

Public School Employees' Retirement System

2019-20 PROPOSED BUDGET

	2017-18 Actual	2018-19 Act 1A	2019-20 Gov's Request	Gov's INC+/DEC-\$ from Avail.	Gov's INC+/DEC- %
General Fund Appropriations:					
GRANTS & SUBSIDIES					
Department of Education:					
School Employees' Retirement	\$ 2,264,000	\$ 2,487,500	\$ 2,648,000	\$ 160,500	6.5%
Total General Fund	\$ 2,264,000	\$ 2,487,500	\$ 2,648,000	\$ 160,500	6.5%
School Employees' Retirement Fund					
Administration - Public School Employees' Retirement Fund	\$ 52,453	\$ 51,637	\$ 51,838	\$ 201	0.4%
Investment Related Expenses	\$ 20,278	\$ 22,712	\$ 34,480	\$ 11,768	51.8%
Health Insurance Account (restricted acct)	\$ 2,067	\$ 1,910	\$ 1,967	\$ 57	3.0%
PSERS - DC Fund					
Administration - PSERS Defined Contribution Fund (restricted acct)	\$ 89	\$ 4,950	\$ 2,454	\$ (2,496)	n/a

Program Highlights:

For the fiscal year ended 6/30/18, the PSERS Fund had an investment rate of return of 9.27% (prior FY return was 10.14%) and a year-end net asset value of \$56.728 Billion (\$55.952 Billion at 6/30/17). The annualized rate of return, net of fees, for the three, five and ten year periods ended 6/30/18 were 6.84%, 7.62%, and 5.03%, respectively; over the past 25 years ended 6/30/18, the average annualized rate of return was 7.88%.

Funded status as of 6/30/18 was 56.5% (as compared to 56.3% at 6/30/17 and 123.8% at 6/30/00).
Unfunded accrued liability as of 6/30/18 is \$44.9 Billion (+\$0.34 Billion from 6/30/17).

As reported in the 2/4/19 *Pensions & Investments*, PSERS is the 34th largest plan among U.S. corporate and public defined benefit pension plans (among 1,000 plans listed) - last year was 31st. It is the 15th largest state-sponsored defined benefit public pension plan in the U.S.

PSERS Member Demographics (as of 6/30/18):

Total Active & Retired Members: 489,650 Active = 256,362 (52.4%) Annuitants = 233,288 (47.6%)
Average Annual Pension as of 6/30/18 = \$25,405 (+\$118 or 0.47% from prior year)
Annuitant Average Age = 70.0 years
Ratio of active/retired members: 1.10 to 1

Approximately \$6.6 Billion in benefit payments in fiscal year 2017-18.

Over the past 10 years, PSERS had the following experience:

\$58.948 Billion in benefits and expenses
\$22.986 Billion in net investment income
\$20.022 Billion in employer contributions
\$9.831 Billion in employee contributions

Negative External Cash Flow (NECF) over last 10 years when comparing contributions and benefit payments/expenses is -\$29.1 Billion. For the year ended 6/30/18, NCF percentage is -2.5%. For the first time in more than a decade, PSERS NECF is better than the public pension funds NECF average of -2.8%.

Sources of the \$44.855 Billion Unfunded Accrued Liability (as of 6/30/18)

\$18.657 Billion - Employer Underfunding
\$18.245 Billion - Investment Performance
\$7.524 Billion - Benefit Enhancements
\$0.429 Billion - Changes to Assumptions, Cost Method, Net Demographics & Salary Experience
\$44.855 Billion

2018-19 employer contribution rate is 33.43%. Employer contribution rate for 2019-20 was adopted in December as 34.29% (pension contribution rate = 32.60%; premium assistance contribution rate = 0.83%).

Of the 34.29% ECR, 25.87% is to pay the unfunded accrued liability. This translates to approximately \$0.76 of every contribution dollar paid.

The 2019-20 employer contribution rate of 34.29% will provide 100% of the ADC (actuarially determined contribution) for the fourth year in a row.

Employer contribution rate projected to remain above 30% through 2034-35.

As of 6/30/18, 77,171 or 30.1%, of active members are Act 120 members, with an associated employer normal cost of less than 3%. The Act 120 normal cost is one of the lowest employer normal cost rates among major U.S. public pension plans. Act 5 (effective for new PSERS members July 1, 2019) will continue to reduce PSERS normal cost.

Active membership of PSERS increased by 0.2% in 2017-18, reversing annual decreases in active membership that occurred every year since 2010 when active membership was at its' high point of 282,041 members. Low point in active membership was in 2016-17 at 255,945.

PA Investments as of 6/30/18 = \$2.18 Billion (approximately 3.97% of the total fund).

PSERS incurred \$467.7 Million in management fees in FY 2018 (high point was \$558 Million in FY 2015; \$474.5 Million last fiscal year). This translates to 74 basis points. It should be noted that PSERS includes all investment staff salaries and all related Investment Office administrative and vendor services in the calculation of management fees.

As of 6/30/18, PSERS' investment staff managed over 37.0% of assets internally (\$23.8 Billion), which saved over \$43.0 Million in management fees in FY 2017-18.

For their Administrative budget PSERS is requesting an appropriation of \$51.644 Million, an increase of \$7 thousand (0.1%), due to increased personnel costs (+2.5%) from the annualization of costs associated with new staff hired to implement and oversee the new Act 5 benefit tiers.

The Investment Related Expense budget is requested to increase by +\$11.8M (+51.8%) to fund 10 new investment office positions to manage additional assets internally.

State Employees' Retirement System

2019-20 PROPOSED BUDGET

	2017-18 Actual	2018-19 Available	2019-20 Gov's Request	Gov's INC+/DEC-\$	Gov's INC+/DEC-%
General Fund Appropriations:					
State Employees' Retirement Fund					
State Employees' Retirement Administration	\$ 32,619	\$ 30,766	\$ 31,208	\$ 442	1.4%
Investment Expenses	\$ 7,176	\$ 10,142	\$ 11,084	\$ 942	9.3%
SERS - Defined Contribution Fund					
Admin - SERS DC Plan (Restricted Revenues)	\$ -	\$ 4,901	\$ 3,852	\$ (1,049)	-21.4%

Program Highlights:

In calendar year 2018, the State Employees' Retirement Fund had a total investment rate of return of approximately -4.3% (unaudited) and a year-end estimated total market value of \$26.8 Billion (\$29.4 Billion at 12/31/17). Over the past 5 years the annualized rate of return is 4.6%; over the past 10 years the annualized rate of return is 7.2%; over the past 30 years the annualized rate of return is 8.4%.

The actuarial value of the fund first exceeded actuarial accrued liabilities in 1992. Based on preliminary 2018 year-end data, at 12/31/18, the fund is projected to be 56.5% funded, down from 59.4% on 12/31/17 (132.4% at high point on 12/31/00). Unfunded liability is projected to be \$22.32 Billion as of December 31, 2018.

As reported in the 2/4/19 *Pensions & Investments*, SERS is the 64th largest plan among U.S. corporate and public pension plans (among 1,000 plans listed) - last year was 66th. It is the 33rd largest state-sponsored defined benefit public pension plan in the U.S.

SERS Member Demographics:

Total Members: 234,154 Active = 103,147 (44.1%) Annuitants = 131,007 (55.9%)
Average Annual Pension in 2018 of Superannuation Annuitants = \$28,880 (+\$528 or +1.86% from prior year)
Average Annuitant Age = 72.4 years
Ratio of Active/Retired Members: 0.79 to 1
** In last 10 years annuitants & beneficiaries have increased by 19.5% while active members have declined by 6.3%

Approximately \$3.4 Billion in benefit payments made in calendar year 2018.

Over the past 10 years, SERS had the following experience:

- \$29.166 Billion in benefits and expenses
- \$19.137 Billion in investment income
- \$10.415 Billion in employer contributions
- \$3.639 Billion in employee contributions

Negative External Cash Flow (NECF) over last 10 years when comparing contributions and benefit payments/expenses is -\$4.025 Billion. For the year ended 12/31/18, the estimated NECF is -\$2.584 Billion.

2018-19 composite employer contribution is 32.9%. Estimated composite employer contribution rate will increase to 33.4% in 2019-20, with employer contribution rate for Class AA Age 60 retirement of 34.68% (preliminary).
2018-19 Class AA Age 60 rate is 34.63%.

Of the projected 33.4% composite employer contribution rate, approximately 28.5% is required to pay the unfunded accrued liability. This translates to \$0.85 of every employer contribution dollar paid.

Approximately 41.0% of current active SERS members are Act 120 members with employer normal cost rate of 4.88%.

Employer contribution rate peak is projected to occur in 2022-23 with the rate of 34.47%.
Rate projected to remain above 20% through 2040-41 (data may change when 2018 actuarial valuation becomes available in late Spring 2019).

PA Investments as of 12/31/18 = \$741.5 Million; approximately 2.8% of the total fund (unaudited fair market value).

ERS incurred \$126.6 Million in management fees in CY 2018 (up slightly from \$126.5 Million in CY 2017). This translates to 43.7 basis points. It should be noted that the management fees that SERS is reporting only include costs for manager investment expenses; investment personnel costs, consultant & other investment costs are not included.

ERS is requesting administrative appropriation authority of \$30.546 Million, a decrease of \$220 thousand from the current year. The Governor's Budget recommends an increase in funding of \$442 thousand, or 1.4%, to \$31.208 Million. ERS request reflects the elimination of funding for non-recurring costs for equipment and software purchases.

The Investment Related Expense budget increases by 9.3%, or \$942 thousand as consultant costs decreased due to completion of the biennial update to the strategic investment plan.

Suggested Questions for PSERS and SERS

1. What is the average annual annuity benefit for PSERS and SERS?

From time to time there is a news story about retired state employees or school teachers who are receiving annual annuities above \$100,000. What percentage of each system's annuitants receive pensions above \$100,000?

What types of jobs did these individuals have that garnered them such large pensions?

2. Among state public pension plans can you tell us the approximate number of defined benefit plans, hybrid plans, or straight defined contribution plans?

Do you know how many states have converted their defined benefit plans to hybrid or defined contribution plans?

3. What is the average rate of pay state and school employees contribute to their pension plans? How do these amounts compare to other states?

4. In discussions of public pension plans I have heard the term normal cost. Can you please tell me in layman's terms, what normal cost is?

What is the current normal cost for PSERS and SERS?

Regarding PSERS and SERS have normal costs always been paid, and if not, has that led to any of the current unfunded liability for PSERS and SERS?

5. What is the average assumed rate of return for PSERS and SERS and how do the rates compare to other public pension plans throughout the United States?

Why don't the pension system boards reduce the assumed rate of return from 7.25% to something that is more easily attainable with less risk?

6. SERS Specific Question -- Why is SERS on a calendar year basis when the Commonwealth operates on a fiscal year basis? How difficult would it be to convert SERS to a fiscal year operating and reporting basis?

What costs would be incurred to make the conversion to a fiscal year basis?

Would there be any impact on the funded status or employer contribution rates?

7. PSERS Specific - PSERS sponsors two post-employment healthcare programs. Can you please provide the committee with a brief overview of these programs?

Does the Commonwealth pay for post-employment health care for retired school employees?

8. The Governor's Budget recommends 10 new positions for both of your systems – 10 investment office positions for PSERS paid from investment related expenses, and 10 positions for SERS for defined contribution rollout paid from restricted funds for the administration of the DC plan. I have several questions about the recommended increase in complement.

- For SERS the DC plan was implemented January 1, 2019, so why should positions be added in the new fiscal year? Is SERS short-staffed now on the DC roll-out?
- Recently a new position was created, the Special Assistant to the Executive Director. Why is this position necessary?
- Will the 10 PSERS investment office positions allow PSERS to bring more of its investment functions in-house? Will this lessen investment costs? If so, can you provide an estimate of the amount that will be saved?

9. With respect to the operating budgets for PSERS and SERS, what have your systems done to control administrative costs?

How do administrative costs of PSERS and SERS compare to other comparable pension funds in other states?

10. I understand that Pennsylvania is one of only two states in which the pension trust funds do not have their own custodial bank (Ohio is other state). Additionally, the Treasury Department has not issued an RFP for custodian bank services since 1997. When asked about this at the Treasury Department budget hearing, the Treasurer stated that PSERS protested the issuing of an RFP in 2015. Why?

We also asked Treasurer Torsella for his thoughts on the pension systems having their own custodian bank. The Treasurer stated that allowing the pension systems to have their own custodian banks would impact transparency of PSERS and SERS. Please tell us whether you think there would be negative impacts on transparency if PSERS and SERS could seek their own custodian bank or banks.

Are there benefits to PSERS and SERS having their own custodial banks especially now that Act 5 directed the pension systems to select custodian banks for the new Act 5 defined contribution benefit tiers?

Are there any savings that PSERS and SERS could obtain from seeking competitive bids on custodian bank services?

Are there any potential drawbacks to allowing PSERS and SERS to seek custodian bank services?

Do you have any information on how often custodian bank services should be reviewed and potentially re-bid?

11. We have had two rounds of pension reform in the less than ten years – Act 120 of 2010 and most recently Act 5 of 2017. The pension benefit plan designs have been altered in a significant way with employees bearing some or all of the investment risk. Employer costs are still rising. Do we need more pension reform?

Asset Allocation & Investments

12. How often do each of your boards review the asset allocation for each of your funds?

Walk us through the process for reviewing the asset allocation. Is stress testing involved in the asset allocation review process?

How have the annual asset allocation targets changed over the years?

When markets turn down, can each of your boards adjust the allocation targets or the allocation of assets in each class of assets?

13. Does the funded status of a public pension fund impact the amount of risk the pension fund administrators take when investing? Please explain why or why not? (NOTE: See Center for Retirement Research study).
14. Investment earnings contribute more than 60% of the funding for the benefits paid by PSERS and SERS. SERS took a beating in 2018 as markets tanked at the end of the year. How have investments fared over the long-term (25 years) for both PSERS and SERS? Why is it important to look at long-term investment returns rather than one-year returns?
15. Both PSERS and SERS have very sophisticated and diversified investment portfolios. Why is diversification so important?
- Wouldn't it be simpler and cheaper to go just with something more basic? Say, a simple 60/40 equity/bond portfolio?
16. Both PSERS and SERS have several non-traditional or alternative investments in their portfolios. Why is it necessary to engage in non-traditional investments? Don't they carry more risk?

Are the risk and the fees paid for non-traditional investments justified by the value they add to pension funds?

Do other state public pension funds engage in non-traditional or alternative investments?

17. The Governor's Budget proposes significant increases in funding for Investment Related Expenses for both systems, but particularly PSERS where an increase of more than \$11.7 million is proposed; an increase of 51.8%. Please explain to the committee why such a large increase would be needed for PSERS investment operations.
18. Can you tell me the dollar amount of investments PSERS and SERS make in Pennsylvania? What percentage of invested funds does this represent?

Do any of the investments involve Pennsylvania infrastructure? Would that be a wise investment for the pension funds?

Act 5 Implementation

19. The new Act 5 pension plan became effective for SERS on January 1, 2019, and for PSERS will go into effect with the new fiscal year starting July 1, 2019. Please give us an update on how the implementation of the Act 5 plan, with its various benefit tiers, is going. What are the total estimated implementation costs of the Act 5 plans?
20. General Fund dollars have been expended for the implementation of the defined contribution components of the Act 5 benefit tiers. Initially PSERS had excess School Employees' Retirement appropriation authority transferred to the DC Plan administration restricted account. This year DC Plan administration costs were funded through a direct transfer of sales tax revenue to the restricted PSERS and SERS DC administration accounts. How long will these transfers be necessary?
21. **SERS Specific Question** – Act 5 of 2017 mandates that SERS switch to the traditional entry age normal cost methodology in 2023. The actuarial note that was prepared prior to the adoption of Act 5 shows that the switch to the traditional entry age normal methodology will increase the normal cost for SERS from 1.46% to 9.0%. Is this correct?

Will employer contribution rates increase?

Is the Commonwealth essentially under-funding SERS until 2023, because of the modified entry age normal cost calculation that is currently being used?

Public Pension Management & Asset Investment Review Commission (the Act 5 Commission)

22. Act 5 of 2017 created the Public Pension Management and Asset Investment Review Commission (the "Act 5 Commission") to review PSERS and SERS investment practices and make recommendations to increase efficiency and reduce costs by \$3 billion over 30 years. The Act 5 Commission issued a voluminous report in mid-December. The report contained many recommendations for PSERS and SERS to increase efficiency and transparency. What are each of your systems doing to address the recommendations of the Act 5 Commission?

23. The Act 5 Commission recommends annual stress testing. Will there be costs to each of your pension systems to do the stress testing? What is the estimated cost for annual stress testing?

Does the data you will get from the stress testing justify the expense of the annual stress testing?

24. The Act 5 Commission recommended that SERS and PSERS should have a larger position in passive investments. Would allocating a greater percentage to passively managed funds, or index funds, have any impact on the systems' assumed rates of return?

25. The Act 5 Commission stated that SERS and PSERS are among the most expensively managed pension funds in the United States in terms of fees. I believe the Act 5 Commission may have said the third and fourth most expensively managed funds. Do you agree with this assessment? Why?

26. Page 203 of the Act 5 Commission report contains a table entitled, Peer Group Total Portfolio Returns (2017). The table shows that PSERS and SERS had the lowest 10-year returns among the group, and in all comparisons were below the peer group average. I have several questions starting with is the peer group an accurate depiction of comparable pension funds? Why or why not?

Why were PSERS and SERS lower than the other funds on the table?

What other facts should the General Assembly consider when reviewing the PSERS and SERS portfolio returns shown on the table?

27. The Act 5 Commission gave PSERS and SERS less than satisfactory ratings regarding the amount of management fees the systems pay each year. In fact, the report indicates the fees paid are very high and the fees are not justified by the return on investment. Do you think this evaluation is accurate? Why or why not?

28. The Act 5 Commission criticizes both PSERS and SERS, but particularly SERS, on the lack of transparency on fee reporting. The assertion has been made that the systems are hiding fees paid. The Commission was especially critical of management fees and carried interest with private equity investments. Please comment on this and tell us why the fees and carried interest arrangements are not readily reported.

29. The Executive Summary of the Act 5 Commission report (p. 17) states,
"While the Commission was careful to draft a report that was well sourced and accurate, there are two important caveats – first, as a consequence of limited access to each systems' investment records, expenses and performance data, the Commission was compelled to rely upon outside sources, make reasonable assumptions and perform independent calculations. Doing so may have resulted in some inaccuracies or misstatements."

Did either PSERS or SERS fail to provide the Commission with requested data? If yes, why was data not provided?

Do you think the Act 5 Commission report contains inaccuracies or misstatements, and if you believe so, would you be willing to provide the Committee with written documentation of the inaccuracies?

30. Do you believe the consultants relied upon by the Commission had the expertise to properly advise the Act 5 Commissioners on facts related to management fees and asset allocation strategies? In other words, did the consultants have actual top, or even mid-level, portfolio management experience?

31. One of the most significant recommendations of the Act 5 Commission report is to establish a consolidated central pension investment office to implement and execute all investments for PSERS and SERS. The consolidated central pension investment office would *"be overseen by an Investment Oversight Committee of a small number (perhaps 5) of well-established, senior investment professionals selected and nominated by an appropriate process, such as nomination by the Governor and confirmation by the Senate. The Investment Office Oversight Committee would have exclusive authority to select and hire all Office [consolidated central pension investment office] professionals."*

I have to say this proposal gives me pause, largely because the House would have no role or say in the process.

Are there any other states that have anything like the proposed Investment Office Oversight Committee? Are the pension systems of the states that have such committees similar to Pennsylvania's?

What are the estimated savings that could be obtained from combining the investment offices of PSERS and SERS? The funds still must be separately maintained, right?

**2019-2020
SERS
BUDGET HEARING MATERIALS**

**STATE EMPLOYEES' RETIREMENT SYSTEM
FISCAL YEAR 2019-20 BUDGET SUBMISSION
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STATE EMPLOYEES' RETIREMENT SYSTEM MISSION STATEMENT

The mission of the State Employees' Retirement System (SERS) is to provide retirement benefits and services to our members through sound administration and prudent investments.

APPROPRIATIONS COMMITTEE OF THE PENNSYLVANIA HOUSE AND SENATE
STATE EMPLOYEES' RETIREMENT SYSTEM
State Employees' Retirement Fund - Administration
Justification of Appropriation Request

I. SUMMARY FINANCIAL DATA

(Dollar Amounts in Thousands)

	Actual 2017-2018	Available 2018-2019	Budgeted 2019-2020
Other Funds	32,619	30,766	30,546
Other Funds - Restricted Revenues	1,500	1,500	1,500
	<u>34,119</u>	<u>32,266</u>	<u>32,046</u>

II. DETAIL BY MAJOR OBJECT

	Actual 2017-2018	Available 2018-2019	Budgeted 2019-2020	Change Budgeted vs. Available	Percent Change
PERSONNEL					
Other Funds	17,232	17,084	17,518	434	2.54%
Other Funds - Restricted Revenue	0	0	0	0	0.00%
Total Personnel	17,232	17,084	17,518	434	2.54%
OPERATING					
Other Funds	15,277	13,432	12,778	-654	-4.87%
Other Funds - Restricted Revenue	1,500	1,500	1,500	0	0.00%
Total Operating	16,777	14,932	14,278	-654	-4.87%
FIXED ASSETS					
Other Funds	110	250	250	0	0.00%
Other Funds - Restricted Revenue	0	0	0	0	0.00%
Total Fixed Assets	110	250	250	0	0.00%
TOTAL FUNDS					
Other Funds	32,619	30,766	30,546	-220	-0.72%
Other Funds - Restricted Revenue	1,500	1,500	1,500	0	0.00%
Total	<u>34,119</u>	<u>32,266</u>	<u>30,546</u>	<u>-220</u>	<u>-0.72%</u>

III. HISTORY OF LAPSES

(Dollar Amounts in Thousands)

	2016-2017	2017-2018	Estimated 2018-2019
Other Funds	0	0	0

IV. COMPLEMENT INFORMATION

	January 2017	January 2018	January 2019
Benefit Factor	79.20%	75.80%	76.80%
Other Funds			
Authorized	175	165	177
Filled	157	151	167

APPROPRIATIONS COMMITTEE OF THE PENNSYLVANIA HOUSE AND SENATE
STATE EMPLOYEES' RETIREMENT SYSTEM
State Employees' Retirement Fund - Investments
Justification of Appropriation Request

I. SUMMARY FINANCIAL DATA

(Dollar Amounts in Thousands)

	Actual 2017-2018	Available 2018-2019	Budgeted 2019-2020
Other Funds	9,251	10,142	11,234
Other Funds - Restricted Revenues	0	0	0
	9,251	10,142	11,234

II. DETAIL BY MAJOR OBJECT

	Actual 2017-2018	Available 2018-2019	Budgeted 2019-2020	Change Budgeted vs. Available	Percent Change
PERSONNEL					
Other Funds	3,433	4,380	4,964	584	13.33%
Other Funds - Restricted Revenue	0	0	0	0	0.00%
Total Personnel	3,433	4,380	4,964	584	13.33%
OPERATING					
Other Funds	5,818	5,762	6,270	508	8.82%
Other Funds - Restricted Revenue	0	0	0	0	0.00%
Total Operating	5,818	5,762	6,270	508	8.82%
FIXED ASSETS					
Other Funds	0	0	0	0	0.00%
Other Funds - Restricted Revenue	0	0	0	0	0.00%
Total Fixed Assets	0	0	0	0	0.00%
TOTAL FUNDS					
Other Funds	9,251	10,142	11,234	1,092	10.77%
Other Funds - Restricted Revenue	0	0	0	0	0.00%
Total	9,251	10,142	11,234	1,092	10.77%

III. HISTORY OF LAPSES

(Dollar Amounts in Thousands)

	2016-2017	2017-2018	Estimated 2018-2019
Other Funds	0	0	0

IV. COMPLEMENT INFORMATION

	January 2017	January 2018	January 2019
Benefit Factor	54.90%	53.70%	52.70%
Other Funds			
Authorized	22	19	22
Filled	12	12	22

APPROPRIATIONS COMMITTEE OF THE PENNSYLVANIA HOUSE AND SENATE
STATE EMPLOYEES' RETIREMENT SYSTEM
State Employees' Retirement Fund – Defined Contribution
Justification of Appropriation Request

I. SUMMARY FINANCIAL DATA

(Dollar Amounts in Thousands)

	Actual 2017-2018	Available 2018-2019	Budgeted 2019-2020
Other Funds	0	4,901	3,834
Other Funds - Restricted Revenues	0	0	0
	0	4,901	3,834

II. DETAIL BY MAJOR OBJECT

	Actual 2017-2018	Available 2018-2019	Budgeted 2019-2020	Change Budgeted vs. Available	Percent Change
PERSONNEL					
Other Funds	0	1,058	2,497	1,439	136.01%
Other Funds - Restricted Revenue	0	0	0	0	0.00%
Total Personnel	0	1,058	2,497	1,439	136.01%
OPERATING					
Other Funds	0	3,843	1,337	-2,506	-65.21%
Other Funds - Restricted Revenue	0	0	0	0	0.00%
Total Operating	0	3,843	1,337	-2,506	-65.21%
FIXED ASSETS					
Other Funds	0	0	0	0	0.00%
Other Funds - Restricted Revenue	0	0	0	0	0.00%
Total Fixed Assets	0	0	0	0	0.00%
TOTAL FUNDS					
Other Funds	0	4,901	3,834	-1,067	-21.77%
Other Funds - Restricted Revenue	0	0	0	0	0.00%
Total	0	4,901	3,834	-1,067	-21.77%

III. HISTORY OF LAPSES

(Dollar Amounts in Thousands)

	2016-2017	2017-2018	Estimated 2019-2020
Other Funds	0	0	0

IV. COMPLEMENT INFORMATION

	January 2017	January 2018	January 2019
Benefit Factor	0%	68.2%	79.00%
Other Funds			
Authorized	0	0	12
Filled	0	0	12

V. PROGRAM NARRATIVE

DESCRIPTION OF PROGRAMS

As of December 31, 2018, SERS has an estimated membership of approximately 103,000 active members within 102 participating agencies, and more than 131,000 annuitant and beneficiary members, the Pennsylvania State Employees' Retirement System (SERS) is one of the largest statewide public pension plans in the country. Membership is mandatory for most state employees and for eligible employees of independent agencies. The employer contribution rate is adjusted annually, in order to maintain the actuarial soundness of the fund. After a member fulfills the minimum service requirements, SERS provides benefits in the event of retirement, disability and/or death. Expenses related to the management of the investment portfolio are treated as a reduction of investment revenue rather than as an administrative expense. The State Employees' Retirement Fund is administered by an independent Board of Trustees under the Retirement Code (Title 71, PAC. S.).

SERS was established in 1923 by Commonwealth Statute (Title 71) as an Independent Board, to administer a pension plan for the Commonwealth. Employees contribute at the appropriate statutory rate. Participating agencies contribute at a rate established annually by actuarial review. The employee and employer contributions, along with the investment earnings of the fund, are used to administer the system and to pay benefits based on a fixed benefit formula. As of December 31, 2018, the investment fund had an estimated market value of approximately \$26.82 billion.

SERS has seven regional retirement counseling offices in operation. The regional offices are located in Bensalem, Harrisburg Montoursville, Pittsburgh, Seneca, State College and Wilkes-Barre. Members obtain all retirement counseling from SERS.

Act 81 of 1987 established the Commonwealth's Deferred Compensation Program. That Program allows Commonwealth employees to voluntarily defer a portion of their salaries into a retirement savings account. The cost of staffing the Deferred Compensation Program is paid through the SERS administrative budget. The participants in the Deferred Compensation Program subsequently reimburse the SERS fund for all related expenditures. As of December 31, 2018, the Program had estimated assets of approximately \$3.3 billion.

Act 5 of 2017 established the Commonwealth's 401(a) Defined Contribution Plan which requires a set percentage of employee and employer contributions to be invested in the plan as directed by the participant. Participation in the defined contribution plan is mandatory for most new state employees hired on or after January 1, 2019, and available to employees of non-state, public and quasi-public institutions authorized by the Retirement Code.

STATUTORY AUTHORITY

The State Employees' Retirement Board, designated an Independent Board, receives its statutory authority to request an administrative appropriation in Section 5902(c) of the Retirement Code (Title 71, PA C. S.). This section provides the Retirement Board with the authority to submit through the Governor, to the General Assembly, an annual budget covering the administration of the fund. The appropriation is funded from the investment earnings of the Retirement Fund.

VI. PROGRAM PERFORMANCE

The key component of the SERS Mission Statement is to provide retirement benefits and services to our members through sound administration and prudent investments. Our mission statement goals are customer-focused. Additionally, prime consideration is given to better informing management to enable it to further minimize demand for taxpayer dollars.

VII. COST ASSUMPTIONS

The State Employees' Retirement System Fiscal Year 2019-2020 administrative budget request contains the required funding to enable the System to meet its operational goals while insuring the continuation of necessary services to its members. The cost for the administration of the agency is influenced by a variety of factors including a growing annuitant population, changes in policy and procedures, recent legislation and court decisions, and membership (both active and retired).

The agency has identified GO-TIME projects for Fiscal Year 2019-2020 as part of the State Employees' Retirement System's budget request. These projects include cost savings of \$41,584 anticipated for printing and postage cost reductions realized as a result of producing SERS publications in-house.

VIII. OTHER INFORMATION

Non-Recurring Expenditures: Fiscal Year 2018-2019 (in thousands)

Personnel	0
Operations	0
Fixed Assets	<u>250</u>
Total	250

Equipment and software purchases

Budgetary Reserves: Fiscal Year 2018-2019 (in thousands)

State Appropriations	0
Federal Funds	0
Other Funds	0
Other Funds - Restricted Revenues	<u>0</u>
Total	0

Fiscal Year 2017-2018 Obligations Rolled Forward to Fiscal Year 2018-2019 (in thousands)

	Expenditures	Encumbrances
Personnel	0	0
Operations	0	0
Fixed Assets	0	0
Total	0	0

Need for Fiscal Year 2018-2019 Supplemental Appropriations

SERS does not anticipate the need for supplemental appropriations for Fiscal Year 2018-2019.

**COMPARATIVE FINANCIAL STATEMENT
STATE EMPLOYEES' RETIREMENT SYSTEM
DEFERRED COMPENSATION FUND - FUND 043**

(Dollar Amounts in Thousands)

	2015-16 ACTUAL	2016-17 ACTUAL	2017-18 ACTUAL	2018-19 AVAILABLE	2019-20 BUDGET	2020-21 PLAN YR 1	2021-22 PLAN YR 2	2022-23 PLAN YR 3	2023-24 PLAN YR 4
Beginning Balance	\$ 117,331	\$ 29,674	\$ 16,515	\$ 41,873	\$ 27,695	\$ 30,329	\$ 33,042	\$ 35,835	\$ 38,712
Revenue:									
Employee Contributions	\$ 135,057	\$ 139,907	\$ 139,877	\$ 144,073	\$ 148,395	\$ 152,847	\$ 157,432	\$ 162,155	\$ 167,020
Sale of Securities	\$ -	\$ 3,943	\$ 72,789	\$ 34,677	\$ 52,955	\$ 54,544	\$ 56,180	\$ 57,866	\$ 59,602
Purchase of Securities	\$ (80,541)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Interest	\$ 368	\$ 471	\$ 1,376	\$ 1,417	\$ 1,460	\$ 1,504	\$ 1,549	\$ 1,595	\$ 1,643
Total Receipts	\$ 54,884	\$ 144,321	\$ 214,042	\$ 180,167	\$ 202,810	\$ 208,895	\$ 215,161	\$ 221,616	\$ 228,265
Total Funds Available	\$ 172,215	\$ 173,995	\$ 230,557	\$ 222,040	\$ 230,505	\$ 239,224	\$ 248,203	\$ 257,451	\$ 266,977
Disbursements:									
Benefits and Rollovers	\$ 135,059	\$ 149,631	\$ 181,063	\$ 186,495	\$ 192,090	\$ 197,853	\$ 203,789	\$ 209,903	\$ 216,200
Fees and Expenses	\$ 7,482	\$ 7,849	\$ 7,621	\$ 7,850	\$ 8,086	\$ 8,329	\$ 8,579	\$ 8,836	\$ 9,101
Total Expenditures	\$ (142,541)	\$ (157,480)	\$ (188,684)	\$ (194,345)	\$ (200,176)	\$ (206,182)	\$ (212,368)	\$ (218,739)	\$ (225,301)
Ending Balance	\$ 29,674	\$ 16,515	\$ 41,873	\$ 27,695	\$ 30,329	\$ 33,042	\$ 35,835	\$ 38,712	\$ 41,676

**COMPARATIVE FINANCIAL STATEMENT
STATE EMPLOYEES' RETIREMENT SYSTEM
STATE EMPLOYEES' RETIREMENT FUND – FUND 061**

(Dollar Amounts in Thousands)

	2015-16 ACTUAL	2016-17 ACTUAL	2017-18 ACTUAL	2018-19 AVAILABLE	2019-20 BUDGET	2020-21 PLAN YR 1	2021-22 PLAN YR 2	2022-23 PLAN YR 3	2023-24 PLAN YR 4
Beginning Balance	\$ 27,179,885	\$ 25,677,011	\$ 27,600,396	\$ 29,211,263	\$ 30,254,581	\$ 31,258,086	\$ 32,206,917	\$ 33,105,074	\$ 33,978,379
Receipts:									
Contributions of Employees	\$ 407,088	\$ 425,073	\$ 434,469	\$ 381,500	\$ 387,500	\$ 394,500	\$ 401,500	\$ 409,000	\$ 417,000
Contributions of Employers	\$ 1,382,987	\$ 1,712,992	\$ 1,976,914	\$ 2,053,780	\$ 2,070,263	\$ 2,074,266	\$ 2,085,733	\$ 2,123,197	\$ 2,142,158
Transfer from PSERS	\$ 12,446	\$ 10,443	\$ 11,340	\$ 11,340	\$ 11,340	\$ 11,340	\$ 11,340	\$ 11,340	\$ 11,340
Directed Commissions	\$ 142	\$ 133	\$ 162	\$ 162	\$ 162	\$ 162	\$ 162	\$ 162	\$ 162
Net Investment Adjustment	\$ (132,741)	\$ 3,064,829	\$ 2,658,681	\$ 2,117,817	\$ 2,193,457	\$ 2,266,211	\$ 2,335,001	\$ 2,400,118	\$ 2,463,432
Other	\$ 6,119	\$ 11,656	\$ 17,594	\$ 17,594	\$ 17,594	\$ 17,594	\$ 17,594	\$ 17,594	\$ 17,594
Total Receipts	\$ 1,676,041	\$ 5,225,126	\$ 4,999,160	\$ 4,582,193	\$ 4,680,316	\$ 4,764,073	\$ 4,851,330	\$ 4,961,411	\$ 5,051,686
Funds Available	\$ 28,855,926	\$ 30,902,137	\$ 32,599,556	\$ 33,793,456	\$ 34,934,897	\$ 36,022,159	\$ 37,058,247	\$ 38,066,485	\$ 39,030,065
Disbursements:									
Treasury	\$ 163	\$ 29	\$ (6)	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150
Benefits and Expenses	\$ 3,178,752	\$ 3,301,712	\$ 3,388,299	\$ 3,538,725	\$ 3,676,661	\$ 3,815,092	\$ 3,953,023	\$ 4,087,956	\$ 4,215,892
Total Disbursements	\$ (3,178,915)	\$ (3,301,741)	\$ (3,388,293)	\$ (3,538,875)	\$ (3,676,811)	\$ (3,815,242)	\$ (3,953,173)	\$ (4,088,106)	\$ (4,216,042)
Ending Balance	\$ 25,677,011	\$ 27,600,396	\$ 29,211,263	\$ 30,254,581	\$ 31,258,086	\$ 32,206,917	\$ 33,105,074	\$ 33,978,379	\$ 34,814,023

**COMPARATIVE FINANCIAL STATEMENT
STATE EMPLOYEES' RETIREMENT SYSTEM
DEFERRED COMPENSATION FUND - SHORT-TERM PORTFOLIO - FUND 110**

(Dollar Amounts in Thousands)

	2015-16 ACTUAL	2016-17 ACTUAL	2017-18 ACTUAL	2018-19 AVAILABLE	2019-20 BUDGET	2020-21 PLAN YR 1	2021-22 PLAN YR 2	2022-23 PLAN YR 3	2023-24 PLAN YR 4
Beginning Balance	\$ 56,203	\$ 61,207	\$ 66,705	\$ 67,514	\$ 68,339	\$ 69,180	\$ 70,038	\$ 70,913	\$ 71,806
Revenue:									
Transfers from Deferred Compensation Fund	\$ 12,458	\$ 14,038	\$ 25,306	\$ 25,812	\$ 26,328	\$ 26,855	\$ 27,392	\$ 27,940	\$ 28,499
Interest	\$ 203	\$ 555	\$ 970	\$ 989	\$ 1,009	\$ 1,029	\$ 1,050	\$ 1,071	\$ 1,092
Total Receipts	\$ 12,661	\$ 14,593	\$ 26,276	\$ 26,801	\$ 27,337	\$ 27,884	\$ 28,442	\$ 29,011	\$ 29,591
Funds Available	\$ 68,864	\$ 75,800	\$ 92,981	\$ 94,315	\$ 95,676	\$ 97,064	\$ 98,480	\$ 99,924	\$ 101,397
Expenditures:									
Transfers to Deferred Compensation Fund	\$ 7,657	\$ 9,095	\$ 25,467	\$ 25,976	\$ 26,496	\$ 27,026	\$ 27,567	\$ 28,118	\$ 28,680
Total Expenditures	\$ (7,657)	\$ (9,095)	\$ (25,467)	\$ (25,976)	\$ (26,496)	\$ (27,026)	\$ (27,567)	\$ (28,118)	\$ (28,680)
Ending Balance	\$ 61,207	\$ 66,705	\$ 67,514	\$ 68,339	\$ 69,180	\$ 70,038	\$ 70,913	\$ 71,806	\$ 72,717

**COMPARATIVE FINANCIAL STATEMENT
STATE EMPLOYEES' RETIREMENT SYSTEM
BENEFIT COMPLETION PLAN – FUND 165**

(Dollar Amounts in Thousands)

	2015-16 ACTUAL	2016-17 ACTUAL	2017-18 ACTUAL	2018-19 AVAILABLE	2019-20 BUDGET	2020-21 PLAN YR 1	2021-22 PLAN YR 2	2022-23 PLAN YR 3	2023-24 PLAN YR 4
Beginning Balance	\$ 3,858	\$ 3,850	\$ 2,290	\$ 532	\$ 660	\$ 741	\$ 750	\$ 723	\$ 665
Receipts:									
Contributions of Employers	\$ 1,509	\$ -	\$ 450	\$ 1,880	\$ 1,897	\$ 1,894	\$ 1,927	\$ 1,963	\$ 2,002
Interest	\$ 11	\$ 25	\$ 23	\$ 23	\$ 23	\$ 23	\$ 23	\$ 23	\$ 23
Total Receipts	\$ 1,520	\$ 25	\$ 473	\$ 1,903	\$ 1,920	\$ 1,917	\$ 1,950	\$ 1,986	\$ 2,025
Funds Available	\$ 5,378	\$ 3,875	\$ 2,763	\$ 2,435	\$ 2,580	\$ 2,658	\$ 2,700	\$ 2,709	\$ 2,690
Disbursements:									
Benefits and Expenses	\$ 1,528	\$ 1,585	\$ 2,231	\$ 1,775	\$ 1,839	\$ 1,908	\$ 1,977	\$ 2,044	\$ 2,108
Total Disbursements	\$ (1,528)	\$ (1,585)	\$ (2,231)	\$ (1,775)	\$ (1,839)	\$ (1,908)	\$ (1,977)	\$ (2,044)	\$ (2,108)
Cash Balance, Ending	\$ 3,850	\$ 2,290	\$ 532	\$ 660	\$ 741	\$ 750	\$ 723	\$ 665	\$ 582

**COMPARATIVE FINANCIAL STATEMENT
STATE EMPLOYEES' RETIREMENT SYSTEM
DEFINED CONTRIBUTION FUND - FUND 219**

This fund was created to meet the provisions of Act 5 of 2017 to provide for receipt and accounting of member and employer contributions, investment of those funds and payment of defined contribution benefits to eligible members of the State Employees' Retirement System. Participation in the defined contribution plan is mandatory for most new state employees hired on or after January 1, 2019 and available to employees of non-state, public and quasi-public institutions authorized by the Retirement Code. The fund receives revenue from employee contributions, employer contributions and income derived from its investment portfolio. Employers pay 100 percent of the employer share of contributions to the fund. Investment income is used to credit interest to each member's account; to pay the administrative expenses of the retirement system; and to accumulate monies for the payment of future benefits. Management of the fund and payment of benefits are overseen by the State Employees' Retirement Board.

(Dollar Amounts in Thousands)

	2015-16 ACTUAL*	2016-17 ACTUAL*	2017-18 ACTUAL	2018-19 AVAILABLE	2019-20 BUDGET	2020-21 PLAN YR 1	2021-22 PLAN YR 2	2022-23 PLAN YR 3	2023-24 PLAN YR 4
Cash Balance, Beginning:	\$ -	\$ -	\$ -	\$ 5,269	\$ 10,299	\$ 25,547	\$ 48,515	\$ 82,855	\$ 129,437
Receipts:									
Contributions of Employees	\$ -	\$ -	\$ -	\$ 6,000	\$ 17,700	\$ 29,300	\$ 40,900	\$ 52,700	\$ 64,800
Contributions of Employers	\$ -	\$ -	\$ -	\$ 3,400	\$ 10,100	\$ 16,700	\$ 23,400	\$ 30,100	\$ 37,100
Appropriation (a)	\$ -	\$ -	\$ 5,269	\$ 4,901	\$ 3,834	\$ 1,250	\$ 2,500	\$ 4,500	\$ 5,500
Net Investment Adjustment	\$ -	\$ -	\$ -	\$ 330	\$ 1,348	\$ 2,730	\$ 4,122	\$ 5,525	\$ 6,957
Other	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Receipts	\$ -	\$ -	\$ 5,269	\$ 14,631	\$ 32,982	\$ 49,980	\$ 70,922	\$ 92,825	\$ 114,357
Total Funds Available	\$ -	\$ -	\$ 5,269	\$ 19,900	\$ 43,281	\$ 75,527	\$ 119,437	\$ 175,680	\$ 243,794
Disbursements:									
Benefits and Expenses (b)	\$ -	\$ -	\$ -	\$ 9,601	\$ 17,734	\$ 27,012	\$ 36,582	\$ 46,243	\$ 56,197
Total Disbursements	\$ -	\$ -	\$ -	\$ (9,601)	\$ (17,734)	\$ (27,012)	\$ (36,582)	\$ (46,243)	\$ (56,197)
Cash Balance, Ending	\$ -	\$ -	\$ 5,269	\$ 10,299	\$ 25,547	\$ 48,515	\$ 82,855	\$ 129,437	\$ 187,597

*Fund 2019 was created in FY 2017 and no reportable information for the period specified.

CASHFLOWSTATEMENT
STATE EMPLOYEES' RETIREMENT SYSTEM
DEFERRED COMPENSATION FUND - FUND 043

Act 1987-81 established the Commonwealth Deferred Compensation Program (DCP). The DCP enables eligible employees to voluntarily defer a portion of their compensation into a supplemental retirement savings plan. The State Employees' Retirement Board is responsible for administration of the DCP.

Contributions to the DCP began in 1988. The DCP is funded primarily from voluntary employee contributions and interest as detailed in footnote below. These funds, together with the returns they earn less expenses, are available to formerly eligible employees for distribution when they meet requirements such as retirement. Cash balance is reflection of uninvested funds at a point in time.

Statement of Cash Receipts and Disbursements:
(Dollar Amounts in Thousands)

	Actual 2015-16	Actual 2016-17	Actual 2017-18	Available 2018-19	Request 2019-20	2020-21 PY1	2021-22 PY2	2022-23 PY3	2023-24 PY4
Cash Balance, Beginning:	\$ 117,331	\$ 29,674	\$ 16,515	\$ 41,873	\$ 27,695	\$ 30,329	\$ 33,042	\$ 35,835	\$ 38,712
Receipts:									
Employee Contributions	\$ 135,057	\$ 139,907	\$ 139,877	\$ 144,073	\$ 148,395	\$ 152,847	\$ 157,432	\$ 162,155	\$ 167,020
Net Sale or Purchase of Securities	\$ (80,541)	\$ 3,943	\$ 72,789	\$ 34,677	\$ 52,955	\$ 54,544	\$ 58,180	\$ 57,866	\$ 59,602
Interest (a)	\$ 368	\$ 471	\$ 1,376	\$ 1,417	\$ 1,460	\$ 1,504	\$ 1,549	\$ 1,595	\$ 1,643
Total Receipts	\$ 54,884	\$ 144,321	\$ 214,042	\$ 180,167	\$ 202,810	\$ 208,895	\$ 215,161	\$ 221,616	\$ 228,265
Total Funds Available	\$ 172,215	\$ 173,995	\$ 230,557	\$ 222,040	\$ 230,505	\$ 239,224	\$ 248,203	\$ 257,451	\$ 266,977
Disbursements:									
Benefits and Rollovers	\$ 135,059	\$ 149,631	\$ 181,063	\$ 186,495	\$ 192,090	\$ 197,853	\$ 203,789	\$ 209,903	\$ 216,200
Fees and Expenses	\$ 7,482	\$ 7,849	\$ 7,621	\$ 7,850	\$ 8,086	\$ 8,329	\$ 8,579	\$ 8,836	\$ 9,101
Total Disbursements	\$ (142,541)	\$ (157,480)	\$ (188,684)	\$ (194,345)	\$ (200,176)	\$ (206,182)	\$ (212,368)	\$ (218,739)	\$ (225,301)
Cash Balance, Ending	\$ 29,674	\$ 16,515	\$ 41,873	\$ 27,695	\$ 30,329	\$ 33,042	\$ 35,835	\$ 38,712	\$ 41,676

^a Includes interest earned on funds controlled by State Employees' Retirement System and Department of Treasury.

CASH FLOW STATEMENT
STATE EMPLOYEES' RETIREMENT SYSTEM
STATE EMPLOYEES' RETIREMENT FUND – FUND 061

This fund was created in 1923 to accumulate reserves for the payment of pensions to eligible former state employees. Money in this fund is used to pay retirement, disability and death benefits to members of the State Employees' Retirement System and their beneficiaries. Membership in the system is mandatory for most state employees, and available to employees of non-state entities such as the Pennsylvania State University, the Turnpike Commission, the Delaware River Port Authority, and other public and quasi-public institutions authorized by the Retirement Code.

The fund receives revenue from employee contributions, employer contributions, and income derived from its investment portfolio. Employer contributions are an actuarially determined percentage of payroll sufficient to fund current and future benefit payments. Investment income is used to credit interest to each member's account; to pay the administrative expenses of the retirement system; and to accumulate monies for the payment of future benefits. Management of the fund and payment of benefits is overseen by the State Employees' Retirement Board.

Act 2010-120 mandates benefit reductions for new members effective January 1, 2011, for most and December 1, 2010, for legislators. Act 120 provisions include: (1) a new Class A-3 for most new employees, including legislators, with a reduced accrual rate of 2% and an employee contribution rate of 6.25%, but with an optional Class A-4 with a 2.5% accrual rate and a 9.30% employee rate; (2) normal retirement age increased from 60 to 65 or 50 to 55, as applicable; (3) no Option 4 withdrawal of employee contributions and interest for vested members; (4) increasing vesting from five to ten years; (5) purchase of service at full cost; (6) Rule of 92 with 35 years of service minimum; and (7) shared risk. Amortization of unfunded liability as of December 31, 2009 began on July 1, 2010.

On June 12, 2017, Governor Wolf signed Act 2017-5 into law. This law fundamentally changes retirement options for most new hires beginning January 1, 2019. For most new members, this legislation establishes two hybrid defined benefit/defined contribution tiers and a straight defined contribution plan. In addition to new hires, current members will have the opportunity to opt-in between January 1, 2019 and March 31, 2019.

The cash balance shown in the statement includes substantial investment assets. The net investment adjustment item is to reflect the carrying value of long-term investments.

Statement of Cash Receipts and Disbursements:
(Dollar Amounts in Thousands)

	Actual 2015-16	Actual 2016-17	Actual 2017-18	Available 2018-19	Request 2019-20	Plan Year 1 2020-21	Plan Year 2 2021-22	Plan Year 3 2022-23	Plan Year 4 2023-24
Cash Balance, Beginning:	\$ 27,179,885	\$ 25,677,011	\$ 27,600,396	\$ 29,211,263	\$ 30,254,581	\$ 31,258,086	\$ 32,206,917	\$ 33,105,074	\$ 33,978,379
Receipts:									
Contributions of Employees	\$ 407,088	\$ 425,073	\$ 434,469	\$ 381,500	\$ 387,500	\$ 394,500	\$ 401,500	\$ 409,000	\$ 417,000
Contributions of Employers	\$ 1,382,987	\$ 1,712,992	\$ 1,976,914	\$ 2,053,780	\$ 2,070,263	\$ 2,074,266	\$ 2,085,733	\$ 2,123,197	\$ 2,142,158
Transfer from PSERS	\$ 12,446	\$ 10,443	\$ 11,340	\$ 11,340	\$ 11,340	\$ 11,340	\$ 11,340	\$ 11,340	\$ 11,340
Directed Commissions	\$ 142	\$ 133	\$ 162	\$ 162	\$ 162	\$ 162	\$ 162	\$ 162	\$ 162
Net Investment Adjustment	\$ (132,741)	\$ 3,064,829	\$ 2,558,681	\$ 2,117,817	\$ 2,193,457	\$ 2,266,211	\$ 2,335,001	\$ 2,400,118	\$ 2,463,432
Other	\$ 6,119	\$ 11,656	\$ 17,594	\$ 17,594	\$ 17,594	\$ 17,594	\$ 17,594	\$ 17,594	\$ 17,594
Total Receipts	\$ 1,676,041	\$ 5,225,126	\$ 4,999,160	\$ 4,582,193	\$ 4,680,316	\$ 4,764,073	\$ 4,851,330	\$ 4,961,411	\$ 5,051,686
Total Funds Available	\$ 28,855,926	\$ 30,902,137	\$ 32,599,556	\$ 33,793,456	\$ 34,934,897	\$ 36,022,159	\$ 37,058,247	\$ 38,066,485	\$ 39,030,065
Disbursements:									
Treasury	\$ 163	\$ 29	\$ (6)	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150
Benefits and Expenses	\$ 3,178,752	\$ 3,301,712	\$ 3,388,299	\$ 3,538,725	\$ 3,676,661	\$ 3,815,092	\$ 3,953,023	\$ 4,087,956	\$ 4,215,892
Total Disbursements	\$ (3,178,915)	\$ (3,301,741)	\$ (3,388,293)	\$ (3,538,875)	\$ (3,676,811)	\$ (3,815,242)	\$ (3,953,173)	\$ (4,088,106)	\$ (4,216,042)
Cash Balance, Ending	\$ 25,677,011	\$ 27,600,396	\$ 29,211,263	\$ 30,254,581	\$ 31,258,086	\$ 32,206,917	\$ 33,105,074	\$ 33,978,379	\$ 34,814,023

CASH FLOW STATEMENT
STATE EMPLOYEES' RETIREMENT SYSTEM DEFERRED COMPENSATION FUND
SHORT-TERM PORTFOLIO - FUND 110

Act 1987-81 established the Commonwealth Deferred Compensation Program (DCP). The DCP enables eligible employees to voluntarily defer a portion of their compensation into a supplemental retirement savings plan. Pennsylvania Treasury Department's Short-Term Money Market Fund is one of the available funds for employees to choose as an investment option. In order to maintain the identity of the investments and deferred compensation contributions, the Deferred Compensation Fund - Short-Term Portfolio was established.

Statement of Cash Receipts and Disbursements:

(Dollar Amounts in Thousands)

	ACTUAL 2015-16	ACTUAL 2016-17	ACTUAL 2017-18	AVAILABLE 2018-19	BUDGET 2019-20	PLAN YR 1 2020-21	PLAN YR 2 2021-22	PLAN YR 3 2022-23	PLAN YR 4 2023-24
Cash Balance, Beginning:	\$ 56,203	\$ 61,207	\$ 66,705	\$ 67,514	\$ 68,339	\$ 69,180	\$ 70,038	\$ 70,913	\$ 71,806
Receipts:									
Transfers from Deferred Compensation Fund	\$ 12,458	\$ 14,038	\$ 25,306	\$ 25,812	\$ 26,328	\$ 26,855	\$ 27,392	\$ 27,940	\$ 28,499
Interest	\$ 203	\$ 555	\$ 970	\$ 989	\$ 1,009	\$ 1,029	\$ 1,050	\$ 1,071	\$ 1,092
Total Receipts	\$ 12,661	\$ 14,593	\$ 26,276	\$ 26,801	\$ 27,337	\$ 27,884	\$ 28,442	\$ 29,011	\$ 29,591
Total Funds Available	\$ 68,864	\$ 75,800	\$ 92,981	\$ 94,315	\$ 95,676	\$ 97,064	\$ 98,480	\$ 99,924	\$ 101,397
Disbursements:									
Transfers to Deferred Compensation Fund	\$ 7,657	\$ 9,095	\$ 25,467	\$ 25,976	\$ 26,496	\$ 27,026	\$ 27,567	\$ 28,118	\$ 28,680
Total Disbursements	\$ (7,657)	\$ (9,095)	\$ (25,467)	\$ (25,976)	\$ (26,496)	\$ (27,026)	\$ (27,567)	\$ (28,118)	\$ (28,680)
Cash Balance, Ending	\$ 61,207	\$ 66,705	\$ 67,514	\$ 68,339	\$ 69,180	\$ 70,038	\$ 70,913	\$ 71,806	\$ 72,717

**CASH FLOW STATEMENT
STATE EMPLOYEES' RETIREMENT SYSTEM
BENEFIT COMPLETION PLAN – FUND 165**

This fund was created in 2003 to accumulate reserves for the payment of pensions to eligible former state employees with a statutory benefit entitlement under the State Employees' Retirement Code that exceeds the limits of Section 415(b) of the Internal Revenue Code (IRC). Reserves in this fund will be disbursed to members of the retirement system in accordance with the provision of IRC Section 415(m).

The fund receives revenue from employer contributions and interest income. Employer contributions are an actuarially determined percentage of payroll sufficient to fund the benefit payments of the forthcoming calendar year and the on-going expenses to administer the plan. Management of the fund and payment of benefits is overseen by the State Employees' Retirement Board.

Statement of Cash Receipts and Disbursements:

(Dollar Amounts in Thousands)

	Actual 2015-16	Actual 2016-17	Actual 2017-18	Available 2018-19	Request 2019-20	Plan Year 1 2020-21	Plan Year 2 2021-22	Plan Year 3 2022-23	Plan Year 4 2023-24
Cash Balance, Beginning:	\$ 3,858	\$ 3,850	\$ 2,290	\$ 532	\$ 660	\$ 741	\$ 750	\$ 723	\$ 665
Receipts:									
Contributions of Employers	\$ 1,509	\$ -	\$ 450	\$ 1,880	\$ 1,897	\$ 1,894	\$ 1,927	\$ 1,963	\$ 2,002
Interest	\$ 11	\$ 25	\$ 23	\$ 23	\$ 23	\$ 23	\$ 23	\$ 23	\$ 23
Total Receipts	\$ 1,520	\$ 25	\$ 473	\$ 1,903	\$ 1,920	\$ 1,917	\$ 1,950	\$ 1,986	\$ 2,025
Total Funds Available	\$ 5,378	\$ 3,875	\$ 2,763	\$ 2,435	\$ 2,580	\$ 2,658	\$ 2,700	\$ 2,709	\$ 2,690
Disbursements:									
Benefits and Expenses	\$ 1,528	\$ 1,585	\$ 2,231	\$ 1,775	\$ 1,839	\$ 1,908	\$ 1,977	\$ 2,044	\$ 2,108
Total Disbursements	\$ (1,528)	\$ (1,585)	\$ (2,231)	\$ (1,775)	\$ (1,839)	\$ (1,908)	\$ (1,977)	\$ (2,044)	\$ (2,108)
Cash Balance, Ending	\$ 3,850	\$ 2,290	\$ 532	\$ 660	\$ 741	\$ 750	\$ 723	\$ 665	\$ 582

CASH FLOW STATEMENT
STATE EMPLOYEES' RETIREMENT SYSTEM
DEFINED CONTRIBUTION FUND – FUND 219

According to the provisions of Act 2017-5, this fund was created in FY 2017-18 to accumulate reserves for the payment of defined contribution plan retirement benefits to eligible former state employees. Money in this fund is used to pay expenses of the plan and retirement benefits to participants of the State Employees' Defined Contribution Plan and their beneficiaries. Participation in the plan is mandatory for most new state employees hired on or after January 1, 2019 and available to employees of non-state entities, such as the Pennsylvania State University, the Turnpike Commission, the Delaware River Port Authority and other public and quasi-public institutions authorized by the Retirement Code.

The fund receives revenue from employee contributions, employer contributions, appropriations and income derived from its investment portfolio. All fees, costs and expenses of establishing and administering the plan and the trust and investing the assets of the trust shall be borne by the participants and paid from assessments against the balances of the individual investment accounts as established by the Board, except that the fees, costs and expenses of establishing and administering the plan and the trust shall be paid by the Commonwealth through annual appropriations. Management of the fund and payment of benefits are overseen by the State Employees' Retirement Board.

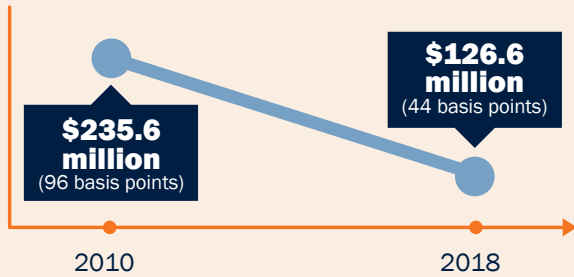
Statement of Cash Receipts and Disbursements:

(Dollar Amounts in Thousands)

	Actual* 2015-16	Actual* 2016-17	Actual 2017-18	Available 2018-19	Request 2019-20	Plan Year 1 2020-21	Plan Year 2 2021-22	Plan Year 3 2022-23	Plan Year 4 2023-24
Cash Balance, Beginning:	\$ -	\$ -	\$ -	\$ 5,269	\$ 10,299	\$ 25,547	\$ 48,515	\$ 82,855	\$ 129,437
Receipts:									
Contributions of Employees	\$ -	\$ -	\$ -	\$ 6,000	\$ 17,700	\$ 29,300	\$ 40,900	\$ 52,700	\$ 64,800
Contributions of Employers	\$ -	\$ -	\$ -	\$ 3,400	\$ 10,100	\$ 16,700	\$ 23,400	\$ 30,100	\$ 37,100
Appropriation (a)	\$ -	\$ -	\$ 5,269	\$ 4,901	\$ 3,834	\$ 1,250	\$ 2,500	\$ 4,500	\$ 5,500
Net Investment Adjustment	\$ -	\$ -	\$ -	\$ 330	\$ 1,348	\$ 2,730	\$ 4,122	\$ 5,525	\$ 6,957
Other	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Receipts	\$ -	\$ -	\$ 5,269	\$ 14,631	\$ 32,982	\$ 49,980	\$ 70,922	\$ 92,825	\$ 114,357
Total Funds Available	\$ -	\$ -	\$ 5,269	\$ 19,900	\$ 43,281	\$ 75,527	\$ 119,437	\$ 175,680	\$ 243,794
Disbursements:									
Benefits and Expenses (b)	\$ -	\$ -	\$ -	\$ 9,601	\$ 17,734	\$ 27,012	\$ 36,582	\$ 46,243	\$ 56,197
Total Disbursements	\$ -	\$ -	\$ -	\$ (9,601)	\$ (17,734)	\$ (27,012)	\$ (36,582)	\$ (46,243)	\$ (56,197)
Cash Balance, Ending	\$ -	\$ -	\$ 5,269	\$ 10,299	\$ 25,547	\$ 48,515	\$ 82,855	\$ 129,437	\$ 187,597

*Fund 219 was created in FY 2017 and no reportable information for the period specified.

SERS decreased manager investment expenses



In 2018
SERS retired
4,680
members
and welcomed
11,257
new members

SERS paid nearly
\$3.4 billion
in benefits in 2018

41% of SERS active employees belong to post-Act 120 classes of service

As of Dec 31, 2018 SERS had

103,147
active members

131,007
annuitants

2018 Contributions to the SERS Fund

\$394 million
members contributed

\$2.2 billion
employers contributed

Total FY 19/20 Spending Request



\$34.4 million

\$1.5 million

directed commissions

\$20.0 million
personnel

\$15.6 million
operations

\$0.3 million
fixed assets

Samples from operations =

IT consulting-system upgrade **\$4.3 million**
real estate **\$2.1 million**
treasury services **\$1.5 million**
postage **\$0.7 million**
legal services **\$0.6 million**
office equipment **\$0.2 million**

SERS average active member

46 years old

12 years of service

SERS average retired member

72 years old

receives
\$28,880
per year

Global Public Equity
-10.3%

Private Equity
11.7%

Cash
2.1%

Legacy Hedge Funds
-13.7%

Real Estate
-1.3%

Fixed Income
-0.9%

In 2018
the SERS
fund returned
-4.3%
(unaudited)

Data throughout is estimated/unaudited

SERS 2019 Supplemental Budget Book

January 31, 2019

Honorable Stan Saylor
Majority Chairman
House Appropriations Committee
245 Main Capitol
Harrisburg, PA 17120-2094

Honorable Matt Bradford
Democratic Chairman
House Appropriations Committee
512 E. Main Capitol
Harrisburg, PA 17120-2070

Gentlemen and Members of the Appropriations Committee:

On behalf of the State Employees' Retirement System (SERS), I am pleased to provide you with the enclosed detailed information concerning SERS operations, investments, and request for spending authority. We trust the information provided within will be useful in your deliberations related to the development and passage of the FY 2019-20 commonwealth budget.

For FY 2019-20, SERS proposes a \$30.5 million spending authority, which is drawn from SERS funds, not general government operating accounts and \$3.8 million, which is expected to be appropriated from non-SERS funds, for the new defined contribution plan.

This year SERS will serve approximately 240,000 active, vested, and retired members. The average retiree who has worked to full retirement age received an average annual annuity of \$28,880. The system paid out nearly \$3.4 billion dollars in 2018, of which approximately \$3.1 billion – approximately 91% – was paid to members who live within Pennsylvania.

In 2018, SERS experienced an estimated investment loss of 4.3%, due in large part to the high level of market volatility that occurred throughout the year, but especially during the fourth quarter. The impact was felt across the globe. During 2018, the Dow Jones Average fell 5.6%. The S&P 500 was down 6.2% and the Nasdaq fell 3.9%. Globally, the FTSE All-World index, which tracks thousands of stocks across a range of markets, fell 11.3% in 2018 – the index's worst performance since the global financial crisis, and a sharp reversal from its nearly 25% gain in 2017. In short, it was a challenging year.

Even in the face of such economic challenges, SERS continues to strive to improve services to our stakeholders, as well as improving efficiencies in the delivery of benefits and reducing cost in the administration of the system to our employers. Reducing investment fees has been an ongoing goal for SERS. Since 2010, we have reduced fees and expenses for our investment program by more than \$109 million.

During 2018, SERS also provided information and testimony to the Public Pension Management and Asset Investment Review Commission, which was created as a result of Act 2017-5 for the purpose

of studying, identifying and recommending ways the Commonwealth's public pension funds might improve their processes in regard to transparency, investment strategies and performance, stress testing and more. The SERS board is currently reviewing more than 100 specific recommendations that were identified in the commission's final report. We look forward to working with the general assembly to review and act upon their recommendations.

Act 2017-5 also resulted in a number of important fundamental changes to the retirement options for most new hires beginning January 1, 2019. For most new members, this legislation establishes two hybrid defined benefit/defined contribution tiers and a straight defined contribution plan. In addition to new hires, current members will have the opportunity to opt-in between January 1, 2019, and March 31, 2019. During the second half of 2018, SERS staff worked hard to develop communications programs to educate members about their choices, and we are working with them now to provide guidance and support as they make their selections.

Members can be assured that their retirement system is administered well, and that staff carefully manages the funds entrusted to the Board.

We continue to value our commitment to our members and the taxpayers of Pennsylvania to employ a prudent investment policy to ensure that meaningful retirement benefits are available to those employees who have served the people of Pennsylvania. It has been, and will continue to be, 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 12th at 10:00 a.m. If you have questions, comments, or concerns before then, please do not hesitate to call.

Sincerely,



David R. Fillman
Chairman

SERS 2019 SUPPLEMENTAL BUDGET BOOK

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SERS Organization

SERS ORGANIZATION

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 \$26.8 billion as of December 31, 2018.

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

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

Mission

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

Vision

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

Guiding Principles

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

SERS ORGANIZATION

Services & Operations

The approximately 200 employees who work for the State Employees' Retirement System share a singular focus: serving SERS members. Some SERS employees serve members by investing and overseeing approximately \$26.8 billion. Other SERS employees serve members by ensuring that every monthly payment is made correctly and on time. Still others audit and account for each penny, provide online information, or answer members' questions in person or over the phone.

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

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

Examples of services offered to retired members include:

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

SERS ORGANIZATION

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.

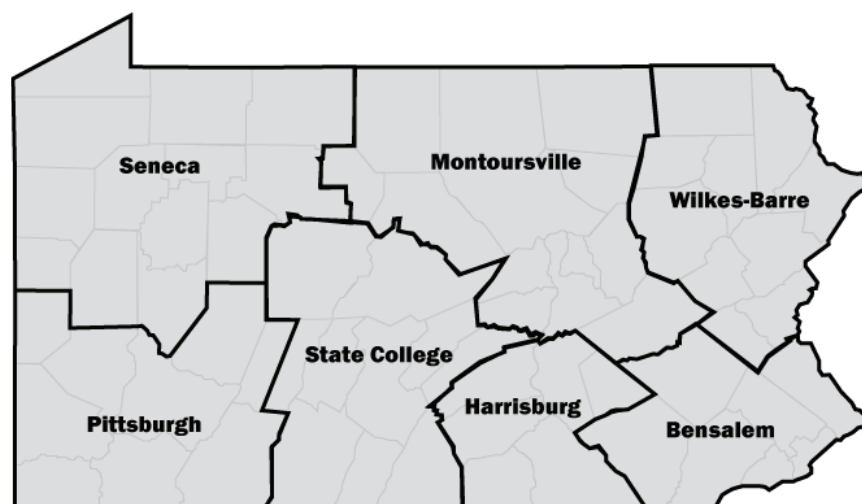
Montoursville Regional Counseling Center. Serving retired members who live and active members who work in Bradford, Cameron, Clinton, Columbia, Lycoming, Montour, Northumberland, Potter, Schuylkill, Snyder, Sullivan, Tioga, and Union counties.

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

Services & Operations

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

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

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

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

The **office of finance and administration** maintains accounting controls and oversees all SERS funds. It administers all transactions including, for example, member payments; member and employer contributions; investment purchases and sales; and operational expenses and budgeting. The office also manages facilities and procurement, and oversees the accounting and financial reporting for the deferred compensation and defined contribution plans.

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

The **legal office** advises the State Employees' Retirement Board on matters related to member appeals and administrative hearings, securities actions and litigation matters, the administration of the Commonwealth of Pennsylvania Deferred Compensation Program and State Employees' Defined Contribution Plan, 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

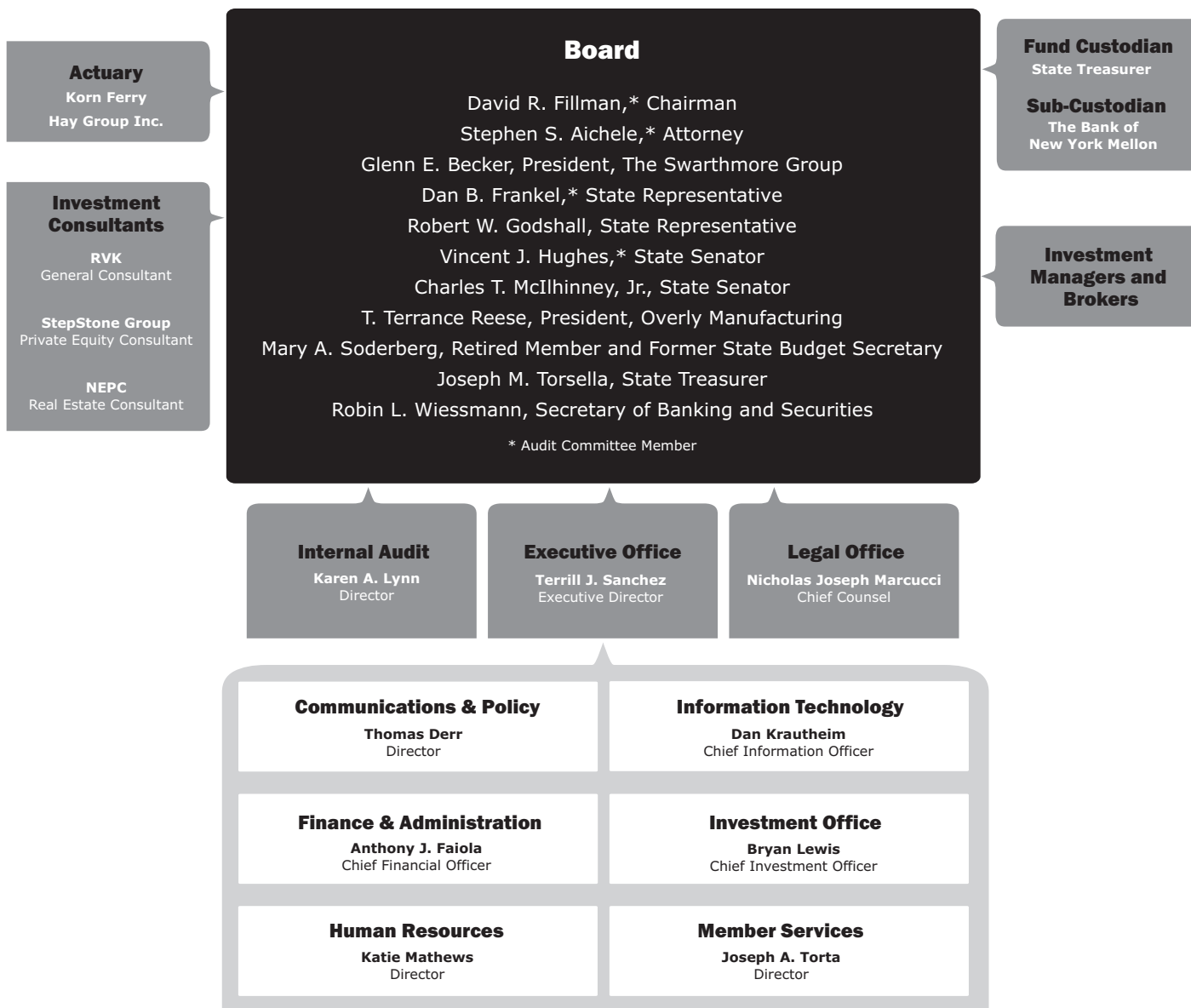
Services & Operations

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** supports the agency by hiring, developing, and managing employees. The division is responsible for classification, compensation, disability services, employee relations, equal employment, onboarding, performance management, staffing, time administration, training, and work-related injury programs. The division also facilitates the annual financial disclosure processes for SERS board members and staff.

SERS ORGANIZATION

Services & Operations



As of 12/31/18

SERS ORGANIZATION

Proposed FY 2019-20 Administrative Budget

	Rebudget 2015-2016	Rebudget 2016-2017	Rebudget 2017-2018	Rebudget 2018-2019	Budget Request
Personnel Services	\$16,934,000	\$16,548,700	\$18,560,500 ^{1/}	\$17,084,000 ^{1/}	\$17,518,000
Operational					
Travel	56,400	54,300	55,800	65,800	90,000
Training	116,950	125,600	79,500	138,550	103,600
Communication Services	418,400	472,500	481,400	471,500 ^{1/}	548,000
Consultants - Non EDP	401,600	349,700	811,000 ^{1/}	820,000 ^{1/}	953,500
Legal Services/Fees	386,000	280,000	641,000 ^{1/}	521,100 ^{1/}	355,500
Specialized Services	455,670	545,550	630,350 ^{1/}	1,571,400 ^{1/}	1,207,000
Advertising	5,000	8,000	10,000	8,000	8,000
IT Consulting	1,200,000	1,620,100	6,150,500 ^{1/}	4,353,000 ^{1/}	4,228,000
Contracted Maintenance Non-IT	41,300	49,300	58,900	65,400	47,300
Hardware/Software and Maintenance	1,071,160	1,518,500	2,123,600 ^{1/}	1,610,250	1,539,000
Real Estate	1,680,091	1,710,100	1,727,390	1,926,250 ^{1/}	1,971,000
Vehicles	25,600	23,000	25,800	25,000	26,800
Office Equipment	94,600	95,300	146,250 ^{1/}	215,800 ^{1/}	157,400
Other Rentals/Leases	3,600	3,600	3,600	6,300	4,000
Office Supplies	107,000	139,200	122,500	117,050 ^{1/}	106,000
Educational Supplies	3,140	2,200	153,100 ^{1/}	82,000 ^{1/}	1,700
Motorized Equipment Maintenance	3,500	3,500	3,500	4,000	6,000
Postage	352,100	471,960	646,500 ^{1/}	610,500 ^{1/}	600,500
Freight	3,500	3,500	3,200	3,200	4,000
Printing	157,100	226,400	217,450 ^{1/}	209,600 ^{1/}	132,000
Subscriptions & Licensing	35,590	59,350	39,150	43,900	57,800
Membership Dues	26,000	26,540	25,300	27,900	37,900
Conference Expenses	8,400	8,600	14,300	16,500	27,900
Insurance, Surety, & Fidelity Bonds	13,000	13,000	13,000	13,000	13,000
Treasury Services	1,190,000	1,255,000	1,145,360	1,475,500	1,500,000
Other Operational	203,299	203,300	119,900	530,500	552,100
Total Operational	8,059,000	9,268,100	15,448,350	14,932,000	14,278,000
Fixed Assets	250,000	250,000	110,000	250,000	250,000
Less Directed Commissions	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000
Total Annual Budget	\$23,743,000	\$24,566,800	\$32,618,850	\$30,766,000	\$30,546,000

^{1/}Figures include amounts needed to implement the defined benefit portion of Act 2017-5.

SERS ORGANIZATION

Proposed FY 2019-20 Administrative Budget

Directed Commission Revenue & Expense

	FY 2018-19 Budget	FY 2019-20 Budget
Beginning Balance	\$3,219,240	\$1,819,240
Directed Commission Revenue	100,000	100,000
Total Available	3,319,240	1,919,240
Directed Commission Expense	1,500,000	1,500,000
Ending Balance	\$1,819,240	\$419,240

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

Proposed FY 2019-20 Defined Contribution Budget

	Rebudget 2017-2018 ^{1/}	Rebudget 2018-2019 ^{1/}	Budget Request
Personnel Services	\$1,891,000	\$2,782,000	\$2,497,000
Operational			
Travel	0	0	9,400
Training	0	0	12,500
Consultants - Non EDP	250,000	287,500	125,000
Legal Services/Fees	279,000	193,000	200,000
Specialized Services	1,890,000	1,230,000	541,000
IT Consulting	400,000	100,000	100,000
Telecom - Voice - Services	0	2,500	0
Hardware/Software and Maintenance	50,000	0	0
Facilities and Equipment	58,750	0	0
Real Estate	0	56,000	150,000
Educational Supplies	150,000	0	0
Maintenance Material and Supplies	0	0	50,000
Postage	200,000	125,000	101,000
Printing	100,000	125,000	48,100
Total Operational	3,377,750	2,119,000	1,337,000
Total Annual Budget	\$5,268,750	\$4,901,000	\$3,834,000

^{1/}Figures include amounts needed to implement the defined contribution portion of Act 2017-5.

SERS ORGANIZATION

Legislation

No legislation that affected SERS operations was enacted in 2018.

SERS Members

SERS MEMBERS

Demographics as of December 31

Total Active & Annuitant Members

Year Ending December 31	Total Members ^{1/}	Active Members	Annuitants & Beneficiaries
2018	234,154	103,147	131,007
2017	232,451	102,978	129,473
2016	231,970	104,632	127,338
2015	229,714	105,025	124,689
2014	226,680	104,431	122,249
2013	225,238	105,186	120,052
2012	223,109	106,048	117,061
2011	222,363	107,021	115,342
2010	220,968	109,255	111,713
2009	219,746	110,107	109,639

^{1/}Totals do not include inactive members.

Active Members: Age & Service

Average Age	46.3
Average Years of Service	11.8

Total Annuitants & Beneficiaries: By Category

	2015	2016	2017	2018
Normal	61,753	63,315	64,796	65,968
Early	43,272	43,974	44,284	44,383
Disability	8,512	8,578	8,593	8,626
Beneficiary/Survivor	11,152	11,471	11,800	12,030

Annuitants & Beneficiaries: Average Age

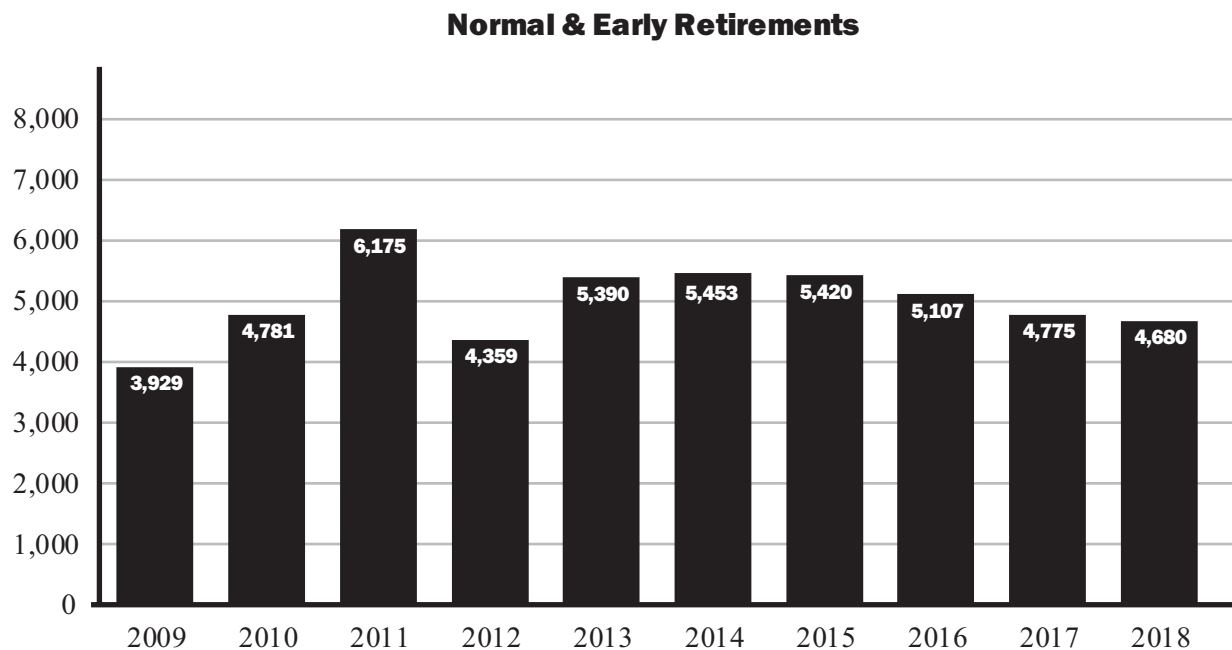
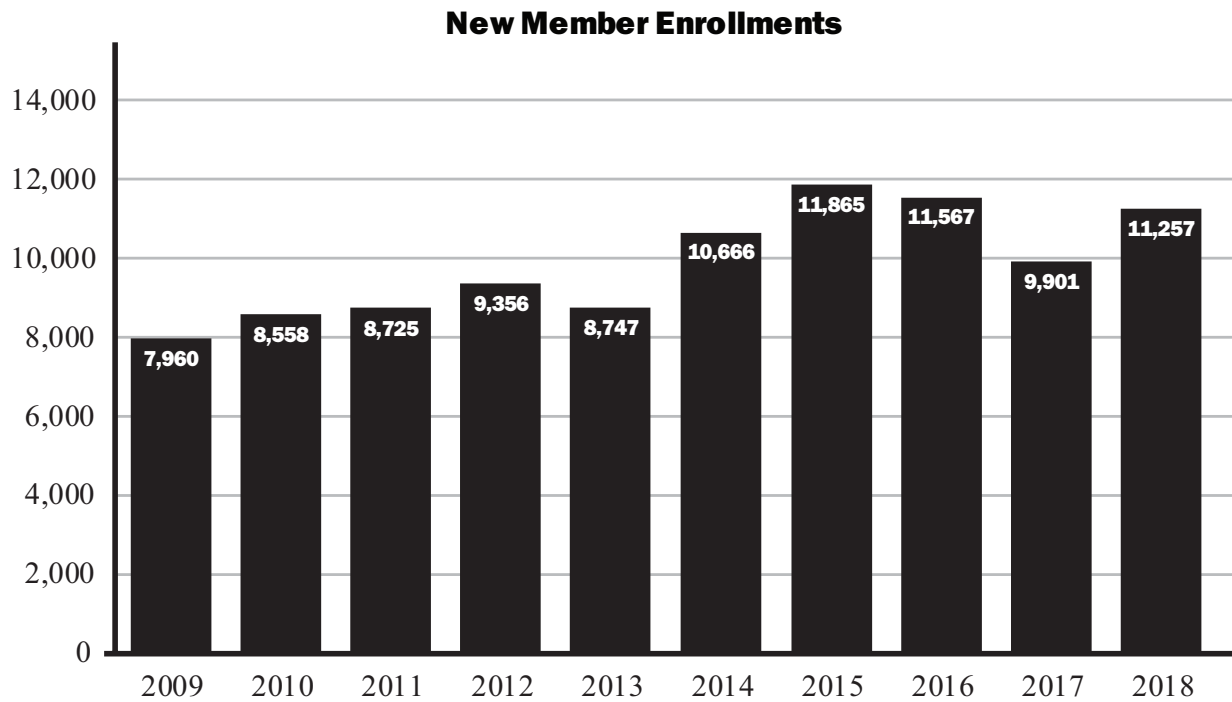
	2015	2016	2017	2018
Normal	72.3	72.3	72.3	72.4
Early	64.0	64.3	64.7	65.1
Disability	63.0	63.4	63.7	64.1
Beneficiary/Survivor	74.6	74.5	74.6	74.6

Annuitants & Beneficiaries: Average Annual Pension

	2015	2016	2017	2018
Normal	\$27,042	\$27,722	\$28,352	\$28,880
Early	16,934	17,412	17,751	18,096
Disability	15,020	15,245	15,521	15,753
Beneficiary/Survivor	12,007	12,505	12,947	13,350

SERS MEMBERS

Demographics as of December 31



SERS Fund

SERS FUND

Funding Process

Defined Benefit Plan

The Pennsylvania State Employees' Retirement System currently administers four 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 plan. 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 plan are provided in the last section of this book.

In the defined benefit plan, both the employer and the member pay a certain percentage of the member's salary to the SERS Fund for as long as the member works for the commonwealth. For FY 2018-19, employers are contributing 32.9% of payroll and most members are paying 6.25%. SERS invests this money to achieve returns to help ensure sufficient funds are available to make payments to current and future retirees.

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

Act 2017-5

In addition to administering these two traditional plans, the system spent much of 2018 working to implement a new plan that was established under the auspices of Act 2017-5, which was signed into law on June 12, 2017, and took effect January 1, 2019.

Act 2017-5 established two new side-by-side hybrid defined benefit (DB)/defined contribution (DC) benefit options and a new DC-only option for most state employees who first enter SERS membership on or after January 1, 2019. Most hazardous duty employees are exempt from the new benefit options. However, hazardous duty employees starting on or after January 1, 2019, will have a 10% cap on voluntary overtime that is includable for retirement covered earnings.

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

2018 Overview

In 2018, SERS made approximately \$3.4 billion in benefit payments, approximately \$3.1 billion of

Funding Process

which stayed in Pennsylvania. The average annual pension paid to a retired member who worked to full retirement age was \$28,880.

Determining Adequate Funding for a Defined Benefit Plan

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

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

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.

Current Key Actuarial Assumptions

7.25%
long-term investment return
5.6%
average salary growth
2.6%
rate of inflation

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 forecast uncertain future events.

SERS actuarial firm conducts an in-depth investigation and analysis—known as an experience study every five years. The actuary uses actual and expected experience and data to set economic and demographic assumptions. 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.

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.

Each year, SERS’ actuarial firm uses the most recent active member and retiree demographic data to

SERS FUND

Funding Process

determine total expected future obligations. The actuary then compares those obligations to the expected value of the fund's assets, based on current audited financial statements and future economic assumptions.

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

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

Member Contributions

Active members pay a certain percentage of their pay toward their retirement benefit. While different classes of membership pay different rates, most members currently pay 6.25% of their pay. The percentage is set by statute and the rate does not change from year to year. Members' contributions are withheld from their paychecks and sent directly from their employer to SERS. In 2018, member contributions to SERS totaled an estimated \$394 million.

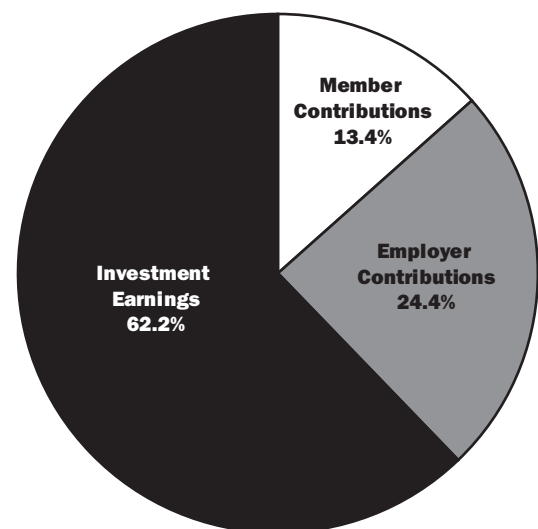
Courts have ruled that public retirement benefits may not be retroactively changed in any way that may be a "net detriment" to employees. "Net detriment" has been interpreted as a reduction in benefits already earned, and/or as an increase in member contributions required to maintain such benefits.

There are some instances, however, in which member contributions can increase. For example, Pennsylvania's Act 2010-120 introduced a "risk sharing" provision whereby if there is a multi-year period of investment returns below the assumed rate and if employers have met their contribution obligations to the pension system, the contributions paid by those who entered SERS membership on or after January 1, 2011, could increase. In addition, Act 2017-5 created new classes that have shared gain and loss, and adjusted Act 2010-120 classes to add a shared gain provision. The result is that all classes with shared risk are treated similarly. To date, the shared risk provision has not been triggered. It will be reviewed again in 2020, considering investment performance for calendar years 2011 through 2019.

Investment Earnings

SERS overall investment objective is to assure adequate fund reserves at the least cost to commonwealth citizens and to protect against the erosion of principal by inflation. SERS seeks to provide investment earnings that meet, or preferably exceed, the assumed rate of return over complete economic cycles.

SERS Funding Sources
(20-Year Cumulative History)



SERS FUND

Funding Process

SERS strives to meet this objective by applying acceptable risk parameters and allocations to investments that are diversified by type, industry, quality, and geography.

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

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

As a result of SERS' 90-plus years of operation and the trend of people living longer, the system now has more retired members than active members. In 2019, SERS is projected to pay out approximately \$96 million more each month than it takes in through member and employer contributions.

As a normal outcome of a maturing pension system, the liquidity needs of its fund increase requiring ongoing rebalancing of assets. In recognition of this fact and in acknowledgement of continuing economic challenges, SERS again reduced its assumed rate of return in 2017; this time, from 7.5% to 7.25%. This change has implications for the employer contribution rate, as discussed below. For 11 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 6.0%, a 25-year rate of return of 7.7%, and a 30-year return of 8.4%. 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 as previously discussed, is designed to moderate the need for future employer rate increases that may be prompted by investment underperformance. To date, the shared risk provision has not been triggered. It will be reviewed again in 2020, considering investment performance for calendar years 2011 through 2019.

Employer Contributions

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

The employer normal cost is expressed as a percentage of payroll and is the amount employers would contribute if all actuarial assumptions were precisely correct, including the fund earning exactly its

SERS FUND

Funding Process

assumed rate of return. The normal cost of benefits as of the 2017 actuarial valuation was 4.88%.

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%. The rate for the current fiscal year is 32.9%.

The total dollars contributed by employers has grown significantly in recent years. In 1988, employer contributions totaled \$382 million. In 2018 that figure was approximately \$2.2 billion.

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

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

FY 2017-18 was the first year since contribution rates were mandated through Act 2010-120 that rate collars were no longer needed and the commonwealth paid the full actuarially required contribution. Thanks in large part to widespread market turbulence that cast a shadow on much of 2018, the FY 2019-20 employer contribution rate is currently projected to bump up slightly to 33.4% of payroll. Of that contribution rate, approximately 4.9% will go to fund the benefits of new SERS members in the current year (normal cost) and approximately 28.5% will go to pay down the unfunded liability.

Long-Term Snapshot		
	1988	2018
Employer Rate	13.03%	32.93%
Employer Contributions	\$382 million	\$2.2 billion
Member Rate	5.00%	6.25%
Member Contributions	\$153 million	\$394 million
Active Members	109,000	103,000
Annuityants	71,000	131,000

Looking at the relative sizes of the current-year and unfunded liability components of the employer rate listed above, it is clear that the unfunded liability is the most significant driving factor in the employer contribution rate. Extreme volatility in 2018 delayed an anticipated decrease in the projected employer rate for FY 2019-20, but beginning in FY 2023-24, employer rates are expected to decline annually.

The system currently uses a modified entry-age funding method. Act 2017-5 requires a traditional entry-age funding method with the 2021 valuation that will result in a single-year increase in the FY 2022-23 rate with a steady decline thereafter.

SERS FUND

Funding Process

Projected Payout, Funding Status & Employer Contributions

Assuming a modified entry-age funding method through 2020 with a traditional entry-age funding method starting in 2021, level-dollar amortization, five-year smoothing of assets, no FY 18 or later for Act 2010-120 collars, 5.6% salary growth, 2.6% inflation, -4.3% investment return in CY 2018 with 7.25% return thereafter, 6.25% pre Act 2017-5 employee contribution, 8.25% Act 2017-5 employee contribution for hybrid class A-5, 7.5% Act 2017-5 employee contribution for both hybrid class A-6 and 401a Defined Contribution only election.

Valuation Year Ended Dec 31	CY Payout	CY Funding Status		Fiscal Year	Expected FY Payroll (\$ millions)	FY Employer Contribution	
	Benefits & Expenses (\$ billions)	Funded Ratio	Unfunded Liability (\$ billions)			Employer Contribution Rate	Expected FY Contribution (\$ millions)
2018	\$3.4	56.5%	\$22.32	2019/20	\$6,446.8	33.37%	\$2,151.4
2019	3.6	56.3	22.72	2020/21	6,633.7	33.50	2,222.5
2020	3.7	56.8	22.72	2021/22	6,826.1	33.16	2,263.6
2021	3.8	62.6	18.19	2022/23	7,024.0	34.47	2,421.2
2022	4.0	62.5	18.45	2023/24	7,227.7	34.38	2,484.8
2023	4.1	63.6	18.04	2024/25	7,437.4	33.57	2,496.5
2024	4.2	64.9	17.57	2025/26	7,653.0	32.75	2,506.1
2025	4.3	66.1	17.04	2026/27	7,875.0	31.93	2,514.7
2026	4.4	67.5	16.46	2027/28	8,103.3	31.13	2,522.3
2027	4.5	68.8	15.82	2028/29	8,338.3	30.33	2,529.2
2028	4.6	70.2	15.13	2029/30	8,580.2	29.56	2,536.1
2029	4.7	71.7	14.39	2030/31	8,829.0	28.80	2,543.1
2030	4.8	73.2	13.59	2031/32	9,085.0	28.08	2,550.9
2031	4.9	74.8	12.74	2032/33	9,348.5	27.47	2,568.2
2032	5.0	76.5	11.82	2033/34	9,619.6	26.90	2,587.8
2033	5.1	78.3	10.82	2034/35	9,898.6	26.33	2,606.5
2034	5.1	80.3	9.74	2035/36	10,185.6	25.77	2,624.6
2035	5.2	82.5	8.57	2036/37	10,481.0	25.22	2,642.8
2036	5.3	84.9	7.31	2037/38	10,784.9	24.67	2,660.7
2037	5.4	87.5	5.95	2038/39	11,097.7	24.14	2,679.3
2038	5.5	90.4	4.49	2039/40	11,419.5	23.62	2,697.5
2039	5.6	93.7	2.91	2040/41	11,750.7	19.15	2,250.6
2040	5.7	96.3	1.68	2041/42	12,091.5	15.88	1,920.5
2041	5.8	98.4	0.71	2042/43	12,442.1	10.38	1,291.1
2042	5.9	99.7	0.14	2043/44	12,803.0	8.04	1,029.3
2043	6.1	100.4	(0.14)	2044/45	13,174.2	7.68	1,012.4
2044	6.2	101.1	(0.42)	2045/46	13,556.3	7.26	984.6
2045	6.4	101.9	(0.67)	2046/47	13,949.4	6.25	871.6
2046	6.5	102.4	(0.82)	2047/48	14,354.0	5.74	824.5
2047	6.7	103.0	(0.92)	2048/49	14,770.2	5.66	835.7

¹/Figures are based on 2017 actuarial funding valuation.

SERS FUND

Actuarial Status

Restoring SERS Defined Benefit Plan Funding

The SERS funded ratio is expected to improve as those who entered SERS membership before January 2011 retire and post-January 2011 members continue to grow in number. In 2018, SERS retired 4,680 members and added 11,257 new members. Currently, approximately 41% of SERS' active members belong to the post Act 2010-120 classes of service.

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

Even more impactful, Act 2010-120 also recognized the need for greater rates of employer funding and allowed employer contributions to increase over time. To ensure predictability and to moderate overall budget impacts, the general assembly set rate collars for increased employer contribution rates.

In 2018, extreme market volatility led to losses for investors across the board, including pension funds such as SERS, resulting in a projected slight uptick in the employer contribution rate.

As the employer rate has increased significantly over the last several years, its impact on paying down the liability is dramatic. Such funding is among the most crucial components of the overall, long-term stability of the pension system.

Current Funded Position of SERS Defined Benefit Plan

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

In general, a funding ratio of 80% or better is considered “healthy” for a pension system. Per a 2017 Wilshire report, Pennsylvania is among 74 out of 103 other state retirement systems that are currently below the 80% threshold. At the close of 2018, SERS' estimated funded ratio was 56.5% (actuarial value) or 52.8% (market value). SERS projects reaching the 80% funded threshold in 2034.

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:

SERS Funding Status

Year	Funded		Unfunded Actuarial Liability (\$ billions)
	Actuarial Value	Market Value	
2018	56.5%	52.8%	\$22.32
2017	59.4	60.7	19.66

The 2018 estimated unfunded liability is \$22.3 billion, which is now expected to decline as the required contribution payments are maintained.

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^{1/}

(\$ millions)

Calendar Year	Member Contributions	Investment Earnings	Employer Contributions	Benefits & Expenses	Fair (Market) Value
2009	\$349	\$3,561	\$253	(\$2,297)	\$24,662
2010	349	3,076	273	(2,474)	25,886
2011	351	480	392	(2,732)	24,377
2012	348	2,794	566	(2,696)	25,389
2013	352	3,724	795	(2,866)	27,394
2014	366	1,462	1,084	(2,968)	27,338
2015	372	88	1,360	(3,103)	26,055
2016	375	1,587	1,622	(3,251)	26,388
2017	383	4,066	1,898	(3,330)	29,405
2018 ^{2/}	394	(1,701) ^{3/}	2,172	(3,449)	26,821
10-Year Total	\$3,639	\$19,137	\$10,415	(\$29,166)	

^{1/}10-year net additions and deductions were \$4,025.

^{2/}2018 figures are unaudited

^{3/}Figure does not include 4th quarter earnings for all Private Equity and Real Estate. Data not yet available.

SERS Fund

Overview

Investment Program | Overview

Investment Policy

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

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

The major elements of the policy are:

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

SERS FUND

Investment Program | Overview

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

Investment Objectives

As indicated in SERS *Statement of Investment Policy*, the objectives of the SERS Fund are to provide benefit payments to participants and beneficiaries at the lowest cost to the commonwealth and to fund the program through a carefully planned and executed investment program.

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

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

SERS FUND

Investment Program | Overview

Asset Allocation Trend

Prudent Investor Investment Standards

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

Total Fund Asset Allocation

SERS develops a biennial investment plan which provides direction for the SERS investment program. The *2018-2019 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, 2018)

Asset Class	Market Exposure	% of Total Fund	Long-Term 10-Year Strategic Target
Private Equity	\$3,911.2	14.6%	16.0%
Global Public Equity	13,802.0	51.5	48.0
Real Estate	1,935.9	7.2	12.0
Multi-Strategy	2,369.2	8.8	10.0
Legacy Hedge Funds	47.1	0.2	*
Fixed Income	3,999.0	14.9	11.0
Cash	757.0	2.8	3.0
Total Fund	\$26,821.4	100.0%	100.0%

*Legacy Hedge Funds asset class is in liquidation.

Investment Program | Overview

Number of Investment Managers

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

Number of Investment Portfolios

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

SERS Fund

Performance

SERS FUND

Investment Program | Performance

Estimated Calendar Year, Net-of-Fees Returns^{1/}

For the period ending December 31, 2018

Asset Class	1-Year Total Return	3-Year Total Return	5-Year Total Return	10-Year Total Return
Private Equity ^{2/,5/}	11.7%	10.4%	10.1%	9.4%
<i>Burgiss All Private Equity Custom Index^{3/,5/}</i>	16.6	13.8	13.4	11.1
<i>Russell 3000 Index+3%^{4/,5/}</i>	21.1	20.6	16.9	15.4
Global Public Equity	-10.3	6.5	4.1	10.2
<i>MSCI ACWI IM Index (Net)</i>	-10.1	6.5	4.2	9.7
Real Estate ^{5/}	-1.3	1.3	4.8	2.4
<i>Real Estate Custom Benchmark^{5/,6/}</i>	7.2	7.6	9.4	5.1
<i>Consumer Price Index+3%^{5/}</i>	5.3	5.0	4.6	4.5
Multi-Strategy	0.0	NA	NA	NA
<i>Russell 3000 Index</i>	-5.2	9.0	7.9	13.2
<i>S&P/LSTA Leveraged Loan Index</i>	0.4	4.8	3.1	8.6
Legacy Hedge Funds	-13.7	-1.9	-1.9	0.4
<i>HF Custom Index^{7/}</i>	-6.2	1.4	1.5	5.0
Fixed Income	-0.9	3.1	2.5	6.8
<i>Bloomberg Barclays U.S. Aggregate Bond Index</i>	0.0	2.1	2.5	3.5
Cash	2.1	1.4	1.1	0.7
<i>BofA ML 3 Month U.S. T-Bill Index</i>	1.9	1.0	0.6	0.4
Total Fund	-4.3%	5.5%	4.6%	7.2%
Total Fund Custom Benchmark	-2.1%	6.4%	5.3%	8.4%
Total Fund Custom Public Market Equivalent Benchmark	-1.0%	7.6%	6.2%	9.2%

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

^{2/}Historical Private Equity performance includes Buyouts, Special Situations, and Venture Capital.

^{3/}Intended to compare the program's performance to its peers.

^{4/}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.

^{5/}Private Equity, Real Estate, and their corresponding benchmarks are reported on a quarter lagged basis.

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

^{7/}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^{1/}

For the period ending June 30, 2018

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

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

^{2/}Historical Private Equity performance includes Buyouts, Special Situations, and Venture Capital.

^{3/}Intended to compare the program's performance to its peers.

^{4/}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.

^{5/}Private Equity, Real Estate, and the corresponding Real Estate Custom Benchmark are reported on a quarter lagged basis.

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

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

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

SERS FUND

Investment Program | Performance

Fund Values and Annual Return

(\$ millions)

Year Ended	SERS Fund Fair Value	Annual Total Fund Rate of Return ^{1/}
1989	\$9,785	17.8%
1990	9,886	1.0
1991	11,940	22.6
1992	12,453	7.4
1993	13,701	13.2
1994	13,330	-1.1
1995	16,343	25.2
1996	18,492	15.4
1997	21,312	18.5
1998	24,123	16.3
1999	28,093	19.9
2000	27,880	2.2
2001	24,706	-7.9
2002	20,880	-10.9
2003	24,536	24.3
2004	26,641	15.1
2005	28,752	14.5
2006	32,053	16.4
2007	35,516	17.2
2008	22,796	-28.7
2009	24,662	9.1
2010	25,886	11.9
2011	24,377	2.7
2012	25,389	12.0
2013	27,394	13.6
2014	27,338	6.4
2015	26,055	0.4
2016	26,388	6.5
2017	29,405	15.1
2018 ^{2/}	26,821	-4.3

^{1/}Returns were calculated using the Modified Dietz day-weighted return methodology.

^{2/}2018 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	\$126,624,117
Consultant	3,830,847
Personnel	3,088,645
Custodian	1,364,064
Subscription and membership	258,134
Operational	142,072
Legal	3,226
Total Investment Expenses	\$135,311,105

Consultant Expenses

Firm	Service Type	Expenses ^{1/}
StepStone Group	Private equity investments	\$1,975,000
RVK	General investments	621,218
NEPC	Real estate investments	505,584
Fairview Capital Partners	Investment portfolio management	359,198
STP	Data warehouse hosting	172,500
Institutional Shareholders Services	Proxy services	92,680
GCM Customized Investment Group	Investment portfolio management	53,667
Abel/Noser	Transaction cost analysis	51,000
Total Consultant Expenses		\$3,830,847

^{1/}Korn Ferry Hay Group, SERS actuary, was paid \$355,366. These are not included in the table above because they are considered an administrative expense.

Manager Investment Expenses

Asset Class	Fees/Expenses	Fees/Expenses ^{2/} (in basis points)
Private Equity	\$67,636,111	170.6
Global Public Equity	21,638,401	14.0
Real Estate	19,185,153	86.4
Multi-Strategy	10,239,558	43.9
Legacy Hedge Funds	236,624	24.3
Fixed Income	7,688,270	18.9
Total Manager Fees and Expenses	\$126,624,117	43.7

^{2/}The fees/expenses were divided by SERS total fund and asset class quarterly average values during calendar year 2018 to arrive at the basis point calculations.

History of Manager Investment Expenses

Calendar Year	Fees/Expenses	Fees/Expenses (in basis points)
2014	\$177,383,430	64.8
2015	157,930,597	59.1
2016	159,447,442	61.3
2017	126,541,221	45.6
2018	126,624,117	43.7

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.

2018 Manager Investment Expenses Detail

Manager	City	State/Country	Fees/ Expenses
Private Equity			
ABRY Advanced Securities Fund	Boston	MA	\$4,346
ABRY Partners V	Boston	MA	2,241
ABRY Partners VI	Boston	MA	58,665
ABRY Partners VII	Boston	MA	122,085
ABRY Partners VIII	Boston	MA	438,135
ABRY Senior Equity II	Boston	MA	27,790
ADV Opportunities Fund I	Hong Kong	China	504,554
Advent International GPE VI-A	Boston	MA	134,331
Advent International GPE VII-B	Boston	MA	387,246
Advent International GPE VIII-B	Boston	MA	746,635
Advent Latin American Private Equity Fund IV	Boston	MA	80,514
Advent Latin American Private Equity Fund V	Boston	MA	151,360
Advent Latin American Private Equity Fund VI	Boston	MA	500,000
ASF VII B	New York	NY	456,164
ASF VII PA Coinvestment Fund	New York	NY	37,169
Asia Alternative Capital Partners V	San Francisco	CA	495,385
Asia Alternatives Capital Partners	San Francisco	CA	23,165
Asia Alternatives Capital Partners II	San Francisco	CA	90,740
Asia Alternatives Capital Partners III	San Francisco	CA	218,445
AXA Secondary Fund V B	Paris	France	138,448
Berkshire Fund VII	Boston	MA	142,974
Berkshire Fund VIII	Boston	MA	612,490
Blackstone Capital Partners VII	New York	NY	750,000
Capvis Equity IV	Baar	Switzerland	856,247
Carlyle Energy Mezz Opp Fund	New York	NY	389,192
Centerbridge Capital Partners I	New York	NY	123,002
Centerbridge Capital Partners III	New York	NY	408,733
Clearlake Capital Group	Santa Monica	CA	214,281
Clearlake Capital V	Santa Monica	CA	927,065
CVC Capital Partners VII	London	United Kingdom	1,648,905
Dover Street VII	Boston	MA	30,000
Energy Spectrum Partners V	Dallas	TX	31,432

SERS FUND

Investment Program | Expenses & Fees

2018 Manager Investment Expenses Detail (continued)

Manager	City	State/Country	Fees/ Expenses
Private Equity (continued)			
Eureka II	Yardley	PA	\$48,315
Eureka III	Yardley	PA	340,000
Francisco Partners III	San Francisco	CA	100,124
Francisco Partners IV	San Francisco	CA	173,991
FSN Capital IV	Oslo	Norway	333,820
FSN Capital V	Oslo	Norway	1,640,610
Great Hill Equity Partners IV	Boston	MA	202,774
GTCR XI	Chicago	IL	166,340
GTCR XII	Chicago	IL	606,033
H.I.G. Bayside Debt & LBO Fund II	London	United Kingdom	355,852
H.I.G. Bayside Loan Opportunity Fund III	London	United Kingdom	420,106
H.I.G. Bayside Loan Opportunity Fund IV	London	United Kingdom	315,351
H.I.G. Brazil and Latin America Partners	Rio de Janeiro	Brazil	1,250,000
H.I.G. Europe Capital Partners II	Miami	FL	1,483,837
H.I.G. Growth LBO & Equity Fund II	Miami	FL	239,461
Hahn & Company II	Seoul	Korea	939,429
Hahn & Company III	Seoul	Korea	507,473
HarbourVest Partners VII	Boston	MA	111,942
HarbourVest Partners VIII	Boston	MA	724,950
HarbourVest V-Asia Pacific & Rest of World	Boston	MA	193,188
Horizon Impact Fund - HarbourVest	Boston	MA	397,103
Horizon Impact Fund B - HarbourVest	Boston	MA	353,020
Insight Venture Partners IX	New York	NY	787,240
Insight Venture Partners VII	New York	NY	183,490
Insight Venture Partners VIII	New York	NY	740,614
Insight Venture X	New York	NY	1,949,444
JMI Equity Fund VI	Baltimore	MD	341,141
JMI Equity Fund VII	Baltimore	MD	145,972
JMI Equity Fund VIII	Baltimore	MD	365,000
Kelso VIII	New York	NY	151,020
Keystone Legacy Fund	West Hartford	CT	9,477,086
KPS Special Situations Fund IV	New York	NY	21,768
LBC Credit Partners III	Philadelphia	PA	537,931
Lexington Capital Partners VI	New York	NY	7,871
Lightspeed India Partners	New Delhi	India	357,750
Lightspeed Venture Partners VII	Menlo Park	CA	207,724
Lightspeed Venture Partners VIII	Menlo Park	CA	232,156
LLR Equity Partners III	Philadelphia	PA	185,996
LLR Equity Partners IV	Philadelphia	PA	612,504

SERS FUND

Investment Program | Expenses & Fees

2018 Manager Investment Expenses Detail (continued)

Manager	City	State/Country	Fees/ Expenses
Private Equity (continued)			
LLR PE Ptrn V	Philadelphia	PA	\$2,316,378
Madison Dearborn Capital Partners VI	Chicago	IL	134,895
Meritech Capital Partners IV	Palo Alto	CA	300,000
Meritech Capital Partners V	Palo Alto	CA	517,500
New Enterprise Associates 12	Baltimore	MD	306,953
Newbridge Asia IV	San Francisco	CA	45,995
NewSpring Growth Capital II	King of Prussia	PA	65,431
NewSpring Growth Capital III	King of Prussia	PA	338,896
Oaktree Opportunities Fund IX	Los Angeles	CA	579,653
Oaktree Opportunities Fund VIII	Los Angeles	CA	43,102
Oaktree Opportunities Fund VIIIb	Los Angeles	CA	96,539
OCM Opportunities Fund VII	Los Angeles	CA	20,876
OCM Opportunities Fund VIIb	Los Angeles	CA	53,125
OCM Power Opportunities Fund III	Los Angeles	CA	68,553
Permira VI	London	United Kingdom	983,886
Primavera Capital Fund II	Hong Kong	China	978,760
Providence Equity Partners VI	Providence	RI	61,951
Providence Strategic Growth II	Providence	RI	560,735
Providence Strategic Growth III	Providence	RI	1,500,000
Ridgemont Equity II	Charlotte	NC	198,860
RRJ Capital Master Fund III	Hong Kong	China	919,781
Silver Lake Partners V	Cupertino	CA	167,289
Sterling Group Partners IV	Houston	TX	372,965
T. Rowe Price Stock Distribution Account	Baltimore	MD	519,490
TDR Capital IV	London	United Kingdom	1,545,899
TPG Asia V	Fort Worth	TX	47,895
TPG Partners VI	Fort Worth	TX	134,981
Vista Equity Partners Fund VI	Oakland	CA	2,135,695
Weathergage Venture Capital	Redwood City	CA	164,024
Weathergage Venture Capital II	Redwood City	CA	208,125
Wind Point VIII	Chicago	IL	667,175
Private Equity Manager Fees			54,015,572
Private Equity Manager Expenses			13,620,539
Total Private Equity Manager Investment Expenses			67,636,111
Global Public Equity			
Ashmore Emerging Markets Small Cap ^{1/}	Arlington	VA	55,711
BlackRock MSCI Emerging Markets Index	New York	NY	534,316
BlackRock MSCI World Ex U.S. Index	New York	NY	603,406

SERS FUND

Investment Program | Expenses & Fees

2018 Manager Investment Expenses Detail (continued)

Manager	City	State/Country	Fees/ Expenses
Global Public Equity (continued)			
Delaware Emerging Markets	Philadelphia	PA	\$1,736,865
Emerald U.S. Small Cap Growth	Lancaster	PA	3,027,127
FIS Group	Philadelphia	PA	498,493
Globeflex Emerging Markets Small Cap	San Diego	CA	631,678
Harris Associates	Chicago	IL	4,009,585
Iridian Asset Management	Westport	CT	2,195,413
Martin Currie Emerging Markets All-Cap Concentrated	Edinburgh	United Kingdom	4,172,240
Mellon Capital Management Russell 1000 Index	Pittsburgh	PA	381,685
Mellon Capital Management Russell 2000 Core Index	Pittsburgh	PA	64,674
Mellon Capital Management Russell 2000 Value Index	Pittsburgh	PA	120,227
Walter Scott & Partners Limited	Edinburgh	United Kingdom	3,596,213
Global Public Equity Manager Fees			21,627,633
Global Public Equity Manager Expenses			10,768
Total Global Public Equity Manager Investment Expenses			21,638,401
Real Estate			
Berwind Investment Partnership IX	Yardley	PA	204,832
Berwind Investment Partnership V	Yardley	PA	573
Berwind Investment Partnership VI	Yardley	PA	8,126
Berwind Investment Partnership VII	Yardley	PA	96,632
Berwind Investment Partnership VIII	Yardley	PA	41,557
Blackstone Property Partners	New York	NY	1,482,103
Blackstone Real Estate Partners VI	New York	NY	77,435
Blackstone Real Estate Partners VII	New York	NY	580,716
CBRE Clarion Real Estate	Radnor	PA	486,421
CenterSquare Real Estate Securities	Plymouth Meeting	PA	469,716
Clerestory Small Cap Fund I	New York	NY	5,666
Colony Investors VIII	Los Angeles	CA	7,227
Fidelity Real Estate Opportunistic Income Fund	Smithfield	RI	419,991
Forest I.M.A.	Atlanta	GA	37,391
Hawkeye Scout Fund II	Austin	TX	253,669
Heitman American Real Estate Trust	Chicago	IL	1,352,402
Heitman I.M.A.	Chicago	IL	933,432
LaSalle I.M.A.	Chicago	IL	3,599,649
LEM Real Estate High-Yield Debt Fund III	Philadelphia	PA	147,012
Lowe GTO	Los Angeles	CA	940,972
Lowe I.M.A.	Los Angeles	CA	2,300,095

SERS FUND

Investment Program | Expenses & Fees

2018 Manager Investment Expenses Detail (continued)

Manager	City	State/Country	Fees/ Expenses
Real Estate (continued)			
Lubert Adler Fund IV	Philadelphia	PA	\$2,854
Lubert Adler Fund V	Philadelphia	PA	27,574
Lubert Adler Fund VI	Philadelphia	PA	38,521
Lubert Adler Fund VII	Philadelphia	PA	211,826
Mesirow RE Value III	Chicago	IL	458,333
Oak Street Real Estate Capital Fund IV, LP	Chicago	IL	173,015
Prudential Latin America Residential Fund III	Parsippany	NJ	46,743
Prudential Latin America Retail Fund I	Parsippany	NJ	3,916
Prudential Senior Housing IV	Parsippany	NJ	201,871
Prudential Senior Housing V	Parsippany	NJ	484,013
Rockpoint Finance Fund I	Dallas	TX	8,626
Rockpoint Real Estate Fund II	Dallas	TX	11,840
Rockpoint Real Estate Fund III	Dallas	TX	86,920
Rockpoint Real Estate Fund V	Dallas	TX	748,279
SRE Opportunity Fund III	Chicago	IL	908,333
Starwood Fund VIII	Greenwich	CT	144,600
UBS Trumbull Property Fund	Stamford	CT	735,381
UBS Trumbull Property Income Fund	Stamford	CT	702,154
ValStone Opportunity Fund V	Birmingham	MI	219,951
Westbrook Fund V	Dallas	TX	47,001
Westbrook Fund VI	Dallas	TX	54,028
Westbrook Fund VII	Dallas	TX	176,523
Westbrook Fund VIII	Dallas	TX	103,491
Real Estate Manager Fees			19,041,410
Real Estate Manager Expenses			143,743
Total Real Estate Manager Investment Expenses			19,185,153
Multi-Strategy			
Apollo Hybrid Value Fund	New York	NY	28,473
Blackstone Keystone	New York	NY	5,838,807
Eaton Vance Management	Boston	MA	397,139
ICG Europe VII	New York	NY	184,208
Mellon Capital Management Russell 3000 Index	Pittsburgh	PA	137,671
SEI Structured Credit Fund	Oaks	PA	2,879,704
TSSP TAO 4	San Francisco	CA	773,556
Total Multi-Strategy Manager Investment Expenses			10,239,558

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Investment Program | Expenses & Fees

2018 Manager Investment Expenses Detail (continued)

Manager	City	State/Country	Fees/ Expenses
Legacy Hedge Funds^{1/}			
Arden Keystone	New York	NY	\$34,785
Entrust Keystone	New York	NY	149,433
Mesirow Financial	Chicago	IL	10,149
PAAMCO	Irvine	CA	41,462
Rock Creek	Washington	DC	795
Total Legacy Hedge Funds Manager Investment Expenses			236,624
Fixed Income			
BNY Mellon Cash Investment Strategies	Pittsburgh	PA	273,737
Brandywine Global	Philadelphia	PA	750,117
Brown Brothers Harriman	New York	NY	264,376
New Century Advisors TIPS	Chevy Chase	MD	263,624
NISA Custom TIPS Intermediate	St. Louis	MO	482,808
PIMCO Core	Newport Beach	CA	1,436,035
PIMCO US Treasuries	Newport Beach	CA	499,122
Pyramis Global Advisors	Boston	MA	1,948,814
Stone Harbor Emerging Market Debt	New York	NY	664,458
Stone Harbor High Yield	New York	NY	684,978
Taplin Canida Habacht (TCH)	Miami	FL	420,201
Total Fixed Income Manager Investment Expenses			7,688,270
Total Manager Investment Expenses			\$126,624,117

^{1/}Public market or hedge fund manager in liquidation or liquidated.

SERS Fund

Portfolio Snapshots

SERS FUND

Investment Program | Portfolio Snapshot | Private Equity

Role in the SERS Fund

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

Program Structure

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

Objective

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

Performance is measured relative to the following benchmarks:

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

Private Equity

as of December 31, 2018

	Unfunded Commitments (\$ millions)	Fair Value (\$ millions)	% of Total Fund
Core Sub-Asset Classes			
Buyout	\$1,822.1	\$1,853.5	6.9%
Special Situations	272.5	550.2	2.1
Venture Capital	154.3	504.6	1.9
Total Core Sub-Asset Classes	2,248.9	2,908.3	10.9
Non-Core Holdings^{1/}			
Keystone Legacy Fund	211.5	1,002.9	3.7
Total Private Equity	\$2,460.4	\$3,911.2	14.6%

^{1/}163 of SERS' Private Equity Holdings from each of the core sub-asset classes buyouts, special situations, and venture capital have been reclassified to non-core holdings to be managed through a special purpose vehicle, Keystone Legacy Fund.

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, 2018, based on fair value, the program's exposure was:

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

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

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

SERS FUND

Investment Program | Portfolio Snapshot | Private Equity

Buyouts Committed, Drawn, and Distributed (continued)

Active Buyout Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed ^{1/}	Accumulated Capital Drawn	Accumulated Distributions ^{2/}
7. Blackstone Communications Partners I	Mega	8/29/2000	\$25,000,000	\$25,114,042	\$30,998,189
Blackstone Capital IV	Mega	2/26/2003	75,000,000	69,055,278	187,102,881
Blackstone Capital Partners V	Mega	5/30/2006	150,000,000	149,911,432	234,220,011
Blackstone Capital Partners VII	Mega	10/21/2016	50,000,000	21,080,759	1,046,910
8. Capvis Equity IV	Middle	1/30/2014	49,855,591	41,764,846	29,023,875
9. Carlyle Energy Mezzanine Opportunities Fund	Small	9/5/2012	50,000,000	60,664,539	25,597,737
Horizon Strategic Fund - Carlyle Group	Small	1/23/2014	100,000,000	86,075,971	16,934,926
10. CVC Capital Partners VII	Mega	*	91,202,040	0	0
11. Energy Spectrum Partners V	Small	7/9/2007	28,326,735	27,637,356	51,487,729
12. Eureka II	Growth Equity	1/30/2006	20,000,000	21,807,603	20,777,356
Eureka Growth Capital III	Growth Equity	10/21/2013	20,000,000	12,849,982	10,514,420
13. Francisco Partners	Middle	7/27/2000	50,000,000	47,769,948	61,464,903
Francisco Partners II	Middle	7/10/2006	30,000,000	29,383,916	41,240,515
Francisco Partners III	Middle	10/17/2011	20,000,000	20,046,401	27,949,721
Francisco Partners IV	Middle	4/15/2015	25,000,000	24,597,173	2,822,173
14. FSN Capital IV	Middle	12/19/2013	46,049,703	37,755,593	35,577,736
FSN Capital V	Middle	1/4/2017	77,189,328	20,495,041	7,103,931
15. GTCR VIII	Middle	7/7/2003	75,000,000	69,393,599	120,471,948
GTCR IX	Middle	12/1/2006	50,000,000	47,916,718	86,149,702
GTCR Fund XI	Middle	9/2/2014	25,000,000	21,649,585	11,061,321
GTCR Fund XII	Large	3/31/2018	32,500,000	1,677,000	286,544
16. Great Hill Equity Partners III	Middle	3/7/2006	35,000,000	35,000,000	41,373,122
Great Hill Equity Partners IV	Middle	9/8/2008	25,000,000	25,125,662	43,569,581
17. H.I.G. Growth Buyouts & Equity Fund II	Growth Equity	7/20/2011	15,000,000	12,635,329	4,086,778
H.I.G. Europe Capital Partners II	Small	1/10/2014	27,544,596	16,364,744	542,327
H.I.G. Brazil and Latin America Partners	Middle	8/12/2015	50,000,000	16,619,177	9,139
18. Hahn & Company II	Middle	5/29/2015	50,000,000	39,771,304	4,640,962
Hahn & Company III	Middle	*	56,250,000	0	0
Hahn & Company III - Supplemental Fund	Middle	*	18,750,000	0	0
19. HarbourVest IPEP III	Fund of Funds	6/30/1998	40,000,000	39,400,000	61,092,165
HarbourVest Partners VI	Fund of Funds	5/7/1999	200,000,000	196,586,055	249,916,050
HarbourVest Partners VII	Fund of Funds	3/24/2003	75,000,000	73,687,500	103,049,718
HIPEP V-Asia Pacific & Rest of World	Fund of Funds	5/9/2006	30,000,000	28,245,316	34,025,749
HarbourVest Partners VIII	Fund of Funds	10/5/2006	100,000,000	98,000,000	120,879,011
Horizon Impact Fund	Small	10/24/2014	50,000,000	39,004,802	10,399,736
Horizon Impact Fund B	Small	5/31/2017	100,000,000	17,250,000	0

SERS FUND

Investment Program | Portfolio Snapshot | Private Equity

Buyouts Committed, Drawn, and Distributed (continued)

Active Buyout Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed ^{1/}	Accumulated Capital Drawn	Accumulated Distributions ^{2/}
20. Hellman & Friedman Capital Partners IX	Buyout	*	\$90,000,000	\$0	\$0
Hellman & Friedman Capital Partners V	Large	12/20/2004	80,000,000	71,563,406	192,198,376
Hellman & Friedman Capital Partners VI	Large	6/5/2007	125,000,000	119,913,412	217,035,494
Hellman & Friedman Capital Partners VIII	Large	9/1/2016	50,000,000	34,486,364	3,530,532
21. Incline Equity Partners III	Small	1/14/2013	15,000,000	15,637,582	13,568,696
22. JMI Equity Fund V	Growth Equity	6/7/2005	24,000,000	24,009,205	128,903,788
JMI Equity Fund VI	Growth Equity	6/27/2007	40,000,000	40,000,246	67,630,800
JMI Equity Fund VII	Growth Equity	2/14/2011	10,000,000	9,780,000	10,289,532
JMI Equity Fund VIII	Growth Equity	10/1/2015	25,000,000	18,025,000	5,700,223
23. Kelso VII	Middle	10/18/2004	40,000,000	41,169,937	65,700,625
Kelso VIII	Middle	11/29/2007	150,000,000	146,004,916	127,302,885
24. LLR Equity Partners II	Middle	1/29/2004	25,000,000	25,000,000	44,945,591
LLR Equity Partners III	Middle	7/24/2008	30,000,000	29,108,722	38,837,202
LLR Equity Partners IV	Middle	3/14/2014	50,000,000	45,485,764	26,526,316
LLR Equity Partners V	Middle	3/21/2018	75,000,000	14,710,417	2,706,267
25. Madison Dearborn Capital Partners IV	Middle	4/2/2001	90,000,000	90,365,390	169,072,775
Madison Dearborn Capital Partners V	Middle	10/20/2006	75,000,000	71,558,278	113,628,059
Madison Dearborn Capital Partners VI	Middle	5/27/2008	50,000,000	51,070,609	74,156,247
26. NGP Keystone	Large	*	25,000,000	0	0
NGP XII	Large	*	75,000,000	0	0
27. Newbridge Asia IV	Middle	9/27/2005	40,000,000	38,903,378	85,754,593
28. NewSpring Growth Capital II	Growth Equity	12/5/2006	10,000,000	9,850,000	13,962,639
NewSpring Growth Capital III	Growth Equity	7/27/2012	25,000,000	22,397,102	2,218,985
29. OCM/GFI Power Opportunities Fund II	Small	5/9/2005	25,000,000	13,470,852	41,644,215
Oaktree Power Opportunities Fund III	Middle	10/18/2010	25,000,000	17,464,459	22,150,923
30. Permira European Fund II	Large	6/7/2000	48,000,000	45,672,612	91,464,087
Permira European Fund III	Large	1/12/2004	115,960,000	127,340,454	217,778,356
Permira IV	Large	12/14/2006	127,779,198	137,230,712	203,511,684
Permira VI	Large	1/10/2017	56,202,000	25,473,614	0
31. Primavera Capital Fund II	Large	11/17/2015	50,000,000	49,733,659	3,601,127
32. Providence Equity Partners IV	Large	11/27/2000	25,000,000	23,420,840	56,065,270
Providence Equity Partners V	Large	4/4/2005	45,000,000	42,692,171	51,743,883
Providence Equity Partners VI	Large	3/16/2007	50,000,000	53,854,821	56,559,060
Providence Strategic Growth II	Small	12/7/2016	60,000,000	47,789,012	18,335,697
Providence Strategic Growth III	Small	3/31/2018	75,000,000	13,325,397	7,852
33. Ridgmont Equity Partners II	Small	11/30/2015	50,000,000	38,267,743	8,709,714
34. Sentinel Capital Partners V	Middle	7/15/2014	10,000,000	8,671,252	4,324,736
35. Silver Lake Partners V	Large	3/31/2018	78,000,000	15,452,880	0

SERS FUND

Investment Program | Portfolio Snapshot | Private Equity

Buyouts Committed, Drawn, and Distributed (continued)

Active Buyout Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed ^{1/}	Accumulated Capital Drawn	Accumulated Distributions ^{2/}
36. Sterling Group Partners IV	Middle	6/15/2016	\$20,000,000	\$7,906,532	\$342,813
37. TA X	Middle	4/25/2006	70,000,000	69,732,009	90,382,009
38. TDR Capital IV	Middle	*	83,638,400	0	0
39. Thoma Bravo Fund XIII	Mega	*	75,000,000	0	0
40. TPG Partners III	Mega	1/13/2000	75,000,000	64,119,169	165,990,273
TPG Partners IV	Mega	12/29/2003	30,000,000	27,981,463	57,884,226
TPG Partners V	Mega	6/27/2006	88,831,038	92,531,812	116,367,518
TPG Asia V	Large	2/19/2008	22,500,000	21,964,311	21,268,474
TPG Partners VI	Mega	5/22/2008	44,294,641	50,104,252	57,470,348
41. TSG8	Middle	*	100,000,000	0	0
42. Vista Equity Partners Fund VII	Large	*	75,000,000	0	0
Vista Equity Partners Fund VI	Large	12/29/2016	150,000,000	138,018,382	2,489,894
43. Wind Point Partners VIII	Small	9/14/2017	100,000,000	44,872,788	3,870,252
Total Active Buyouts			\$6,231,273,270	\$4,484,633,546	\$5,599,400,567

Cash flows as of September 30, 2018.

*Not funded as of September 30, 2018.

^{1/}Commitments as of December 31, 2018.

^{2/}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.

Special Situations Committed, Drawn, and Distributed

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

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

Cash flows as of September 30, 2018.

^{1/}Commitments as of December 31, 2018.

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

Cash flows as of September 30, 2018.

*Not funded as of September 30, 2018.

^{1/}Commitments as of December 31, 2018.

^{2/}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.

^{3/}T. Rowe Price acts as a stock liquidation account. All cash and stock distributions are reflected in the corresponding distributions.

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.

Legacy Private Equity Committed, Drawn, and Distributed

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

Cash flows as of September 30, 2018.

^{1/}Commitments as of December 31, 2018.

^{2/}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.

^{3/}Effective July 1, 2018, 163 Private Equity Holdings with total commitments in the aggregate of \$5.5 billion were reclassified from each of the core sub-asset classes buyouts, special situations, and venture capital to non-core holdings to be managed through a special purpose vehicle, Keystone Legacy Fund.

SERS FUND

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 12/31/18 ^{1/} (\$ millions)
Global Mandates		
1. Walter Scott & Partners Limited	Global Growth	\$865.9
Total Global Mandates		865.9
U.S. Equity		
2. Emerald Advisers	U.S. Small-cap growth	564.4
3. Iridian Asset Management	U.S. Mid-cap value	371.9
4. Mellon Capital Management Russell 1000 Index	Russell 1000 Index	4,804.8
Mellon Capital Management Russell 2000 Core Index	Russell 2000 Core	277.7
Mellon Capital Management Russell 2000 Value Index	Russell 2000 Value	508.0
Total U.S. Equity		6,526.8
Non-U.S. Developed Markets Equity		
5. Artisan Partners - Global ex U.S.	Global ex-U.S. growth	1.2
6. BlackRock MSCI World ex U.S. Index	Developed ex-U.S. Index	4,254.0
7. Harris Associates	Non-U.S. Small-cap value	479.1
Mellon Capital Management MSCI World ex U.S. Index	MSCI World ex-U.S. Index	6.4
8. Morgan Stanley Investment Management Limited-developed ex U.S.	EAFE value	1.4
9. Templeton Investment Counsel - Global ex U.S.	Global ex-U.S. value	1.4
10. FIS Group Inc.	International Small-cap	174.6
Total Non-U.S. Developed Markets Equity		4,918.1
Emerging Markets Equity		
BlackRock/Emerging Markets Index Fund	MSCI Emerging Markets Index	623.5
11. GlobeFlex Capital	Small-cap - GARP	84.0
12. Macquarie Emerging Markets	Mid/large cap value	296.2
13. Martin Currie Investment Management	All-cap	285.1
14. Leading Edge	Emerging Markets	201.1
Total Emerging Markets Equity		1,489.9
Transition Assets		
15. Northern Trust	Transition	1.3
Total Transition Assets		1.3
Total Global Public Equity		\$13,802.0

^{1/}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 has several roles within SERS overall investment portfolio, including enhancing returns and providing diversification, income, and an inflation hedge. As in the past, SERS has emphasized a balance between value-add/opportunistic real estate strategies which can provide competitive total returns through capital appreciation, with core/core plus strategies, which have a larger emphasis on income, and in many cases, increased liquidity. SERS will seek to achieve this balanced risk profile by focusing on top-tier managers in each aspect of Real Estate, which is expected to result in attractive, long-term risk-adjusted returns.

Program Structure

Investments in Real Estate are categorized into four strategies: core/core plus, value-add and opportunistic, real estate securities, and natural resources/infrastructure related strategies and funds. SERS will build its Real Estate allocation towards its long-term target by steadily increasing investments in both relatively stable, core/core plus investments as well as value-add and opportunistic strategies. New target allocations within the Real Estate program are designed to balance expected return, liquidity, diversification, and inflation hedging, while decreasing expected risk. SERS Real Estate program is subject to the investment pacing established by the investment plan to help manage the liquidity profile of the total fund to align with the projected increase in retirement benefit payments.

Objective

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

Real Estate

as of December 31, 2018

Sub-Asset Class	Fair Value (\$ millions)	% of Total Fund
Core/Core Plus ^{1/}	\$589.4	2.2%
Value Add/Opportunistic SMA	716.5	2.7
Value Add/Opportunistic Funds ^{1/}	400.7	1.5
Natural Resources/Infrastructure	5.6	0.0
Real Estate Securities (REITs)	223.7	0.8
Total Real Estate	\$1,935.9	7.2%

^{1/}As of September 30, 2018, unfunded commitments are \$383.5 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	Capital Committed ^{1/}	Accumulated Capital Drawn	Accumulated Distributions
Core/Core Plus					
1. Blackstone Property Partners	Diversified	2017	\$300,000,000	\$300,000,000	\$2,180,246
2. Heitman America Real Estate Trust	Diversified	2007	100,000,000	100,000,000	0
3. UBS Trumbull Property Fund	Diversified	1988	25,558,525	25,558,525	67,265,772
UBS Trumbull Property Income Fund	Diversified	1988	33,332,027	33,332,027	87,606,992
Total Core/Core Plus			458,890,552	458,890,552	157,053,010

Value Add/Opportunistic Funds

4. AG Asia Realty Fund	Diversified	2007	25,000,000	23,500,000	20,812,500
5. Apollo Real Estate Fund III	Diversified	1998	50,000,000	50,000,000	74,810,023
6. Berwind Investment Partnership V	Diversified	1999	25,000,000	24,136,964	43,926,194
Berwind Investment Partnership VI	Diversified	2002	25,000,000	24,543,712	41,584,267
Berwind Investment Partnership VII	Diversified	2005	25,000,000	25,000,000	9,095,711
Berwind Investment Partnership VIII	Diversified	2007	15,588,238	14,912,018	19,049,366
Berwind Investment Partnership IX	Diversified	2012	25,000,000	24,303,409	22,328,308
Blackstone Real Estate Partners IV	Diversified	2003	25,000,000	25,000,000	36,944,774
Blackstone Real Estate Partners V	Diversified	2006	50,000,000	47,912,974	92,970,654
Blackstone Real Estate Partners VI	Diversified	2007	75,000,000	71,319,075	145,326,608
Blackstone Real Estate Partners VII	Diversified	2011	75,000,000	63,677,499	65,529,067
7. C-III Recovery Fund III	Diversified	2017	100,000,000	19,671,122	0
8. Clerestory Small Cap Fund I	Diversified	2010	18,000,000	15,228,956	13,844,513
9. Colony Investors VIII	Diversified	2007	22,500,000	21,655,800	7,962,017
10. Fidelity Real Estate Opportunistic Income Fund	Debt	2007	35,000,000	35,000,000	75,242,679
11. Fillmore West Fund	Diversified	2008	30,000,000	29,342,336	31,763,691
12. Hawkeye Scout Fund I	Diversified	2009	75,000,000	75,000,000	116,323,890
Hawkeye Scout Fund II	Diversified	2016	30,000,000	27,630,079	0
13. LEM Real Estate High-Yield Debt Fund III	Debt	2013	25,000,000	6,795,058	20,772,914

SERS FUND

Investment Program | Portfolio Snapshot | Real Estate

Real Estate (continued)

Fund / Manager	Asset Type	SERS Initial Funding	Capital Committed ^W	Accumulated Capital Drawn	Accumulated Distributions
14. Lubert Adler Fund III	Diversified	2000	\$30,000,000	\$28,729,020	\$44,171,118
Lubert Adler Fund IV	Diversified	2004	25,000,000	23,820,755	11,552,208
Lubert Adler Fund V	Diversified	2006	30,000,000	30,000,000	5,783,261
Lubert Adler Fund VI	Diversified	2008	20,927,116	19,200,031	15,763,543
Lubert Adler Fund VI-A	Diversified	2010	4,072,884	3,347,634	6,209,104
Lubert Adler Fund VII	Diversified	2014	25,000,000	22,925,725	6,211,006
15. Mesirow Financial Real Estate Value Fund III	Diversified	2018	25,000,000	7,405,659	74,261
16. Oak Street Real Estate Fund IV	Diversified	2017	100,000,000	24,857,109	751,893
17. OCM Real Estate Opp Fund III	Diversified	2003	25,000,000	25,000,000	42,218,554
18. Oxford GSA Fund	Diversified	2006	30,000,000	21,369,627	18,384,338
19. Prudential Latin America Retail Fund I	Retail	2006	25,000,000	2,271,117	8,162,626
Prudential Latin America Residential Fund III	Multi-Family	2008	29,654,968	24,708,749	11,380,777
Prudential Senior Housing Fund IV	Senior Housing	2011	25,000,000	20,799,516	16,718,852
Prudential Senior Housing Fund V	Senior Housing	2015	50,000,000	30,958,534	1,782,081
20. Rockpoint Finance Fund I	Residential Land	2007	50,000,000	2,527,500	1,899,395
Rockpoint Real Estate Fund II	Diversified	2005	35,000,000	34,138,784	30,679,156
Rockpoint Real Estate Fund III	Diversified	2007	50,000,000	46,391,722	65,247,824
Rockpoint Real Estate Fund V	Diversified	2015	50,000,000	25,946,245	0
21. Singerman III	Diversified	2017	50,000,000	2,000,000	0
Singerman III Select	Diversified	*	50,000,000	0	0
22. Starwood Fund IV	Diversified	1997	37,750,000	37,750,000	81,388,229
Starwood Fund VI	Diversified	2001	50,000,000	50,000,000	51,299,808
Starwood Fund VII	Diversified	2006	35,000,000	35,000,000	25,486,147
Starwood Fund VIII	Diversified	2009	50,000,000	45,356,281	67,386,219
23. ValStone Opportunity Fund V	Diversified	2014	14,663,402	14,663,402	3,209,834
24. Westbrook Fund V	Diversified	2004	25,000,000	25,000,000	44,485,779
Westbrook Fund VI	Diversified	2006	35,000,000	35,000,000	31,087,858
Westbrook Fund VII	Diversified	2007	50,000,000	50,000,000	50,363,635
Westbrook Fund VIII	Diversified	2009	50,000,000	50,000,000	62,318,055
Total Value Add/Opportunistic Funds			1,828,156,608	1,363,796,412	1,542,302,738

SERS FUND

Investment Program | Portfolio Snapshot | Real Estate

Real Estate (continued)

Fund / Manager	Asset Type	SERS Initial Funding	Capital Committed ^{1/}	Accumulated Capital Drawn	Accumulated Distributions
Value Add/Opportunistic SMA^{2/}					
Heitman I.M.A.	Diversified	1988	NA	\$813,635,039	\$1,092,759,873
25. LaSalle I.M.A.	Diversified	1994	NA	444,715,936	527,795,686
LaSalle Takeover I.M.A.	Diversified	2018	NA	204,196,078	0
26. HotelAVE I.M.A.	Hotel	2018	NA	58,890,000	0
27. Lowe I.M.A.	Diversified	1994	NA	715,229,496	1,069,043,541
Lowe GTO	Diversified	2012	NA	349,069,212	343,848,419
Total Value Add/Opportunistic SMA				2,585,735,760	3,033,447,518
Natural Resources/Infrastructure^{2/}					
28. Forest I.M.A.	Timberland	1992	NA	124,231,969	242,367,376
Total Natural Resources/Infrastructure				124,231,969	242,367,376
REITs^{2/}					
29. CBRE Clarion Real Estate Securities	Diversified	1996	NA	210,848,120	669,514,323
30. CenterSquare Real Estate Securities	Diversified	2002	NA	26,282,779	36,168,336
Total REITs				237,130,899	705,682,659
Total Real Estate			\$2,287,047,160	\$4,769,785,592	\$5,680,853,301

Cash flows as of September 30, 2018.

^{*/}Not funded as of September 30, 2018.

^{1/}Commitments as of December 31, 2018.

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

SERS FUND

Investment Program | Portfolio Snapshot | Multi-Strategy

Role in the SERS Fund

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

Program Structure

SERS Multi-Strategy program invests in a diverse set of strategies including distressed debt, direct lending, structured credit, niche credit, and opportunistic equity. The program will be less liquid than traditional strategies.

Objective

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

Multi-Strategy

as of December 31, 2018

Sub-Asset Class	Fair Value (\$ millions)	% of Total Fund
Private Credit Funds ^{1/}	\$90.8	0.3%
Credit-Focused Strategies	892.3	3.3
Opportunistic Equity and Fixed Income	1,386.1	5.2
Total Multi-Strategy	\$2,369.2	8.8%

^{1/}As of September 30, 2018, unfunded commitments are \$802.6 million.

SERS FUND

Investment Program | Portfolio Snapshot | Multi-Strategy

Private Markets

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

Private Credit Committed, Drawn, and Distributed

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

Public Markets

Manager	Investment Style	Market Exposure as of 12/31/18 ^{3/} (\$ millions)
Credit-Focused Strategies		
8. Blackstone Keystone	Fund-of-Funds	\$892.3
Total Credit Focused Strategies		892.3
Opportunistic Equity & Fixed Income		
9. Eaton Vance	Global Macro Strategy	189.2
10. Mellon Capital Management Russell 3000 Index	Russell 3000 Core	876.8
11. SEI Structured Credit Fund	High Yield Bank Loans	320.0
Total Opportunistic Equity & Fixed Income		1,386.0
Total Public Market Multi-Strategy		\$2,278.3

Cash flows as of September 30, 2018.

*Not funded as of September 30, 2018.

^{1/}Commitments as of December 31, 2018.

^{2/}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.

^{3/}Includes securities and cash, which the manager had available for investment.

SERS FUND

Investment Program | Portfolio Snapshot | Legacy Hedge Funds

Role in the SERS Fund

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

Program Structure

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

Objective

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

Status

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

SERS FUND

Investment Program | Portfolio Snapshot | Legacy Hedge Funds

Legacy Hedge Funds			Market Exposure as of 12/31/18 ^{1/} (\$ millions)
Manager	Investment Style		
Funds-of-Hedge Funds			
1. Entrust Keystone	Fund-of-Funds		\$10.5
Total Funds-of-Hedge Funds			10.5
Absolute Return Strategies			
2. Arden	Fund-of-Funds		13.5
3. Blackstone - Stable Alpha	Fund-of-Funds		5.8
4. Morgan Stanley Alternative Investment Partners	Fund-of-Funds		3.5
5. PAAMCO	Fund-of-Funds		5.4
6. Robeco Investment	Fund-of-Funds		0.2
7. Rock Creek	Fund-of-Funds		0.2
8. Legacy Hedge Funds	Fund-of-Funds		4.2
Total Absolute Return Strategies			32.8
Direct Investments			
9. Luxor Capital Partners	Direct Hedge Fund		2.6
10. Pine River Fund	Direct Hedge Fund		1.2
Total Direct Investments			3.8
Total Legacy Hedge Funds			\$47.1

^{1/}Includes securities and cash, which the manager had available for investment.

SERS FUND

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 four strategies and a separate cash allocation to improve transparency on SERS unallocated cash amount.

Objective

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

SERS FUND

Investment Program | Portfolio Snapshot | Fixed Income

Fixed Income

Manager		Investment Style	Market Exposure as of 12/31/18 ^{1/} (\$ millions)
Core Plus Fixed Income			
1.	Brandywine Global	Global Sovereign Credit	\$186.3
2.	Pyramis Global Advisors	Commercial Mortgage-Backed Securities	317.6
3.	Stone Harbor	Emerging Market Debt	160.6
	Stone Harbor	Global High Yield	159.7
4.	W.R. Huff	High Yield (liquidating)	0.2
5.	Waterfall Asset Management	Asset-Backed Securities	0.2
Total Core Plus			824.6
Core Fixed Income			
6.	Mellon Capital Management	Bloomberg Barclays U.S. Aggregate	1,028.9
7.	PIMCO Core	Bloomberg Barclays U.S. Aggregate ex. Treasuries	612.4
8.	Taplin, Canida & Habacht (TCH)	U.S. Credit	178.5
Total Core			1,819.8
Global Treasury Inflation Protected Securities (TIPS)			
9.	Brown Brothers Harriman	Global TIPS	213.7
10.	New Century Advisors	Global TIPS	111.0
11.	NISA Investment Advisors	U.S. TIPS	481.1
Total Global Treasury Inflation Protected Securities (TIPS)			805.8
Nominal U.S. Treasuries			
	PIMCO U.S. Treasuries	Domestic Treasuries	548.8
Total Nominal U.S. Treasuries			548.8
Total Fixed Income			\$3,999.0

^{1/}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.

Cash		
Manager	Investment Style	Market Exposure as of 12/31/18 ^{1/} (\$ millions)
Cash		
1. PA State Treasury (STIF)	Cash	\$757.0
Total Cash		\$757.0

^{1/}Includes securities and cash, which the manager had available for investment.

SERS Fund

Pennsylvania Investments

SERS FUND

Investment Program | Pennsylvania Investments

Pennsylvania Investments

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

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

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

Fair value of Pennsylvania investments as of December 31, 2018, was approximately \$741.5 million, or 2.8% of the SERS Fund.

Pennsylvania Investments by Asset Class

(\$ millions)

Asset Class	Total PA Fair Value
Private Equity	\$65.0
Global Public Equity	269.5
Real Estate	381.6
Fixed Income	25.4
Total Pennsylvania Investments	\$741.5

Private Equity

SERS Private Equity program dates back to 1985. Initially the program targeted a 1% allocation to venture capital with a focus to invest with managers located in Pennsylvania or with managers who had Pennsylvania investment mandates. Over its life, the program has grown to include national and international based private equity, special situation, and venture capital managers. Since inception, SERS Private Equity program has made commitments of over \$1.3 billion to 66 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, 2018, SERS active Private Equity managers held investments in 56 Pennsylvania-based companies. SERS pro-rata investment value in these companies is approximately \$65.0 million. This equates to 1.7% 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 and Fixed Income

SERS maintains a universe of institutionally investable Pennsylvania-based companies. The PA-based company universe is comprised of 154 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 \$270 million invested in stocks of Pennsylvania-based companies, as of December 31, 2018. These securities are held in SERS various externally managed global public equity portfolios.

Pennsylvania Investments - Global Public Equity

(\$ millions)

Manager	Fair Value
Emerald Advisers	\$75.6
Iridian Asset Management	16.4
Martin Currie Investment Management	5.2
Mellon Capital Management	172.3
Total Pennsylvania Investments - Global Public Equity	\$269.5

Pennsylvania Based Companies Top 10 Public Equity Positions

As of December 31, 2018

Air Products & Chemicals Inc.
American Eagle Outfitters Inc.
CNB Financial Corporation
Comcast Corporation
Epam Systems Inc.
Five Below Inc.
Nutrisystem Inc.
Ollie's Bargain Outlet Holding
PNC Financial Services Group Inc.
Versum Materials Inc.

SERS FUND

Investment Program | Pennsylvania Investments

SERS had approximately \$25.4 million invested in fixed income securities issued by Pennsylvania-based companies, as of December 31, 2018. These securities are held in SERS various externally managed bond portfolios.

SERS has approximately \$757 million invested in the Pennsylvania Treasury Department's short-term investment pool.

Pennsylvania Investments - Fixed Income

(\$ millions)

Manager	Fair Value
Brandywine Global	\$3.5
Mellon Capital Management	7.3
PIMCO	5.8
Stone Harbor	3.5
Taplin, Canida & Habacht	5.3
Total Pennsylvania Investments - Fixed Income	\$25.4

Real Estate

In 1987, SERS began investing directly in the Pennsylvania commercial real estate market. 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, 2018, the SERS real estate portfolio contained approximately 29 Pennsylvania investments totaling 3.1 million square feet of office, retail, and warehouse space, as well as, 2,924 apartment, hotel, and senior housing units and 630,000 square feet of self-storage, representing 5,354 units.

The gross fair value of the Pennsylvania real estate portfolio investments totaled \$1.6 billion, of which SERS ownership share was \$370 million.

In addition to the above, SERS held \$11.6 million in PA based real estate investment trusts.

SERS Fund

Minority/Woman-Owned Managers and Brokers

SERS FUND

Investment Program | Minority/Woman-Owned Managers and Brokers

Minority/Woman-Owned Investment Managers

The following firms classify themselves as minority and/or woman-owned firms and were under contract with SERS to provide investment management services within SERS Global Public Equity or Fixed Income portfolio as of December 31, 2018:

Firm	Status	SERS Assets Under Management
FIS Group	Minority/Woman-Owned	\$175 million market value
GlobeFlex Capital	Minority/Woman-Owned	\$84 million market value
Leading Edge Investment Advisors	Minority-Owned	\$201 million market value
New Century Advisors	Woman-Owned	\$111 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, 2018:

Firm	Status	SERS Committed Capital
Asia Alternatives Capital Partners	Minority/Woman-Owned	\$340 million
Avenue Capital Group	Woman-Owned	\$70 million
Brightwood Capital	Minority-Owned	\$100 million
Clearlake Capital Partners	Minority-Owned	\$70 million
hotelAVE	Woman-Owned	NA
Hawkeye Partners	Woman-Owned	\$105 million
Incline Equity Partners	Minority-Owned	\$15 million
Kline Hawkes & Co.	Minority-Owned	\$15 million
Technology Crossover Ventures	Minority-Owned	\$75 million
Oak Street	Minority-Owned	\$100 million
Thoma Bravo	Minority-Owned	\$75 million
TSG Consumer Partners	Woman-Owned	\$100 million
Vista Equity Partners	Minority-Owned	\$225 million
Weathergage Capital	Woman-Owned	\$50 million
Wind Point	Minority-Owned	\$100 million

Effective July 1, 2018, 163 of SERS' Private Equity Holdings with total commitments in the aggregate of \$5.5 billion were reclassified from each of the core sub-asset classes buyouts, special situations, and venture capital to non-core holdings via a special purpose vehicle, Keystone Legacy Fund to be managed by Minority/Woman-Owned firm, Fairview Capital Partners.

SERS FUND

Investment Program | Minority/Woman-Owned Managers and Brokers

Minority/Woman-Owned Brokers Brokerage Commissions

The table below lists the minority/woman-owned brokerage firms utilized by SERS external investment managers during calendar year 2018.

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 \$455,680 for the year. It is estimated this year that SERS U.S. equity managers directed approximately 9% of their trades through minority/woman-owned brokerage firms. Fixed Income managers traded a combined \$258.3 million of securities through minority/woman-owned brokerage firms.

Firm	Minority/ Woman-Owned Commissions
Cabrera Capital Markets	\$36,624
CastleOak Securities	2,069
C.L. King Directed	22,531
CV Brokerage	2,429
Drexel Hamilton	17,447
Loop Capital	51,026
Mischler Direct	21,408
North South Capital	8,899
Sturdivant & Company	52,918
Susquehanna Direct	110,173
Telsey Advisory	42,388
The Fig Group	79,773
Tribal Capital Markets	2,160
Vandham Securities	4,924
Williams Capital Group	911
Total Minority/Woman-Owned Commissions	\$455,680

Deferred Compensation Plan

DEFERRED COMPENSATION PLAN

History, Growth & Highlights

As discussed earlier in this book, the Pennsylvania State Employees' Retirement System administers four retirement plans to help safeguard the financial security of the commonwealth's public workforce in its retirement years -- a defined benefit pension plan, a defined contribution investment plan, a hybrid plan that combines the pension and investment plans into one benefit, and a supplemental deferred compensation (deferred comp) plan. While most employees are required to participate in either the pension, investment, or hybrid plans; most employees also have access to the voluntary deferred comp plan, which allows participants to have some of their pay automatically deducted on a pre- and/or post-tax basis and invested for retirement.

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

Deferred Comp History

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

Deferred comp 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 deferred comp. Responsibilities of the third-party administrator include, but are not limited to, marketing deferred comp, 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 2018 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 deferred comp is extremely low and is borne solely by participants, using no commonwealth funds.

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

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

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

DEFERRED COMPENSATION PLAN

History, Growth & Highlights

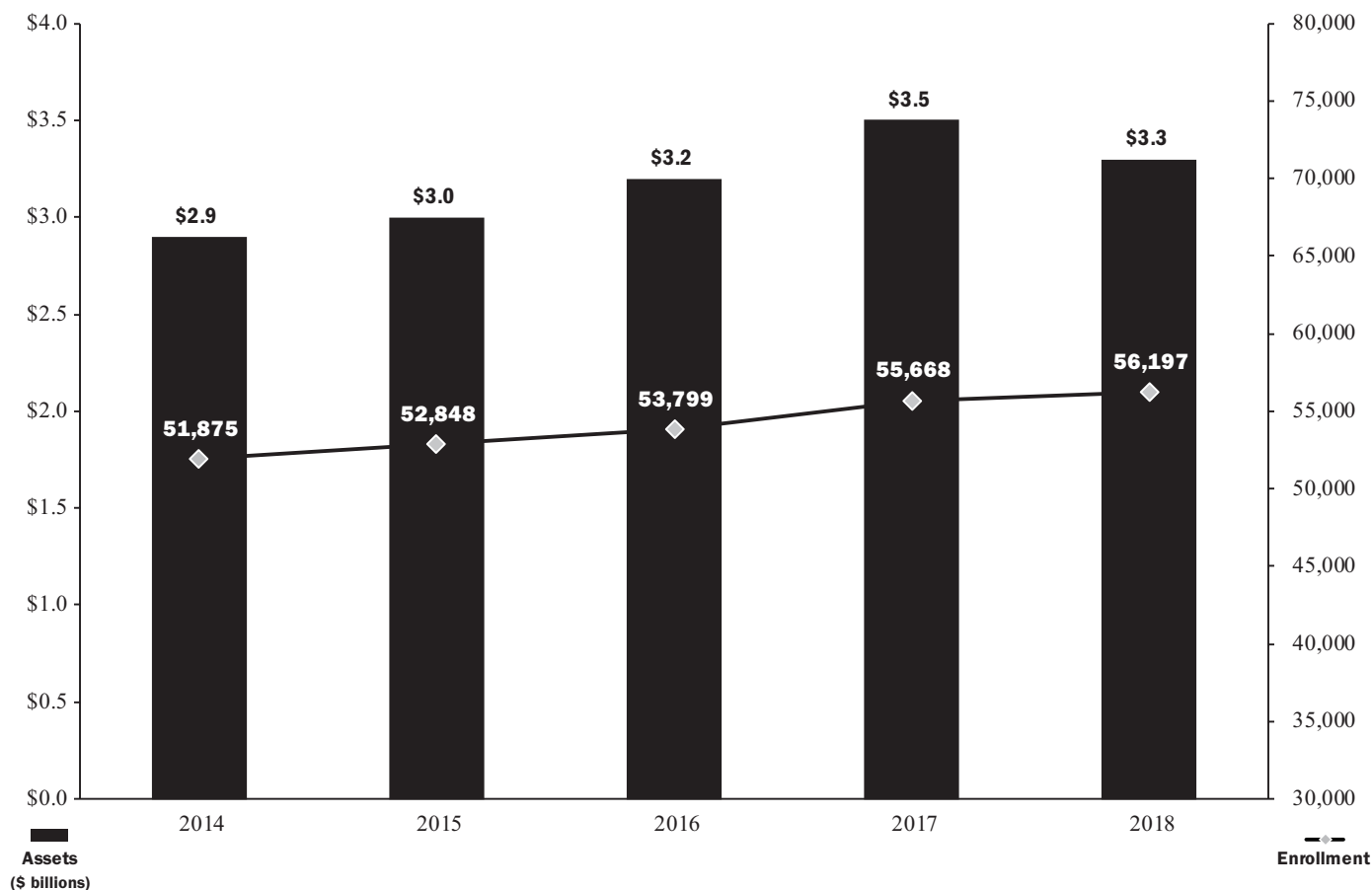
Growth of Deferred Comp

In 2018, over 56,000 participants had saved approximately \$3.3 billion in deferred comp.

As of December 31, there were 34,102 active and 22,095 inactive participants in deferred comp. From 2014 to 2018, annual deferrals have ranged from \$129 million to \$146 million per year and total fund value grew from approximately \$2.9 billion to approximately \$3.3 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 \$75 million in 2014 to \$107 million in 2018.

Deferred Comp Assets & Enrollment



DEFERRED COMPENSATION PLAN

History, Growth & Highlights

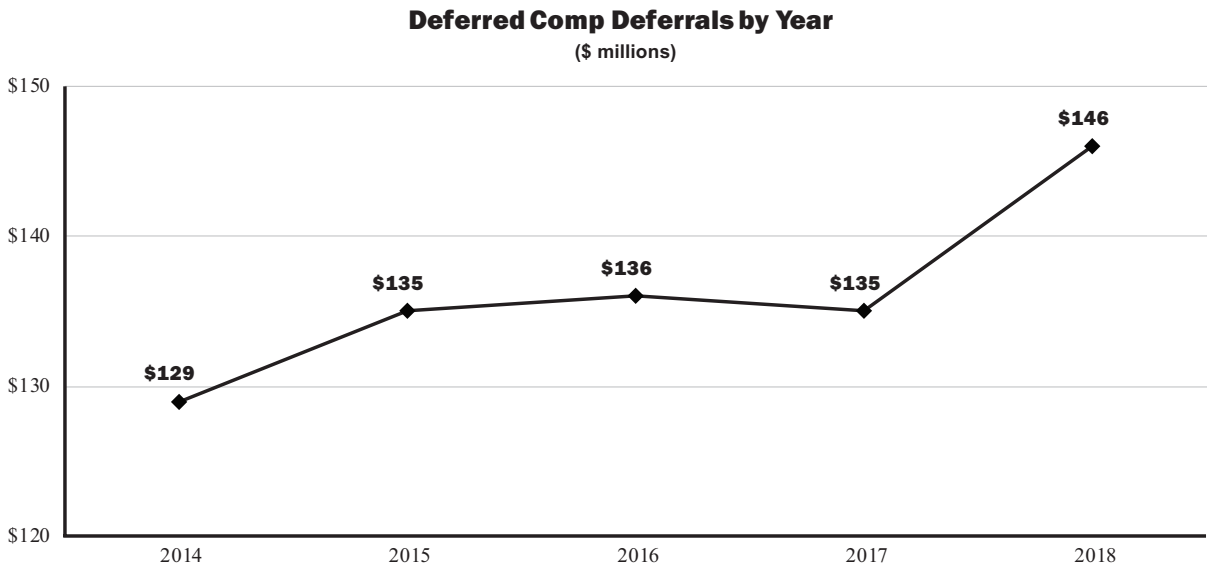
Deferred Comp Highlights

In deferred comp, 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 deferred comp participant to allocate their investments among the options provided. Once money is invested in deferred comp, it must remain until an employee leaves state service or an emergency exists that is within code parameters.

To assist deferred comp 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 number. 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 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.



DEFERRED COMPENSATION PLAN

Performance, Expenses & Fees

Estimated Calendar Year, Net-of-Fees Returns

For the period ending December 31, 2018

Fund Name	Inception Date	1 Year	3 Year	5 Year	10 Year
Stable Value Fund	07-1995	2.22%	2.02%	2.11%	2.76%
Short-Term Investment Fund	10-1988	2.08	1.25	0.81	0.56
U.S. Bond Index Fund	02-1995	0.01	2.02	2.49	3.36
60/40 Balanced Stock & Bond Fund	05-2006	-2.19	6.52	6.23	9.48
U.S. Large Company Stock Index Fund	12-1994	-4.39	9.26	8.50	13.15
U.S. Small/Mid Company Stock Index Fund	08-1998	-9.33	7.54	5.32	13.70
International Company Stock Index Fund	08-1998	-13.39	3.40	0.75	6.42
Aggressive Portfolio Fund	10-2003	-5.66	6.58	5.50	10.17
Moderate Portfolio Fund	10-2003	-4.07	5.52	4.82	8.60
Conservative Portfolio Fund	10-2003	-1.58	3.63	3.32	5.46

Expenses and Fees

As of December 31, 2018

Fund Name	Investment Manager Fund Operating Expense	Annual Asset Fee ^{1/}	Annual Administrative Fee ^{2/}
Stable Value Fund	0.2870%	0.07%	\$24
Short-Term Investment Fund	0.0000	0.07	24
U.S. Bond Index Fund	0.0200	0.07	24
60/40 Balanced Stock & Bond Fund	0.0140	0.07	24
U.S. Large Company Stock Index Fund	0.0100	0.07	24
U.S. Small/Mid Company Stock Index Fund	0.0200	0.07	24
International Company Stock Index Fund	0.0200	0.07	24
Aggressive Portfolio Fund	0.0152	0.07	24
Moderate Portfolio Fund	0.0164	0.07	24
Conservative Portfolio Fund	0.0143	0.07	24

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

^{2/}Deducted at \$2.00 monthly and also prorated against all available core investment options.