normal	\$25,839	\$26,426	\$27,042	\$27,722
Early	16,333	16,604	16,934	17,410
Disability	14,573	14,797	15,020	15,245
Beneficiary/Survivor	11,386	11,651	12,007	12,505

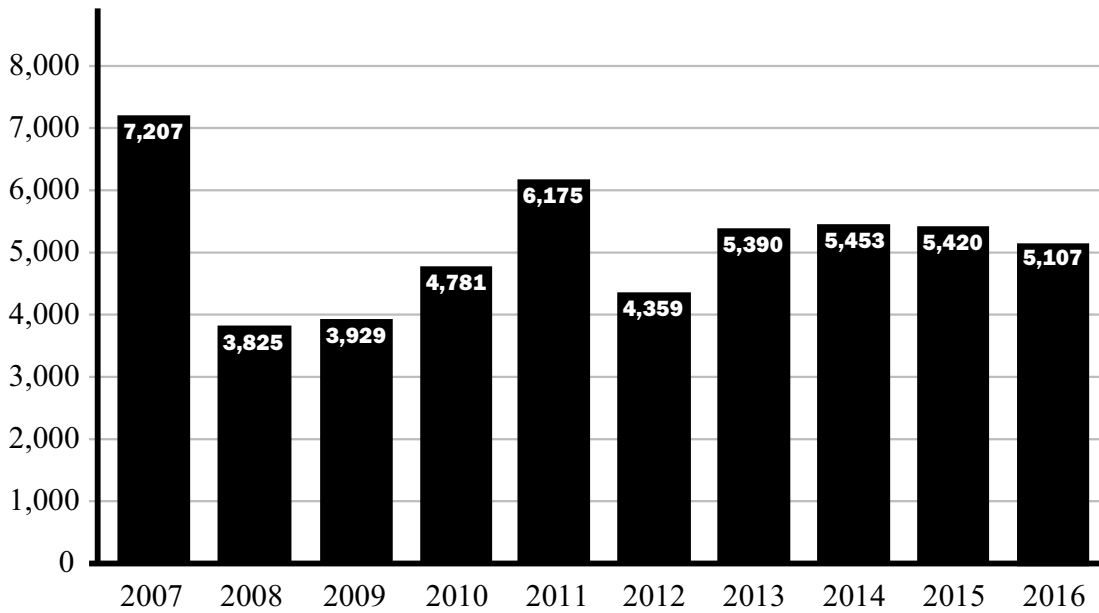
# SERS MEMBERS

## Demographics as of December 31

### New Member Enrollments



### Normal & Early Retirements



**SERS Fund**



# SERS FUND

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## Funding Process

### Defined Benefit Plan

The Pennsylvania State Employees' Retirement System 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 deferred compensation program.

The economic engine of the defined benefit plan is the SERS Fund, which is reviewed in depth in this section. Details about the deferred compensation program are provided in the last section of this book.

In the defined benefit plan, both the employer and the employee pay a certain percentage of the employee's salary to the SERS Fund for as long as the employee works for the commonwealth. For FY 2016/17, employers are contributing 29.5% (per current legislative mandates) of payroll and most employees 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 2016, SERS earned an estimated 6.5% return on its investments. SERS anticipates that this will be the last year of the legislatively-mandated contribution limits.

When employees 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 employee'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 2016, SERS made approximately \$3.2 billion in benefit payments, approximately \$2.9 billion of which stayed in Pennsylvania. The average annual pension paid to a retired state employee who worked to full retirement age was \$27,722.

### 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 an employee's working career provide sufficient funding to pay for that particular employee'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

7.5%  
long-term  
investment return

5.7%  
average salary growth

2.75%  
rate of inflation

Each year, SERS actuarial firm uses the most recent employee 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 employee 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—employee 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.

### Employee Contributions

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

# SERS FUND

## Funding Process

withheld from their paychecks and sent directly from their employer to SERS. In 2016, employee contributions to SERS totaled an estimated \$374 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 employee contributions required to maintain such benefits.

There are some instances, however, in which employee contributions can increase. For example, Pennsylvania’s Act 2010-120 introduced a “risk sharing” provision that allows for an increase in contributions of employees generally hired on or after January 1, 2011, 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. An increased employee “shared risk contribution” can be established every three years beginning in 2014. The additional contribution cannot increase by more than 0.5% in any three-year period, and cannot exceed 2% in total.

### *Investment Earnings*

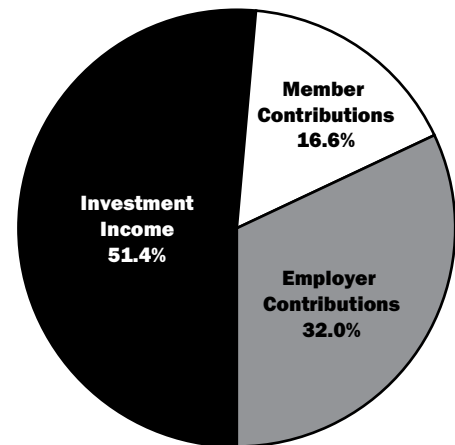
SERS overall investment objective is to assure adequate fund reserves at the least cost to commonwealth citizens and to protect against the erosion of principal by inflation. SERS seeks to provide investment earnings that meet, or preferably exceed, the assumed rate of return over complete economic cycles. 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+ years of operation and the trend of people living longer, the system now has more retired members than active members. In 2017, SERS is projected to pay out approximately \$87 million more each month than it takes in through employee and employer contributions.

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



# SERS FUND

## Funding Process

As a normal consequence of SERS greater maturity, the liquidity needs of the fund increase and require an 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 2012; this time, from 8% to 7.5%. This change has significant implications for the employer contribution rate, as discussed below.

### Public Pension Fund Assumed Rates of Return

(National Association of State Retirement Administrators, February 2016)

Rate	# of Plans Using Rate
< 7.00%	7
7.00%	5
7.01% - 7.50%	50 (SERS)
7.51% - 7.99%	30
8.00%	31
8.01% - 8.49%	3
8.50%	1

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 7.2%, a 25-year rate of return of 8.1%, and a 30-year return of 8.6%. 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. Additionally, based upon SERS latest initial estimates for the period 2014 to 2017, no employee "shared risk" contribution will be required.

### *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 employee 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 2015 actuarial valuation was 4.52%.

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 1986, employer contributions totaled \$407 million, in 2016 that figure was nearly \$1.6 billion.

According to the Budget Office, SERS employers under the Governor’s jurisdiction paid less than half of the employers’ total—about 43%—from general funds. About 22% came from special funds; about 17% came from federal funds; and about 18% 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 8.0% to 7.5% in 2012, the change increased the unfunded liability by approximately \$2.1 billion.

FY 2017-18 will be the first year since legislatively-mandated contribution rates were enacted through Act 2010-120 that collars are expected to drop away and the commonwealth will be paying the uncollared required rate. The FY 2017-18 employer contribution is currently projected to be 31.8% of payroll. Of that contribution rate, approximately 4.5% will go to fund the benefits of new SERS members in the current year (normal cost) and approximately 27.3% will go to pay toward the unfunded liability.

Projections suggest that the increase in employer contributions will be \$202 million next fiscal year.

Looking at the relative sizes of the current-year and unfunded liability components discussed above, clearly the unfunded liability is driving employer contribution rate increases. On a positive note, Pennsylvania has reached the peak and the rate will now begin a slow, steady decline. Additionally, the funded ratio of the SERS Fund will continue to rise.

### Long-Term Snapshot

	1986	2016
<b>Employer Rate</b>	13.09%	29.51%
<b>Employer Contributions</b>	\$407 million	\$1.6 billion
<b>Employee Rate</b>	5.00%	6.25%
<b>Employee Contributions</b>	\$139 million	\$374 million
<b>Active Employees</b>	109,000	105,000
<b>Annuitants</b>	67,000	127,000

# SERS FUND

## Funding Process

### Projected Payout, Funding Status & Employer Contributions

Assuming entry-age funding method, level-dollar amortization, five-year smoothing of assets, Act 2010-120 collars, 5.7% salary growth, 2.75% inflation, 6.5% investment return in CY 2016 with 7.5% return thereafter, 6.25% employee contribution.

Valuation Year Ended Dec 31	CY Payout		CY Funding Status		Fiscal Year	FY Employer Contribution		
	Benefits & Expenses (\$ billions)	Funded Ratio	Unfunded Liability (\$ billions)	Expected FY Payroll (\$ millions)		Employer Contribution Rate	Expected FY Contribution (\$ millions)	
2016	\$3.3	58.7%	\$19.51		2017/18	\$6,446.0	31.77%	\$2,047.6
2017	3.4	59.4	19.52		2018/19	6,642.6	31.34	2,082.1
2018	3.5	59.5	19.82		2019/20	6,845.2	31.31	2,143.0
2019	3.6	59.7	20.01		2020/21	7,054.0	31.16	2,197.8
2020	3.7	60.7	19.80		2021/22	7,269.1	30.57	2,221.9
2021	3.8	61.8	19.50		2022/23	7,490.8	29.92	2,241.2
2022	4.0	63.0	19.15		2023/24	7,719.3	29.27	2,259.6
2023	4.1	64.2	18.76		2024/25	7,954.7	28.63	2,277.2
2024	4.2	65.4	18.33		2025/26	8,197.3	27.99	2,294.4
2025	4.3	66.7	17.85		2026/27	8,447.3	27.37	2,312.0
2026	4.4	67.9	17.33		2027/28	8,705.0	26.77	2,330.0
2027	4.5	69.2	16.77		2028/29	8,970.5	26.18	2,348.6
2028	4.6	70.6	16.17		2029/30	9,244.1	25.61	2,367.6
2029	4.7	72.0	15.51		2030/31	9,526.0	25.06	2,387.3
2030	4.8	73.5	14.80		2031/32	9,816.6	24.53	2,407.6
2031	4.9	75.0	14.04		2032/33	10,116.0	24.01	2,428.5
2032	5.0	76.6	13.21		2033/34	10,424.5	23.50	2,450.0
2033	5.0	78.3	12.31		2034/35	10,742.5	23.01	2,472.3
2034	5.1	80.1	11.35		2035/36	11,070.1	22.54	2,495.2
2035	5.2	82.0	10.30		2036/37	11,407.8	22.08	2,518.8
2036	5.3	84.1	9.17		2037/38	11,755.7	21.63	2,543.2
2037	5.4	86.2	7.96		2038/39	12,114.2	21.20	2,568.4
2038	5.5	88.5	6.64		2039/40	12,483.7	20.78	2,594.3
2039	5.6	91.0	5.22		2040/41	12,864.5	16.69	2,146.8
2040	5.7	92.9	4.16		2041/42	13,256.8	13.72	1,819.0
2041	5.8	94.2	3.38		2042/43	13,661.2	10.41	1,422.6
2042	5.9	95.0	2.95		2043/44	14,077.8	8.36	1,177.3
2043	6.1	95.3	2.76		2044/45	14,507.2	8.12	1,178.4
2044	6.2	95.6	2.58		2045/46	14,949.7	7.82	1,168.8
2045	6.3	95.8	2.41		2046/47	15,405.7	6.96	1,072.1

# SERS FUND

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## Actuarial Status

### Restoring SERS Defined Benefit Plan Funding

The SERS unfunded liability has grown slower than it otherwise would have due to Act 2010-120, which 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 other provisions for employees hired on or after January 1, 2011. One aspect of Act 2010-120 is that retirement provisions for legislators elected after December 1, 2010, were reduced and made consistent with those of most rank-and-file employees.

It will, however, take considerable time to realize benefits from the lower costs. SERS funded ratio will improve as employees hired before January 2011 retire and post-January 2011 hires begin to fill employee ranks in greater proportion. In 2016, SERS retired 5,107 state employees and added 11,567 new members. Currently, more than 32% of SERS active members belong to the post Act 2010-120 classes of service.

Act 2010-120 also recognized the need for greater rates of employer funding and does allow employer contributions to increase over time. To ensure predictability and to moderate overall budget impacts, the General Assembly set forth measured intervals for increased employer contribution rates.

Because the employer rate was below actual cost for a number of years, SERS unfunded liability will continue to grow in the near term. As the employer rate increases, however, 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 employees.

In general, a funding ratio of 80% or better is considered “healthy” for a pension system. Per a 2016 Wilshire report, Pennsylvania is among 65 out of 98 other state retirement systems that are currently below the 80% threshold. At the close of 2016, SERS estimated funded ratio was 58.7% (actuarial value) or 56.2% (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>2016<sup>1/</sup></b>	58.7	56.2

<sup>1/</sup>2016 values are projected.

The 2016 estimated unfunded liability is \$19.5 billion. The liability will continue to grow in the near term, however, 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
2007	\$334	\$5,246	\$244	\$(2,361)	\$35,516
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 <sup>2/</sup>	374	1,554 <sup>3/</sup>	1,595	(3,276)	26,302
<b>10-Year Total</b>	<b>\$3,532</b>	<b>\$10,924</b>	<b>\$6,797</b>	<b>\$(27,004)</b>	

<sup>1/</sup>10-year net additions and deductions were \$(5,751).

<sup>2/</sup>2016 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 December 2016.

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

The major elements of the policy are:

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

# 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.

## 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.

#### *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, 2016)

Asset Class	Market Exposure	% of Total Fund	Long-Term 10-Year Strategic Target
Private Equity	\$4,137.0	15.7%	16.0%
Global Public Equity	12,188.6	46.3	43.0
Real Estate	2,311.8	8.8	12.0
Hedge Funds	2,046.5	7.8	12.0
Fixed Income	4,315.6	16.4	14.0
Cash	1,302.7	5.0	3.0
<b>Total Fund</b>	<b>\$26,302.2</b>	<b>100.0%</b>	<b>100.0%</b>

# SERS FUND

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## Investment Program | Overview

### Number of Investment Managers

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

### Number of Investment Portfolios

Asset Class	Investment Portfolios
Private Equity	351
Global Public Equity	17
Real Estate	55
Hedge Funds	17
Fixed Income	22
Cash	1
<b>Total Portfolios</b>	<b>463</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, 2016

Effective July 1, 2016, SERS changed the asset allocation per *2016-2017 Strategic Investment Plan*. 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>	6.8%	8.7%	10.0%	9.5%
<i>Burgiss All Private Equity Custom Index<sup>3/, 5/</sup></i>	7.5	11.1	12.2	10.0
<i>Russell 3000 Index+3%<sup>4/, 5/</sup></i>	18.4	13.8	19.8	10.6
Global Public Equity	8.4	3.2	10.3	3.3
<i>MSCI ACW IM Index (Net)</i>	8.4	3.2	9.6	3.8
Real Estate <sup>5/</sup>	3.2	8.0	9.5	3.2
<i>Real Estate Custom Benchmark<sup>5/, 6/</sup></i>	12.1	6.3	7.9	4.1
<i>Consumer Price Index+3%<sup>5/</sup></i>	4.5	4.1	4.3	4.8
Hedge Funds	4.1	0.1	2.6	NA
<i>HF Custom Index<sup>7/</sup></i>	0.1	1.2	6.2	5.1
Fixed Income	5.6	2.9	3.4	5.0
<i>Bloomberg U.S. Aggregate Bond Index</i>	2.6	3.0	2.2	4.3
Cash	0.7	0.6	0.5	1.2
<i>BofA ML 3 Month U.S. T-Bill Index</i>	0.3	0.1	0.1	0.8
<b>Total Fund</b>	<b>6.5%</b>	<b>4.4%</b>	<b>7.7%</b>	<b>4.3%</b>
<i>Total Fund Custom Benchmark</i>	<i>7.3%</i>	<i>4.9%</i>	<i>7.9%</i>	<i>5.5%</i>
<i>Total Fund Custom Public Market Equivalent Benchmark</i>	<i>8.4%</i>	<i>5.5%</i>	<i>9.4%</i>	<i>6.0%</i>

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

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

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

<sup>4/</sup>The Russell 3000 Index+3% is a long-term benchmark by which SERS measures its private market performance. Shorter term variances (1-year and 3-year) can be pronounced due to the nature of private assets and are not as relevant for benchmark purposes.

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

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

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



# SERS FUND

## Investment Program | Performance

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

For the period ending June 30, 2016

Effective July 1, 2016, SERS changed the asset allocation per *2016-2017 Strategic Investment Plan*. 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
Alternative Investments <sup>2/, 5/</sup>	5.2%	9.9%	9.6%	9.8%
<i>Burgiss All Private Equity Custom Index<sup>3/, 5/</sup></i>	6.7	12.3	10.9	10.4
<i>Russell 3000 Index+3%<sup>4/, 5/</sup></i>	2.6	14.5	14.3	10.1
Global Public Equity	-4.6	6.1	6.1	3.9
<i>MSCI ACW IM Index (Net)</i>	-3.9	6.1	5.4	4.5
Real Assets <sup>5/</sup>	0.2	4.7	4.6	3.5
<i>Real Assets Custom Benchmark<sup>5/</sup></i>	5.0	6.9	7.0	3.9
<i>Consumer Price Index+3%</i>	4.0	4.1	4.4	4.8
Diversifying Assets	-6.2	3.1	3.8	NA
<i>DA Custom Index<sup>6/</sup></i>	-8.4	3.4	5.6	NA
Fixed Income	4.7	3.9	3.8	5.8
<i>Bloomberg U.S. Aggregate Bond Index</i>	6.0	4.1	3.8	5.1
Liquidity Reserve	0.7	0.7	0.5	1.4
<i>BofA ML 3 Month U.S. T-Bill Index</i>	0.2	0.1	0.1	1.0
<b>Total Fund</b>	<b>-0.4%</b>	<b>5.8%</b>	<b>5.9%</b>	<b>4.8%</b>
<i>Total Fund Custom Benchmark</i>	<b>0.8%</b>	<b>6.3%</b>	<b>6.4%</b>	<b>6.0%</b>
<i>Total Fund Custom Public Market Equivalent Benchmark</i>	<b>0.4%</b>	<b>6.9%</b>	<b>7.3%</b>	<b>6.4%</b>

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

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

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

<sup>4/</sup>The Russell 3000 Index+3% is a long-term benchmark by which SERS measures its private market performance. Shorter term variances (1-year and 3-year) can be pronounced due to the nature of private assets and are not as relevant for benchmark purposes.

<sup>5/</sup>Alternative Investments, its corresponding benchmarks, the Private Energy, Non-Core Real Estate, Core Real Estate, and REITs sections of Real Assets, and its corresponding benchmarks are reported on a quarter lagged basis.

<sup>6/</sup>Beginning April 2014, the DA Custom Index is comprised of the HFRI Fund-of-Funds Strategic Index consistent with board approval of the *2014-2015 Strategic Investment Plan*, which establishes this index as the appropriate benchmark for Diversifying Assets with regard to its composition and objectives.

# SERS FUND

## Investment Program | Performance

### Fund Values & Annual Return

Year End	SERS Fund Fair Value (\$ millions)	Annual Total Fund Rate of Return <sup>1/</sup>
1987	\$7,367	3.3%
1988	8,312	12.8
1989	9,785	17.8
1990	9,886	1.0
1991	11,940	22.6
1992	12,453	7.4
1993	13,701	13.2
1994	13,330	-1.1
1995	16,343	25.2
1996	18,492	15.4
1997	21,312	18.5
1998	24,123	16.3
1999	28,093	19.9
2000	27,880	2.2
2001	24,706	-7.9
2002	20,880	-10.9
2003	24,536	24.3
2004	26,641	15.1
2005	28,752	14.5
2006	32,053	16.4
2007	35,516	17.2
2008	22,796	-28.7
2009	24,662	9.1
2010	25,886	11.9
2011	24,377	2.7
2012	25,389	12.0
2013	27,394	13.6
2014	27,338	6.4
2015	26,055	0.4
2016 <sup>2/</sup>	26,302	6.5

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

<sup>2/</sup>2016 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	\$162,488,479
Consultant	3,628,898
Personnel	2,389,877
Custodian	1,212,037
Subscription and membership	706,364
Operational	39,004
<b>Total Investment Expenses</b>	<b>\$170,464,659</b>

### Consultant Expenses

Firm	Service Type	Expenses <sup>1/</sup>
StepStone Group	Private equity investments	\$1,975,000
The Townsend Group	Real estate investments	728,000
RVK	General investments	576,218
GCM Customized Investment Group	Investment portfolio management	210,000
Institutional Shareholders Services	Proxy services	92,680
Abel/Noser	Transaction cost analysis	47,000
<b>Total Consultant Expenses</b>		<b>\$3,628,898</b>

<sup>1/</sup>Korn Ferry Hay Group, SERS actuary, was paid \$434,672 and Funston Advisory Services LLC, a governance consultant, was paid \$255,780. 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	\$72,500,294	165.0
Global Public Equity	29,172,486	26.7
Real Estate	34,065,714	112.1
Hedge Funds	13,241,420	74.1
Fixed Income	13,508,565	31.6
<b>Total Manager Fees and Expenses</b>	<b>\$162,488,479</b>	<b>62.5</b>

<sup>2/</sup>The fees/expenses were divided by SERS total fund and asset class quarterly average values during calendar year 2016 to arrive at the basis point calculations.

### History of Manager Investment Expenses

Calendar Year	Fees/Expenses	Fees/Expenses (in basis points)
2012	\$186,025,370	75.1
2013	175,099,249	68.2
2014	177,383,430	64.8
2015	157,930,597	59.1
2016	162,488,479	62.5

# 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.

### 2016 Manager Investment Expenses Detail

Manager	City	State/Country	Fees/ Expenses
<b>Private Equity</b>			
Abingworth Bioventures V	London	United Kingdom	\$495,277
ABRY Advanced Securities Fund	Boston	MA	2,009
ABRY Mezzanine Partners	Boston	MA	724
ABRY Partners IV	Boston	MA	39,596
ABRY Partners V	Boston	MA	13,910
ABRY Partners VI	Boston	MA	127,076
ABRY Partners VII	Boston	MA	287,053
ABRY Partners VIII	Boston	MA	346,963
ABRY Senior Equity II	Boston	MA	45,735
ABS Capital Partners V	Baltimore	MD	72,304
ABS Capital Partners VI	Baltimore	MD	375,000
ADV Opportunities Fund I	Hong Kong	China	1,210,737
Advent International GPE VI-A	Boston	MA	148,915
Advent International GPE VII-B	Boston	MA	515,210
Advent International GPE VIII-B	Boston	MA	479,839
Advent Latin American Private Equity Fund IV	Boston	MA	257,195
Advent Latin American Private Equity Fund V	Boston	MA	170,881
Advent Latin American Private Equity Fund VI	Boston	MA	500,000
Alloy Ventures 2005	Palo Alto	CA	648,700
Alpha Private Equity Fund 5	Paris	France	237,312
Artiman Ventures II	Palo Alto	CA	250,005
Artiman Ventures III	Palo Alto	CA	358,544
ASF VII B	New York	NY	1,543,836
Asia Alternatives Capital Partners	San Francisco	CA	86,366
Asia Alternatives Capital Partners II	San Francisco	CA	110,585
Asia Alternatives Capital Partners III	San Francisco	CA	205,115
Asia Pacific Growth Fund III	San Francisco	CA	5,000
Audax Private Equity Fund V	Boston	MA	102,705
Austin Ventures IX	Austin	TX	218,870
Avenue Asia Special Situations Fund IV	New York	NY	114,507
Avenue Special Situations Fund VI	New York	NY	58,519

# SERS FUND

## Investment Program | Expenses & Fees

### 2016 Manager Investment Expenses Detail (continued)

Manager	City	State/Country	Fees/ Expenses
<b>Private Equity (continued)</b>			
AXA Secondary Fund III	Paris	France	\$14,853
AXA Secondary Fund III-2	Paris	France	8,725
AXA Secondary Fund IV	Paris	France	237,597
AXA Secondary Fund V B	Paris	France	415,899
Bain Capital Asia Fund	Boston	MA	142,426
Bain Capital Europe III	Boston	MA	338,203
Bain Capital Fund IX	Boston	MA	730,682
Bain Capital Fund VIII-E	Boston	MA	104,765
Bain Capital Fund X	Boston	MA	511,872
Bain Capital IX Coinvestment Fund	Boston	MA	155,903
Bain Capital X Coinvestment Fund	Boston	MA	17,291
Baring India Private Equity Fund III Limited	Port Lewis	Mauritius	67,527
Baring Vostok Private Equity Fund IV	Guernsey	Channel Islands	370,690
Battery Ventures VIII	Waltham	MA	457,570
Battery Ventures VIII Side Car Fund	Waltham	MA	112,416
BC European Capital IX	London	United Kingdom	256,680
Berkshire Fund VI	Boston	MA	62,339
Berkshire Fund VII	Boston	MA	239,786
Berkshire Fund VIII	Boston	MA	382,411
Birchmere Ventures III	Pittsburgh	PA	29,274
Blackstone Capital Partners V	New York	NY	197,083
Blackstone Capital Partners VII	New York	NY	495,833
Brait IV	Grand Cayman	Cayman Islands	245,530
Brynwood Partners VI	Greenwich	CT	125,729
Capvis Equity IV	Baar	Switzerland	1,515,308
Care Capital Investments III	Princeton	NJ	148,005
Carlyle Energy Mezz Opp Fund	New York	NY	348,904
Centerbridge Capital Partners I	New York	NY	2,926
Centerbridge Capital Partners III	New York	NY	357,980
Cerberus Institutional Partners Series Three	New York	NY	23,723
Cerberus Institutional Partners Series Four	New York	NY	192,374
Charterhouse Capital Partners IX	London	United Kingdom	346,532
Charterhouse Capital Partners VIII	London	United Kingdom	9,563
Chequers Capital XV	Paris	France	194,949
CID Greater China Venture Capital Fund II	Taipei	Taiwan	251,012
Clearlake Capital Group	Santa Monica	CA	276,589
Clearstone Venture Partners III-A	Santa Monica	CA	198,225
Clessidra Capital Partners II	Milan	Italy	80,778
Code, Hennessy & Simmons V	Chicago	IL	72,738

# SERS FUND

## Investment Program | Expenses & Fees

### 2016 Manager Investment Expenses Detail (continued)

Manager	City	State/Country	Fees/ Expenses
<b>Private Equity (continued)</b>			
Cognetas Fund II	London	United Kingdom	\$79,864
CVI Global Value Fund	Grand Cayman	Cayman Islands	276,954
Denham Commodity VI	Boston	MA	875,000
Devon Park Bioventures	Wayne	PA	80,583
Dover Street VII	Boston	MA	375,000
Draper Triangle Ventures II	Pittsburgh	PA	111,483
Draper Triangle Ventures III	Pittsburgh	PA	200,000
Energy Spectrum Partners V	Dallas	TX	29,037
Eureka II	Yardley	PA	104,511
Eureka III	Yardley	PA	388,000
Excelsior Capital Asia Partners III	Hong Kong	China	36,116
First Reserve Fund XI	Greenwich	CT	168,312
First Reserve Fund XII	Greenwich	CT	277,976
Francisco Partners III	San Francisco	CA	206,491
Francisco Partners IV	San Francisco	CA	214,978
Frazier Healthcare V	Seattle	WA	29,484
FSN Capital IV	Oslo	Norway	586,306
Great Hill Equity Partners III	Boston	MA	586,412
Great Hill Equity Partners IV	Boston	MA	360,664
GTCR IX	Chicago	IL	293,939
GTCR VIII	Chicago	IL	71,181
GTCR XI	Chicago	IL	326,332
Guggenheim Technology Ventures I	King of Prussia	PA	1,198
H.I.G. Bayside Debt & LBO Fund II	London	United Kingdom	348,482
H.I.G. Bayside Loan Opportunity Fund III	London	United Kingdom	1,000,000
H.I.G. Bayside Loan Opportunity Fund IV	London	United Kingdom	375,000
H.I.G. Brazil and Latin America Partners	Rio de Janeiro	Brazil	937,500
H.I.G. Europe Capital Partners II	Miami	FL	552,375
H.I.G. Growth LBO & Equity Fund II	Miami	FL	300,000
Hahn & Company II	Seoul	Korea	994,209
Halpern Denny Fund III	Boston	MA	2,171
HarbourVest Partners VII	Boston	MA	447,027
HarbourVest Partners VIII	Boston	MA	875,000
HarbourVest V-Asia Pacific & Rest of World	Boston	MA	234,900
Hellman & Friedman Capital Partners VI	San Francisco	CA	46,228
Hellman & Friedman Capital Partners VIII	San Francisco	CA	258,488
Highland Capital Partners VII	Lexington	MA	559,766
Highland Consumer Fund I	Lexington	MA	425,554
Horizon Impact Fund - HarbourVest	Boston	MA	205,396

# SERS FUND

## Investment Program | Expenses & Fees

### 2016 Manager Investment Expenses Detail (continued)

Manager	City	State/Country	Fees/ Expenses
<b>Private Equity (continued)</b>			
Incline Equity Partners III	Pittsburgh	PA	\$132,255
Insight Venture Partners IX	New York	NY	1,000,898
Insight Venture Partners VII	New York	NY	228,915
Insight Venture Partners VIII	New York	NY	864,768
InterWest Partners IX	Menlo Park	CA	32,778
InterWest Partners X	Menlo Park	CA	549,749
Invemed Catalyst Fund	New York	NY	11,647
IP III	Bellevue	WA	27,736
IP IV	Bellevue	WA	76,360
J.H. Whitney VII	Stamford	CT	366,674
JMI Equity Fund VI	Baltimore	MD	523,503
JMI Equity Fund VII	Baltimore	MD	186,116
JMI Equity Fund VIII	Baltimore	MD	365,000
JP Morgan U.S. Corp Finance Investors II	New York	NY	204,409
JP Morgan Venture Capital Investors II	New York	NY	444,506
JP Morgan Venture Capital Investors III	New York	NY	792,259
Kelso VIII	New York	NY	684,677
Knightsbridge Venture Capital VI	Bartlesville	OK	113,760
KPS Special Situations Fund IV	New York	NY	221,429
LBC Credit Partners III	Philadelphia	PA	809,025
Lexington Capital Partners VI	New York	NY	121,033
Lightspeed India Partners	New Delhi	India	318,949
Lightspeed Venture Partners VII	Menlo Park	CA	254,045
Lightspeed Venture Partners VIII	Menlo Park	CA	280,651
Lime Rock Partners IV	Westport	CT	146,913
Lime Rock Partners V	Westport	CT	242,546
LLR Equity Partners II	Philadelphia	PA	27,388
LLR Equity Partners III	Philadelphia	PA	305,393
LLR Equity Partners IV	Philadelphia	PA	1,638,396
Madison Dearborn Capital Partners V	Chicago	IL	57,177
Madison Dearborn Capital Partners VI	Chicago	IL	158,738
Meritech Capital Partners III	Palo Alto	CA	175,000
Meritech Capital Partners IV	Palo Alto	CA	364,500
Meritech Capital Partners V	Palo Alto	CA	517,500
Morgenthaler Partners IX	Menlo Park	CA	408,841
Morgenthaler Partners VIII	Menlo Park	CA	91,050
New Enterprise Associates 12	Baltimore	MD	277,534
New York Life Capital Partners III	New York	NY	135,869
New York Life Capital Partners IV	New York	NY	209,223



# SERS FUND

## Investment Program | Expenses & Fees

### 2016 Manager Investment Expenses Detail (continued)

Manager	City	State/Country	Fees/ Expenses
<b>Private Equity (continued)</b>			
NewSpring Growth Capital II	King of Prussia	PA	\$114,018
NewSpring Growth Capital III	King of Prussia	PA	272,561
Nordic Capital VII	Stockholm	Sweden	1,112,548
Novitas Capital III	King of Prussia	PA	32,897
Oak Investment Partners XI	Westport	CT	28,646
Oak Investment Partners XII	Westport	CT	369,848
Oaktree Opportunities Fund IX	Los Angeles	CA	779,740
Oaktree Opportunities Fund VIII	Los Angeles	CA	69,051
Oaktree Opportunities Fund VIIIb	Los Angeles	CA	127,953
OCM Opportunities Fund VI	Los Angeles	CA	61,855
OCM Opportunities Fund VII	Los Angeles	CA	132,689
OCM Opportunities Fund VIIIb	Los Angeles	CA	86,283
OCM Power Opportunities Fund III	Los Angeles	CA	47,797
OCM Principal Opportunities Fund IV	Los Angeles	CA	63,221
Patriot Financial Partners	Philadelphia	PA	294,111
Permira IV	London	United Kingdom	336,539
Pitango Venture Capital Fund IV	Herzliya	Israel	18,600
Pitango Venture Capital Fund V	Herzliya	Israel	455,797
Platinum Equity Capital Partners III	Beverly Hills	CA	875,000
Polaris Venture Partners V	Waltham	MA	817,596
Primavera Capital Fund II	Hong Kong	China	1,000,000
Providence Equity Partners V	Providence	RI	61,821
Providence Equity Partners VI	Providence	RI	166,491
Providence Strategic Growth II	Providence	RI	806,667
Quaker BioVentures	Philadelphia	PA	1,134
Quaker BioVentures II	Philadelphia	PA	317,655
Ridgemont Equity II	Charlotte	NC	1,189,059
RRJ Capital Master Fund III	Hong Kong	China	1,076,665
Sankaty Credit Opportunities III	Boston	MA	129,259
Sankaty Credit Opportunities IV	Boston	MA	72,460
SCP Private Equity Partners II	Wayne	PA	79,880
Segulah IV	Jersey	Channel Islands	187,350
SFC Energy Partners I	Denver	CO	109,891
SFC Energy Partners II	Denver	CO	503,895
ShoreView Capital Partners II	Minneapolis	MN	130,127
Siguler Guff BRIC Opportunities Fund	New York	NY	31,425
Siguler Guff BRIC Opportunities Fund II	New York	NY	107,904
Sofinnova Venture Partners VII	San Francisco	CA	343,233

# SERS FUND

## Investment Program | Expenses & Fees

### 2016 Manager Investment Expenses Detail (continued)

Manager	City	State/Country	Fees/ Expenses
<b>Private Equity (continued)</b>			
Sterling Capital Partners II	Northbrook	IL	\$79,822
Sterling Capital Partners III	Northbrook	IL	216,038
Sterling Group Partners IV	Houston	TX	253,696
Summit Partners Private Equity Fund VII	Boston	MA	837,626
Summit Partners Venture Capital Fund II	Boston	MA	214,910
T. Rowe Price Stock Distribution Account	Baltimore	MD	302,366
Technology Leaders V	Wayne	PA	125,337
Templeton Strategic Emerging Markets Fund III	Fort Lauderdale	FL	944,879
Three Arch Partners IV	Portola Valley	CA	93,153
TPG Asia V	Fort Worth	TX	74,588
TPG Partners V	Fort Worth	TX	180,390
TPG Partners VI	Fort Worth	TX	200,576
Versa Capital Partners	Philadelphia	PA	183,871
Vista Equity Partners Fund VI	Oakland	CA	2,366,205
W Capital Partners II	New York	NY	187,673
Weathergag Venture Capital	Redwood City	CA	202,500
Weathergag Venture Capital II	Redwood City	CA	250,000
Weston Presidio V	Boston	MA	400,000
Yucaipa American Alliance Fund II	Los Angeles	CA	110,458
<b>Private Equity Manager Fees</b>			<b>65,014,059</b>
<b>Private Equity Manager Expenses</b>			<b>7,486,235</b>
<b>Total Private Equity Manager Investment Expenses</b>			<b>72,500,294</b>
<b>Global Public Equity</b>			
Artisan Partners - Global ex US	Milwaukee	WI	2,405,987
Ashmore Emerging Markets Small Cap	Arlington	VA	581,991
BlackRock/Emerging Markets Index Non-Lendable Fund	San Francisco	CA	130,644
Delaware Emerging Markets	Philadelphia	PA	1,492,999
Diamond Hill Concentrated	Columbus	OH	7,150,963
Emerald Advisors - PA Companies	Lancaster	PA	1,725,952
Emerald Small Cap Growth	Lancaster	PA	250,258
Epoch Value	New York	NY	1,107,945
Globeflex Emerging Markets Small Cap	San Diego	CA	466,974
Harris Associates	Chicago	IL	3,253,767
Iridian Asset Management	Westport	CT	1,876,211
Martin Currie Emerging Markets All-Cap Concentrated	Edinburgh	United Kingdom	875,890
Mellon Capital Management MSCI World ex US Index	Pittsburgh	PA	430,969

# SERS FUND

## Investment Program | Expenses & Fees

### 2016 Manager Investment Expenses Detail (continued)

Manager	City	State/Country	Fees/ Expenses
<b>Global Public Equity (continued)</b>			
Mellon Capital Management Russell 1000 Growth	Pittsburgh	PA	\$62,130
Mellon Capital Management Russell 1000 Index	Pittsburgh	PA	265,474
Mellon Capital Management Russell 2000 Core	Pittsburgh	PA	5,760
Mellon Capital Management Russell 2000 Value	Pittsburgh	PA	11,390
Mellon Capital Management - PA Companies	Pittsburgh	PA	274,465
Morgan Stanley Investment Management Limited-developed ex US	London	United Kingdom	1,539,941
Templeton Investment Counsel - Global ex US	Fort Lauderdale	FL	1,802,361
Walter Scott & Partners Limited	Edinburgh	United Kingdom	2,743,258
Wellington DIH	Boston	MA	593,767
<b>Global Public Equity Manager Fees</b>			<b>29,049,096</b>
<b>Global Public Equity Manager Expenses</b>			<b>123,390</b>
<b>Total Global Public Equity Manager Investment Expenses</b>			<b>29,172,486</b>
<b>Real Estate</b>			
AG Asia Realty Fund	New York	NY	108,631
Berwind Investment Partnership IX	Yardley	PA	249,868
Berwind Investment Partnership V	Yardley	PA	2,285
Berwind Investment Partnership VI	Yardley	PA	13,018
Berwind Investment Partnership VII	Yardley	PA	194,095
Berwind Investment Partnership VIII	Yardley	PA	62,728
Blackstone Real Estate Partners VI	New York	NY	307,926
Blackstone Real Estate Partners VII	New York	NY	819,919
CBRE Clarion Real Estate	Radnor	PA	1,088,536
CenterSquare Real Estate Securities	Plymouth Meeting	PA	344,628
Clerestory Small Cap Fund I	New York	NY	61,003
Colony Investors VIII	Los Angeles	CA	174,144
Fidelity Real Estate Opportunistic Income Fund	Smithfield	RI	491,740
Fillmore West Fund	San Francisco	CA	64,775
Forest I.M.A.	Atlanta	GA	917,916
Hawkeye Scout Fund I	Austin	TX	91,932
Hawkeye Scout Fund II	Austin	TX	160,918
Heitman American Real Estate Trust	Chicago	IL	575,345
Heitman I.M.A.	Chicago	IL	9,725,391
LaSalle I.M.A.	Chicago	IL	5,631,289
LEM Real Estate High-Yield Debt Fund III	Philadelphia	PA	375,000
Lowe GTO	Los Angeles	CA	2,607,287
Lowe I.M.A.	Los Angeles	CA	5,115,721

# SERS FUND

## Investment Program | Expenses & Fees

### 2016 Manager Investment Expenses Detail (continued)

Manager	City	State/Country	Fees/ Expenses
<b>Real Estate (continued)</b>			
Lubert Adler Fund IV	Philadelphia	PA	\$4,384
Lubert Adler Fund V	Philadelphia	PA	59,954
Lubert Adler Fund VI	Philadelphia	PA	3,427
Lubert Adler Fund VII	Philadelphia	PA	370,773
Prudential Latin America Residential Fund III	Parsippany	NJ	121,724
Prudential Senior Housing IV	Parsippany	NJ	244,901
Prudential Senior Housing V	Parsippany	NJ	623,288
Rockpoint Finance Fund I	Dallas	TX	11,837
Rockpoint Real Estate Fund II	Dallas	TX	29,683
Rockpoint Real Estate Fund III	Dallas	TX	97,322
Rockpoint Real Estate Fund V	Dallas	TX	650,905
Starwood Fund VII	Greenwich	CT	255,409
Starwood Fund VIII	Greenwich	CT	268,714
UBS Trumbull Property Fund	Stamford	CT	727,549
UBS Trumbull Property Income Fund	Stamford	CT	516,738
ValStone Opportunity Fund V	Birmingham	MI	219,951
Westbrook Fund V	Dallas	TX	47,000
Westbrook Fund VI	Dallas	TX	128,687
Westbrook Fund VII	Dallas	TX	186,934
Westbrook Fund VIII	Dallas	TX	158,281
<b>Real Estate Manager Fees</b>			<b>33,911,556</b>
<b>Real Estate Manager Expenses</b>			<b>154,158</b>
<b>Total Real Estate Manager Investment Expenses</b>			<b>34,065,714</b>
<b>Hedge Funds</b>			
Arden Keystone	New York	NY	388,120
BAAM Commodities	New York	NY	2,748,673
Blackstone Keystone	New York	NY	6,474,224
Entrust Keystone	New York	NY	1,930,529
Hoplite Partners	New York	NY	304,512
Luxor Capital Partners	New York	NY	276,944
MKP Opportunity Fund	New York	NY	195,610
PAAMCO	Irvine	CA	64,154
Pine River Fund	Minnetonka	MN	300,032
Rock Creek	Washington	DC	22,780
Samlyn Onshore Fund	New York	NY	307,915
Stelliam Fund	New York	NY	227,927
<b>Total Hedge Funds Manager Investment Expenses</b>			<b>13,241,420</b>

# SERS FUND

## Investment Program | Expenses & Fees

### 2016 Manager Investment Expenses Detail (continued)

Manager	City	State/Country	Fees/ Expenses
<b>Fixed Income</b>			
Brandywine Global	Philadelphia	PA	\$717,472
Brown Brothers Harriman	New York	NY	261,067
Harvest Fund MLP	Wayne	PA	931,911
Kayne Anderson MLP	Los Angeles	CA	1,110,369
MacKay Shields Core	New York	NY	443,004
Mellon Capital Management Bloomberg Aggregate Index	Pittsburgh	PA	178,627
New Century Advisors	Chevy Chase	MD	269,375
NISA Custom TIPS Intermediate	St. Louis	MO	474,678
PIMCO Core	Newport Beach	CA	434,999
PIMCO U.S. Treasuries	Newport Beach	CA	280,863
PNC Short Duration	Pittsburgh	PA	354,677
Pyramis Global Advisors	Boston	MA	1,891,174
SEI Structured Credit Fund	Oaks	PA	2,166,597
Stone Harbor Emerging Market Debt	New York	NY	551,047
Stone Harbor High Yield	New York	NY	712,283
StoneRidge Short Duration	Malvern	PA	210,345
Taplin Canida Habacht (TCH)	Miami	FL	445,260
UBS Core Bond	Chicago	IL	234,974
Waterfall Asset Management	New York	NY	1,563,308
Wellington U.S. Treasuries	Boston	MA	276,535
<b>Total Fixed Income Manager Investment Expenses</b>			<b>13,508,565</b>
<b>Total Manager Investment Expenses</b>			<b>\$162,488,479</b>

# **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, 2016

Sub-Asset Class	Unfunded Commitments (\$ millions)	Fair Value (\$ millions)	% of Total Fund
Buyouts	\$1,296.2	\$2,368.1	9.0%
Special Situations	471.5	686.1	2.6
Venture Capital	107.9	1,082.8	4.1
<b>Total Private Equity</b>	<b>\$1,875.6</b>	<b>\$4,137.0</b>	<b>15.7%</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, 2016, 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	35.5%	United States	70.5%	Financials	26.7%
U.S. Venture Capital	23.3	China	5.2	Information Technology	20.5
Non-U.S. <sup>1/</sup>	23.1	United Kingdom	3.3	Consumer Discretionary	15.5
Distressed/Oppportunistic	11.9	Canada	1.7	Health Care	15.1
Pennsylvania-Related	6.2	Germany	1.3	Industrials	9.3
		Italy	1.2	Energy	5.5
		France	0.7	Materials	3.0
		Rest of World	16.1	Consumer Staples	2.4
				Telecommunication Services	1.1
				Utilities	0.9

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

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



# 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.

### Buyouts Committed, Drawn, and Distributed

Active Buyouts Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions <sup>2/</sup>
1. ABRY Partners IV	Middle	3/30/2001	\$35,000,000	\$25,444,662	\$52,812,428
ABRY Partners V	Middle	7/29/2005	45,000,000	41,670,955	81,798,412
ABRY Partners VI	Middle	3/26/2008	50,000,000	59,696,320	87,237,589
ABRY Partners VII	Middle	8/10/2011	30,000,000	36,469,526	21,141,049
ABRY Partners VIII	Middle	5/5/2015	25,000,000	17,608,802	1,599,680
2. ABS Capital Partners IV	Growth Equity	10/13/2000	35,000,000	30,984,280	66,247,486
ABS Capital Partners V	Growth Equity	11/14/2005	20,000,000	19,704,037	34,309,702
ABS Capital Partners VI	Growth Equity	3/13/2009	40,000,000	38,672,783	16,671,863
3. Advent Latin American Private Equity Fund IV	Middle	8/2/2007	30,000,000	30,797,073	32,090,921
Advent International GPE VI-A	Large	7/7/2008	35,000,000	34,446,330	46,367,504
Advent Latin American Private Equity Fund V	Middle	5/17/2010	15,000,000	13,342,500	2,520,000
Advent International GPE VII-B	Large	12/6/2012	40,000,000	34,140,000	5,299,752
Advent Latin American Private Equity Fund VI	Middle	5/11/2015	25,000,000	4,662,500	375,000
Advent International GPE VIII-B	Large	9/26/2016	50,000,000	1,050,000	0
4. Alpha Private Equity Fund 4	Small	5/15/2002	26,508,000	35,605,050	77,986,040
Alpha Private Equity Fund 5	Small	4/1/2006	57,796,800	65,860,056	82,402,625
5. APAX Excelsior VI	Small	7/3/2000	35,000,000	34,151,324	56,527,379
APAX Europe V	Mega	4/27/2001	53,262,000	70,406,088	150,017,403
APAX Europe VI	Mega	5/19/2005	76,349,190	76,478,697	132,091,952
APAX Europe VII	Mega	6/27/2007	132,170,235	138,620,555	133,692,573
6. Apollo Investment Fund IV	Mega	9/30/1998	75,000,000	74,838,620	124,814,033
Apollo Investment Fund V	Mega	8/23/2001	50,000,000	44,948,713	122,053,240
Apollo Investment Fund VI	Mega	7/19/2006	40,000,000	38,908,796	52,007,933
7. Asia Alternatives Capital Partners	Fund of Funds	6/26/2007	50,000,000	24,938,888	30,097,366
Asia Alternatives Capital Partners II	Fund of Funds	3/7/2008	50,000,000	27,986,027	17,447,596
Asia Alternatives Korea Buyout Investors (Hahn & Co)	Small	7/22/2011	7,000,000	8,177,183	3,409,593
Asia Alternatives Capital Partners III	Fund of Funds	8/3/2012	50,000,000	44,722,762	14,097,110
Penn Asia Investors	Fund of Funds	9/28/2012	83,000,000	57,303,328	9,049,076
8. Asia Pacific Growth Fund III	Growth Equity	9/28/1999	15,000,000	15,337,963	16,708,736

# 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>
9.	Audax Private Equity Fund	Middle	5/25/2000	\$35,000,000	\$36,839,098	\$55,479,437
	Audax Private Equity Fund II	Middle	6/17/2005	25,000,000	25,517,169	45,110,929
	Audax Private Equity Fund III	Middle	11/7/2007	37,000,000	42,168,137	67,213,704
	Audax Private Equity Fund V	Middle	1/25/2016	50,000,000	4,979,503	0
10.	Bain Capital Fund VII	Mega	7/6/2000	25,000,000	25,000,000	47,998,008
	Bain Capital Fund VIII-E	Mega	12/15/2004	12,144,000	13,502,825	19,631,405
	Bain Capital Fund IX	Mega	4/10/2006	75,000,000	75,863,618	107,099,750
	Bain Capital IX Coinvestment Fund	Mega	4/20/2006	15,000,000	15,618,923	21,797,333
	Bain Capital Asia Fund	Middle	10/18/2007	12,000,000	11,544,001	10,908,405
	Bain Capital Fund X	Mega	1/15/2008	90,000,000	88,333,867	77,349,313
	Bain Capital Europe III	Mega	7/10/2008	72,432,276	66,079,936	86,318,731
	Bain Capital X Coinvestment Fund	Mega	7/28/2008	5,000,000	1,225,000	708,402
11.	Baring India Private Equity Fund III Limited	Small	10/10/2008	5,000,000	5,058,949	2,333,969
12.	Baring Vostok Private Equity Fund IV	Middle	3/10/2008	30,000,000	30,694,840	12,752,395
13.	BC European Capital VII	Large	7/28/2000	32,658,500	37,921,760	96,576,440
	BC European Capital VII Top Up	Large	7/2/2001	10,046,300	12,351,504	32,386,202
	BC European Capital VIII	Large	12/13/2005	98,107,500	97,538,004	104,856,917
	BC European Capital IX	Large	9/16/2011	26,472,535	22,363,035	9,207,653
14.	Berkshire Fund VI	Middle	7/11/2002	20,000,000	18,828,770	40,470,269
	Berkshire Fund VII	Middle	11/15/2006	32,000,000	32,118,432	40,109,246
	Berkshire Fund VIII	Middle	8/25/2011	30,000,000	25,983,772	3,946,324
15.	Blackstone Communications Partners I	Mega	8/29/2000	25,000,000	25,114,042	30,981,079
	Blackstone Capital IV	Mega	2/26/2003	75,000,000	68,934,327	173,015,491
	Blackstone Capital Partners V	Mega	5/30/2006	150,000,000	149,729,848	198,822,317
	Blackstone Capital Partners VII	Mega	*	50,000,000	0	0
16.	Brait IV	Small	12/11/2006	25,000,000	22,188,592	2,873,282
17.	Brynwood Partners V	Small	7/31/2005	10,000,000	10,491,974	18,886,569
	Brynwood Partners VI	Small	10/13/2009	10,000,000	11,062,989	17,388,065
18.	Capvis Equity IV	Middle	1/30/2014	49,855,591	16,324,648	5,742,363
19.	Carlyle Energy Mezzanine Opportunities Fund	Small	9/5/2012	50,000,000	48,569,692	19,509,985
	Horizon Strategic Fund - Carlyle Group	Small	1/23/2014	100,000,000	59,479,896	8,230,928
20.	Charterhouse Capital Partners VII	Middle	1/17/2003	55,482,500	54,972,470	109,645,407
	Charterhouse Capital Partners VIII	Middle	4/19/2006	66,563,400	72,831,664	69,466,398
	Charterhouse Capital Partners IX	Middle	4/28/2009	66,385,000	58,665,385	65,564,824
21.	Chequers Capital XV	Middle	7/5/2006	31,133,996	33,048,083	43,079,896
22.	Clayton Dubilier & Rice VI	Middle	12/31/1998	50,000,000	36,437,713	57,754,625
23.	Clearlake Capital Partners IV	Middle	9/1/2015	15,000,000	7,987,561	179,402

# 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>
24. Clessidra Capital Partners II	Middle	11/5/2008	\$25,631,168	\$17,687,616	\$20,490,598
25. Code Hennessy & Simmons IV	Middle	9/16/1999	100,000,000	100,000,000	156,498,466
Code Hennessy & Simmons V	Middle	11/10/2005	50,000,000	53,837,905	73,697,969
26. Denham Commodity VI	Large	4/20/2012	50,000,000	33,175,107	14,218,001
27. Elevation Partners	Middle	11/10/2005	35,000,000	31,212,376	49,520,850
28. Energy Spectrum Partners V	Small	7/9/2007	30,000,000	27,492,413	51,462,955
29. Eureka II	Growth Equity	1/30/2006	20,000,000	19,322,987	16,811,369
Eureka Growth Capital III	Growth Equity	10/21/2013	20,000,000	8,236,154	8,188,885
30. Excelsior Capital Asia Partners III	Small	8/17/2006	25,000,000	24,958,791	12,595,490
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	37,332,704
First Reserve Fund XII	Mega	11/19/2008	50,000,000	54,635,687	23,916,611
32. Francisco Partners	Middle	7/27/2000	50,000,000	47,828,275	59,477,043
Francisco Partners II	Middle	7/10/2006	30,000,000	28,504,996	35,672,218
Francisco Partners III	Middle	10/17/2011	20,000,000	18,270,000	3,799,238
Francisco Partners IV	Middle	4/15/2015	25,000,000	8,500,000	0
33. FSN Capital IV	Middle	12/19/2013	46,049,703	30,655,921	5,672,225
FSN Capital V	Middle	*	77,189,328	0	0
34. Great Hill Equity Partners II	Middle	3/28/2001	35,000,000	35,063,336	77,605,735
Great Hill Equity Partners III	Middle	3/7/2006	35,000,000	35,000,000	40,355,000
Great Hill Equity Partners IV	Middle	9/8/2008	25,000,000	24,606,912	25,925,662
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 VI	Middle	9/30/1998	50,000,000	50,000,000	43,229,799
GTCR VIII	Middle	7/7/2003	75,000,000	69,393,599	114,671,436
GTCR IX	Middle	12/1/2006	50,000,000	46,666,718	79,736,269
GTCR XI	Middle	9/2/2014	25,000,000	11,187,500	337,977
37. H.I.G. Growth Buyouts & Equity Fund II	Growth Equity	7/20/2011	15,000,000	5,584,431	2,654,945
H.I.G. Europe Capital Partners II	Small	1/10/2014	27,544,596	345,686	0
H.I.G. Brazil and Latin America Partners	Middle	8/12/2015	50,000,000	1,256,862	0
38. Hahn & Company II	Middle	5/29/2015	50,000,000	21,037,815	129
39. Halpern Denny Fund III	Growth Equity	4/26/2000	25,000,000	24,886,871	28,106,844
40. HarbourVest IPEP III	Fund of Funds	6/30/1998	40,000,000	39,400,000	60,470,425
HarbourVest Partners VI	Fund of Funds	5/7/1999	200,000,000	196,586,055	227,369,078
Harbourvest IPEP IV	Fund of Funds	4/9/2001	40,000,000	39,000,000	64,628,560
HarbourVest Partners VII	Fund of Funds	3/24/2003	75,000,000	73,687,500	82,621,687
HIPEP V-Asia Pacific & Rest of World	Fund of Funds	5/9/2006	30,000,000	28,245,316	27,027,474
HarbourVest Partners VIII	Fund of Funds	10/5/2006	100,000,000	97,500,000	82,364,086
Horizon Impact Fund - Harbourvest	Small	10/24/2014	50,000,000	20,799,406	1,874,983

# 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>
41.	Hellman & Friedman Capital Partners V	Large	12/20/2004	\$80,000,000	\$71,563,406	\$191,684,081
	Hellman & Friedman Capital Partners VI	Large	6/5/2007	125,000,000	119,499,471	187,436,259
	Hellman & Friedman Capital Partners VIII	Large	9/1/2016	50,000,000	1,024,742	0
42.	InterMedia Partners VII	Small	1/5/2007	15,000,000	17,745,011	10,807,978
43.	Invemed Catalyst Fund	Small	10/19/1999	25,000,000	14,761,445	11,020,751
44.	J.H. Whitney IV	Small	2/1/2000	20,000,000	17,964,926	7,529,485
	J.H. Whitney VI	Small	1/5/2006	50,000,000	49,616,832	40,539,938
	J.H. Whitney VII	Small	10/12/2010	25,000,000	25,181,826	8,890,170
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	121,989,437
	JMI Equity Fund VI	Growth Equity	6/27/2007	40,000,000	40,000,246	65,090,573
	JMI Equity Fund VII	Growth Equity	2/14/2011	10,000,000	9,780,000	4,631,456
	JMI Equity Fund VIII	Growth Equity	10/1/2015	25,000,000	5,450,000	0
47.	Kelso VII	Middle	10/18/2004	40,000,000	41,169,937	65,656,477
	Kelso VIII	Middle	11/29/2007	150,000,000	143,867,689	88,400,663
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	15,346,695	7,129,953
	Lime Rock Resources	Middle	12/28/2005	20,000,000	19,290,189	25,249,364
	Lime Rock Partners IV	Middle	11/16/2006	25,000,000	27,545,641	15,449,510
	Lime Rock Partners V	Middle	10/2/2008	42,500,000	44,999,890	22,768,943
50.	LLR Equity Partners	Middle	2/4/2000	25,000,000	24,576,062	52,558,191
	LLR Equity Partners II	Middle	1/29/2004	25,000,000	25,000,000	40,501,146
	LLR Equity Partners III	Middle	7/24/2008	30,000,000	29,108,722	26,263,623
	LLR Equity Partners IV	Middle	3/14/2014	50,000,000	30,542,708	3,157,895
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	71,527,448	93,994,766
	Madison Dearborn Capital Partners VI	Middle	5/27/2008	50,000,000	49,693,369	62,832,669
52.	Meridian Venture Partners II	Small	2/11/2005	10,000,000	10,000,000	12,456,671
53.	Motion II B	Middle	11/2/2005	48,204,998	47,639,871	35,073,212
54.	New York Life Capital Partners III	Fund of Funds	6/30/2006	50,000,000	54,801,227	35,204,198
	New York Life Capital Partners IV	Fund of Funds	4/4/2008	50,000,000	54,230,796	58,558,140
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	20,468,750	2,218,985
56.	Nordic Capital V	Middle	5/7/2004	34,996,500	46,006,701	131,273,683
	Nordic Capital VI	Middle	7/25/2006	54,369,000	64,472,507	66,224,992
	Nordic Capital VII	Middle	5/2/2008	92,519,165	97,955,973	33,021,166
57.	Oakhill Capital Partners	Middle	5/17/1999	50,000,000	53,718,802	93,999,577

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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>
58.	OCM/GFI Power Opportunities Fund II	Small	5/9/2005	\$25,000,000	\$13,470,852	\$41,644,215
	Oaktree Power Opportunities Fund III	Middle	10/18/2010	25,000,000	16,537,030	13,173,469
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	25,688,334
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	213,883,495
	Permira IV	Large	12/14/2006	127,779,198	136,060,572	172,856,829
	Permira VI	Large	*	56,202,000	0	0
62.	PNC Equity Partners II	Small	8/30/2007	15,000,000	13,422,972	17,117,700
	Incline Equity Partners III	Small	1/14/2013	15,000,000	10,516,535	7,592,775
63.	Primavera Capital Fund II	Large	11/17/2015	50,000,000	10,700,437	36,336
64.	Providence Equity Partners IV	Large	11/27/2000	25,000,000	23,439,922	55,913,545
	Providence Equity Partners V	Large	4/4/2005	45,000,000	42,681,604	48,063,726
	Providence Equity Partners VI	Large	3/16/2007	50,000,000	53,171,865	46,191,104
	Providence Strategic Growth II	Small	*	60,000,000	0	0
65.	Ridgemont Equity Partners II	Small	11/30/2015	50,000,000	7,991,432	0
66.	Segulah IV	Middle	9/25/2008	16,705,647	16,759,289	9,664,250
67.	Sentinel Capital Partners V	Middle	7/15/2014	10,000,000	4,625,682	162,100
68.	SFC Energy Partners I	Small	7/27/2007	25,000,000	24,921,811	22,575,508
	SFC Energy Partners II	Small	12/19/2011	25,000,000	16,576,240	2,222,349
69.	ShoreView Capital Partners	Small	6/16/2003	38,000,000	32,425,893	53,089,462
	ShoreView Capital Partners II	Small	3/27/2008	40,000,000	38,472,684	50,894,320
70.	Siguler Guff BRIC Opportunities Fund	Fund of Funds	5/8/2006	10,000,000	9,558,299	7,019,332
	Siguler Guff BRIC Opportunities Fund II	Fund of Funds	4/9/2008	25,000,000	24,373,443	9,529,179
71.	Sterling Capital Partners I	Middle	10/31/2002	15,000,000	14,979,168	30,587,922
	Sterling Capital Partners II	Middle	8/18/2005	30,000,000	29,893,709	27,324,339
	Sterling Capital Partners III	Middle	8/13/2007	32,000,000	31,610,435	30,703,208
72.	Sterling Group Partners IV	Middle	6/15/2016	20,000,000	2,508,651	249,324
73.	Summit V	Growth Equity	3/31/1998	37,500,000	36,187,500	49,997,247
	Summit Ventures VI	Growth Equity	3/23/2001	62,000,000	63,914,751	124,366,643
	Summit Partners Private Equity Fund VII	Middle	2/9/2006	97,134,500	97,134,505	116,319,485
74.	TA X	Middle	4/25/2006	70,000,000	69,732,009	84,082,009
75.	Thomas H. Lee Equity Fund VI	Large	11/14/2006	50,000,000	53,636,865	44,809,304

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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>
76.	TPG Partners III	Mega	1/13/2000	\$75,000,000	\$64,119,169	\$165,383,087
	TPG Partners IV	Mega	12/29/2003	30,000,000	27,981,463	55,247,338
	Newbridge Asia IV	Middle	9/27/2005	40,000,000	38,903,378	82,887,170
	TPG Partners V	Mega	6/27/2006	95,756,241	92,531,812	92,327,963
	TPG Asia V	Large	2/19/2008	22,500,000	21,885,033	17,857,487
	TPG Partners VI	Mega	5/22/2008	45,000,000	48,349,980	40,585,817
77.	Vestar Capital Partners III	Middle	6/30/1997	25,000,000	24,362,534	27,746,687
	Vestar Capital Partners IV	Middle	1/25/2000	100,000,000	97,632,498	171,785,140
	Vestar Capital Partners V	Middle	1/25/2006	50,000,000	51,501,157	39,320,063
78.	Vista Equity Partners Fund VI	Large	*	150,000,000	0	0
79.	Weston Presidio III	Growth Equity	12/31/1998	35,000,000	31,989,586	30,705,066
	Weston Presidio IV	Growth Equity	6/21/2000	35,000,000	34,451,015	39,417,544
	Weston Presidio V	Growth Equity	12/8/2005	50,000,000	49,736,928	69,483,635
80.	Yucaipa American Alliance Fund II	Middle	1/13/2009	25,000,000	29,699,340	15,650,108
	<b>Total Active Buyouts</b>			<b>\$8,429,404,403</b>	<b>\$7,295,104,709</b>	<b>\$9,118,798,015</b>

Cash flows as of September 30, 2016.

\*Not funded as of September 30, 2016.

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

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

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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	\$47,390,286
ABRY Senior Equity II	Mezzanine	7/27/2006	30,000,000	28,019,267	43,788,432
ABRY Advanced Securities Fund	Distressed/Restructuring	8/1/2008	25,000,000	23,430,048	38,682,209
2. ADV Opportunities Fund I	Distressed/Restructuring	10/5/2015	50,000,000	26,808,026	(389,528)
3. AG Capital Recovery Partners V	Distressed/Restructuring	4/17/2006	20,000,000	20,000,000	20,922,013
4. Avenue Special Situations Fund IV	Distressed/Restructuring	3/27/2006	50,000,000	50,000,000	68,816,017
Avenue Asia Special Situations Fund IV	Distressed/Restructuring	6/30/2006	50,000,000	31,897,973	28,551,591
Avenue Special Situations Fund V	Distressed/Restructuring	6/4/2007	70,000,000	70,004,050	92,444,416
Avenue Europe Special Situations Fund	Distressed/Restructuring	7/30/2008	38,632,500	25,749,356	37,715,569
Avenue Special Situations Fund VI	Distressed/Restructuring	11/2/2010	20,000,000	20,068,464	13,328,606
5. AXA Secondary Fund III	Secondaries	11/19/2004	26,000,000	21,737,894	35,912,410
AXA Secondary Fund III-2	Secondaries	11/24/2004	14,000,000	11,677,210	18,320,851
AXA Secondary Fund IV	Secondaries	2/26/2007	80,000,000	69,800,706	79,125,243
AXA Secondary Fund V B	Secondaries	6/19/2012	75,000,000	59,396,383	42,715,532
ASF VII B	Secondaries	2/19/2016	100,000,000	8,035,971	(159,597)
ASF VII PA Co-Invest	Secondaries	5/18/2016	50,000,000	5,000	0
6. Centerbridge Capital Partners I	Distressed/Restructuring	2/27/2007	50,000,000	56,623,951	94,381,249
Centerbridge Capital Partners III	Distressed/Restructuring	5/21/2015	30,000,000	7,988,338	316,253
7. Cerberus Institutional Partners	Distressed/Restructuring	3/5/1999	35,000,000	35,000,000	79,906,454
Cerberus Institutional Partners Series Two	Distressed/Restructuring	10/9/2001	35,000,000	30,100,793	93,674,154
Cerberus Institutional Partners Series Three	Distressed/Restructuring	11/13/2003	35,000,000	22,321,354	46,873,421
Cerberus Institutional Partners Series Four	Distressed/Restructuring	11/27/2006	75,000,000	69,258,215	83,183,729
8. CVI Global Value Fund	Distressed/Restructuring	2/23/2007	60,000,000	57,151,667	79,498,461

# 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>
9. Dover Street VII	Secondaries	7/2/2008	\$30,000,000	\$28,745,287	\$32,097,671
10. H.I.G. Bayside Debt & LBO Fund II	Distressed/Restructuring	6/17/2008	30,000,000	30,010,001	21,600,649
H.I.G. Bayside Loan Opp. Fund III	Distressed/Restructuring	6/12/2013	50,000,000	26,940,680	6,165,019
H.I.G. Bayside Loan Opp. Fund IV	Distressed/Restructuring	1/16/2015	25,000,000	5,698,483	2,760,382
11. JP Morgan U.S. Corp Finance Investors II	Distressed/Restructuring	1/14/2003	50,000,000	53,232,339	77,920,802
12. KPS Special Situations Fund IV	Distressed/Restructuring	5/8/2014	25,000,000	4,273,007	3,379,367
13. Landmark Equity IV	Secondaries	3/31/1995	14,923,291	12,495,850	18,728,790
Landmark Equity Partners V	Secondaries	12/31/1995	19,624,113	19,434,947	23,521,627
14. LBC Credit Partners III	Mezzanine	3/4/2013	50,000,000	47,004,932	25,439,119
15. Lexington Capital Partners II	Secondaries	6/30/1998	40,000,000	39,538,000	52,511,592
Lexington Capital Partners III	Secondaries	1/26/1999	35,000,000	34,516,449	43,363,378
Lexington Capital Partners V	Secondaries	1/17/2002	75,000,000	74,623,418	121,050,013
Lexington Capital Partners VI	Secondaries	10/21/2005	50,000,000	53,066,325	57,412,866
16. Matlin Patterson Global Opportunities Partners II	Distressed/Restructuring	6/30/2004	30,000,000	30,410,597	10,578,309
17. OCM Opportunities Fund III	Distressed/Restructuring	1/20/2000	60,000,000	60,007,890	89,378,449
OCM Principal Opportunities II	Distressed/Restructuring	4/24/2001	25,000,000	25,000,000	43,894,166
OCM Opportunities Fund IV	Distressed/Restructuring	9/26/2001	70,000,000	70,000,000	115,463,024
Oaktree Capital Management	Distressed/Restructuring	5/28/2004	40,000,000	40,581,778	110,121,820
OCM Opportunities Fund V	Distressed/Restructuring	8/12/2004	40,000,000	40,003,507	64,752,116
OCM Opportunities Fund VI	Distressed/Restructuring	9/28/2005	40,000,000	40,000,000	61,619,202
OCM Principal Opportunities Fund IV	Distressed/Restructuring	1/24/2007	20,000,000	20,400,000	24,556,516
OCM Opportunities Fund VII	Distressed/Restructuring	5/16/2007	40,000,000	40,000,000	50,516,068
OCM Opportunities Fund VIIb	Distressed/Restructuring	6/3/2008	40,000,000	36,000,000	57,846,712
OCM Opportunities Fund VIII	Distressed/Restructuring	9/20/2010	12,500,000	12,583,425	12,078,721
OCM Opportunities Fund VIIIb	Distressed/Restructuring	8/22/2011	12,500,000	12,500,000	4,953,369
Oaktree Opportunities Fund IX	Distressed/Restructuring	3/26/2013	50,000,000	50,000,000	0



# 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>
18. Platinum Equity Capital Partners III	Distressed/Restructuring	8/5/2013	\$50,000,000	\$40,327,571	\$31,321,510
Platinum Equity Capital Partners IV	Distressed/Restructuring	*	100,000,000	0	0
19. RRJ Capital Master Fund III	Growth Equity	12/10/2015	50,000,000	3,688,889	0
20. Sankaty Credit Opportunities III	Distressed/Restructuring	3/8/2007	50,000,000	50,000,000	46,526,866
Sankaty Credit Opportunities IV	Distressed/Restructuring	7/15/2008	40,000,000	38,000,000	48,313,505
21. Templeton Strategic Emerging Markets Fund III	Distressed/Restructuring	5/29/2009	100,000,000	95,482,762	38,536,354
22. Versa Capital Partners	Distressed/Restructuring	10/16/2005	20,000,000	23,611,753	15,988,714
Versa Capital Partners II	Distressed/Restructuring	7/31/2008	15,000,000	15,754,364	5,867,313
23. W Capital Partners II	Secondaries	8/8/2007	40,000,000	39,034,444	42,874,012
<b>Total Active Special Situations</b>			<b>\$2,488,179,904</b>	<b>\$1,984,772,551</b>	<b>\$2,406,135,792</b>

Cash flows as of September 30, 2016.

\*Not funded as of September 30, 2016.

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

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

# 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	\$23,353,836
Abingworth Bioventures V	Balanced	1/23/2007	33,775,000	28,200,224	36,338,542
2. Accel Europe	Early Stage	7/2/2001	15,000,000	11,350,000	13,250,330
3. Adams Capital Management III	Early Stage	11/21/2000	30,000,000	30,000,000	7,011,905
4. Advanced Technology Ventures VI	Balanced	3/9/2000	10,000,000	10,000,000	4,320,705
Advanced Technology Ventures VII	Balanced	7/11/2001	27,000,000	27,000,000	27,000,001
5. Alloy Ventures 2000	Early Stage	5/19/2000	20,000,000	20,000,000	5,125,846
Alloy Ventures 2002	Early Stage	7/22/2002	25,000,000	25,000,000	15,448,474
Alloy Annex I	Early Stage	10/31/2003	5,000,000	5,000,000	1,271,247
Alloy Ventures 2005	Early Stage	8/11/2005	25,000,000	25,000,000	8,492,217
6. APEX Investment Fund V	Early Stage	4/19/2002	20,000,000	20,651,307	7,429,304
7. Artiman Ventures II	Early Stage	10/27/2006	25,000,000	25,000,000	13,141,575
Artiman Ventures III	Early Stage	8/9/2010	20,000,000	17,810,000	0
8. Atlas Venture Fund VI	Early Stage	8/1/2001	24,800,000	24,800,000	12,864,773
9. Austin Ventures VIII	Balanced	7/26/2001	20,932,140	21,100,362	33,669,094
Austin Ventures IX	Balanced	1/9/2006	15,000,000	15,127,754	16,396,495
10. Battery Ventures VIII	Balanced	8/13/2007	25,000,000	24,748,251	44,383,691
Battery Ventures VIII Side Car Fund	Balanced	8/29/2008	9,000,000	6,690,210	17,412,210
11. Birchmere Ventures III	Early Stage	5/5/2005	10,000,000	10,407,708	8,692,184
12. Care Capital Investments III	Balanced	2/8/2006	25,000,000	23,017,590	5,610,747
13. Charles River Partnership XI	Early Stage	2/15/2001	11,032,259	11,032,259	14,422,548
14. CID Greater China Venture Capital Fund II	Balanced	8/10/2007	20,000,000	18,420,000	18,303,137
15. Clearstone Venture Partners III-A	Early Stage	12/22/2004	25,000,000	24,250,000	12,828,843
16. Cross Atlantic Technology Fund	Balanced	2/14/2000	20,000,000	20,149,041	23,742,240
Cross Atlantic Technology Fund II	Balanced	1/28/2002	32,900,000	32,900,000	32,507,568
17. Devon Park Bioventures	Balanced	12/15/2006	10,842,697	9,589,743	23,545,999
18. Draper Fisher Jurvetson Fund VI	Early Stage	8/13/1999	8,000,000	8,000,000	5,347,835
Draper Fisher Jurvetson Fund VII	Early Stage	9/22/2000	20,000,000	20,000,000	9,344,854
19. Draper Triangle Ventures	Early Stage	12/20/1999	20,000,000	20,708,909	11,357,493
Draper Triangle Ventures II	Early Stage	10/13/2004	12,000,000	13,196,647	12,759,958
Draper Triangle Ventures III	Early Stage	1/28/2015	10,000,000	4,515,303	0
20. Fairview Capital	Fund of Funds	9/30/1994	10,000,000	10,000,000	4,543,128
Fairview II	Fund of Funds	3/31/1998	10,000,000	9,870,000	4,028,770

# 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	\$12,700,255
Frazier Healthcare IV	Balanced	9/27/2001	30,000,000	29,820,000	24,821,191
Frazier Healthcare V	Balanced	5/10/2005	30,000,000	29,625,000	40,668,626
22. Guggenheim Technology Ventures I	Early Stage	11/17/2008	2,000,000	2,000,000	585,422
23. Healthcare Ventures V	Early Stage	12/31/1997	25,000,000	25,000,000	52,714,973
Healthcare Ventures VI	Early Stage	6/19/2000	35,000,000	35,000,000	4,722,059
Healthcare Ventures VII	Early Stage	10/29/2002	35,000,000	35,000,000	16,404,798
Healthcare Ventures VIII	Early Stage	8/22/2005	30,000,000	29,775,000	15,913,398
24. Highland Capital Partners VI	Early Stage	10/25/2001	25,000,000	25,000,000	35,781,431
Highland Capital Partners VII	Early Stage	10/13/2006	35,000,000	35,001,991	27,335,325
Highland Consumer Fund I	Early Stage	5/4/2007	25,000,000	24,263,199	7,358,806
25. IP II	Balanced	12/17/2001	8,600,000	8,584,073	2,799,296
IP III	Balanced	11/19/2004	10,500,000	9,555,000	12,920,296
IP IV	Balanced	9/21/2007	14,000,000	13,300,000	10,671,872
26. Insight Venture Partners VI	Balanced	8/21/2007	30,000,000	32,244,176	59,033,977
Insight Venture Partners VII	Balanced	4/27/2011	20,000,000	20,781,133	12,590,034
Insight Venture Partners VIII	Balanced	7/10/2013	50,000,000	49,100,000	3,449,743
Insight Venture Partners IX	Balanced	3/24/2015	50,000,000	24,000,000	36,562
27. InterWest Partners VIII	Early Stage	8/25/2000	25,000,000	25,000,000	11,786,981
InterWest Partners IX	Balanced	10/19/2005	20,000,000	20,000,000	19,192,552
InterWest Partners X	Balanced	10/30/2008	30,000,000	27,000,000	2,300,138
28. JP Morgan Venture Capital Investors	Fund of Funds	7/8/1999	100,000,000	107,875,494	69,598,840
JP Morgan Venture Capital Investors II	Fund of Funds	9/8/2000	100,000,000	112,179,832	110,474,398
JP Morgan Venture Capital Investors III	Fund of Funds	6/20/2006	100,000,000	109,799,209	70,596,060
29. Kline Hawkes Pacific	Balanced	8/30/2000	15,000,000	15,100,498	7,024,260
30. Knightsbridge Venture Capital VI	Fund of Funds	12/7/2004	20,000,000	18,266,667	11,273,946
31. Lightspeed Venture Partners VII	Early Stage	2/27/2006	18,000,000	17,737,490	6,660,237
Lightspeed Venture Partners VIII	Early Stage	6/27/2008	15,000,000	14,400,000	17,020,129
Lightspeed India Partners I	Early Stage	8/14/2015	15,000,000	5,100,000	0
32. Media/Communications Ventures Fund V	Growth Equity	9/27/2000	35,000,000	34,812,205	56,014,639
33. Meritech Capital Partners II	Late Stage	1/2/2001	26,475,166	24,842,529	37,926,932
Meritech Capital Partners III	Late Stage	4/5/2006	35,000,000	34,475,000	177,406,870
Meritech Capital Partners IV	Late Stage	2/10/2011	20,000,000	18,700,000	9,325,898
Meritech Capital Partners V	Late Stage	9/3/2014	23,000,000	8,797,500	0
34. Morgenthaler Partners VII	Balanced	7/26/2001	35,000,000	35,143,798	28,717,913
Morgenthaler Partners VIII	Balanced	10/3/2005	35,000,000	35,957,046	37,466,826
Morgenthaler Partners IX	Balanced	11/25/2008	20,000,000	19,200,000	27,486,796

# 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.	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
36.	New Enterprise Associates VII	Early Stage	12/31/1996	30,000,000	30,000,000	102,186,705
	New Enterprise Associates IX	Early Stage	11/15/1999	20,000,000	19,600,000	6,787,262
	New Enterprise Associates X	Early Stage	12/11/2000	35,000,000	35,028,000	32,493,542
	New Enterprise Associates 11	Early Stage	3/1/2004	25,000,000	25,000,000	53,030,687
	New Enterprise Associates 12	Early Stage	6/26/2006	35,000,000	35,631,130	39,693,167
37.	Novitas Capital III	Early Stage	4/17/2003	10,000,000	9,925,000	3,924,047
38.	Oak Investment Partners XI	Late Stage	7/21/2004	35,000,000	34,989,508	15,565,248
	Oak Investment Partners XII	Late Stage	7/10/2006	40,000,000	39,968,468	28,154,258
39.	Pitango Venture Capital Fund IV	Early Stage	7/19/2004	20,000,000	20,001,534	9,809,664
	Pitango Venture Capital Fund V	Early Stage	8/22/2007	30,000,000	28,163,295	16,866,840
40.	Polaris Venture Partners II	Balanced	9/30/1998	25,000,000	24,750,000	40,761,283
	Polaris Venture Partners III	Balanced	1/21/2000	50,000,000	49,500,000	30,006,909
	Polaris Venture Partners IV	Balanced	9/30/2002	50,000,000	49,750,000	38,429,448
	Polaris Venture Partners V	Balanced	8/8/2006	50,000,000	49,000,000	33,243,318
41.	Quaker BioVentures	Balanced	2/20/2003	20,000,000	20,000,000	5,472,501
	Quaker BioVentures II	Balanced	4/3/2007	25,000,000	23,250,000	14,298,256
42.	SCP Private Equity Partners II	Late Stage	6/15/2000	25,000,000	25,000,000	7,843,446
43.	Sofinnova Venture Partners VII	Early Stage	1/18/2007	20,000,000	20,000,000	26,736,522
44.	Summit Accelerator Fund	Early Stage	11/15/1999	8,000,000	7,609,500	13,302,985
	Summit Partners Venture Capital Fund II	Early Stage	9/22/2006	15,000,000	15,823,703	27,059,160
45.	T.Rowe Price Stock Distribution Account <sup>3/</sup>	Late Stage	1/3/2005		See Footnote	
46.	Three Arch Capital	Balanced	12/20/2000	20,000,000	19,500,000	16,008,488
	Three Arch Partners IV	Balanced	6/4/2004	20,000,000	19,050,000	18,242,900
47.	TL Ventures IV	Early Stage	5/13/1999	35,000,000	35,000,000	25,582,809
	TL Ventures V	Early Stage	10/18/2000	40,000,000	40,048,219	16,100,247
48.	US Venture Partners VII	Balanced	2/18/2000	13,750,000	13,750,000	4,800,279
	US Venture Partners VIII	Early Stage	6/1/2001	26,250,000	25,830,000	30,849,103
49.	Weathergag Venture Capital	Fund of Funds	6/26/2007	25,000,000	22,875,000	18,431,174
	Weathergag Venture Capital II	Fund of Funds	6/29/2010	25,000,000	22,750,000	4,358,292

# 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	\$7,034,048
<b>Total Active Venture Capital</b>			<b>\$2,636,495,593</b>	<b>\$2,572,321,671</b>	<b>\$2,251,511,936</b>

Cash flows as of September 30, 2016.

\*Not funded as of September 30, 2016.

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

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

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

# 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 12/31/16 <sup>4/</sup> (\$ millions)
<b>Global Mandates</b>		
1. Walter Scott & Partners Limited	Growth	\$687.5
<b>Total Global Mandates</b>		<b>687.5</b>
<b>U.S. Equity</b>		
2. Emerald Advisers	Small-cap growth	504.7
3. Iridian Asset Management	Mid-cap private business value	394.2
4. Mellon Capital Management Russell 1000 Index	Russell 1000 Index	4,603.0
Mellon Capital Management Russell 2000 Core	Russell 2000 Core	272.2
Mellon Capital Management Russell 2000 Value	Russell 2000 Value	541.5
<b>Total U.S. Equity</b>		<b>6,315.6</b>
<b>Non-U.S. Developed Markets Equity</b>		
5. Artisan Partners - Global ex U.S.	Global ex-U.S. growth	363.8
6. Harris Associates	Small-cap intrinsic value	493.8
Mellon Capital Management MSCI World ex U.S. Index	MSCI World ex-U.S. Index	2,596.8
7. Morgan Stanley Investment Management Limited-developed ex U.S.	EAFE value	379.0
8. Templeton Investment Counsel - Global ex U.S.	Global ex-U.S. value	550.8
<b>Total Non-U.S. Developed Markets Equity</b>		<b>4,384.2</b>
<b>Emerging Markets Equity</b>		
9. Ashmore EMM	Small-cap value	121.3
10. BlackRock/Emerging Markets Index Non-Lendable Fund	MSCI Emerging Markets Index	135.2
11. Delaware Investment Advisers	Mid/large cap value	241.5
12. GlobeFlex Capital	Small-cap - GARP	74.1
13. Martin Currie Investment Management	All-cap	229.0
<b>Total Emerging Markets Equity</b>		<b>801.1</b>
<b>Transition Assets</b>		
14. Northern Trust	Transition	0.2
<b>Total Transition Assets</b>		<b>0.2</b>
<b>Total Global Public Equity</b>		<b>\$12,188.6</b>

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

# 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 Fund Index - Open End Diversified Core Equity, S&P Developed Market Property Index for REITs, & CPI plus a 3% premium for Timber and Agriculture, with the various components weighted according to long-term allocation targets within the asset class), over a three- to five-year period.

#### Real Estate

as of December 31, 2016

Sub-Asset Class	Fair Value (\$ millions)	% of Total Fund
Core Real Estate	\$325.3	1.2%
Non-Core Real Estate <sup>1/</sup>	511.4	2.0
Separate Accounts	1,082.4	4.1
Timberland	153.2	0.6
REITs	239.5	0.9
<b>Total Real Estate</b>	<b>\$2,311.8</b>	<b>8.8%</b>

<sup>1/</sup>As of September 30, 2016, unfunded commitments are \$173.3 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 Real Estate</b>					
1. Heitman America Real Estate Trust	Diversified	2007	\$100,000,000	\$140,702,747	\$40,702,747
2. UBS Trumbull Property Fund	Diversified	1988	25,558,525	25,558,525	66,185,346
UBS Trumbull Property Income Fund	Diversified	1988	33,332,027	33,332,027	86,625,792
<b>Total Core Real Estate</b>			<b>158,890,552</b>	<b>199,593,299</b>	<b>193,513,885</b>
<b>Non-Core Real Estate</b>					
3. AG Asia Realty Fund	Diversified	2007	25,000,000	23,500,000	20,812,500
4. Apollo Real Estate Fund III	Diversified	1998	50,000,000	52,456,214	77,266,237
5. Berwind Investment Partnership V	Diversified	1999	25,000,000	26,809,652	45,513,547
Berwind Investment Partnership VI	Diversified	2002	25,000,000	24,543,712	39,054,058
Berwind Investment Partnership VII	Diversified	2005	25,000,000	25,000,000	2,320,250
Berwind Investment Partnership VIII	Diversified	2007	15,588,238	14,912,018	8,531,721
Berwind Investment Partnership IX	Diversified	2012	25,000,000	32,579,587	19,192,370
6. Blackstone Real Estate Partners IV	Diversified	2003	25,000,000	33,958,442	42,860,641
Blackstone Real Estate Partners V	Diversified	2006	50,000,000	58,307,184	83,883,467
Blackstone Real Estate Partners VI	Diversified	2007	75,000,000	83,702,435	119,891,906
Blackstone Real Estate Partners VII	Diversified	2011	75,000,000	89,413,797	61,458,726
7. Clerestory Small Cap Fund I	Diversified	2010	18,000,000	15,856,712	10,290,687
8. Colony Investors VIII	Diversified	2007	22,500,000	23,905,943	6,692,995
9. Fidelity Real Estate Opportunistic Income Fund <sup>2/</sup>	Debt	2007	35,000,000	35,000,000	-
10. Fillmore West Fund	Diversified	2008	30,000,000	35,374,912	22,343,820
11. Hawkeye Scout Fund I	Diversified	2009	75,000,000	78,038,821	118,663,120
Hawkeye Scout Fund II	Diversified	2016	30,000,000	1,371,009	0
12. LEM Real Estate High-Yield Debt Fund III	Debt	2013	25,000,000	25,000,000	7,694,491
13. Lubert Adler Fund III	Diversified	2000	30,000,000	30,000,000	45,442,098
Lubert Adler Fund IV	Diversified	2004	25,000,000	26,500,000	14,042,774
Lubert Adler Fund V	Diversified	2006	30,000,000	30,621,958	5,187,176
Lubert Adler Fund VI	Diversified	2008	21,945,337	19,880,760	13,771,441
Lubert Adler Fund VI-A	Diversified	2010	3,054,663	3,869,240	5,622,604
Lubert Adler Fund VII	Diversified	2014	25,000,000	17,500,000	0

# 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>Non-Core Real Estate (continued)</b>					
14. OCM Real Estate Opp Fund III	Diversified	2003	\$25,000,000	\$25,000,000	\$41,778,732
15. Oxford GSA Fund	Diversified	2006	21,369,627	27,205,500	24,220,211
16. Prudential Latin America Retail Fund I	Retail	2006	25,000,000	28,906,216	34,797,726
Prudential Latin America Residential Fund III	Multi-Family	2008	29,654,968	24,708,749	10,712,767
Prudential Senior Housing Fund III	Senior Housing	2006	35,000,000	36,412,463	60,702,700
Prudential Senior Housing Fund IV	Senior Housing	2011	25,000,000	23,806,811	9,687,513
Prudential Senior Housing Fund V	Senior Housing	2015	50,000,000	11,729,280	0
17. Rockpoint Finance Fund I	Residential Land	2007	50,000,000	4,399,572	1,566,309
Rockpoint Real Estate Fund I	Diversified	2004	25,000,000	25,772,035	31,379,795
Rockpoint Real Estate Fund II	Diversified	2005	35,000,000	37,383,717	27,825,949
Rockpoint Real Estate Fund III	Diversified	2007	50,000,000	50,294,970	63,450,795
Rockpoint Real Estate Fund V	Diversified	2015	50,000,000	7,973,880	134,526
18. Starwood Fund IV	Diversified	1997	37,750,000	37,750,000	81,363,493
Starwood Fund VI	Diversified	2001	50,000,000	50,153,525	37,655,142
Starwood Fund VII	Diversified	2006	35,000,000	35,000,000	15,386,983
Starwood Fund VIII	Diversified	2009	50,000,000	52,975,073	64,232,031
19. ValStone Opportunity Fund V	Diversified	2014	14,663,402	17,511,819	5,304,760
20. Westbrook Fund V	Diversified	2004	25,000,000	27,071,162	44,485,779
Westbrook Fund VI	Diversified	2006	35,000,000	43,154,659	34,568,680
Westbrook Fund VII	Diversified	2007	50,000,000	55,521,338	48,090,909
Westbrook Fund VIII	Diversified	2009	50,000,000	59,326,620	67,808,262
<b>Total Non-Core Real Estate</b>			<b>1,554,526,235</b>	<b>1,490,159,785</b>	<b>1,475,689,691</b>
<b>Separate Accounts<sup>3/</sup></b>					
Heitman I.M.A.	Diversified	1988	N/A	919,055,486	1,194,474,873
21. LaSalle I.M.A.	Diversified	1994	N/A	801,764,412	964,822,922
22. Lowe I.M.A.	Diversified	1994	N/A	1,240,387,758	1,331,415,240
Lowe GTO	Diversified	2012	N/A	368,869,212	222,770,000
<b>Total Separate Accounts</b>				<b>3,330,076,868</b>	<b>3,713,483,035</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>Timberland<sup>3/</sup></b>					
23. Forest I.M.A.	Timberland	1992	N/A	\$124,231,969	\$108,472,772
<b>Total Timberland</b>				<b>124,231,969</b>	<b>108,472,772</b>
<b>REITs<sup>3/</sup></b>					
24. CBRE Clarion Real Estate Securities	Diversified	1996	N/A	273,206,464	611,774,297
25. CenterSquare Real Estate Securities	Diversified	2002	N/A	26,197,305	36,082,862
<b>Total REITs</b>				<b>299,403,769</b>	<b>647,857,159</b>
<b>Total Real Estate</b>			<b>\$1,713,416,787</b>	<b>\$5,443,465,690</b>	<b>\$6,139,016,542</b>

Cash flows as of September 30, 2016.

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

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

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

# SERS FUND

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## Investment Program | Portfolio Snapshot | Hedge Funds

### Role in the SERS Fund

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

### Program Structure

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

### Objective

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

# SERS FUND

## Investment Program | Portfolio Snapshot | Hedge Funds

### Hedge Funds

Manager	Investment Style	Market Exposure as of 12/31/16 <sup>4/</sup> (\$ millions)
<b>Funds-of-Hedge Funds</b>		
1. Arden Keystone	Fund-of-Funds	\$149.7
2. Blackstone Keystone	Fund-of-Funds	1,041.6
3. Entrust Keystone	Fund-of-Funds	308.8
<b>Total Hedged Strategies</b>		<b>1,500.1</b>
<b>Absolute Return Strategies</b>		
Arden	Fund-of-Funds	20.3
Blackstone - Stable Alpha	Fund-of-Funds	23.3
4. Mesirow Financial	Fund-of-Funds	13.7
5. Morgan Stanley Alternative Investment Partners	Fund-of-Funds	8.4
6. PAAMCO	Fund-of-Funds	8.1
7. Robeco Investment	Fund-of-Funds	0.3
8. Rock Creek	Fund-of-Funds	2.7
<b>Total Absolute Return Strategies</b>		<b>76.8</b>
<b>Direct Investments</b>		
9. Hoplite Partners	Direct Hedge Fund	21.1
10. Luxor Capital Partners	Direct Hedge Fund	15.7
11. MKP Opportunity Fund	Direct Hedge Fund	15.4
12. Pine River Fund	Direct Hedge Fund	20.7
13. Samlyn Onshore Fund	Direct Hedge Fund	15.9
14. Stelliam Fund	Direct Hedge Fund	16.1
<b>Total Direct Investments</b>		<b>104.9</b>
<b>Commodities</b>		
BAAM Commodities	Commodities	364.7
<b>Total Commodities</b>		<b>364.7</b>
<b>Total Hedge Funds</b>		<b>\$2,046.5</b>

<sup>4/</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 U.S. Aggregate Bond Index, over a three- to five-year period.

# SERS FUND

## Investment Program | Portfolio Snapshot | Fixed Income

### Fixed Income

Manager	Investment Style	Market Exposure as of 12/31/16 <sup>4/</sup> (\$ millions)
<b>Core Plus Fixed Income</b>		
1. Brandywine Global	Global Sovereign Credit	\$175.3
2. Harvest Fund MLP	Energy Infrastructure	136.6
3. Kayne Anderson MLP	Energy Infrastructure	121.9
4. PIMCO EMD	Emerging Market Debt (liquidating)	0.1
5. Pyramis Global Advisors	Commercial Mortgage-Backed Securities	291.3
6. SEI Structured Credit Fund	High Yield Bank Loans	272.8
7. Stone Harbor	Emerging Market Debt	138.3
Stone Harbor	Global High Yield	175.5
8. W.R. Huff	High Yield (liquidating)	9.8
9. Waterfall Asset Management	Asset-Backed Securities	177.1
<b>Total Core Plus</b>		<b>1,498.7</b>
<b>Core Fixed Income</b>		
10. MacKay Shields Core	Bloomberg Aggregate	192.3
11. Mellon Capital Management	Bloomberg Aggregate	428.0
PIMCO Core	Bloomberg Aggregate ex. Treasuries	243.2
12. Taplin, Canida & Habacht (TCH)	U.S. Credit	173.9
13. UBS Core Bond	Bloomberg Aggregate	101.3
<b>Total Core</b>		<b>1,138.7</b>
<b>Global Treasury Inflation Protected Securities (TIPS)</b>		
14. Brown Brothers Harriman	Global TIPS	210.5
15. New Century Advisors	Global TIPS	106.1
16. NISA Investment Advisors	U.S. TIPS	472.8
<b>Total Global Treasury Inflation Protected Securities (TIPS)</b>		<b>789.4</b>
<b>Nominal U.S. Treasuries</b>		
PIMCO U.S. Treasuries	Domestic Treasuries	269.9
17. Wellington U.S. Treasuries	Domestic Treasuries	263.5
<b>Total Nominal U.S. Treasuries</b>		<b>533.4</b>
<b>Short-Term Notes</b>		
18. PNC Short Duration	Short Duration Government Credit	236.4
19. StoneRidge Short Duration	Short Duration Government Credit	119.0
<b>Total Short-Term Notes</b>		<b>355.4</b>
<b>Total Fixed Income</b>		<b>\$4,315.6</b>

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

# 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 12/31/16 <sup>4/</sup> (\$ millions)
<b>Cash</b>		
1. PA State Treasury (STIF)	Cash	\$1,302.6
<b>Total Cash</b>		<b>1,302.6</b>
<b>Liquidate Holdings</b>		
Liquidate Holdings	Securities to be Liquidated	0.1
<b>Total Liquidate Holdings</b>		<b>0.1</b>
<b>Total Cash</b>		<b>\$1,302.7</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 December 2016. 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, 2016, was approximately \$587.3 million, or 2.2% of the SERS Fund.

### Pennsylvania Investments by Asset Class

(\$ millions)

Asset Class	Total PA Fair Value
Private Equity	\$102.0
Global Public Equity	301.2
Real Estate	158.2
Fixed Income	25.9
<b>Total Pennsylvania Investments</b>	<b>\$587.3</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 buyout, 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, 2016, SERS active Private Equity managers held investments in 82 Pennsylvania-based companies. SERS pro-rata investment value in these companies is approximately \$102.0 million. This equates to 2.5% 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 256 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 \$301.2 million invested in stocks of Pennsylvania-based companies, as of December 31, 2016. These securities are held in SERS various externally managed global public equity portfolios.

### Pennsylvania Investments - Global Public Equity

(\$ millions)

Manager	Fair Value
Emerald Advisers	\$97.1
Iridian Asset Management	23.8
Mellon Capital Management	176.6
Martin Currie Investment Management	3.7
<b>Total Pennsylvania Investments - Global Public Equity</b>	<b>\$301.2</b>

### Pennsylvania Based Companies Top 10 Public Equity Positions

As of December 31, 2016

Air Products & Chemicals, Inc.
Axalta Coating Systems Ltd.
CNB Financial Corporation
Comcast Corporation
Entercom Communications Corp.
EPAM Systems, Inc.
Knoll, Inc.
Sunoco Logistics Partners L.P.
The Kraft Heinz Company
The PNC Financial Services Group, Inc.

# SERS FUND

## Investment Program | Pennsylvania Investments

### Fixed Income

SERS had approximately \$25.9 million invested in fixed income securities issued by Pennsylvania-based companies, as of December 31, 2016. These securities are held in SERS various externally managed bond portfolios.

SERS has approximately \$1.3 billion invested in the Pennsylvania Treasury Department's short-term investment pool.

### Pennsylvania Investments - Fixed Income

(\$ millions)

Manager	Fair Value
Pyramis Global Advisors	\$7.8
Stone Harbor	1.0
Harvest Fund MLP	11.9
Mellon Capital Management	1.9
MacKay Shields Core	2.1
UBS Core Bond	1.2
<b>Total Pennsylvania Investments - Fixed Income</b>	<b>\$25.9</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, 2016, the SERS real estate portfolio contained 40 Pennsylvania investments totaling 2.3 million square feet of office, retail, and warehouse space, as well as, 3,860 apartment, hotel, and senior housing units and 578,597 square feet of self-storage, representing 4,749 units.

The gross fair value of the Pennsylvania real estate portfolio investments totaled \$1.5 billion, of which SERS ownership share was \$158.2 million.

# **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, 2016:

Firm	Status	SERS Assets Under Management
GlobeFlex Capital	Minority/Woman-Owned	\$74 million market value
New Century Advisors	Woman-Owned	\$106 million market value
StoneRidge Investment Partners	Minority/Woman-Owned	\$119 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, 2016:

Firm	Status	SERS Committed Capital
Asia Alternatives Capital Partners	Minority/Woman-Owned	\$157 million
Avenue Capital Group	Woman-Owned	\$229 million
Clearlake Capital Partners	Minority-Owned	\$15 million
Fairview Capital Partners	Minority/Woman-Owned	\$20 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 2016.

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 \$251,923 for the year. It is estimated this year that SERS U.S. equity managers directed 3% of their trades through minority/woman-owned brokerage firms. Fixed Income managers traded a combined \$41.7 million of securities through minority/woman-owned brokerage firms.

Firm	Minority/ Woman-Owned Commissions
C.L. King Directed	\$48,900
CV Brokerage	7,564
Drexel Hamilton	20,909
Greentree Brokerage	43,312
Loop Capital	7,924
M R King Securities	19,285
M. Ramsey King	4,152
Mischler Direct	10,771
North South Capital	1,246
Spear Leeds & Kellogg	6,316
Sturdivant & Company	38,843
Susquehanna Direct	869
Telsey Advisory	26,651
Valdes & Moreno	14,745
Williams	436
<b>Total Minority/Woman-Owned Commissions</b>	<b>\$251,923</b>

# Deferred Compensation Program

# DEFERRED COMPENSATION PROGRAM

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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 deferred compensation program (DCP).

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

### DCP History

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

DCP 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 DCP. Responsibilities of the third-party administrator include, but are not limited to, marketing DCP, 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 DCP is extremely low and is borne solely by participants, using no commonwealth funds.

In 2012, DCP 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.



# DEFERRED COMPENSATION PROGRAM

## History, Growth & Highlights

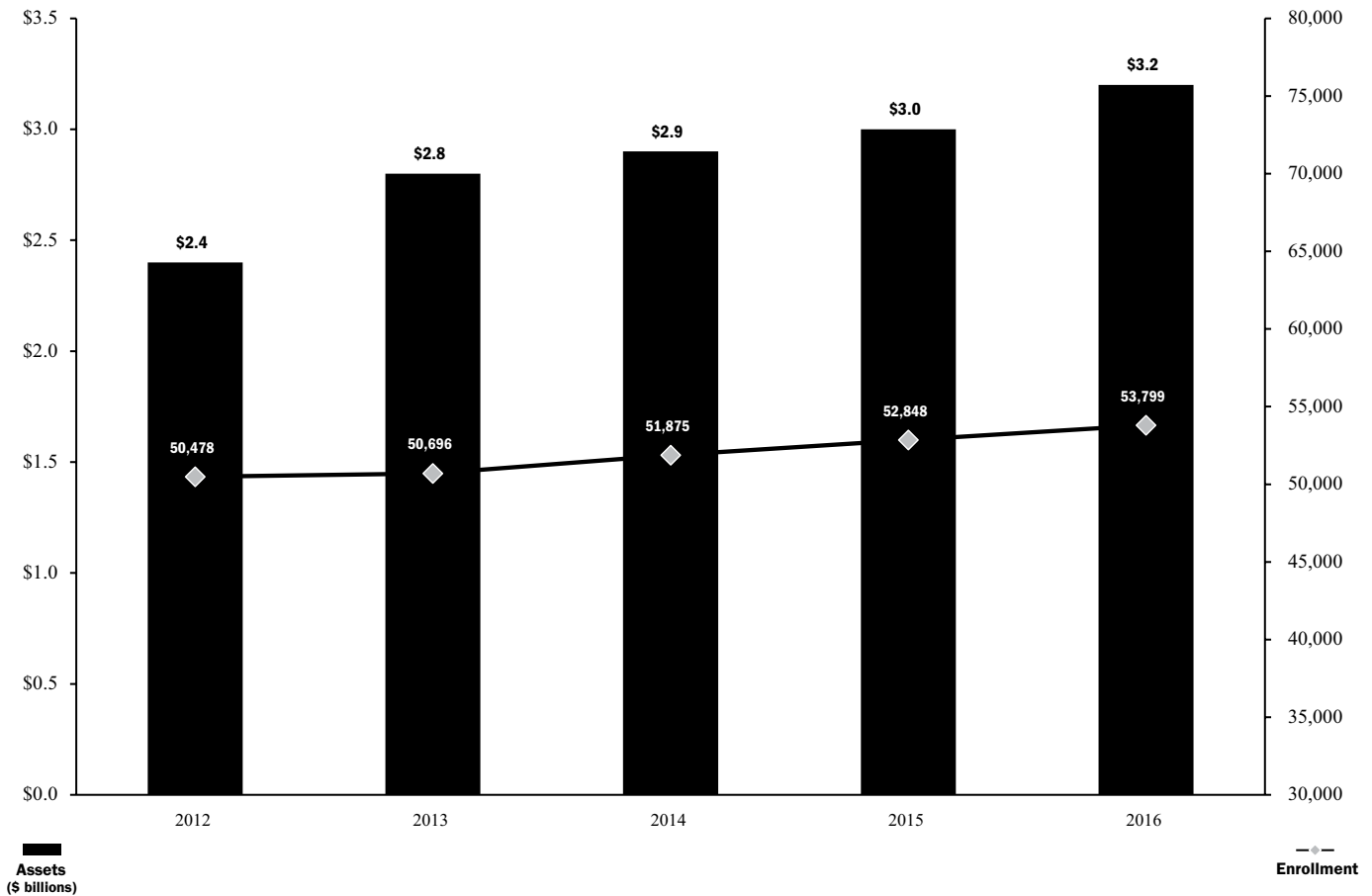
### Growth of DCP

In 2016, nearly 54,000 participants had saved approximately \$3.2 billion in DCP.

As of December 31, there were 32,803 active and 20,996 inactive participants in DCP. From 2012 to 2016, annual deferrals have ranged from \$122 million to \$136 million per year and total fund value grew from approximately \$2.4 billion to approximately \$3.2 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 \$62 million in 2012 to \$91 million in 2016.

**DCP Assets & Enrollment**



# DEFERRED COMPENSATION PROGRAM

## History, Growth & Highlights

### DCP Highlights

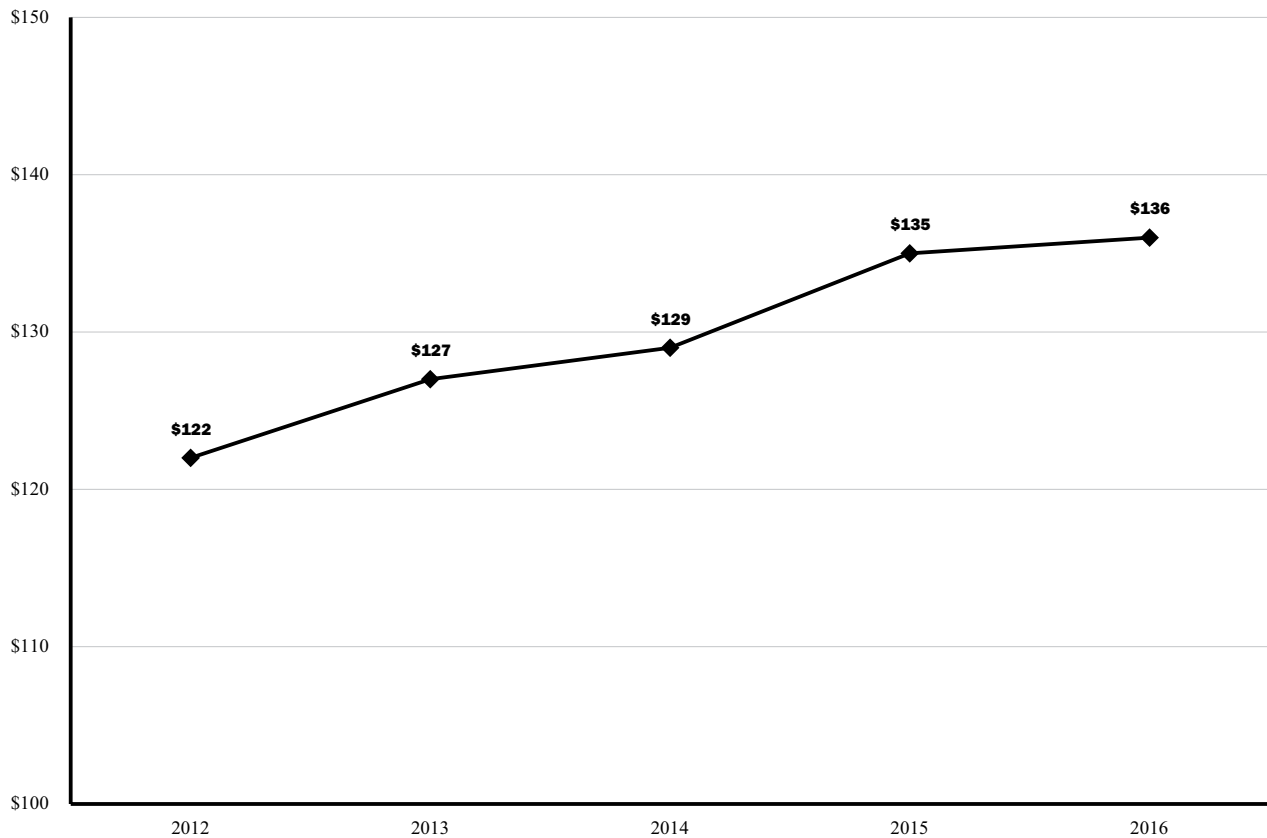
In DCP, employees may elect to have any sum they choose—as little as \$5 or 0.5% per pay period up to IRS limits— withheld from their pay to save for retirement and achieve certain tax advantages. They may change the amount of their deferrals at any time, and it is up to each DCP participant to allocate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

To assist DCP 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.

**DCP Deferrals by Year**  
(\$ millions)



# DEFERRED COMPENSATION PROGRAM

## History, Growth & Highlights

### Deferred Compensation Program Historical Returns<sup>1/</sup>

For the period ending December 31, 2016

Fund Name	Inception Date	1 Year	5 Years	10 Years	Since Inception
Stable Value Fund	07-1995	2.31%	2.74%	3.65%	4.70%
Short Term Money Market Fund	10-1988	0.59	0.27	1.04	3.33
Aggregate Bond Index Fund	02-1995	2.59	2.17	4.29	5.68
60/40 Balanced Fund	05-2006	8.18	9.65	6.35	6.95
Stock Index Fund	12-1994	11.99	14.68	7.01	9.60
Extended Market Fund	08-1998	16.08	14.61	8.15	8.76
EAFE Equity Index Fund	08-1998	1.73	6.81	1.03	3.93
Aggressive Portfolio Fund	10-2003	8.51	10.66	5.77	7.76
Moderate Portfolio Fund	10-2003	7.02	8.55	5.62	7.02
Conservative Portfolio Fund	10-2003	4.36	4.94	4.42	5.14

<sup>1/</sup>Returns are gross-of-fees.