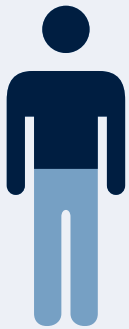


**DEFINED BENEFIT PLAN**

Traditional Pension

**Defined Benefit Plan****\$30.7 million**

FY 2020-21 Administrative Budget

In 2019  
SERS retired**4,969**members  
and welcomed**11,595**

new members

**56.1%** funded  
**\$23.4** billion unfunded liabilitypaid more than  
**\$3.5 billion**  
in pension benefits**\$30.9**  
billion in assets**102**  
employers**45%** of SERS active employees belong to post-Act 120 classes of serviceSERS Fund 2019  
Investment Return**18.8%****As of Dec 31, 2019****132,731**  
retirees &  
beneficiaries**103,266**  
active members

average retired member

**73** years old  
receives  
**\$29,440**  
per year at full retirement

average active member

**46** years old  
**12** years of service**DEFINED CONTRIBUTION PLAN**

Investment Option

**Defined Contribution Plan****\$4.6 million**

FY 2020-21 Administrative Budget

**\$310,000**distributions/withdrawals  
in 2019**\$9.2**million in  
assets**As of Dec 31, 2019 SERS had****7,802**  
accounts**102**  
employers**Contributions** participant \$4.1 million  
employer \$2.7 million**DEFERRED COMPENSATION PLAN**

Supplemental Benefit

**Deferred Compensation Plan****\$4.7 million**FY 2020-21 Administrative Budget  
(paid by plan participants)**\$261 million**distributions/withdrawals  
in 2019**\$3.9**billion in  
assets**As of Dec 31, 2019 SERS had****57,432**  
accounts**87**  
employers**Participant Contributions**  
\$153 million**SERS 2020 Supplemental Budget Book**

February 15, 2020



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

Honorable Patrick M. Browne  
Majority Chairman  
Senate Appropriations Committee  
281 Main Capitol  
Harrisburg, PA 17120-3016

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

Honorable Vincent J. Hughes  
Democratic Chairman  
Senate Appropriations Committee  
545 Main Capitol  
Harrisburg, PA 17120-3007

Gentlemen and Members of the Appropriations Committee:

I am pleased to present you with this financial overview for the Pennsylvania State Employees' Retirement System for FY 2020-21. For the coming fiscal year, SERS proposes a \$30.7 million administrative budget for our Defined Benefit Plan, funded from member and employer contributions and investment earnings. We also request \$4.6 million in commonwealth funds to cover administrative costs to manage the new Defined Contribution Plan.

During 2019, SERS experienced investment gains of nearly 19% for our defined benefit plan, more than double the fund's assumed rate of return. Thanks to these positive returns, along with our continued push toward greater efficiencies and transparency, including four consecutive years of full funding from the General Assembly, we continue to progress toward our long-term goal of eliminating our unfunded liability.

SERS expects to receive more than \$2.1 billion (33.59% of payroll) from commonwealth employers in our Defined Benefit Plan during this fiscal year. For FY 2020-21, the employer contribution is projected to bump up slightly to 33.63%, which will generate an estimated \$2.2 billion. While these significant contribution amounts will continue through the next decade, large annual increases have now peaked following significant steps by the governor and legislature over the past decade to fully fund retirement obligations.

This year SERS will serve nearly 243,000 members and participants, and administer more than 57,000 Deferred Compensation Plan accounts. In 2019, the average retiree who worked to full retirement age was 73 years old and received an average annuity of \$29,440. In 2019, we paid out more than \$3.5 billion benefit payments to the commonwealth's retirees and beneficiaries, of which more than \$3.2 billion was paid to members living in Pennsylvania.

SERS now administers four retirement plans, including the new hybrid and defined contribution plans implemented in 2019. As such, we remain committed to preparing our members and participants to achieve financial success and security in retirement.

Sincerely,

A handwritten signature in black ink, appearing to read "David R. Fillman". The signature is fluid and cursive, with a prominent initial "D" and "F".

David R. Fillman  
Chairman

# SERS 2020 SUPPLEMENTAL BUDGET BOOK

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# SERS Organization

# SERS ORGANIZATION

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## Agency Description

Established in 1923, SERS is one of the nation's oldest and largest statewide retirement plans for public employees. SERS is responsible for administering nearly \$35 billion in assets held in trust for nearly 243,000 members and participants, as of December 31, 2019. SERS also administers more than 57,000 accounts on behalf of those who also participate in the supplemental Deferred Compensation Plan.

Most state employees are required to participate in a SERS-administered retirement plan, as directed by the State Employees' Retirement Code. SERS is responsible for administering the 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 benefit plans and the fiduciary responsibility for their 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 administer all SERS retirement plans.

SERS administers four retirement plans for state employees – three plans require mandatory employee and employer contributions and one plan allows only voluntary employee contributions:

- **Hybrid Plan** – is a combination of two Internal Revenue Code-defined plans – a traditional pension or IRC section 401(a) defined benefit plan with an IRC section 401(a) defined contribution investment plan. This plan requires mandatory contributions from both the employee and the employer. There are two classes of service within the Hybrid Plan, class A-5 and class A-6.
- **Defined Contribution Plan** – is an IRC section 401(a) investment plan. This plan requires mandatory contributions from both the employee and the employer.
- **Defined Benefit Plan** – is a traditional pension plan defined by IRC section 401(a). This plan requires mandatory contributions from both the employee and the employer.
- **Deferred Compensation Plan** – is a voluntary supplemental plan defined by IRC section 457(b). This plan allows only voluntary employee contributions.

Most new state employees are automatically enrolled in the Hybrid Plan A-5 class of service, with the right to opt out of that class of service into the A-6 class of service or the Defined Contribution Plan. The exceptions are hazardous-duty employees and those who contributed to the traditional defined benefit pension plan in the past. In those two cases, the employee is automatically enrolled in the traditional defined benefit pension plan.

Additionally, all SERS members as of January 1, 2019, were given a one-time, irrevocable option to switch to either one of the hybrid plan classes of service or the defined contribution-only plan. Sixty-eight members opted into one of the new plans.

Each plan is described in greater detail, including participation, asset value, and contribution rates, in the following sections.

# SERS ORGANIZATION

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## Mission, Vision & Guiding Principles

### 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 is currently developing a new strategic plan that will guide the agency's work beginning July 1, 2020, through June 30, 2023.

# SERS ORGANIZATION

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## Services & Operations

The approximately 200 employees who work for SERS share a singular focus: serving SERS' members and participants. Some SERS employees serve members by investing and overseeing nearly \$35 billion in plan assets. Other SERS employees serve members by ensuring that every payment is made correctly and on time. Still others audit and account for plan assets, provide key membership data, or answer member and participant questions in person or over the phone.

Some work is behind-the-scenes, while other work touches members and participants more directly.

Examples of services offered to active and vested members and participants include:

- Issuing annual statements that present a snapshot of each of the member's and participant's SERS plans in one document
- 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 benefit application process

Examples of services offered to retired members include:

- Issuing annual statements 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 the implications of pension changes related to marriage, divorce, or death
- Tracking and reissuing pension payments
- Assisting spouses, children, and other survivors upon the death of a SERS member or participant

# SERS ORGANIZATION

## Services & Operations

Approximately a quarter of SERS employees are wholly dedicated to providing services to members and participants through a network of field offices statewide, including:

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

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

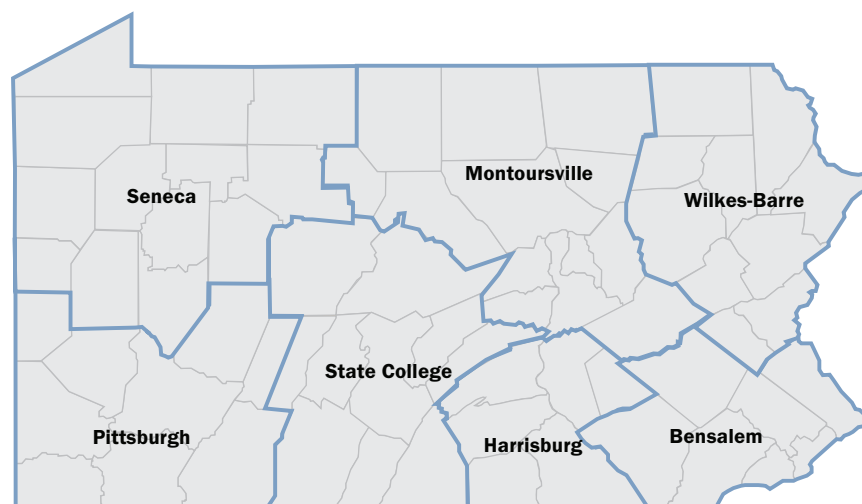
**Montoursville Regional Counseling Center.** Serving retired members who live and active members who work in Bradford, Cameron, Clinton, Columbia, Lycoming, Montour, Northumberland, Potter, Schuylkill, Snyder, Sullivan, Tioga, and Union counties.

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

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

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

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





# SERS ORGANIZATION

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## Services & Operations

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

The **executive office** provides strategic leadership and administrative oversight of agency operations. The Executive Director (Secretary) is expressly charged with statutorily prescribed duties including review and analysis of legislation, maintaining files and records required for actuarial evaluations, and responding to information inquiries and requests from press, commonwealth officials, state employees and the general public, among others. The executive office 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 and Administration 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 and participant services** provides direct assistance to SERS active, vested, and retired members and participants, 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' retirement plans. The office recommends and implements investment policies; manages the strategic asset allocation; monitors fund cash flow, investment managers, fund risks, and performance; and researches and recommends investment opportunities. The office also maintains a high level of expertise related to the analysis of capital and global markets.

The **office of finance and administration** is responsible for the accounting and financial reporting associated with SERS' retirement plans. It ensures the appropriate accounting controls exist and the financial statements for each plan are presented in accordance with generally accepted accounting principles. It administers all transactions including, for example, member payments; member and employer contributions; investment purchases and sales; and operational expenses. The office also manages the facilities, budget, procurement, and mail processing.

# SERS ORGANIZATION

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## Services & Operations

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 the Audit, Risk, and Compliance Committee.

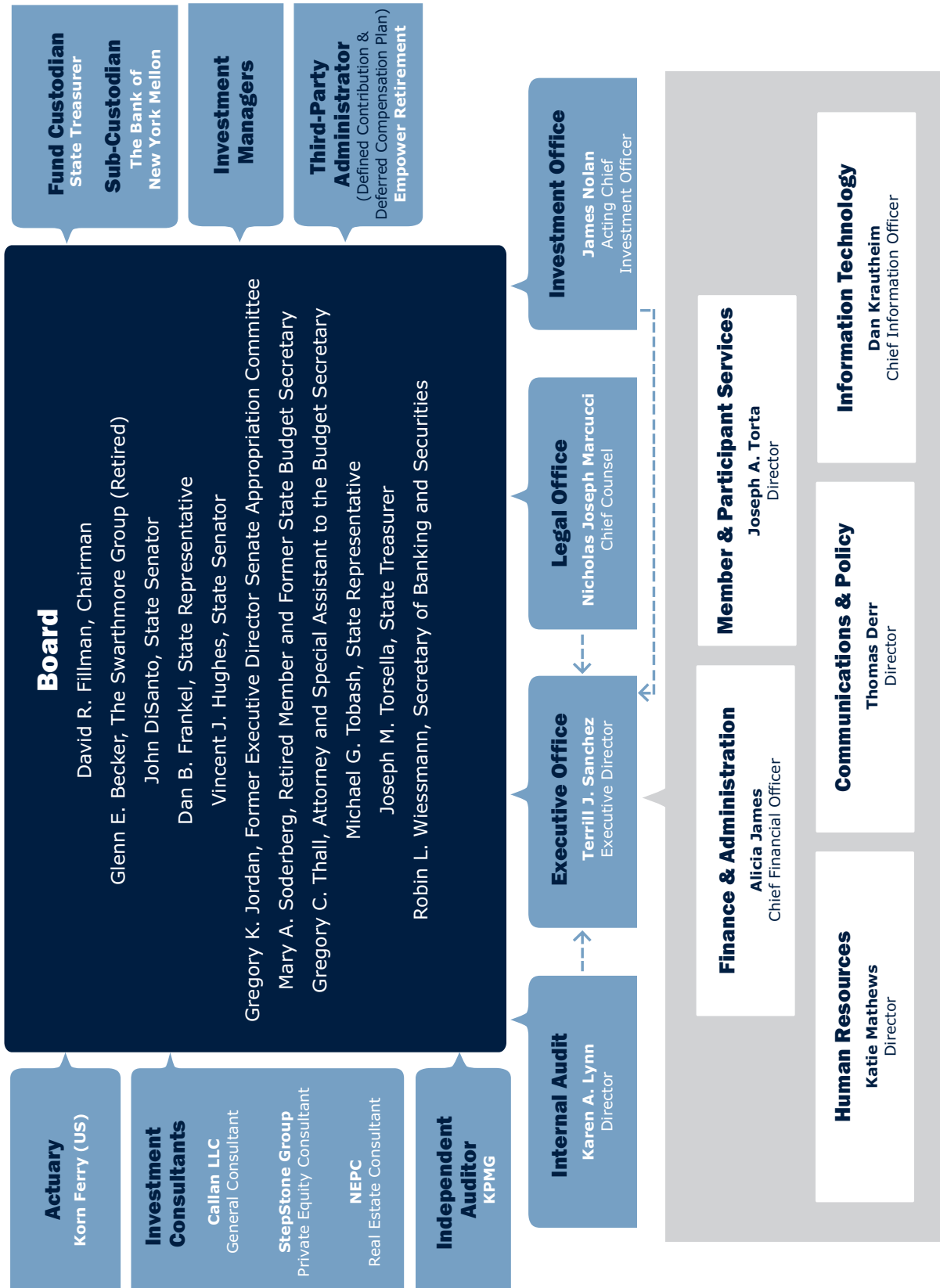
The **legal office** advises the State Employees' Retirement Board on matters related to member appeals and administrative hearings, securities actions and litigation matters, the administration of SERS' retirement plans, and other general legal issues for which the board requests advice. In addition, 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.

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 12/31/19

# SERS ORGANIZATION

## Proposed FY 2020-21 Budget

The budget includes the costs to administer SERS' defined benefit pension plan. The plan receives revenue from employee contributions, employer contributions, and income derived from its investment portfolio. Funds in the plan are used to pay retirement, disability, and death benefits to members and their beneficiaries, as well as the associated costs of administration. These funds are appropriated annually by the general assembly.

### Proposed FY 2020-21 Administrative Budget

	Rebudget 2016-2017	Rebudget 2017-2018	Rebudget 2018-2019	Rebudget 2019-2020	Budget Request
<b>Personnel Services</b>	\$16,548,700	\$18,560,500 <sup>1/</sup>	\$17,084,000 <sup>1/</sup>	\$18,380,500	\$18,792,000
<b>Operational</b>					
Travel	54,300	55,800	65,800	90,000	115,050
Training	125,600	79,500	138,550	103,300	167,500
Communication Services	472,500	481,400	471,500 <sup>1/</sup>	548,000	659,100
Consultants - Non EDP	349,700	811,000 <sup>1/</sup>	820,000 <sup>1/</sup>	1,053,500	1,439,200
Legal Services/Fees	280,000	641,000 <sup>1/</sup>	521,100 <sup>1/</sup>	755,500	525,500
Specialized Services	545,550	630,350 <sup>1/</sup>	1,571,400 <sup>1/</sup>	1,221,600	912,300
Advertising	8,000	10,000	8,000	8,000	5,000
IT Consulting	1,620,100	6,150,500 <sup>1/</sup>	4,353,000 <sup>1/</sup>	4,228,000	2,451,100
Contracted Maintenance Non-IT	49,300	58,900	65,400	47,300	58,000
Hardware/Software and Maintenance	1,518,500	2,123,600 <sup>1/</sup>	1,610,250	1,639,000	2,068,900
Real Estate	1,710,100	1,727,390	1,926,250 <sup>1/</sup>	1,971,000	1,772,500
Vehicles	23,000	25,800	25,000	26,800	29,100
Office Equipment	95,300	146,250 <sup>1/</sup>	215,800 <sup>1/</sup>	159,400	426,000
Other Rentals/Leases	3,600	3,600	6,300	4,000	10,000
Office Supplies	139,200	122,500	117,050 <sup>1/</sup>	106,000	84,350
Educational Supplies	2,200	153,100 <sup>1/</sup>	82,000 <sup>1/</sup>	1,700	500
Motorized Equipment Maintenance	3,500	3,500	4,000	6,000	10,100
Postage	471,960	646,500 <sup>1/</sup>	610,500 <sup>1/</sup>	595,500	595,500
Freight	3,500	3,200	3,200	4,000	2,700
Printing	226,400	217,450 <sup>1/</sup>	209,600 <sup>1/</sup>	132,000	150,200
Subscriptions & Licensing	59,350	39,150	43,900	58,100	57,500
Membership Dues	26,540	25,300	27,900	37,900	53,700
Conference Expenses	8,600	14,300	16,500	31,900	12,000
Insurance, Surety, & Fidelity Bonds	13,000	13,000	13,000	13,000	13,000

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

# SERS ORGANIZATION

## Proposed FY 2020-21 Budget

### Proposed FY 2020-21 Administrative Budget (continued)

	Rebudget 2016-2017	Rebudget 2017-2018	Rebudget 2018-2019	Rebudget 2019-2020	Budget Request
Treasury Services	\$1,255,000	\$1,145,360	\$1,475,500	\$1,500,000	\$1,500,000
Other Operational	203,300	119,900	530,500	336,000	35,200
<b>Total Operational</b>	<b>9,268,100</b>	<b>15,448,350</b>	<b>14,932,000</b>	<b>14,677,500</b>	<b>13,154,000</b>
<b>Fixed Assets</b>	<b>250,000</b>	<b>110,000</b>	<b>250,000</b>	<b>250,000</b>	<b>250,000</b>
<b>Less Directed Commissions</b>	<b>1,500,000</b>	<b>1,500,000</b>	<b>1,500,000</b>	<b>1,500,000</b>	<b>1,500,000</b>
<b>Total Annual Budget</b>	<b>\$24,566,800</b>	<b>\$32,618,850</b>	<b>\$30,766,000</b>	<b>\$31,808,000</b>	<b>\$30,696,000</b>

Directed commissions are reimbursements to SERS for a portion of the fee paid to a broker for executing a trade on behalf of SERS. Directed commissions are included as part of the administrative budget as augmenting revenue and are not appropriated.

### Directed Commission Revenue & Expense

	FY 2019-20 Budget	FY 2020-21 Budget
<b>Beginning Balance</b>	<b>\$3,484,476</b>	<b>\$2,084,476</b>
Directed Commission Revenue	100,000	100,000
<b>Total Available</b>	<b>3,584,476</b>	<b>2,184,476</b>
Directed Commission Expense	1,500,000	1,500,000
<b>Ending Balance</b>	<b>\$2,084,476</b>	<b>\$684,476</b>

# SERS ORGANIZATION

## Proposed FY 2020-21 Budget

This budget includes the investment related expenses associated with the defined benefit pension plan's investment portfolio. These expenses are netted from investment earnings, and are not appropriated.

### Proposed FY 2020-21 Investment Budget

	Rebudget 2016-2017	Rebudget 2017-2018	Rebudget 2018-2019	Rebudget 2019-2020	Budget Request
<b>Personnel Services</b>	\$3,278,000	\$3,433,000	\$4,786,000	\$4,601,000	\$4,939,000
<b>Operational</b>					
Travel	150,000	203,500	202,200	302,500	309,000
Training	29,500	46,500	45,900	61,100	72,200
Consultants - Non EDP	5,409,066	4,642,100	3,753,600	4,162,500	4,050,000
Legal Services/Fees	0	0	300,000	200,000	280,000
Specialized Services	0	1,000	1,000	214,000	98,200
Advertising	0	10,000	24,000	34,000	15,000
IT Consulting	0	0	0	0	129,200
Hardware/Software and Maintenance	0	310,000	312,700	2,700	2,700
Real Estate	0	0	0	0	28,000
Vehicles	0	0	0	0	1,200
Office Equipment	0	0	0	0	37,500
Office Supplies	934	1,000	1,500	1,700	1,600
Printing	0	0	1,000	1,000	1,000
Subscriptions & Licensing	869,900	537,900	644,700	1,434,200	1,410,900
Membership Dues	62,600	64,500	66,900	66,800	56,300
Conference Expenses	0	1,500	2,500	2,500	0
<b>Total Operational</b>	6,522,000	5,818,000	5,356,000	6,483,000	6,492,800
<b>Total Annual Budget</b>	<b>\$9,800,000</b>	<b>\$9,251,000</b>	<b>\$10,142,000</b>	<b>\$11,084,000</b>	<b>\$11,431,800</b>

# SERS ORGANIZATION

## Proposed FY 2020-21 Budget

This budget includes the costs to administer SERS' Defined Contribution Plan, which was created by Act 2017-5. The Defined Contribution Plan receives revenue from employee contributions, employer contributions, and income derived from its investment portfolio. Funds in this plan are used to pay benefits to participants and their beneficiaries. All fees, costs, and expenses of administering the plan are currently being paid by the commonwealth until the plan reaches a more mature status.

### Proposed FY 2020-21 Defined Contribution Plan Budget

	Rebudget 2017-2018 <sup>1/</sup>	Rebudget 2018-2019 <sup>1/</sup>	Rebudget 2019-2020	Budget Request
<b>Personnel Services</b>	\$1,891,000	\$2,782,000	\$2,357,000	\$2,081,000
<b>Operational</b>				
Travel	0	0	12,400	25,700
Training	0	0	8,500	12,200
Communication Services	0	0	0	5,400
Consultants - Non EDP	250,000	287,500	125,000	122,000
Legal Services/Fees	279,000	193,000	200,000	150,000
Specialized Services	1,890,000	1,230,000	541,000	1,219,000
Advertising	0	0	0	2,000
IT Consulting	400,000	100,000	100,000	280,000
Telecom - Voice - Services	0	2,500	0	0
Hardware/Software and Maintenance	50,000	0	0	27,850
Facilities and Equipment	58,750	0	0	0
Real Estate	0	56,000	148,700	180,000
Office Equipment	0	0	0	26,000
Office Supplies	0	0	0	10,250
Educational Supplies	150,000	0	0	100
Postage	200,000	125,000	101,000	250,000
Freight	0	0	0	100
Printing	100,000	125,000	48,100	52,700
Subscriptions & Licensing	0	0	0	200
Membership Dues	0	0	0	4,600
Conference Expenses	0	0	1,300	2,500
Insurance, Surety, & Fidelity Bonds	0	0	0	100,000
Other Operational	0	0	209,000	5,300
<b>Total Operational</b>	<b>3,377,750</b>	<b>2,119,000</b>	<b>1,495,000</b>	<b>2,475,900</b>
<b>Total Annual Budget</b>	<b>\$5,268,750</b>	<b>\$4,901,000</b>	<b>\$3,852,000</b>	<b>\$4,556,900</b>

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

# SERS ORGANIZATION

## Proposed FY 2020-21 Budget

This budget includes the costs to administer SERS' Deferred Compensation Plan. The plan allows commonwealth employees to voluntarily defer a portion of their salaries to a supplemental retirement savings account. All plan expenses are borne by plan participants.

### Proposed FY 2020-21 Deferred Compensation Budget

	Budget Request
<b>Personnel Services</b>	\$710,940
<b>Operational</b>	
Travel	25,530
Training	11,990
Consultants - Non EDP	167,900
Legal Services/Fees	5,000
Specialized Services	3,610,790
Hardware/Software and Maintenance	350
Real Estate	28,500
Office Equipment & Supplies	6,600
Educational Supplies	520
Postage	11,270
Printing	11,940
Subscriptions & Licensing	200
Membership Dues	4,530
Conference Expenses	2,490
Insurance, Surety, & Fidelity Bonds	100,000
Other Operational	5,250
<b>Total Operational</b>	<b>3,992,860</b>
<b>Total Annual Budget</b>	<b>\$4,703,800</b>



# SERS ORGANIZATION

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## Legislation

### Legislation Enacted During 2019

#### Act 2019-1

Senate Bill 113 was signed into law by Governor Wolf on March 28, 2019, as Act 2019-1. The law amends the definition of “crimes related to public office or public employment” in the Public Employee Pension Forfeiture Act (Act 140) by adding any Pennsylvania criminal offense classified as a felony or punishable by a term of imprisonment exceeding five years, as well as all criminal offenses set forth in Federal law and the laws of another state substantially the same as the crimes enumerated in Act 140 as pension forfeiture crimes.

Under Act 2019-1, pension forfeiture occurs immediately upon an initial entry of a jury verdict or judicial finding of guilt, retroactive to the date the plea or finding is entered. The bill also adds specific requirements to the Administrative Office of Pennsylvania Courts to provide the benefits administrator with the necessary court-related and restitution information.

#### Act 2019-52

On July 2, 2019, Governor Wolf signed House Bill 615 into law as Act 2019-52. The law expands the definition of “enforcement officer” to include Game Commission Officers and other commissioned law enforcement personnel employed by the Pennsylvania Game Commission who exercise the same law enforcement powers as Game Commission Officers. The law does not include the same provision for deputy Game Commission Officers. The application of the law is retroactive to September 18, 2017, for employees hired prior to December 31, 2018.

The increased costs for the benefit enhancements, listed below, will be paid by the Pennsylvania Game Commission over a period of 10 years.

- A lower superannuation age (50/55 versus 60/65)
- Immediate eligibility for a disability annuity
- Exempt from mandatory participation in the hybrid and/or defined contribution plans enacted under Act 2017-5

#### Act 2019-72

On July 2, 2019, Governor Wolf also signed Senate Bill 724 into law as Act 2019-72. This law is similar to Act 2019-52, as it includes a provision that adds individuals employed by the Office of State Inspector General charged with law enforcement who have, within the scope of their employment, police powers to enforce laws, to the definition of “enforcement officer.” The application of the law is retroactive to September 18, 2017, for employees hired prior to December 31, 2018, and prospective for employees hired after that date, affording the impacted employees the same benefits enhancements listed above.

The increased costs will be paid by the Office of State Inspector General over a period of 10 years.

# SERS ORGANIZATION

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## Legislation

### **Act 2019-105**

Governor Wolf signed House Bill 1982 into law as Act 2019-105 on November 27, 2019. The law allows eligible employers to enter into an agreement with the State Employees' Retirement Board to make a one-time lump sum payment of 75% to 100% of their respective unfunded actuarial accrued liability. SERS' actuaries will make the calculation of the portion of the unfunded actuarial accrued liability that an eligible employer is liable for based on SERS' most recent valuation report. The eligible employer will receive credit against future actuarially determined contributions on a periodic basis that coincide with its existing schedule for making employer contributions to the system. With limited exceptions, this schedule is fixed once it is set. The lump sum payment covers only liabilities accrued as of the date of the calculation. Future changes in liability, whether gains or losses, will attach to the employer's future contributions. Agreements must be entered into by December 31, 2024, and the lump sum payments must be made by May 1, 2025.



## Hybrid Plan



**6,690**  
hybrid members

**6,427**  
Class A-5

**263**  
Class A-6

**102**  
employers

# HYBRID PLAN

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## Plan Description

The default retirement plan for most new state employees is the Hybrid Plan A-5 class of service that launched January 1, 2019, as established by Act 2017-5.

In this plan, a portion of the employee's retirement benefit comes from a defined benefit pension plan that features guaranteed monthly payments for life based on a calculation. Employers and employees both contribute to this plan. A portion comes from a defined contribution investment plan with the amount of money the employee generates from their investment choices and market performance, in addition to employer and employee contributions.

The SERS Board selects the investment options and hires the third-party administrator of the defined contribution investment plan. For more information on the plan, its investment options, or the third-party administrator, see the [Defined Contribution Plan section](#).

There are two classes of service in this plan, the A-5 and A-6 classes of service. The class of service defines the mandatory employee and employer contribution rates and how quickly the pension portion of the retirement benefit grows each year. For more information on the pension plan, including the benefit calculation, see the [Defined Benefit Plan section](#).

The pension portion of the hybrid benefit grows at a slower rate than the traditional pension-only plan -- at either 1.25% or 1% of the employee's pay for each year they work, compared to between 2% and 4% in the traditional pension-only plan. The growth or "accrual" rate is determined by the employee's class of service in the pension system:

### **A-5 Class of Service**

Members in the Hybrid Plan A-5 class of service contribute a total 8.25% of their pay toward their retirement benefit, which is split between the two plans, with 5% going toward the traditional pension plan and 3.25% going toward the investment plan. Participants may make additional voluntary contributions toward the investment plan.

The amount employers contribute toward the pension portion of the benefit is calculated each year based on the assets and liabilities of the SERS pension fund. Employers also contribute an amount equal to 2.25% of the employee's pay toward the investment plan portion of the retirement benefit.

The pension portion of the benefit is guaranteed to grow by 1.25% of the employee's final average salary for each year they work.

### **A-6 Class of Service**

Members in the Hybrid Plan A-6 class of service contribute a total 7.5% of their pay toward their retirement benefit, which is split between the two plans, with 4% going toward the traditional pension plan and 3.5% going toward the investment plan. Participants may make additional voluntary contributions toward the investment plan.

# HYBRID PLAN

## Plan Description

The amount employers contribute toward the pension portion of the benefit is calculated each year based on the assets and liabilities of the SERS pension fund. Employers also contribute an amount equal to 2% of the employee’s pay toward the investment plan portion of the retirement benefit.

The pension portion of the benefit is guaranteed to grow by 1% of the employee’s final average salary for each year they work.

The employee is eligible for monthly pension payments, or “vested” in the pension system, after working 10 years, and they are eligible for distribution of the employer contributions toward their investment account after working three years. Employee contributions are immediately vested and eligible for distribution upon retirement.

While new employees are automatically enrolled in the Hybrid Plan, A-5 class of service, they have the option to elect either the A-6 class of service or to forgo the traditional pension component altogether and participate exclusively in the Defined Contribution Plan.

### Hybrid Plan Statistics

As of December 31, 2019

<b>Participants</b>	6,690 total 6,427 A-5 Class of Service 263 A-6 Class of Service
<b>Assets</b>	see the <i>Defined Contribution Plan</i> and <i>Defined Benefit Plan</i> sections for the assets in each plan.
<b>Number of Employers</b>	102

**DEFINED  
CONTRIBUTION  
PLAN**

Investment Option

# Defined Contribution Plan

**\$310,000**

distributions/withdrawals  
in 2019

**\$9.2**

million in  
assets

**As of Dec 31, 2019**



**7,802**  
accounts

**102**  
employers

**Contributions**

participant **\$4.1 million**  
employer **\$2.7 million**

## Total FY 2020-21 Spending Request



**\$4.6 million**

**\$2.1  
million**  
personnel

**\$2.5  
million**  
operations

Samples from operations =

- IT consulting-system upgrade **\$280,000**
- postage **\$250,000**
- real estate **\$180,000**
- legal services **\$150,000**
- office equipment **\$26,000**

# DEFINED CONTRIBUTION PLAN

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## Plan Description

While the Hybrid Plan A-5 class of service is the default plan for most new state employees, they have the option to forgo the traditional pension component of those plan options and participate exclusively in the Defined Contribution Plan.

Employees in the Defined Contribution Plan contribute 7.5% of their pay and their employer contributes an amount equal to 3.5% of the employee's pay toward the employee's investment account. The employee is eligible for distribution of the employer contributions, or is "vested" in this plan, after working three years. Employee contributions are immediately vested and eligible for distribution upon retirement.

In this plan, the amount of money an employee has for retirement is based on employer and employee contributions and on the amount of money the employee generates from their investment choices and market performance.

The SERS Board selects the investment options offered through this plan, contracts with investment managers, and contracts through a competitive bid, the third-party administrator of the plan, Empower Retirement, which maintains participant records, carries out investment transactions on behalf of the participants, and counsels participants.

Investment options comprise: a series of target date funds that include a post-retirement date fund, equity funds, fixed income funds, a money market fund, and a self-directed brokerage option.

In addition to the \$9.2 million in participant accounts, this plan also receives annual commonwealth funds to pay all fees, costs, and expenses of administering the plan. On December 31, 2019, the plan had approximately \$2.9 million of these funds available for plan administration.

## Recent Changes

In 2019, the plan experienced the following changes:

- **Added New Retirement Date Fund, Closed Another Fund** – The SERS Board added a new 2065 Retirement Date Fund to the investment options and closed the 2020 Retirement Date Fund. This is routine activity for plans offering target date funds, since each fund has a set lifespan.
- **Added Retirement Solutions Group to Participant Service Team** – Retirement Solutions Group representatives are trained, licensed, and experienced in a broad range of retirement plans so that they can provide education on topics such as investment selection, amounts to save, how to rollover assets from other plans, strategies for increasing savings, etc. The group can also identify asset consolidation and tax-deferring strategies, review a participant's retirement options when they retire, change jobs or at any point in their career, and even assist participants with paperwork, if needed. The Retirement Solutions Group services are provided to participants free of charge, by SERS' third-party administrator, Empower Retirement.

# DEFINED CONTRIBUTION PLAN

## Plan Description

### Defined Contribution Plan Statistics

As of December 31, 2019

<b>Participants</b>	7,802 total accounts 6,938 participants contributing to the plan 6,690 Hybrid Plan participants 248 Defined Contribution Plan participants 864 inactive accounts
<b>Assets</b>	\$9.2 million
<b>Number of Employers</b>	102
<b>Total Participant Mandatory Contributions</b>	\$4.1 million
<b>Total Employer Contributions</b>	\$2.7 million
<b>Total Rollovers into the Plan</b>	61 totaling \$1.7 million
<b>Total Rollovers Out of the Plan</b>	15 totaling \$11,000
<b>Total Distributions/Withdrawals</b>	\$310,000
<b>Total Voluntary After-Tax Contributions</b>	\$117,000



# DEFINED CONTRIBUTION PLAN

## Participation, Assets, Performance, and Fund Expense

### Defined Contribution Plan Investment Options

Participation, Assets, Performance, and Fund Expense

As of December 31, 2019

Fund Name	Participants	Fund Balance	Inception Date	Estimated Calendar Year, Net-of-Fees Returns					Max Total Investment Fund Expense <sup>2/</sup>
				1 Year	3 Year	5 Year	10 Year		
Post Retirement Date Fund	207	\$148,993.21	08-2005	15.63%	7.13%	5.22%	6.14%	0.080%	
2025 Retirement Date Fund	378	377,980.88	07-2006	18.59	8.71	6.32	7.50	0.080	
2030 Retirement Date Fund	610	995,921.76	08-2005	20.77	9.67	6.96	8.07	0.080	
2035 Retirement Date Fund	694	664,646.28	07-2006	22.84	10.56	7.55	8.58	0.080	
2040 Retirement Date Fund	745	787,809.35	08-2005	24.71	11.35	8.05	9.03	0.080	
2045 Retirement Date Fund	731	1,280,822.93	07-2006	26.03	11.83	8.36	9.36	0.080	
2050 Retirement Date Fund	841	1,055,827.15	09-2007	26.60	12.01	8.47	9.59	0.080	
2055 Retirement Date Fund	1,011	1,010,538.38	05-2010	26.66	12.02	8.47	NA	0.080	
2060 Retirement Date Fund	1,317	1,089,607.19	11-2014	26.65	11.99	8.47	NA	0.080	
2065 Retirement Date Fund	1,076	576,239.80	09-2019	NA	NA	NA	NA	0.080	
U.S. Large Company Stock Index Fund	234	387,900.96	03-2009	31.49	15.27	11.70	13.57	0.015	
U.S. Small/Mid Company Stock Index Fund	54	33,973.68	08-1998	28.18	11.15	9.03	12.92	0.025	
U.S. All Company Stock Index Fund	181	154,034.94	12-1994	30.51	14.37	11.11	NA	0.025	
Global Non-U.S. Stock Index Fund	174	232,204.04	01-2011	21.72	10.16	5.78	5.11	0.055	
U.S. Bond Index Fund	162	109,539.25	12-2017	8.66	4.00	2.99	3.68	0.025	
U.S. Short-Term Bond Index Fund	65	18,141.44	12-2017	3.99	NA	NA	NA	0.025	
U.S. Treasury Inflation Protected Security Index Fund <sup>1/</sup>	87	21,521.92	07-2007	8.36	NA	NA	NA	0.025	
Short-Term Investment Fund	21	13,840.70	10-2018	2.31	1.82	1.25	0.73	0.000	

<sup>1/</sup>There was a break in the return history of the TIPS fund between 2010 and 2017, since there were no participants during that time.

<sup>2/</sup>Maximum possible expense that can be charged.

The Plan's annual recordkeeping fee is \$59.50 per participant. The commonwealth is currently covering this fee.

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.

**DEFINED  
BENEFIT  
PLAN**

Traditional Pension

# Defined Benefit Plan

## Total FY 2020-21 Spending Request



**\$30.7 million**

\$1.5 million

directed commissions

**\$18.8 million**  
personnel

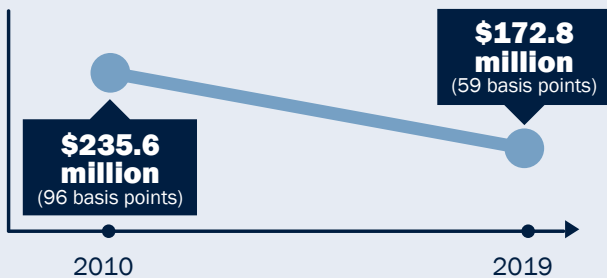
**\$13.15 million**  
operations

**\$0.25 million**  
fixed assets

Samples from operations =

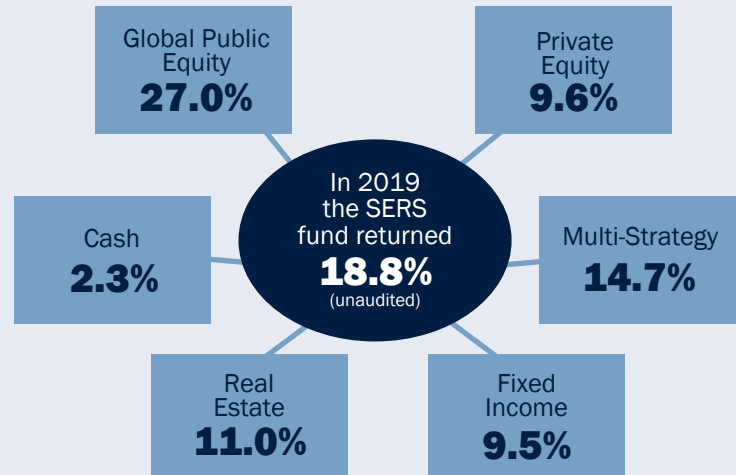
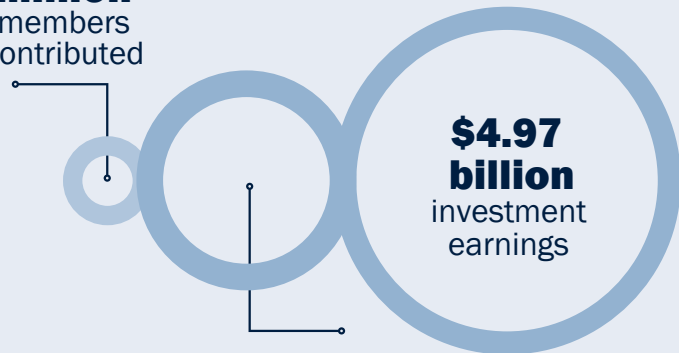
- IT consulting-system upgrade **\$2.5 million**
- hardware/software maintenance **\$2.1 million**
- real estate **\$1.8 million**
- treasury services **\$1.5 million**
- postage **\$0.6 million**
- legal services **\$0.5 million**
- office equipment **\$0.4 million**

## SERS decreased manager investment expenses



## 2019 Contributions to the SERS Fund

**\$409 million**  
members  
contributed

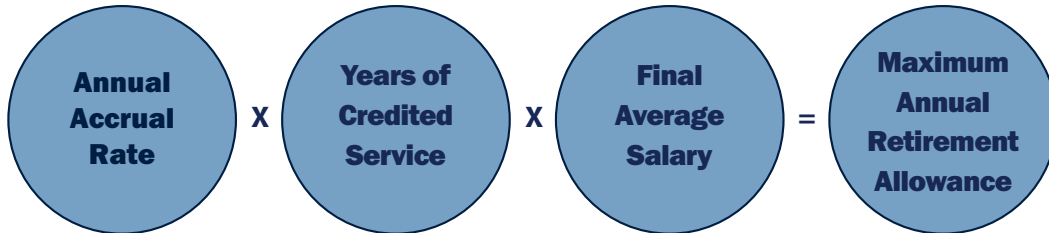


# DEFINED BENEFIT PLAN

## Plan Description

Employees initially hired before Jan. 1, 2019, or into certain law enforcement and security positions after that date, are enrolled in the Defined Benefit Plan, which is a traditional pension plan.

This plan features guaranteed monthly payments for life based on a calculation that considers the employee's years of service and salary:



The economic engine of the Defined Benefit Plan is the SERS Fund, which is professionally managed by SERS and detailed in this section.

Both the employee and their employer contribute toward the Defined Benefit Plan.

The employee contributes a certain percentage of their pay, determined by their class of service in the pension system. The percentages are set by law in the State Employees' Retirement Code and are generally fixed except for a shared-risk/shared-gain provision. For employees hired after December 31, 2010, if SERS investments fail to achieve the assumed rate of return over a number of years; or conversely, if SERS investments outperform the assumed rate of return over a number of years, the employee's contribution rate could change by no more than 3% over/under the base rate for their class of service in the pension system. While contribution rates vary with the vast majority contributing between 5% and 9.3%, most employees contribute 6.25% of their pay toward their pension.

Employers contribute a percentage of their payroll as calculated each year based on the assets and liabilities of the SERS Fund. For fiscal year 2019-20, employers on average are contributing 33.59% of payroll toward their employees' pensions.

SERS invests the contributions to achieve returns to help ensure sufficient funds are available to make required payments to current and future retirees.

Most employees hired after December 31, 2010, are eligible for monthly pension payments, or "vested" in the pension system, after working 10 years.

If employees retire before they reach their full SERS retirement age – either age 50, 55, 60, 65, or 67 depending on their class of service in the system – their pension is reduced for early retirement.

# DEFINED BENEFIT PLAN

## Plan Description

The Defined Benefit Plan also features a disability benefit for employees who become unable to perform their job because of injury or illness and qualify, based on years of service and a review by an independent medical examiner.

## Recent Changes

In 2019, the plan experienced the following changes:

- **Improved Administrative Transparency** – The board approved standard formats for specialty consultant performance reports, staff and consultant memos, and recommended a template for future manager presentations to be posted to [SERS’ public website](#).
- **Improved Defined Benefit Fund Stress Testing** – The board approved a Stress Testing and Risk Assessment report, developed by SERS’ actuarial firm, Korn Ferry, in coordination with SERS’ investment consultant, Callan. The report reviewed a wide range of investment-related, contribution-related, and demographic-related risks that could affect the long-term health and stability of the fund.
- **Adopted a New Investment Policy Statement and Target Asset Allocation** – The board adopted a new investment policy statement that outlines the investment philosophy and practices and serves as the governing policy for the management of the fund. The target asset allocation is projected to achieve SERS’ investment return assumption, reduce investment fees, and increase liquid assets to maintain a level of funds sufficient to pay pension plan benefits and obligations during prolonged periods of market decline and potential budgetary constraints.

### Defined Benefit Plan Statistics

As of December 31, 2019

<b>Members</b>	242,749 total 103,266 active contributing members 6,690 Hybrid Plan 96,576 defined benefit-only plan 6,752 vested members not receiving benefits 132,731 retired members and beneficiaries
<b>Assets</b>	\$30.9 billion
<b>Number of Employers</b>	102
<b>Total Employee Contributions</b>	\$409 million
<b>Total Employer Contributions</b>	\$2.1 billion
<b>Total 2019 Benefit Payments</b>	\$3.5 billion



# Members

# DEFINED BENEFIT PLAN

## Members

### Total Active & Annuitant Members

Year Ending December 31	Total Members <sup>1/</sup>	Active Members	Annuitants & Beneficiaries
2019	235,997	103,266	132,731
2018	234,014	103,007	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

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

### Active Members: Age & Service

Average Age	46.3
Average Years of Service	11.6

### Total Annuitants & Beneficiaries: By Category

	2016	2017	2018	2019
Normal	63,315	64,796	65,968	67,307
Early	43,974	44,284	44,383	44,423
Disability	8,578	8,593	8,626	8,637
Beneficiary/Survivor	11,471	11,800	12,030	12,364

### Annuitants & Beneficiaries: Average Age

	2016	2017	2018	2019
Normal	72.3	72.3	72.4	72.5
Early	64.3	64.7	65.1	65.5
Disability	63.4	63.7	64.1	64.4
Beneficiary/Survivor	74.5	74.6	74.6	74.7

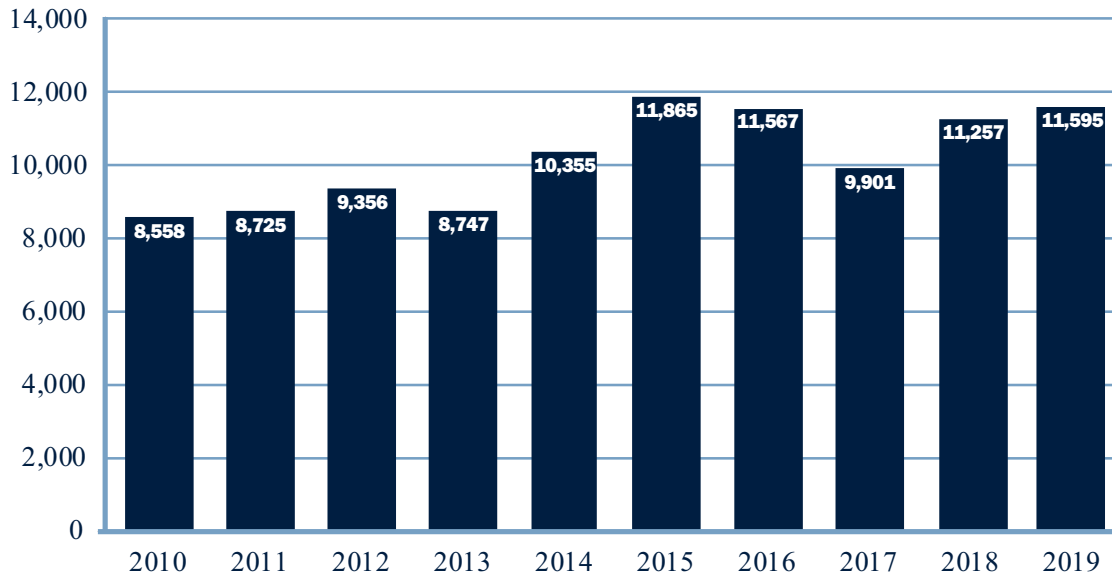
### Annuitants & Beneficiaries: Average Annual Pension

	2016	2017	2018	2019
Normal	\$27,722	\$28,352	\$28,880	\$29,440
Early	17,412	17,751	18,098	18,427
Disability	15,245	15,521	15,753	15,980
Beneficiary/Survivor	12,505	12,947	13,350	13,816

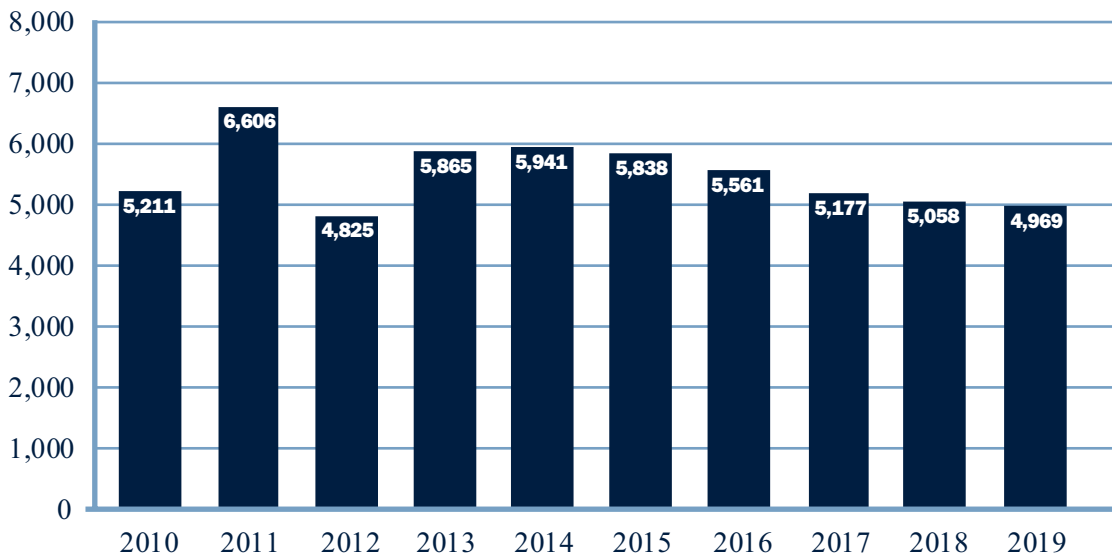
# DEFINED BENEFIT PLAN

## Members

### New Member Enrollments



### Normal, Early, & Disability Retirements





# SERS Fund



# DEFINED BENEFIT PLAN

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## 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 following retirement. Most state employees are required to participate in Pennsylvania's defined benefit plan, although nearly all employees hired after January 1, 2019 may elect to choose a defined contribution only option. 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 2019-20, employers are contributing 33.59% of payroll and most members are paying 6.25%. SERS invests this money to achieve returns to 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.

### 2019 Overview

In 2019, SERS paid more than \$3.5 billion in benefit payments, approximately \$3.2 billion of which stayed in Pennsylvania. The average annual pension paid to a retired member who worked to full retirement age was \$29,440.

### 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 common element of these plans is that employee and employer contributions invested throughout the member's working career provide sufficient funding to pay for that 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.

# DEFINED BENEFIT PLAN

## SERS Fund | Funding Process

### 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' actuary 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, salary growth, and inflation. Demographic assumptions include workforce, disability, and mortality trends. In 2016, SERS delivered its most recent experience study. It is available at [SERS.pa.gov](http://SERS.pa.gov). SERS plans to initiate an updated study in 2020.

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

### 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  
2018 valuation

7.125%  
long-term investment  
return effective with  
2019 valuation

5.55%  
average salary growth

2.6%  
rate of inflation

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

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

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

# DEFINED BENEFIT PLAN

## SERS Fund | Funding Process

### *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 typically does not change from year to year. Members' contributions are withheld from their paychecks and sent directly from their employer to SERS. In 2019, member contributions to SERS totaled an estimated \$409 million.

Courts have ruled that public retirement benefits may not be changed retroactively or prospectively in any way that may be a "net detriment" to current 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.

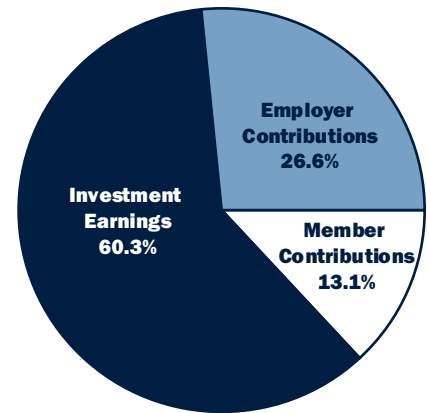
### *Investment Earnings*

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

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

Investment earnings can vary widely from year to year; the SERS Fund, for example, produced an approximate 25% return in 2003 and experienced more than a 28% loss in 2008's worldwide downturn. For funding valuation purposes in order to minimize volatility, Pennsylvania law requires that the differences between actual performance and the assumed rate of return be recognized over a five-year period at a rate of 20% per year—a concept often referred to as "smoothing." SERS examines and sets its assumed rate of return each year based on global market dynamics, investment performance, and other considerations. For example, in 2009, SERS reduced its assumed rate of return from 8.5% to 8%, largely as a result of 2008's global economic collapse.

**SERS Funding Sources**  
(20-Year Cumulative History)



# DEFINED BENEFIT PLAN

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## SERS Fund | Funding Process

As a result of SERS' nearly 100 years of operation and the trend of people living longer, the system now has more retired members than active members. In 2020, SERS is projected to pay out approximately \$90 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 a changing market environment and a desire to provide an opportunity to reduce risk while maintaining the potential for achieving a reasonable long-term rate of investment return, the SERS board, in June 2019, moved to reduce its assumed rate of return from 7.25% to 7.125% effective with the December 31, 2019, actuarial valuation. 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 8.4%, 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 returns over time.

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.

### *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.

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 33.59%.

The total dollars contributed by employers has grown significantly in recent years. In 1989, employer contributions totaled \$417 million. In 2019 that figure was approximately \$2.1 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. FY 2020-21 will be the 4<sup>th</sup> consecutive year that the commonwealth will pay the full actuarially required contributions.

According to the Governor's Budget Office, SERS' employers under the Governor's jurisdiction paid less than half of the employers' total—about 40%—from the general fund. About 48% was paid from special and federal funds, and about 12% was provided from non-state agency employers.

# DEFINED BENEFIT PLAN

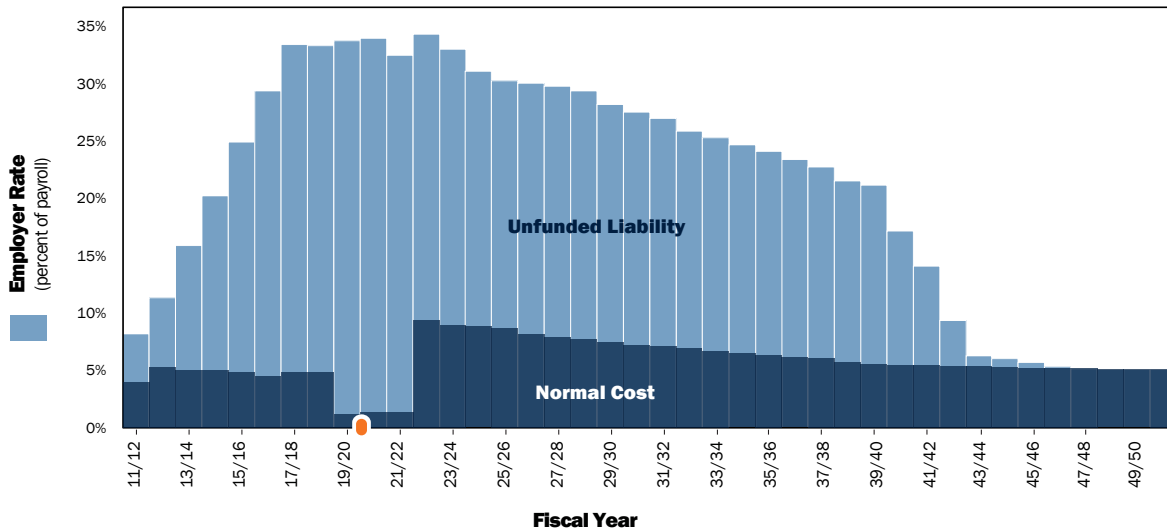
## SERS Fund | Funding Process

The employer contribution rate has two major parts: the cost of the benefit for new SERS members in the current year (applied to all active members), referred to as the employer normal cost; and a contribution toward the unfunded liability. In FY 2019-20 the largest component of the 33.59% employer contribution rate is the 31.6% contribution necessary to pay this unfunded liability.

The employer normal cost is expressed as a percentage of payroll and is the amount employers would contribute to fully fund benefits if all actuarial assumptions were precisely met, including the fund earning its assumed rate of return. The normal cost of benefits as of the 2018 actuarial valuation was 1.25% for newly hired members.

The system currently uses a statutorily required modified entry-age funding method, calculating employer normal rates based upon the cost of new hires only. Using this method the employer normal contribution rate is 1.25% in FY 2019-20. Act 2017-5 requires the use of a traditional entry-age funding method beginning with the 2021 valuation that will base employer normal costs on all active member costs. This shift is projected to increase employer normal costs for FY 2022-23 above 9%. However, the actuarial change will reduce the unfunded liability resulting in a total employer contribution rate that will increase only modestly above the prior year. In FY 2023-24, employer rates are then projected to decline annually until the unfunded liability is retired.

**SERS Employer Rate as a Percent of Payroll**



It should be noted that Act 2017-5 included a savings “plow-back” provision requiring that the annual savings achieved through SERS’ benefit changes flow back into the system rather than to other non-pension obligations. The 33.63% projected employer contribution rate for FY 2020-21 reflects a savings return of 0.7%. Without the plow-back provision, the employer rate would have been lower. The plow-back contributions, currently calculated to range from 0.10% to 0.93% of payroll, are expected in 12 of the next 22 fiscal years and will work to accelerate the systems’ return to fully funded status.

# DEFINED BENEFIT PLAN

## SERS Fund | Funding Process

### Projected Payout, Funding Status & Employer Contributions

Assuming a modified entry-age funding method through the 2020 valuation year, with a traditional entry-age funding method starting with the 2021 valuation year, level-dollar amortization, five-year smoothing of assets, 5.6% salary growth, 2.6% inflation, 18.8% investment return in CY 2019 with 7.125% assumed 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)
2019	\$3.5	56.1%	\$23.41	2020/21	\$6,657.0	33.63%	\$2,238.6
2020	3.7	57.8	22.80	2021/22	6,850.1	32.50	2,225.6
2021	3.8	64.4	17.96	2022/23	7,048.7	33.71	2,374.8
2022	4.0	65.6	17.59	2023/24	7,253.1	32.84	2,381.0
2023	4.1	68.1	16.50	2024/25	7,463.5	31.26	2,331.4
2024	4.2	69.5	15.95	2025/26	7,679.9	30.34	2,328.0
2025	4.3	70.8	15.37	2026/27	7,902.6	29.46	2,326.1
2026	4.4	72.2	14.76	2027/28	8,131.8	28.63	2,325.3
2027	4.5	73.6	14.12	2028/29	8,367.6	27.82	2,325.3
2028	4.6	75.0	13.45	2029/30	8,610.3	27.05	2,326.3
2029	4.7	76.4	12.72	2030/31	8,860.0	26.32	2,328.3
2030	4.8	77.9	11.95	2031/32	9,116.9	25.60	2,330.6
2031	4.9	79.4	11.12	2032/33	9,381.3	25.01	2,342.1
2032	4.9	81.1	10.23	2033/34	9,653.4	24.45	2,355.9
2033	5.0	82.9	9.27	2034/35	9,933.3	23.89	2,368.6
2034	5.1	84.8	8.23	2035/36	10,221.4	23.34	2,380.3
2035	5.1	86.9	7.10	2036/37	10,517.8	22.80	2,392.5
2036	5.2	89.1	5.89	2037/38	10,822.8	22.27	2,404.3
2037	5.2	91.5	4.58	2038/39	11,136.7	21.75	2,416.7
2038	5.3	94.1	3.17	2039/40	11,459.7	21.25	2,428.4
2039	5.3	96.9	1.65	2040/41	11,792.0	16.84	1,979.0
2040	5.4	99.1	0.48	2041/42	12,134.0	13.62	1,645.7
2041	5.5	100.8	(0.43)	2042/43	12,485.8	9.04	1,120.9
2042	5.6	101.8	(0.93)	2043/44	12,847.9	6.74	858.5
2043	5.6	102.2	(1.14)	2044/45	13,220.5	6.40	838.0
2044	5.7	102.6	(1.34)	2045/46	13,603.9	5.99	806.6
2045	5.8	103.0	(1.52)	2046/47	13,998.4	5.32	736.2
2046	5.9	103.2	(1.58)	2047/48	14,404.4	5.25	746.3
2047	6.0	103.2	(1.59)	2048/49	14,822.1	5.18	757.4
2048	6.1	103.3	(1.60)	2049/50	15,251.9	5.11	769.6

# DEFINED BENEFIT PLAN

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## 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 2019, SERS retired 4,969 members and added 11,595 new members. Currently, approximately 45.16% 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 2010-120 is that retirement provisions for legislators elected after December 1, 2010, were reduced and made consistent with those of most rank-and-file employees.

Even more impactful, Act 2010-120 recognized the need to steadily increase employer contributions to fully fund their obligations. To ensure predictability and to moderate overall budget impacts, the general assembly set rate collars for increased employer contribution rates.

Now that SERS employers are paying the full “uncollared” contribution amount, plus making extra “plowback” contributions to return Act 2017-5 savings, the impact on paying down the liability is dramatic. This funding is crucial for the overall long-term health of the pension system. Enacting a dedicated funding source for future contributions could provide additional stability and assurance.

The past year, 2019, saw a dramatic rebound across both equity and debt markets – a welcome windfall following the extreme market volatility in 2018. That volatility led to losses for investors across the board, including pension funds such as SERS, and a slight uptick in the employer contribution rate.

### 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 – 242,749 active, vested, and retired, as of December 31, 2019.

Many pension experts consider a funding ratio of 80% or better to be “healthy” for a pension system. Per a 2019 Wilshire report, Pennsylvania is among 63% of other state retirement systems that are currently below the 80% threshold. At the close of 2019, SERS' estimated funded ratio was 56.1% (actuarial value) or 57.9% (market value). SERS projects reaching the 80% funded threshold in 2032.

# DEFINED BENEFIT PLAN

## SERS Fund | Actuarial Status

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

### SERS Funded Status

Year	Funded		Unfunded Actuarial Liability (\$ billions)
	Actuarial Value	Market Value	
2019	56.1%	57.9%	\$23.4
2018	56.0	52.0	22.8

The 2019 estimated unfunded liability is \$23.4 billion, which is 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
- Gradual reductions in assumed rates of return over the past several years, from 8.5% in 2008 to 7.125% effective in 2019 to reflect changing market conditions
- Cumulative negative impact of the above on the overall size of the fund and its ability to realize the full actuarial effect of investment returns in positive-earning years



# DEFINED BENEFIT PLAN

## SERS Fund | Actuarial Status

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

(\$ millions)

Calendar Year	Member Contributions	Investment Earnings	Employer Contributions	Benefits & Expenses	Fair (Market) Value
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 <sup>2/</sup>	394	(1,442)	2,049	(3,421)	26,937
2019 <sup>3/</sup>	409	4,972 <sup>4/</sup>	2,109	(3,539)	30,888
<b>10-Year Total</b>	<b>\$3,699</b>	<b>\$20,807</b>	<b>\$12,148</b>	<b>(\$30,380)</b>	

<sup>1/</sup>10-year net additions and deductions were \$6,274.

<sup>2/</sup>The Governmental Accounting Standards Board (GASB) issued GASB Statement No. 75, Accounting and Financial Reporting for Postemployment Benefits Other Than Pensions (OPEB) (GASB 75). This required SERS to record its proportionate share of net OPEB liability, (\$48), resulting in restated beginning balance of \$29,357.

<sup>3/</sup>2019 figures are unaudited.

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

# Investment Overview

# DEFINED BENEFIT PLAN

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

The major elements of the policy are:

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

# DEFINED BENEFIT PLAN

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## Investment 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.

In December 2019, the SERS Board adopted a revised statement of investment policy and a 10-year asset allocation strategy designed to further mitigate risk, reduce external management fees, and increase fund liquidity while meeting its long-term return assumption.

The new asset allocation targets increased exposure to liquid, fixed income-oriented investments while simultaneously reducing exposure to less liquid non-traditional strategies.

# DEFINED BENEFIT PLAN

## Investment Overview

### SERS' 2020 Strategic Targets

Asset Class	Current Exposure 12/31/2019	2019 10-Year Strategic Targets	2020 10-Year Strategic Targets
Private Equity	12.7%	16%	14%
Private Credit	1.0	NA <sup>1/</sup>	4
Multi-Strategy	4.9	10	NA
Real Estate	6.7	12	8
Global Equity	3.7	48	NA
U.S. Equity	26.0	0	25
International Developed Markets Equity	19.4	0	13
Emerging Markets Equity	6.6	0	4
Fixed Income	11.3	11	26 <sup>2/</sup>
Inflation Protected (TIPS)	2.8	NA <sup>3/</sup>	4
Cash	4.8	3	2
<b>Estimate Return (Geometric)</b>		7.397%	7.0%
<b>Estimate Risk (Standard Deviation)</b>		16.34%	13.66%

<sup>1/</sup>Private Credit previously included within Multi-Strategy portfolio

<sup>2/</sup>22% target to Core Fixed Income, 4% target to Opportunistic Fixed Income

<sup>3/</sup>Fixed Income previously included TIPS portfolio

### 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 subsequent 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.

#### *Total Fund Asset Allocation*

SERS developed a biennial investment plan which provided direction for the SERS investment program. The *2018-2019 Strategic Investment Plan* was expected to be implemented over a 10-year period. The fund's asset allocation strategy evolves 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 regularly for strategic asset allocation purposes, as well as for diversification needs within each asset class.

# DEFINED BENEFIT PLAN

## Investment Overview

### Asset Allocation

(\$ millions as of December 31, 2019)

Asset Class	Market Exposure	% of Total Fund	2019 10-Year Strategic Targets
Private Equity	\$3,938.5	12.7%	16.0%
Global Public Equity	17,163.9	55.6	48.0
Real Estate	2,085.9	6.7	12.0
Multi-Strategy	1,817.0	5.9	10.0
Legacy Hedge Funds	36.1	0.1	*
Fixed Income	4,375.5	14.2	11.0
Cash	1,471.4	4.8	3.0
<b>Total Fund</b>	<b>\$30,888.3</b>	<b>100.0%</b>	<b>100.0%</b>

\*Legacy Hedge Funds asset class is in liquidation.

### Number of Investment Managers

Asset Class	Investment Managers
Private Equity	61
Global Public Equity	14
Real Estate	27
Multi-Strategy	12
Legacy Hedge Funds	8
Fixed Income	9
Cash	1
<b>Total Managers</b>	<b>132</b>

### Number of Investment Portfolios

Asset Class	Investment Portfolios
Private Equity	182
Global Public Equity	18
Real Estate	58
Multi-Strategy	16
Legacy Hedge Funds	8
Fixed Income	11
Cash	1
<b>Total Portfolios</b>	<b>294</b>

# Performance

# DEFINED BENEFIT PLAN

## Performance

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

For the period ending December 31, 2019

Asset Class	1-Year Total Return	3-Year Total Return	5-Year Total Return	10-Year Total Return
Private Equity <sup>2/,5/</sup>	9.6%	11.4%	9.5%	11.4%
<i>Burgiss All Private Equity Custom Index<sup>3/,5/</sup></i>	7.2	13.1	11.3	13.0
<i>Russell 3000 Index+3%<sup>4/,5/</sup></i>	6.7	16.2	13.7	16.4
Global Public Equity	27.0	12.2	8.5	9.5
<i>MSCI ACW IM Index (Net)</i>	26.4	12.1	8.3	8.9
Real Estate <sup>5/</sup>	11.0	3.4	4.6	7.0
<i>Real Estate Custom Benchmark<sup>5/,6/</sup></i>	6.5	6.4	8.4	9.9
<i>Consumer Price Index +3%<sup>5/</sup></i>	4.7	5.1	4.5	4.8
Multi-Strategy <sup>7/</sup>	14.7	NA	NA	NA
<i>S&amp;P/LSTA Leveraged Loan Index</i>	8.6	4.4	4.5	5.0
<i>Russell 3000 Index</i>	31.0	14.6	11.2	13.4
Fixed Income	9.5	4.3	3.1	4.8
<i>Bloomberg Barclays U.S. Aggregate Bond Index</i>	8.7	4.0	3.1	3.8
Cash	2.3	2.0	1.5	0.9
<i>BofA ML 3 Month U.S. T-Bill Index</i>	2.3	1.7	1.1	0.6
<b>Total Fund<sup>8/</sup></b>	<b>18.8%</b>	<b>9.3%</b>	<b>6.9%</b>	<b>8.1%</b>
<i>Total Fund Custom Benchmark</i>	<i>16.7%</i>	<i>9.3%</i>	<i>7.3%</i>	<i>8.2%</i>
<i>Total Fund Custom Public Market Equivalent Benchmark</i>	<i>16.3%</i>	<i>10.1%</i>	<i>7.8%</i>	<i>8.9%</i>
<i>Total Fund 60/40 Index</i>	<i>19.3%</i>	<i>9.0%</i>	<i>6.4%</i>	<i>7.1%</i>

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

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

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

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

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

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

<sup>7/</sup>The Multi-Strategy asset class has an inception date of October 1, 2017. Performance returns greater than one year are unavailable as of December 31, 2019.

<sup>8/</sup>Please note, because Legacy Hedge Funds are in liquidation, values and performance are no longer reported. However, all performance activity continues to be reflected in SERS' Total Fund return.



# DEFINED BENEFIT PLAN

## Performance

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

For the period ending June 30, 2019

Asset Class	1-Year Total Return	3-Year Total Return	5-Year Total Return	10-Year Total Return
Private Equity <sup>2/,5/</sup>	12.8%	12.3%	9.5%	12.4%
<i>Burgiss All Private Equity Custom Index<sup>3/,5/</sup></i>	10.7	13.8	11.5	14.0
<i>Russell 3000 Index+3%<sup>4/,5/</sup></i>	12.4	16.8	13.6	19.3
Global Public Equity	4.3	11.8	6.3	10.9
<i>MSCI ACW IM Index (Net)</i>	4.6	11.4	6.0	10.3
Real Estate <sup>5/</sup>	0.1	2.1	4.9	5.4
<i>Real Estate Custom Benchmark<sup>5/,6/</sup></i>	8.0	6.8	8.9	8.8
<i>Consumer Price Index +3%<sup>5/</sup></i>	4.9	5.2	4.5	4.8
Multi-Strategy <sup>7/</sup>	6.7	NA	NA	NA
<i>S&amp;P/LSTA Leveraged Loan Index</i>	4.0	5.2	3.7	6.2
<i>Russell 3000 Index</i>	9.0	14.0	10.2	14.7
Fixed Income	7.6	3.4	2.7	6.1
<i>Bloomberg Barclays U.S. Aggregate Bond Index</i>	7.9	2.3	3.0	3.9
Cash	2.4	1.7	1.3	0.8
<i>BofA ML 3 Month U.S. T-Bill Index</i>	2.3	1.4	0.9	0.5
<b>Total Fund<sup>8/</sup></b>	<b>5.7%</b>	<b>8.7%</b>	<b>5.7%</b>	<b>8.6%</b>
<i>Total Fund Custom Benchmark</i>	<i>6.9%</i>	<i>9.0%</i>	<i>6.1%</i>	<i>9.1%</i>
<i>Total Fund Custom Public Market Equivalent Benchmark</i>	<i>6.7%</i>	<i>9.6%</i>	<i>6.7%</i>	<i>9.8%</i>
<i>Total Fund 60/40 Index</i>	<i>6.6%</i>	<i>7.0%</i>	<i>4.7%</i>	<i>7.3%</i>

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

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

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

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

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

<sup>7/</sup>The Multi-Strategy asset class has an inception date of October 1, 2017. Performance returns greater than one year are unavailable as of June 30, 2019.

<sup>8/</sup>Please note, because Legacy Hedge Funds are in liquidation, values and performance are no longer reported. However, all performance activity continues to be reflected in SERS' Total Fund return.

# DEFINED BENEFIT PLAN

## Performance

### Pension Fund Values and Annual Return

(\$ millions)

Year Ended	Pension Fund Fair Value	Annual Total Pension Fund Rate of Return <sup>1/</sup>
1990	\$9,886	1.0%
1991	11,940	22.6
1992	12,453	7.4
1993	13,701	13.2
1994	13,330	-1.1
1995	16,343	25.2
1996	18,492	15.4
1997	21,312	18.5
1998	24,123	16.3
1999	28,093	19.9
2000	27,880	2.2
2001	24,706	-7.9
2002	20,880	-10.9
2003	24,536	24.3
2004	26,641	15.1
2005	28,752	14.5
2006	32,053	16.4
2007	35,516	17.2
2008	22,796	-28.7
2009	24,662	9.1
2010	25,886	11.9
2011	24,377	2.7
2012	25,389	12.0
2013	27,394	13.6
2014	27,338	6.4
2015	26,055	0.4
2016	26,388	6.5
2017	29,405	15.1
2018	26,937	-4.6
2019 <sup>2/</sup>	30,888	18.8

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

<sup>2/</sup>2019 values are estimated and unaudited. Fund fair values for all Private Equity and Real Estate Investments are reported on a quarter-lagged basis.



# Fees & Expenses

# DEFINED BENEFIT PLAN

## Fees & Expenses

### Investment Expenses

Expense Category	Expenses
Manager	\$172,784,600
Consultant	3,815,558
Personnel	3,652,919
Custodian	1,441,762
Subscription and membership	266,493
Operational	197,089
Legal	66,439
<b>Total Investment Expenses</b>	<b>\$182,224,860</b>

### Consultant Expenses

Firm	Service Type	Expenses
StepStone Group	Private equity investments	\$1,998,898
NEPC	Real estate investments	515,190
Fairview Capital Partners	Investment portfolio management	485,419
Callan	General investments	330,969
McKinsey and Company	Special Services	224,400
RVK	General investments	168,120
Other	Other	92,562
<b>Total Consultant Expenses</b>		<b>\$3,815,558</b>

### Manager Investment Expenses

Asset Class	Fees/Expenses	Fees/Expenses <sup>1/</sup> (in basis points)
Private Equity	\$74,725,039	190.5
Global Public Equity	23,612,987	14.9
Real Estate	43,921,242	224.5 <sup>2/</sup>
Multi-Strategy	22,805,902	112.7
Legacy Hedge Funds	89,138	22.0
Fixed Income	7,630,292	18.0
<b>Total Manager Fees and Expenses</b>	<b>\$172,784,600</b>	<b>59.3</b>

<sup>1/</sup>The fees/expenses were divided by SERS total fund and asset class quarterly average values during calendar year 2019 to arrive at the basis point calculations.

<sup>2/</sup>Fees include approximately \$19 million in incentive fees that were earned over a multi-year period but recorded in the current year.

### History of Manager Investment Expenses

Calendar Year	Fees/Expenses	Fees/Expenses (in basis points)
2015	\$157,930,597	59.1
2016	159,447,442	61.3
2017	126,541,221	45.6
2018	124,427,862	43.3
2019	172,784,600	59.3

# DEFINED BENEFIT PLAN

## Fees & Expenses

SERS employs outside investment managers for their investment expertise and services. The managers of the SERS investment portfolio are paid from investment earnings. Their fees and expenses 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.

### 2019 Manager Investment Expenses Detail

Manager	City	State/Country	Fees/ Expenses
<b>Private Equity</b>			
ABRY Advanced Securities Fund	Boston	MA	\$4,152
ABRY Partners VIII	Boston	MA	237,933
ABRY Partners VII	Boston	MA	60,511
ABRY Senior Equity II	Boston	MA	14,881
ADV Opportunities Fund I	Hong Kong	China	550,755
Advent Latin American Private Equity Fund V	Boston	MA	111,789
Advent International GPE VI-A	Boston	MA	65,048
Advent International GPE VII-B	Boston	MA	331,492
Advent International GPE VIII-B	Boston	MA	746,924
Advent Latin American Private Equity Fund IV	Boston	MA	67,593
Advent Latin American Private Equity Fund VI	Boston	MA	500,000
Apollo Investment Fund IX	New York	NY	2,184,157
ASF VII B	New York	NY	1,000,000
ASF VII PA Coinvestment Fund	New York	NY	45,669
ASF VIII B	New York	NY	974,658
Asia Alternatives Capital Partners	San Francisco	CA	1,649
Asia Alternatives Capital Partners II	San Francisco	CA	57,565
Asia Alternatives Capital Partners III	San Francisco	CA	215,270
Asia Alternatives Capital Partners V	San Francisco	CA	486,735
Audax Private Equity Fund VI	Boston	MA	887,576
AXA Secondary Fund V B	Paris	France	129,199
Berkshire Fund VII	Boston	MA	54,257
Berkshire Fund VIII	Boston	MA	110,131
Blackstone Capital Partners VII	New York	NY	750,000
Capvis Equity IV	Baar	Switzerland	529,664
Carlyle Energy Mezz Opp Fund	New York	NY	379,356
Centerbridge Capital Partners III	New York	NY	498,157
Clearlake Capital Group	Santa Monica	CA	118,605
Clearlake Capital V	Santa Monica	CA	34,916
CVC Capital Partners VII	London	United Kingdom	1,362,535
Dover Street VII	Boston	MA	30,000
Eureka III	Yardley	PA	169,877
Eureka II	Yardley	PA	40,859

# DEFINED BENEFIT PLAN

## Fees & Expenses

### 2019 Manager Investment Expenses Detail (continued)

Manager	City	State/Country	Fees/ Expenses
<b>Private Equity (continued)</b>			
Francisco Partners IV	San Francisco	CA	\$464,977
Francisco Partners III	San Francisco	CA	92,202
FSN Capital IV	Oslo	Norway	275,413
FSN Capital V	Saint Helier-Jersey	United Kingdom	1,545,636
GTCR XI	Chicago	IL	236,896
GTCR XII	Chicago	IL	378,774
H.I.G. Bayside Debt & LBO Fund II	London	United Kingdom	269,593
H.I.G. Bayside Loan Opportunity Fund III	London	United Kingdom	653,164
H.I.G. Brazil and Latin America Partners	Rio de Janeiro	Brazil	1,250,000
Hahn & Company II	Seoul	Korea	845,253
Hahn & Company III	Seoul	Korea	1,125,000
Hahn & Company III - Supplemental Fund	Seoul	Korea	70,277
HarbourVest Partners VII	Boston	MA	186
HarbourVest Partners VIII	Boston	MA	605,272
Hellman & Friedman Capital Partners IX	San Francisco	CA	375,547
Hellman & Friedman Capital Partners VIII	San Francisco	CA	715,481
H.I.G. Bayside Loan Opportunity Fund IV	London	United Kingdom	123,389
H.I.G. Growth LBO & Equity Fund II	Miami	FL	436,207
HarbourVest V-Asia Pacific & Rest of World	Boston	MA	138,253
Horizon Impact Fund - HarbourVest	Chicago	IL	262,657
Horizon Impact Fund B - HarbourVest	Boston	MA	454,838
Insight Venture Partners IX	New York	NY	844,402
Insight Venture Partners VII	New York	NY	117,375
Insight Venture Partners VIII	New York	NY	632,303
Insight Venture Partners X	New York	NY	1,728,876
JMI Equity Fund VII	Baltimore	MD	119,451
JMI Equity Fund VIII	Baltimore	MD	348,750
Keystone Legacy Fund	West Hartford	CT	5,392,939
KPS Special Situations Fund IV	New York	NY	105,412
KPS Special Situations Mid Cap Fund	New York	NY	22,090
LBC Credit Partners III	Philadelphia	PA	223,514
Lightspeed India Partners	New Delhi	India	368,900
Lightspeed Venture Partners VII	Menlo Park	CA	78,184
Lightspeed Venture Partners VIII	Menlo Park	CA	205,545
LLR Equity Partners III	Philadelphia	PA	81,706
LLR Equity Partners IV	Philadelphia	PA	542,402
LLR PE Ptrn V	Philadelphia	PA	1,323,110
Madison Dearborn Capital Partners VI	Chicago	IL	23,637

# DEFINED BENEFIT PLAN

## Fees & Expenses

### 2019 Manager Investment Expenses Detail (continued)

Manager	City	State/Country	Fees/ Expenses
<b>Private Equity (continued)</b>			
Meritech Capital Partners IV	Palo Alto	CA	\$300,000
Meritech Capital Partners V	Palo Alto	CA	465,748
New Enterprise Associates 12	Baltimore	MD	54,693
Newbridge Asia IV	San Francisco	CA	28,155
NewSpring Growth Capital III	King of Prussia	PA	322,507
NGP Natural Resources XII	Irving	TX	2,333,624
Oaktree Opportunities Fund VIIIb	Los Angeles	CA	88,187
Oaktree Opportunities Fund IX	Los Angeles	CA	571,034
OCM Opportunities Fund VIIIb	Los Angeles	CA	149
Oaktree Opportunities Fund VIII	Los Angeles	CA	5,575
OCM Power Opportunities Fund III	Los Angeles	CA	144,936
Permira Credit Solutions IV Master SCSp	New York	NY	488,675
Permira VI	London	United Kingdom	831,067
Primavera Capital Fund II	Hong Kong	China	1,003,020
Primavera Capital Fund III	Grand Cayman	Cayman Islands	2,351,759
Providence Equity Partners VI	Providence	RI	5,925
Providence Strategic Growth II	Providence	RI	633,383
Providence Strategic Growth III	Providence	RI	1,071,410
Providence Strategic Growth IV	New York	NY	1,021,978
Ridgemont Equity II	Charlotte	NC	1,020,262
Silver Lake Partners V	Cupertino	CA	1,933,699
Sterling Group Partners IV	Houston	TX	185,967
T. Rowe Price Stock Distribution Account	Baltimore	MD	291,713
TCV X	Menlo Park	CA	682,197
TDR Capital IV	London	United Kingdom	1,559,478
TSG8	San Francisco	CA	2,246,575
Vista Equity Partners Fund VI	Oakland	CA	2,026,066
Vista Equity Partners Fund VII	Oakland	CA	941,644
Weathergage Venture Capital II	Redwood City	CA	187,314
Weathergage Venture Capital	Redwood City	CA	117,434
Wind Point IX-A	Chicago	IL	562,500
Wind Point VIII	Chicago	IL	1,128,196
<b>Private Equity Manager Fees</b>			<b>59,834,394</b>
<b>Private Equity Manager Expenses</b>			<b>14,890,645</b>
<b>Total Private Equity Manager Investment Expenses</b>			<b>74,725,039</b>
<b>Global Public Equity</b>			
BlackRock MSCI Emerging Markets Index	New York	NY	613,185
BlackRock MSCI World Ex U.S. Index	New York	NY	466,863

# DEFINED BENEFIT PLAN

## Fees & Expenses

### 2019 Manager Investment Expenses Detail (continued)

Manager	City	State/Country	Fees/ Expenses
<b>Global Public Equity (continued)</b>			
Emerald U.S. Small Cap Growth	King of Prussia	PA	\$3,182,367
FIS Group	Philadelphia	PA	1,306,899
Globeflex Emerging Markets Small Cap	San Diego	CA	596,510
Harris Associates	Chicago	IL	3,892,209
Iridian Asset Management	Westport	CT	1,978,572
Leading Edge Investment Advisors	San Francisco	CA	1,743,247
Macquarie Emerging Markets	Philadelphia	PA	2,336,161
Martin Currie Emerging Markets All-Cap Concentrated	Edinburgh	United Kingdom	2,677,275
Mellon Capital Management Russell 1000 Index	Pittsburgh	PA	385,644
Mellon Capital Management Russell 2000 Core Index	Pittsburgh	PA	64,330
Mellon Capital Management Russell 2000 Value Index	Pittsburgh	PA	113,053
Walter Scott & Partners Limited	Edinburgh	United Kingdom	3,977,743
<b>Global Public Equity Manager Fees</b>			<b>23,334,058</b>
<b>Global Public Equity Manager Expenses</b>			<b>278,929</b>
<b>Total Global Public Equity Manager Investment Expenses</b>			<b>23,612,987</b>

### Real Estate

Activum SG Fund VI	London	United Kingdom	612,102
Berwind Investment Partnership IX	Yardley	PA	51,870
Berwind Investment Partnership VI	Yardley	PA	4,220
Blackstone Property Partners	New York	NY	3,064,730
Blackstone Real Estate Partners VII	New York	NY	472,025
CBRE Clarion Real Estate	Radnor	PA	52,523
CenterSquare Real Estate Securities	Plymouth Meeting	PA	1,004,901
C-III Recovery Fund III	New York	NY	1,163,076
Clerestory Small Cap Fund I	New York	NY	11,449
Fidelity Real Estate Opportunistic Income Fund	Smithfield	RI	349,180
Forest I.M.A.	Atlanta	GA	40,911
Hawkeye Scout Fund II	Austin	TX	229,636
Heitman American Real Estate Trust	Chicago	IL	1,043,184
Heitman I.M.A.	Chicago	IL	11,764,191
Henderson Park Enhanced Income Fund	London	United Kingdom	400,103
hotelAVE I.M.A.	Irvine	CA	737,078
LaSalle I.M.A.	Chicago	IL	9,385,716
LaSalle Takeover I.M.A.	Chicago	IL	6,144,577
LEM Real Estate High-Yield Debt Fund III	Philadelphia	PA	46,351
Lowe GTO	Los Angeles	CA	537,163
Lubert Adler Fund IV	Philadelphia	PA	153
Lubert Adler Fund VII	Philadelphia	PA	193,279
Mesirow RE Value III	Chicago	IL	250,000



# DEFINED BENEFIT PLAN

## Fees & Expenses

### 2019 Manager Investment Expenses Detail (continued)

Manager	City	State/Country	Fees/ Expenses
<b>Real Estate (continued)</b>			
Oak Street Real Estate Capital Fund IV	Chicago	IL	\$463,063
Oak Street Real Estate Capital Net Lease Property Fund	Chicago	IL	109,753
Prudential Latin America Residential Fund III	Parsippany	NJ	8,998
Prudential Senior Housing IV	Parsippany	NJ	151,321
Prudential Senior Housing V	Parsippany	NJ	296,371
Rockpoint Finance Fund I	Dallas	TX	4,300
Rockpoint Real Estate Fund II	Dallas	TX	11,873
Rockpoint Real Estate Fund III	Dallas	TX	70,928
Rockpoint Real Estate Fund V	Dallas	TX	616,868
SRE Opportunity Fund III	Chicago	IL	750,000
Starwood Fund VIII	Greenwich	CT	84,738
UBS Trumbull Property Fund	Stamford	CT	337,321
ValStone Opportunity Fund V	Birmingham	MI	219,951
Westbrook Fund V	Dallas	TX	47,001
Westbrook Fund VI	Dallas	TX	4,105
Westbrook Fund VII	Dallas	TX	158,968
Westbrook Fund VIII	Dallas	TX	93,003
<b>Real Estate Manager Fees</b>			<b>40,986,980</b>
<b>Real Estate Manager Expenses</b>			<b>2,934,262</b>
<b>Total Real Estate Manager Investment Expenses</b>			<b>43,921,242</b>
<b>Multi-Strategy</b>			
Apollo Hybrid Value Fund	New York	NY	20,965
Audax Direct Lending Solutions Fund - A	Boston	MA	513,242
Blackstone Keystone	New York	NY	9,819,193
Clearlake Opportunities Partners II	Santa Monica	CA	248,759
Eaton Vance Management	Boston	MA	698,468
ICG Europe VII	New York	NY	1,706,146
Mellon Capital Management Russell 3000 Index	Pittsburgh	PA	62,414
SEI Structured Credit Fund	Oaks	PA	2,975,883
TSSP Opportunities IV	San Francisco	CA	1,306,849
TSSP TAO 4	San Francisco	CA	808,452
<b>Multi-Strategy Manager Fees</b>			<b>18,160,371</b>
<b>Multi-Strategy Manager Expenses</b>			<b>4,645,531</b>
<b>Total Multi-Strategy Manager Investment Expenses</b>			<b>22,805,902</b>
<b>Legacy Hedge Funds<sup>1/</sup></b>			
Entrust Keystone	New York	NY	52,581
PAAMCO	Irvine	CA	36,557
<b>Total Legacy Hedge Funds Manager Investment Expenses</b>			<b>89,138</b>

# DEFINED BENEFIT PLAN

## Fees & Expenses

### 2019 Manager Investment Expenses Detail (continued)

Manager	City	State/Country	Fees/ Expenses
<b>Fixed Income</b>			
BNY Mellon Cash Investment Strategies	Pittsburgh	PA	\$272,191
Brandywine Global	Philadelphia	PA	762,305
Brown Brothers Harriman	New York	NY	276,098
New Century Advisors TIPS	Chevy Chase	MD	276,516
NISA Custom TIPS Intermediate	St. Louis	MO	508,608
PIMCO Core	Newport Beach	CA	1,038,739
PIMCO US Treasuries	Newport Beach	CA	545,203
Pyramis Global Advisors	Boston	MA	2,062,615
Stone Harbor Emerging Market Debt	New York	NY	658,378
Stone Harbor High Yield	New York	NY	778,773
Taplin Canida Habacht (TCH)	Miami	FL	450,866
<b>Total Fixed Income Manager Investment Expenses</b>			<b>7,630,292</b>
<b>Total Manager Investment Expenses</b>			<b>\$172,784,600</b>

<sup>1/</sup>Hedge fund manager in liquidation or liquidated.

# Assets

# DEFINED BENEFIT PLAN

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## Assets | 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 commonly require commitments greater than seven years and therefore, must offer premium returns to compensate for illiquidity and risks.

SERS continues efforts to reduce the fees it incurs as a result of its investment in private equity funds/managers. The reduction of fees SERS has experienced over the years is attributable to a number of initiatives including increasing its exposure to co-investment vehicles that carry no management or performance fees.

### 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

# DEFINED BENEFIT PLAN

## Assets | Private Equity

### Private Equity

as of December 31, 2019

(\$ millions)

	Unfunded Commitments	Fair Value	% of Total Fund
<b>Core Sub-Asset Classes</b>			
Buyout	\$1,606.6	\$1,912.4	6.2%
Special Situations	536.7	514.3	1.6
Venture Capital	291.7	763.9	2.5
<b>Total Core Sub-Asset Classes</b>	<b>2,435.0</b>	<b>3,190.6</b>	<b>10.3</b>
<b>Non-Core Holdings<sup>1/</sup></b>			
Keystone Legacy Fund <sup>2/</sup>	159.9	747.9	2.4
<b>Total Private Equity</b>	<b>\$2,594.9</b>	<b>\$3,938.5</b>	<b>12.7%</b>

<sup>1/</sup>A total of 145 legacy holdings from the Private Equity core sub-asset classes (Buyouts, Special Situations, and Venture Capital) make up the Keystone Legacy Fund, a special purpose vehicle which is managed by a third-party.

<sup>2/</sup>Unfunded commitment as of September 30, 2019.

## Portfolio Exposure

The Private Equity program is well diversified by sub-sector, geography, and industry focus. As of September 30, 2019, based on fair value, the program's exposure was:

By Fund Sub-Sector		By Geography <sup>2/</sup>		By Industry <sup>2/</sup>	
U.S. Private Equity	34.1%	United States	68.6%	Information Technology	32.7%
Non-U.S. <sup>1/</sup>	29.5	China	7.1	Financials	23.7
U.S. Venture Capital	20.4	South Korea	3.0	Consumer Discretionary	12.3
Distressed/Opportunistic	10.9	India	2.6	Industrials	10.5
Pennsylvania-Related	5.1	United Kingdom	2.6	Health Care	8.3
		Germany	2.0	Telecommunication Services	3.3
		Brazil	1.4	Energy	2.5
		Rest of World	12.7	Consumer Staples	2.5
				Materials	2.1
				Real Estate	1.3
				Utilities	0.8

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

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

# DEFINED BENEFIT PLAN

## Assets | 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 <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions <sup>2/</sup>
1.	ABRY Partners IV	Middle	3/30/2001	\$27,242,773	\$25,497,290	\$74,633,973
	ABRY Partners V	Middle	7/29/2005	45,000,000	41,742,771	83,293,903
	ABRY Partners VI	Middle	3/26/2008	50,000,000	59,994,861	107,608,270
	ABRY Partners VII	Middle	8/10/2011	30,000,000	37,911,447	48,786,607
	ABRY Partners VIII	Middle	5/5/2015	25,000,000	28,902,579	11,828,459
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	68,452,177
	Advent Latin American Private Equity Fund V	Middle	7/5/2011	15,000,000	14,430,000	7,200,000
	Advent International GPE VII-B	Large	12/6/2012	40,000,000	37,600,000	34,118,262
	Advent Latin American Private Equity Fund VI	Middle	8/13/2015	25,000,000	18,925,000	5,000,000
	Advent International GPE VIII-B	Large	9/26/2016	50,000,000	43,425,000	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	122,507,048
	Apollo Investment Fund VI	Mega	7/19/2006	40,000,000	38,911,805	64,467,407
	Apollo Investment Fund IX	Mega	3/15/2019	85,400,000	8,174,793	884
4.	Asia Alternatives Capital Partners	Fund of Funds	6/26/2007	25,000,000	25,190,179	41,760,199
	Asia Alternatives Capital Partners II	Fund of Funds	3/7/2008	29,949,500	28,897,883	39,529,564
	Asia Alternatives Korea Buyout Investors (Hahn & Co)	Fund of Funds	7/22/2011	7,000,000	8,660,726	9,137,898
	Asia Alternatives Capital Partners III	Fund of Funds	8/3/2012	50,000,000	53,479,545	37,731,918
	Penn Asia Investors	Fund of Funds	9/28/2012	133,000,000	82,365,187	38,994,901
	Asia Alternatives Capital Partners V	Fund of Funds	10/5/2017	50,000,000	8,776,306	164,282
5.	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	80,644,845
	Audax Private Equity Fund V	Middle	1/25/2016	50,000,000	38,611,369	15,078,628
	Audax Private Equity Fund VI	Middle	8/29/2019	75,000,000	4,749,048	0
6.	Berkshire Fund VI	Middle	7/11/2002	20,000,000	18,819,615	54,873,734
	Berkshire Fund VII	Middle	11/15/2006	32,000,000	32,613,861	64,583,417
	Berkshire Fund VIII	Middle	8/25/2011	30,000,000	30,644,097	29,785,272

# DEFINED BENEFIT PLAN

## Assets | Private Equity

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

Active Buyout Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions <sup>2/</sup>
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	69,379,875	69,119,097	192,545,287
Blackstone Capital Partners V	Mega	5/30/2006	150,000,000	150,105,421	242,138,440
Blackstone Capital Partners VII	Mega	10/21/2016	50,000,000	34,606,563	3,072,631
Blackstone Capital Partners VIII	Mega	*	75,000,000	0	0
8. Capvis Equity IV	Middle	1/30/2014	42,937,739	42,153,784	33,984,236
9. Carlyle Energy Mezzanine Opportunities Fund	Small	9/5/2012	50,000,000	64,990,932	31,196,998
Horizon Strategic Fund - Carlyle Group	Small	1/23/2014	100,000,000	86,306,150	37,610,457
10. CVC Capital Partners VII	Mega	12/3/2018	91,762,589	14,786,945	390,578
11. Energy Spectrum Partners V	Small	7/9/2007	27,660,592	27,661,855	51,598,933
12. Eureka II	Growth Equity	1/30/2006	20,000,000	21,884,526	20,777,356
Eureka Growth Capital III	Growth Equity	10/21/2013	20,000,000	14,652,268	13,614,722
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	20,514,684	33,151,148
Francisco Partners IV	Middle	4/15/2015	25,000,000	24,656,280	13,481,280
14. FSN Capital IV	Middle	12/19/2013	37,899,972	37,755,593	49,991,515
FSN Capital V	Middle	1/4/2017	78,439,928	42,637,310	7,278,360
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	22,337,831	17,208,220
GTCR Fund XII	Large	5/4/2018	32,500,000	8,372,000	585,073
16. Great Hill Equity Partners III	Middle	3/7/2006	35,000,000	35,000,000	41,935,541
Great Hill Equity Partners IV	Middle	9/8/2008	25,000,000	25,125,662	56,840,270
17. H.I.G. Growth Buyouts & Equity Fund II	Growth Equity	7/20/2011	15,000,000	14,656,287	4,086,778
H.I.G. Europe Capital Partners II	Small	1/10/2014	24,366,416	16,364,744	3,985,287
H.I.G. Brazil and Latin America Partners	Middle	8/12/2015	50,000,000	20,988,594	9,139
18. Hahn & Company II	Middle	5/29/2015	50,000,000	49,578,055	9,040,888
Hahn & Company III	Middle	12/20/2018	56,250,000	10,540,423	49,788
Hahn & Company III - Supplemental Fund	Middle	12/20/2018	18,750,000	6,522,799	34,031
19. HarbourVest IPEP III	Fund of Funds	6/30/1998	40,000,000	39,400,000	61,092,165
HIPEP V-Asia Pacific & Rest of World	Fund of Funds	5/9/2006	30,000,000	28,245,316	34,879,197
Horizon Impact Fund	Fund of Funds	10/24/2014	50,000,000	40,504,802	20,795,776
Horizon Impact Fund B	Fund of Funds	5/31/2017	100,000,000	38,750,000	0

# DEFINED BENEFIT PLAN

## Assets | Private Equity

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

	Active Buyout Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions <sup>2/</sup>
20.	Hellman & Friedman Capital Partners VI	Large	6/5/2007	\$125,000,000	\$119,913,412	\$218,914,920
	Hellman & Friedman Capital Partners VIII	Large	9/1/2016	50,000,000	50,286,952	4,699,979
	Hellman & Friedman Capital Partners IX	Large	*	90,000,000	0	0
21.	Incline Equity Partners III	Small	1/14/2013	15,000,000	15,701,555	20,874,842
22.	Kelso VII	Middle	10/18/2004	40,000,000	41,194,550	65,845,731
	Kelso VIII	Middle	11/29/2007	150,000,000	146,269,405	164,521,918
23.	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	51,222,009
	LLR Equity Partners IV	Middle	3/14/2014	50,000,000	45,485,764	48,368,421
	LLR Equity Partners V	Middle	3/21/2018	75,000,000	38,522,917	2,706,267
24.	Madison Dearborn Capital Partners IV	Middle	4/2/2001	90,000,000	90,365,390	169,072,775
	Madison Dearborn Capital Partners V	Middle	12/14/2006	75,000,000	71,558,278	113,628,059
	Madison Dearborn Capital Partners VI	Middle	5/27/2008	50,000,000	51,139,430	84,688,770
25.	NGP XII	Large	11/14/2018	75,000,000	24,128,547	113,471
	NGP Keystone	Large	*	25,000,000	0	0
26.	OCM/GFI Power Opportunities Fund II	Small	5/9/2005	13,431,284	13,470,852	41,644,215
	Oaktree Power Opportunities Fund III	Middle	10/18/2010	25,000,000	18,453,089	23,437,650
27.	Permira European Fund II	Large	6/7/2000	45,672,612	45,672,612	91,464,087
	Permira European Fund III	Large	1/12/2004	127,062,518	127,340,454	217,778,356
	Permira IV	Large	12/14/2006	136,376,290	137,762,438	203,511,684
	Permira VI	Large	1/10/2017	56,692,537	44,369,051	0
	Permira VII	Mega	*	75,173,376	0	0
28.	Primavera Capital Fund II	Large	11/17/2015	50,000,000	52,132,478	3,728,092
	Primavera Capital Fund III	Middle	4/12/2019	75,000,000	37,525,121	227,335
29.	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	53,946,228	58,171,556
30.	Ridgemont Equity Partners II	Small	11/30/2015	50,000,000	47,405,136	15,029,495
31.	Sentinel Capital Partners V	Middle	7/15/2014	10,000,000	10,043,414	5,527,616
32.	Silver Lake Partners V	Large	6/12/2018	78,000,000	31,690,894	20,220
33.	Sterling Group Partners IV	Middle	6/15/2016	20,000,000	13,017,042	471,052
34.	TA X	Middle	4/25/2006	70,000,000	69,732,009	90,382,009
35.	TDR Capital IV	Middle	11/16/2018	89,770,683	1,823,120	0
36.	Thoma Bravo Fund XIII	Mega	2/14/2019	75,000,000	27,077,759	303



# DEFINED BENEFIT PLAN

## Assets | Private Equity

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

	Active Buyout Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions <sup>2/</sup>
37.	TPG Partners III	Mega	1/13/2000	\$64,375,746	\$64,119,169	\$165,990,273
	TPG Partners IV	Mega	12/29/2003	27,907,484	27,981,463	57,968,285
	Newbridge Asia IV	Middle	9/27/2005	40,000,000	38,903,378	85,845,344
	TPG Partners V	Mega	6/27/2006	88,831,038	92,531,812	126,478,952
	TPG Asia V	Large	2/19/2008	22,500,000	21,964,311	26,454,835
	TPG Partners VI	Mega	5/22/2008	44,294,641	50,111,214	65,169,482
38.	TSG8	Middle	*	100,000,000	1,980,930	0
39.	Vista Equity Partners Fund VI	Large	12/29/2016	150,000,000	163,996,355	35,980,028
	Vista Equity Partners Fund VII	Large	2/13/2019	75,000,000	13,269,481	36,021
40.	Wind Point Partners VIII	Small	9/14/2017	100,000,000	68,991,365	48,554,180
	Wind Point Partners IX-A	Middle	*	75,000,000	562,500	0
<b>Total Active Buyouts</b>				<b>\$5,731,627,593</b>	<b>\$4,297,390,219</b>	<b>\$5,089,002,449</b>

Cash flows as of September 30, 2019.

\*Not funded as of September 30, 2019.

<sup>1/</sup>Commitments as of December 31, 2019.

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

# DEFINED BENEFIT PLAN

## Assets | 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 <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions <sup>2/</sup>
1. ABRY Mezzanine Partners	Mezzanine	3/15/2002	\$30,000,000	\$26,731,187	\$49,707,116
ABRY Senior Equity II	Mezzanine	7/27/2006	30,000,000	28,282,103	44,960,375
ABRY Advanced Securities Fund	Distressed/Restructuring	8/1/2008	7,262,950	23,508,684	38,682,209
2. ADV Opportunities Fund I	Distressed/Restructuring	10/5/2015	50,000,000	53,820,000	7,523,774
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	99,186,788
AXA Secondary Fund V B	Secondaries	6/19/2012	75,000,000	61,682,742	87,999,708
ASF VII B	Secondaries	2/19/2016	100,000,000	38,680,550	7,537,020
ASF VII PA Co-Invest	Secondaries	5/18/2016	50,000,000	24,138,733	998,004
ASF VIII B	Secondaries	6/13/2019	100,000,000	10,000	0
ASF VIII PA Co-Invest	Secondaries	*	50,000,000	0	0
4. 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	57,490,446	113,475,526
Centerbridge Capital Partners III	Distressed/Restructuring	5/21/2015	30,000,000	19,320,874	6,196,230
6. Clearlake Capital Partners IV	Distressed/Restructuring	9/1/2015	15,000,000	19,224,689	12,443,362
Clearlake Capital Partners V	Distressed/Restructuring	2/1/2018	55,000,000	35,487,996	6,860,078
Clearlake Capital Partners VI	Distressed/Restructuring	*	75,000,000	0	0
7. H.I.G. Bayside Debt & LBO Fund II	Distressed/Restructuring	6/17/2008	30,000,000	30,996,778	45,748,556
H.I.G. Bayside Loan Opp. Fund III	Distressed/Restructuring	6/12/2013	50,000,000	40,418,122	35,141,918
H.I.G. Bayside Loan Opp. Fund IV	Distressed/Restructuring	1/16/2015	25,000,000	17,671,163	11,077,133
8. Dover Street VII	Secondaries	7/2/2008	30,000,000	28,696,128	38,618,229
9. KPS Special Situations Fund IV	Distressed/Restructuring	5/8/2014	25,000,000	21,124,707	7,183,287
KPS Special Situations Mid-Cap Fund	Distressed/Restructuring	*	25,000,000	0	0
KPS Special Situations Fund V	Distressed/Restructuring	*	75,000,000	0	0

# DEFINED BENEFIT PLAN

## Assets | Private Equity

### Special Situations Committed, Drawn, and Distributed (continued)

Active Special Situations Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions <sup>2/</sup>
10. LBC Credit Partners III	Mezzanine	3/4/2013	\$50,000,000	\$46,706,483	\$45,629,006
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	125,170,164
Lexington Capital Partners VI	Secondaries	10/21/2005	50,000,000	53,066,325	69,764,016
12. Oaktree Capital Management	Distressed/Restructuring	5/28/2004	40,000,000	40,582,060	138,695,599
OCM Opportunities Fund V	Distressed/Restructuring	8/12/2004	40,000,000	40,003,507	65,911,274
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	53,450,728
OCM Opportunities Fund VII b	Distressed/Restructuring	6/3/2008	40,000,000	36,000,000	61,488,034
OCM Opportunities Fund VIII	Distressed/Restructuring	9/20/2010	12,500,000	12,583,425	17,430,778
OCM Opportunities Fund VIII b	Distressed/Restructuring	8/22/2011	12,500,000	12,500,000	12,123,310
Oaktree Opportunities Fund IX	Distressed/Restructuring	3/26/2013	50,000,000	50,000,000	21,447,715
13. Platinum Equity Capital Partners III	Distressed/Restructuring	8/5/2013	50,000,000	45,516,573	61,596,689
14. RRJ Capital Master Fund III	Distressed/Restructuring	12/10/2015	50,000,000	37,677,396	23,851,749
<b>Total Active Special Situations</b>			<b>\$1,722,262,950</b>	<b>\$1,235,078,858</b>	<b>\$1,527,480,343</b>

Cash flows as of September 30, 2019.

\*Not funded as of September 30, 2019.

<sup>1/</sup>Commitments as of December 31, 2019.

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

# DEFINED BENEFIT PLAN

## Assets | Private Equity

The Capital Committed column represents total dollars allocated from SERS to each limited partnership. Accumulated Capital Drawn is the portion of SERS' Capital Commitments drawn by the general partner to be invested with underlying portfolio companies along with any reinvested capital. The Accumulated Distributions column shows the value of capital and profits returned to SERS.

### Venture Capital Committed, Drawn, and Distributed

Active Venture Capital Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions <sup>2/</sup>
1. Battery Ventures VIII	Balanced	8/13/2007	\$25,000,000	\$25,050,751	\$55,636,614
Battery Ventures VIII Side Car Fund	Balanced	8/29/2008	6,768,000	6,803,790	17,449,466
2. HarbourVest Partners VI	Fund of Funds	5/7/1999	200,000,000	196,586,055	251,049,275
HarbourVest Partners VII	Fund of Funds	3/24/2003	75,000,000	73,687,500	105,817,387
HarbourVest Partners VIII	Fund of Funds	10/5/2006	100,000,000	98,000,000	133,926,786
3. Insight Venture Partners VI	Growth Equity	8/21/2007	30,000,000	32,244,177	78,429,161
Insight Venture Partners VII	Growth Equity	4/27/2011	20,000,000	21,319,992	43,195,215
Insight Venture Partners VIII	Growth Equity	7/10/2013	50,000,000	52,250,000	67,015,119
Insight Venture Partners IX	Growth Equity	3/24/2015	50,000,000	49,250,000	8,503,088
Insight Venture Partners X	Growth Equity	4/17/2018	100,000,000	71,000,000	34,245
Insight Venture Partners XI	Growth Equity	*	75,000,000	0	0
4. 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	12,440,582
JMI Equity Fund VIII	Growth Equity	10/1/2015	25,000,000	26,600,000	11,546,162
5. Lightspeed Venture Partners VII	Early Stage	2/27/2006	18,000,000	18,000,000	49,449,448
Lightspeed Venture Partners VIII	Early Stage	6/27/2008	15,000,000	14,700,000	28,841,454
Lightspeed India Partners I	Early Stage	8/14/2015	15,000,000	13,155,000	0
6. Meritech Capital Partners III	Late Stage	4/5/2006	35,000,000	35,000,000	190,791,007
Meritech Capital Partners IV	Late Stage	2/10/2011	20,000,000	19,400,000	26,428,350
Meritech Capital Partners V	Late Stage	9/3/2014	23,000,000	21,332,500	5,531,882
7. New Enterprise Associates IX	Early Stage	11/15/1999	20,000,000	19,600,000	7,978,301
New Enterprise Associates X	Early Stage	12/11/2000	35,000,000	35,028,000	33,995,586
New Enterprise Associates 11	Early Stage	3/1/2004	25,000,000	25,000,000	62,741,850
New Enterprise Associates 12	Early Stage	6/26/2006	35,000,000	35,631,130	45,743,461
8. NewSpring Growth Capital II	Growth Equity	4/20/2007	10,000,000	9,850,000	13,962,639
NewSpring Growth Capital III	Growth Equity	7/27/2012	25,000,000	23,361,239	10,192,997
9. Providence Strategic Growth II	Growth Equity	12/7/2016	60,000,000	65,575,025	44,554,278
Providence Strategic Growth III	Growth Equity	7/26/2018	75,000,000	54,092,696	10,914,743
Providence Strategic Growth IV	Growth Equity	*	75,000,000	0	0

# DEFINED BENEFIT PLAN

## Assets | Private Equity

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

	Active Venture Capital Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions <sup>2/</sup>
10.	T.Rowe Price Stock Distribution Account <sup>3/</sup>	Late Stage	1/3/2005	\$0	\$1,057,654,552	\$1,060,037,699
11.	TCV X	Growth Equity	5/17/2019	75,000,000	24,735,000	0
12.	Weathergage Venture Capital	Fund of Funds	6/26/2007	25,000,000	22,875,000	30,661,174
	Weathergage Venture Capital II	Fund of Funds	6/29/2010	25,000,000	23,250,000	14,474,675
<b>Total Active Venture Capital</b>				<b>\$1,417,768,000</b>	<b>\$2,220,812,653</b>	<b>\$2,488,973,444</b>

Cash flows as of September 30, 2019.

\*Not funded as of September 30, 2019.

<sup>1/</sup>Commitments as of December 31, 2019.

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

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

# DEFINED BENEFIT PLAN

## Assets | 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 <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions <sup>2/</sup>
1. Keystone Legacy Non-Core Fund <sup>3/</sup>	Various	7/1/2018	\$5,016,504,405	\$5,023,155,054	\$6,325,724,876
<b>Total Legacy Private Equity</b>			<b>\$5,016,504,405</b>	<b>\$5,023,155,054</b>	<b>\$6,325,724,876</b>

Cash flows as of September 30, 2019.

<sup>1/</sup>Commitments as of September 30, 2019.

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

<sup>3/</sup>A total of 145 legacy holdings from the Private Equity core sub-asset classes (Buyouts, Special Situations, and Venture Capital) make up the Keystone Legacy Fund, a special purpose vehicle which is managed by a third-party.

# DEFINED BENEFIT PLAN

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## Assets | 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.

Consistent with continuing cost reduction efforts, SERS has successfully lowered the overall cost of this program by increasing its exposure to index strategies and consolidating portfolios.

### 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.

# DEFINED BENEFIT PLAN

## Assets | Global Public Equity

### Global Public Equity

(\$ millions)

Manager	Investment Style	Market Exposure as of 12/31/19 <sup>4/</sup>
<b>Global Mandates</b>		
1. Walter Scott & Partners Limited	Global Growth	\$1,135.0
<b>Total Global Mandates</b>		<b>1,135.0</b>
<b>U.S. Equity</b>		
2. Emerald Advisers	Small-cap growth	734.7
3. Mellon Capital Management Russell 1000 Index	Russell 1000 Index	6,312.0
Mellon Capital Management Russell 2000 Core Index	Russell 2000 Core	348.2
Mellon Capital Management Russell 2000 Value Index	Russell 2000 Value	621.6
<b>Total U.S. Equity</b>		<b>8,016.5</b>
<b>Non-U.S. Developed Markets Equity</b>		
4. Artisan Partners - Global ex U.S.	Global ex-U.S. growth	0.8
5. BlackRock MSCI World ex U.S. Index	Developed ex-U.S. Index	5,125.0
6. Harris Associates	Small-cap value	636.2
Mellon Capital Management MSCI World ex U.S. Index	MSCI World ex-U.S. Index	6.3
7. Morgan Stanley Investment Management Limited-developed ex U.S.	EAFE value	0.8
8. Templeton Investment Counsel - Global ex U.S.	Global ex-U.S. value	1.0
9. FIS Group	International Small-cap	214.2
<b>Total Non-U.S. Developed Markets Equity</b>		<b>5,984.3</b>
<b>Emerging Markets Equity</b>		
BlackRock/Emerging Markets Index Fund	MSCI Emerging Markets Index	737.3
10. GlobeFlex Capital	Small-cap - GARP	96.6
11. Macquarie Emerging Markets	Mid/large cap value	467.6
12. Martin Currie Investment Management	All-cap	488.9
13. Leading Edge Investment Advisors	Emerging Markets	236.4
<b>Total Emerging Markets Equity</b>		<b>2,026.8</b>
<b>Transition Assets</b>		
14. Northern Trust	Transition	1.3
<b>Total Transition Assets</b>		<b>1.3</b>
<b>Total Global Public Equity</b>		<b>\$17,163.9</b>

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



# DEFINED BENEFIT PLAN

## Assets | 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, and 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. 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.

As part of this structure, the SERS Investment Office has found success in negotiating favorable economic terms and establishing side-car, co-investment vehicles, to lower investment costs.

### 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, 2019  
(\$ millions)

Sub-Asset Class	Fair Value	% of Total Fund
Core/Core Plus <sup>1/</sup>	\$734.6	2.4%
Value Add/Opportunistic SMA	623.3	2.0
Value Add/Opportunistic Funds <sup>2/</sup>	438.5	1.4
Natural Resources/Infrastructure	5.9	0.0
Real Estate Securities	283.6	0.9
<b>Total Real Estate</b>	<b>\$2,085.9</b>	<b>6.7%</b>

<sup>1/</sup>As of September 30, 2019, unfunded commitments are \$415.2 million.

<sup>2/</sup>As of September 30, 2019, unfunded commitments are \$582.5 million.

# DEFINED BENEFIT PLAN

## Assets | 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.

<b>Real Estate</b>						
Fund / Manager	Asset Type	SERS Initial Funding	Capital Committed <sup>v</sup>	Accumulated Capital Drawn	Accumulated Distributions	
<b>Core Real Estate</b>						
1. Heitman America Real Estate Trust	Diversified	2007	\$100,000,000	\$100,000,000	\$77,826,961	
2. UBS Trumbull Property Fund	Diversified	1988	25,558,525	25,558,525	109,004,302	
<b>Total Core Real Estate</b>			<b>125,558,525</b>	<b>125,558,525</b>	<b>186,831,263</b>	
<b>Core-Plus Real Estate</b>						
3. Blackstone Property Partners	Diversified	2017	300,000,000	300,000,000	1,744,007	
4. Henderson Park Enhanced Income Fund	Diversified	2019	321,722,630	189,808,430	0	
5. Oak Street Real Estate Capital Net Lease Property Fund	Diversified	2019	300,000,000	16,681,270	576,482	
<b>Total Core-Plus Real Estate</b>			<b>921,722,630</b>	<b>506,489,700</b>	<b>2,320,489</b>	
<b>Value Add/Oppportunistic Funds</b>						
6. Activum SG Fund VI	Diversified	*	54,510,000	0	0	
Activum SG Fund VI Pennsylvania Side-Car	Diversified	*	54,510,000	0	0	
7. AG Asia Realty Fund	Diversified	2007	25,000,000	23,500,000	25,187,500	
8. Berwind Investment Partnership VI	Diversified	2002	24,543,712	24,543,712	41,584,267	
Berwind Investment Partnership VII	Diversified	2005	25,000,000	25,000,000	13,134,347	
Berwind Investment Partnership VIII	Diversified	2007	15,588,238	14,912,018	19,916,719	
Berwind Investment Partnership IX	Diversified	2012	25,000,000	24,303,409	36,150,315	
Blackstone Real Estate Partners IV	Diversified	2003	25,000,000	25,000,000	39,865,646	
Blackstone Real Estate Partners V	Diversified	2006	50,000,000	47,912,974	95,150,783	
Blackstone Real Estate Partners VI	Diversified	2007	75,000,000	71,319,075	148,786,302	
Blackstone Real Estate Partners VII	Diversified	2011	75,000,000	64,503,300	86,678,009	
9. Blue Moon Senior Housing II	Senior Housing	*	50,000,000	0	0	
Blue Moon Senior Housing II Sidecar	Senior Housing	*	50,000,000	0	0	
10. C-III Recovery Fund III	Diversified	2017	100,000,000	49,357,034	0	
11. Clerestory Small Cap Fund I	Diversified	2010	18,000,000	15,228,956	15,131,513	
12. Colony Investors VIII	Diversified	2007	22,500,000	21,655,800	7,962,017	

# DEFINED BENEFIT PLAN

## Assets | Real Estate

### Real Estate (continued)

	Fund/Manager	Asset Type	SERS Initial Funding	Capital Committed <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions
13.	Hawkeye Scout Fund I	Diversified	2009	\$75,000,000	\$75,000,000	\$116,815,057
	Hawkeye Scout Fund II	Diversified	2016	30,000,000	27,630,079	503,612
14.	LEM Real Estate High-Yield Debt Fund III	Debt	2013	25,000,000	2,013,201	22,443,686
15.	Lubert Adler Fund III	Diversified	2000	30,000,000	30,000,000	45,177,542
	Lubert Adler Fund IV	Diversified	2004	25,000,000	26,500,000	14,930,514
	Lubert Adler Fund V	Diversified	2006	30,000,000	30,621,958	11,375,984
	Lubert Adler Fund VI	Diversified	2008	20,927,116	19,880,760	18,915,875
	Lubert Adler Fund VII	Diversified	2014	25,000,000	22,820,446	8,170,946
16.	Mesirow Financial Real Estate Value Fund III	Diversified	2018	25,145,833	15,816,520	312,695
	Oak Street Real Estate Fund IV	Diversified	2017	100,000,000	48,173,256	3,069,251
17.	Prudential Latin America Retail Fund I	Retail	2006	2,271,117	2,271,117	8,162,626
	Prudential Latin America Residential Fund III	Multi-Family	2008	29,654,968	24,708,749	13,444,991
	Prudential Senior Housing Fund IV	Senior Housing	2011	22,089,297	20,799,516	18,145,530
	Prudential Senior Housing Fund V	Senior Housing	2015	50,000,000	38,984,487	2,936,071
	Prudential Senior Housing Fund VI	Senior Housing	2019	100,000,000	7,402,701	0
18.	Rockpoint Finance Fund I	Residential Land	2007	2,527,500	2,527,500	2,106,094
	Rockpoint Real Estate Fund II	Diversified	2005	34,138,784	34,138,784	30,679,156
	Rockpoint Real Estate Fund III	Diversified	2007	50,632,887	46,391,722	66,888,445
	Rockpoint Real Estate Fund V	Diversified	2015	50,000,000	36,937,819	5,062,127
19.	Singerman III	Diversified	2017	50,000,000	16,500,000	0
	Singerman III Select	Diversified	2017	50,000,000	3,875,000	0
20.	Starwood Fund VI	Diversified	2001	50,000,000	50,153,525	51,782,742
	Starwood Fund VII	Diversified	2006	35,000,000	35,000,000	27,295,581
	Starwood Fund VIII	Diversified	2009	50,000,000	45,356,281	68,465,826
21.	ValStone Opportunity Fund V	Diversified	2014	14,663,402	14,663,402	3,209,834
22.	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	37,571,397
	Westbrook Fund VII	Diversified	2007	50,000,000	50,000,000	52,787,877
	Westbrook Fund VIII	Diversified	2009	50,000,000	50,000,000	63,418,319
	<b>Total Value Add/Opportunistic Funds</b>			<b>1,826,702,854</b>	<b>1,245,403,101</b>	<b>1,267,704,975</b>

# DEFINED BENEFIT PLAN

## Assets | Real Estate

### Real Estate (continued)

Fund / Manager	Asset Type	SERS Initial Funding	Capital Committed <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions
<b>Value Add/Oppportunistic SMA<sup>2/</sup></b>					
Heitman I.M.A.	Diversified	1988	NA	\$813,635,039	\$1,092,759,873
23. LaSalle I.M.A.	Diversified	1994	NA	444,715,936	778,848,456
LaSalle Takeover I.M.A.	Diversified	2018	NA	236,217,434	9,885,602
24. hotelAVE I.M.A.	Hotel	2018	NA	59,048,685	19,191,396
25. Lowe I.M.A.	Diversified	1994	NA	715,229,496	1,070,987,833
Lowe GTO	Diversified	2012	NA	349,069,212	369,841,373
<b>Total Value Add/Oppportunistic SMA</b>			<b>NA</b>	<b>2,617,915,802</b>	<b>3,341,514,533</b>
<b>Natural Resources/Infrastructure<sup>2/</sup></b>					
26. Forest I.M.A.	Timberland	1992	NA	124,231,969	242,567,376
<b>Total Natural Resources/Infrastructure</b>			<b>NA</b>	<b>124,231,969</b>	<b>242,567,376</b>
<b>REITs<sup>2/</sup></b>					
27. CenterSquare Real Estate Securities	Diversified	2002	NA	183,616,773	36,168,336
<b>Total REITs</b>			<b>NA</b>	<b>183,616,773</b>	<b>36,168,336</b>
<b>Total Real Estate</b>			<b>\$2,873,984,009</b>	<b>\$4,803,215,870</b>	<b>\$5,077,106,972</b>

Cash flows as of September 30, 2019.

\*Not funded as of September 30, 2019.

<sup>1/</sup>Commitments as of December 31, 2019.

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

# DEFINED BENEFIT PLAN

## Assets | Multi-Strategy

### Role in the SERS Fund

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

### Objective

The objective of the Multi-Strategy program was 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, 2019

(\$ millions)

Sub-Asset Class	Fair Value	% of Total Fund
Private Credit Funds <sup>1/</sup>	\$298.3	1.0%
Credit-Focused Strategies	969.8	3.1
Opportunistic Equity & Fixed Income	548.9	1.8
<b>Total Multi-Strategy</b>	<b>\$1,817.0</b>	<b>5.9%</b>

<sup>1/</sup>As of September 30, 2019, unfunded commitments are \$898.6 million.

SERS' 2020 strategic investment strategy will phase out this asset class. A separate private credit portfolio has been established with a 4% long-term fund target.

# DEFINED BENEFIT PLAN

## Assets | Multi-Strategy

### Private Markets

The Capital Committed column represents total dollars allocated from SERS to each limited partnership. Accumulated Capital Drawn is the portion of SERS' Capital Commitments drawn by the general partner to be invested with underlying portfolio companies along with any reinvested capital. The Accumulated Distributions column shows the value of capital and profits returned to SERS.

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

Active Private Credit Funds	Strategy/Stage	SERS Initial Funding	Capital Committed <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions <sup>2/</sup>
1. Apollo Hybrid Value Fund	Distressed and Credit	12/24/2018	\$100,000,000	\$16,840,978	\$109,027
2. Ares Special Opportunities Fund	Distressed/ Restructuring	*	70,000,000	0	0
3. Audax Direct Lending Solutions Fund-A	Direct Lending	10/26/2018	100,000,000	24,820,717	3,052,790
4. Brightwood Capital Fund IV	Direct Lending	4/24/2018	100,000,000	90,000,000	4,981,224
5. Clearlake Opportunity Partners II	Direct Lending	8/30/2019	75,000,000	6,101,384	4,017
6. Glendon Opportunities Fund II	Distressed and Credit	*	150,000,000	0	0
7. ICG Europe Fund VII	Distressed and Credit	8/24/2018	90,030,142	25,356,710	12,206
ICG North American Private Debt Fund II	Distressed and Credit	2/27/2019	50,000,000	5,198,414	228,019
ICG Europe Mid-Market Fund	Distressed and Credit	*	75,173,376	0	0
8. Permira Credit Solutions IV Master (Feeder) SCSp	Direct Lending	9/26/2019	75,000,000	3,900,000	0
9. TSSP Adjacent Opportunities Partners (B)	Distressed and Credit	11/9/2017	100,000,000	57,397,790	7,680,024
TSSP Opportunities Partners IV	Distressed and Credit	1/25/2019	50,000,000	8,088,859	9,829
TSSP Adjacent Opportunities Partners (D)	Distressed and Credit	*	150,000,000	105,477	0
<b>Total Active Private Credit Funds</b>			<b>\$1,185,203,518</b>	<b>\$237,810,329</b>	<b>\$16,077,136</b>

Cash flows as of September 30, 2019

\*Not funded as of September 30, 2019.

<sup>1/</sup>Commitments as of December 31, 2019.

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

# DEFINED BENEFIT PLAN

## Assets | Multi-Strategy

### Public Markets

Manager	Investment Style	Market Exposure as of 12/31/19 <sup>4/</sup> (\$ millions)
<b>Credit-Focused Strategies</b>		
10. Blackstone Keystone	Fund-of-Funds	\$969.8
<b>Total Credit Focused Strategies</b>		<b>969.8</b>
<b>Opportunistic Equity &amp; Fixed Income</b>		
11. Eaton Vance	Global Macro Strategy	213.2
12. SEI Structured Credit Fund	High Yield Bank Loans	335.7
<b>Total Opportunistic Equity &amp; Fixed Income</b>		<b>548.9</b>
<b>Total Public Market Multi-Strategy</b>		<b>\$1,518.7</b>

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

# DEFINED BENEFIT PLAN

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## Assets | 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. SERS is no longer actively investing in this strategy.

### 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.



# DEFINED BENEFIT PLAN

## Assets | Legacy Hedge Funds

<b>Legacy Hedge Funds</b>			
(\$ millions)			
Manager	Investment Style	Market Exposure as of 12/31/19 <sup>1/</sup>	
<b>Funds-of-Hedge Funds</b>			
1. Entrust Keystone	Fund-of-Funds	\$5.4	
<b>Total Funds-of-Hedge Funds</b>		<b>5.4</b>	
<b>Absolute Return Strategies</b>			
2. Arden	Fund-of-Funds	11.4	
3. Morgan Stanley Alternative Investment Partners	Fund-of-Funds	2.5	
4. PAAMCO	Fund-of-Funds	5.2	
5. Robeco Investment	Fund-of-Funds	0.2	
6. Legacy Hedge Funds	Fund-of-Funds	8.8	
<b>Total Absolute Return Strategies</b>		<b>28.1</b>	
<b>Direct Investments</b>			
7. Luxor Capital Partners	Direct Hedge Fund	2.1	
8. Pine River Fund	Direct Hedge Fund	0.5	
<b>Total Direct Investments</b>		<b>2.6</b>	
<b>Total Legacy Hedge Funds</b>		<b>\$36.1</b>	

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

# DEFINED BENEFIT PLAN

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## Assets | 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.

Consistent with continuing cost reduction efforts, SERS has successfully lowered the overall cost of this program by increasing its exposure to index strategies and consolidating portfolios.

### 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.

# DEFINED BENEFIT PLAN

## Assets | Fixed Income

<b>Fixed Income</b>		
(\$ millions)		
Manager	Investment Style	Market Exposure as of 12/31/19 <sup>4/</sup>
<b>Core Plus Fixed Income</b>		
1. Brandywine Global	Global Sovereign Credit	\$204.4
2. Pyramis Global Advisors	Commercial Mortgage-Backed Securities	340.9
3. Stone Harbor	Emerging Market Debt	168.8
Stone Harbor	Global High Yield	197.2
<b>Total Core Plus</b>		<b>911.3</b>
<b>Core Fixed Income</b>		
4. Mellon Capital Management	Bloomberg Barclays U.S. Aggregate	1,118.2
5. PIMCO Core	Bloomberg Barclays U.S. Aggregate ex. Treasuries	670.9
6. Taplin, Canida & Habacht (TCH)	U.S. Credit	205.0
<b>Total Core</b>		<b>1,994.1</b>
<b>Global Treasury Inflation Protected Securities (TIPS)</b>		
7. Brown Brothers Harriman	U.S. TIPS	231.7
8. New Century Advisors	Global TIPS	120.2
9. NISA Investment Advisors	U.S. TIPS	521.3
<b>Total Global Treasury Inflation Protected Securities (TIPS)</b>		<b>873.2</b>
<b>Nominal U.S. Treasuries</b>		
PIMCO U.S. Treasuries	Domestic Treasuries	596.9
<b>Total Nominal U.S. Treasuries</b>		<b>596.9</b>
<b>Total Fixed Income</b>		<b>\$4,375.5</b>

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

# DEFINED BENEFIT PLAN

## Assets | Cash

### Role in the SERS Fund

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

### Program Structure

Cash investments emphasize the use of higher credit quality debt instruments that are liquid and have short maturities and durations, or have floating rates and have historically been invested in the Pennsylvania Treasury Group Investment Fund, a short-term investment fund.

### Objective

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

		<b>Cash</b> (\$ millions)	
Manager	Investment Style		Market Exposure as of 12/31/19 <sup>4/</sup>
<b>Cash</b>			
1. PA State Treasury (STIF)	Cash		\$1,471.4
<b>Total Cash</b>			<b>\$1,471.4</b>

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



# Pennsylvania Investments

# DEFINED BENEFIT PLAN

## 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).

Where investment characteristics are equivalent, the board's current 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, 2019, was approximately \$568.9 million, or 1.8% of the SERS Fund.

### Pennsylvania Investments by Asset Class

(\$ millions)

Asset Class	Total PA Fair Value
Private Equity	\$39.0
Global Public Equity	255.7
Real Estate	253.0
Fixed Income	21.2
<b>Total Pennsylvania Investments</b>	<b>\$568.9</b>

### Private Equity

SERS' Private Equity program dates back to 1985. Initially the program targeted a 1% allocation to venture capital with a focus to invest with managers located in Pennsylvania or with managers who had Pennsylvania investment mandates. Over its life, the program has grown to include national and international based private equity, special situation, and venture capital managers. Since inception, SERS' Private Equity program has made commitments of over \$1.3 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.

# DEFINED BENEFIT PLAN

## Pennsylvania Investments

As of December 31, 2019, SERS' active Private Equity managers held investments in 36 Pennsylvania-based companies. SERS' pro-rata investment value in these companies is approximately \$39 million. This equates to 1.0% 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 160 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 \$256 million invested in stocks of Pennsylvania-based companies, as of December 31, 2019. These securities are held in SERS' various externally managed global public equity portfolios.

#### Pennsylvania Investments - Global Public Equity

(\$ millions)

Manager	Fair Value
Emerald Advisers	\$51.8
Mellon Capital Management	203.9
<b>Total Pennsylvania Investments - Global Public Equity</b>	<b>\$255.7</b>

SERS had approximately \$21 million invested in fixed income securities issued by Pennsylvania-based companies, as of December 31, 2019. These securities are held in SERS' various externally managed bond portfolios.

SERS has approximately \$1.5 billion invested in the Pennsylvania Treasury Department's short-term investment pool.

#### Pennsylvania Investments - Fixed Income

(\$ millions)

Manager	Fair Value
Brandywine Global	\$2.2
Mellon Capital Management	7.7
PIMCO	0.5
Stone Harbor	2.1
Taplin, Canida & Habacht	8.7
<b>Total Pennsylvania Investments - Fixed Income</b>	<b>\$21.2</b>

# DEFINED BENEFIT PLAN

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## Pennsylvania Investments

### Real Estate

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

As of September 30, 2019, the SERS real estate portfolio contained approximately 35 Pennsylvania investments totaling 2.3 million square feet of office, retail, and warehouse space, as well as 3,203 apartment, hotel, and senior housing units and 5,185 self-storage units.

The gross fair value of the Pennsylvania real estate portfolio investments totaled \$1.4 billion, of which SERS' ownership share was \$245 million.

In addition to the above, SERS held approximately \$8.0 million in PA based assets in real estate investment trusts.



# Minority/Woman-Owned Firms

# DEFINED BENEFIT PLAN

## Minority/Woman-Owned Firms

### Minority/Woman-Owned Investment Managers

The Board defines “diverse investment manager” as an investment management firm owned and/or controlled by a majority of persons who are women and/or minorities.

The Board encourages the use of diverse investment managers in managing SERS' assets, encompassing all asset classes, within the bounds of financial and fiduciary prudence, and to take affirmative steps to remove any barriers to the full participation in investment opportunities. SERS believes that professionals and decision-makers who come from diverse backgrounds contribute different points of view that enhance organizational quality and economic performance.

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, 2019:

Firm	Status	SERS Assets Under Management
FIS Group	Minority/Woman-Owned	\$214 million market value
GlobeFlex Capital	Minority/Woman-Owned	\$97 million market value
Leading Edge Investment Advisors	Minority-Owned	\$236 million market value
New Century Advisors	Woman-Owned	\$120 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, 2019:

Firm	Status	SERS Committed Capital
Asia Alternatives Capital Partners	Minority/Woman-Owned	\$295 million
Avenue Capital Group	Woman-Owned	\$20 million
Brightwood Capital	Minority-Owned	\$100 million
Blue Moon Capital Partners	Woman-Owned	\$100 million
Clearlake Capital Partners	Minority-Owned	\$220 million
Fairview Capital Partners	Minority/Woman-Owned	*
hotelAVE	Woman-Owned	NA
Hawkeye Partners	Woman-Owned	\$105 million
Incline Equity Partners	Minority-Owned	\$15 million
Oak Street	Minority-Owned	\$400 million
Thoma Bravo	Minority-Owned	\$75 million
TSG Consumer Partners	Woman-Owned	\$100 million
Vista Equity Partners	Minority-Owned	\$225 million
Weathergag Capital	Woman-Owned	\$50 million
Wind Point	Minority-Owned	\$175 million

\*The Keystone Legacy Fund is a special purpose vehicle to manage SERS’ remaining 145 non-core funds, which includes Buyouts, Special Situations, and Venture Capital.

# DEFINED BENEFIT PLAN

## Minority/Woman-Owned Firms

### 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 2019.

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 \$237,376 for the year. It is estimated this year that SERS' U.S. equity managers directed approximately 8% of their trades through minority/woman-owned brokerage firms. Fixed Income managers traded a combined \$176.7 million of securities through minority/woman-owned brokerage firms.

Firm	Minority/ Woman-Owned Commissions
C.L. King Directed	\$8,012
Loop Capital	21,482
North South Capital	68
Pennserra	2,122
Sturdivant & Company	51,549
Susquehanna Direct	79,161
Telsey Advisory	35,767
The Fig Group	39,215
<b>Total Minority/Woman-Owned Commissions</b>	<b>\$237,376</b>

**DEFERRED  
COMPENSATION  
PLAN**

Supplemental Benefit

# Deferred Compensation Plan

**\$261 million**

distributions/withdrawals  
in 2019

**\$3.9**

billion in  
assets

**As of Dec 31, 2019**



**57,432**  
accounts

**87**

employers

## Participant Contributions

\$153 million

## Total FY 2020-21 Planned Budget



**\$4.7 million**

**\$710,940**  
personnel

**\$4.0  
million**  
operations

Samples from operations =

specialized services **\$3.6 million**

consultants - non EDP **\$167,900**

real estate **\$28,500**

printing **\$11,940**

postage **\$11,270**

office equipment **\$6,600**

legal services **\$5,000**

# DEFERRED COMPENSATION PLAN

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## Plan Description

Most state employees are eligible to participate in the voluntary Deferred Compensation Plan, commonly referred to as “deferred comp.” The plan allows participants to have some of their pay automatically deducted on a before- and/or after-tax basis and invested for retirement.

Participants can contribute as little as \$5 or 0.5% of pay each pay period and as much as the annual IRS contribution limits.

Participants are eligible for withdrawals or distribution of their deferred comp account when they retire, leave state employment, die, suffer an unforeseeable emergency as defined by the Internal Revenue Code, or to purchase service credit in the SERS Defined Benefit Plan.

Established by Act 1987-81, this voluntary supplemental investment plan was established as a trust and is administered in accordance with Internal Revenue Code 457(b). The plan allows participants the flexibility to make traditional before-tax and Roth after-tax contributions.

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

The SERS Board selects the investment options offered through this plan, contracts with investment managers, and contracts through a competitive bid, as the third-party administrator of the plan, Empower Retirement, which maintains participant records, carries out investment transactions on behalf of the participants, counsels participants, and markets the plan.

Investment options comprise a series of target date funds that include a post-retirement date fund (effective January 3, 2020), equity funds, fixed income funds, a money market fund, and a self-directed brokerage option.

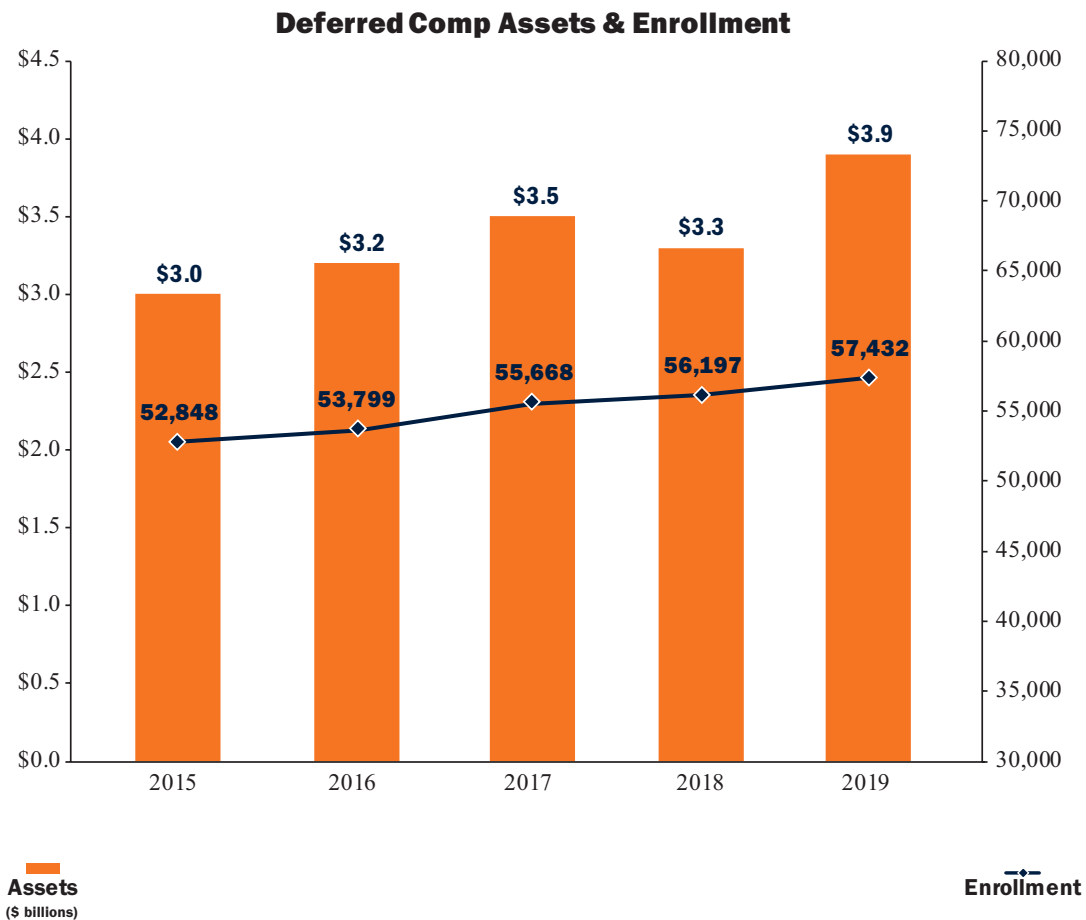
# DEFERRED COMPENSATION PLAN

## Plan Description

### Growth of Deferred Comp

In 2019, more than 57,000 participants had a total of approximately \$3.9 billion invested in deferred comp.

As of December 31, 2019, there were 34,755 active and 22,677 inactive participants in deferred comp. From 2015 to 2019, annual deferrals have ranged from \$135 million to \$153 million per year and the total fund value grew from approximately \$3 billion to approximately \$3.9 billion.



### Recent Changes

In 2019, the plan made the following changes:

- **Streamlined and Simplified Investment Options** - The board incorporated target date funds as the default investment option and eliminated four static allocation, risk-based funds. The board also added the Global Non-U.S. Stock Index Fund (includes Canada and emerging markets) to replace the International Company Stock Index Fund (excludes Canada and emerging markets).

# DEFERRED COMPENSATION PLAN

## Plan Description

- **Changed Administrative Fee Structure** - As part of the new competitively bid contract with Empower Retirement in late 2019, the plan changed the participant’s administrative fee structure from a blended asset-based plus flat-fee structure to a straight flat-fee structure. The administrative fee changed from 7 basis points on assets in the participant’s account plus \$2 per month, to a straight \$4.95 per month. The new fee structure achieves a more equitable distribution of the administrative costs across all plan participants regardless of account balance, since all participants receive the same administrative services regardless of account balance.
- **Added Retirement Solutions Group to Participant Service Team** – Retirement Solutions Group representatives are trained, licensed, and experienced in a broad range of retirement plans so that they can provide education on topics such as investment selection, amounts to save, how to rollover assets from other plans, strategies for increasing savings, etc. The group can also identify asset consolidation and tax-deferring strategies, review a participant’s retirement options when they retire, change jobs or at any point in their career, and even assist participants with paperwork, if needed. The Retirement Solutions Group services are provided to participants free of charge, by SERS’ third-party administrator, Empower Retirement.

### Deferred Compensation Plan Statistics

As of December 31, 2019

<b>Participants</b>	57,432 total accounts 34,755 actively contributing participants
<b>Assets</b>	\$3.9 billion
<b>Number of Employers</b>	87
<b>Total Participant Contributions</b>	\$153 million
<b>Total Rollovers Into the Plan</b>	833 totaling \$63 million
<b>Total Rollovers Out of the Plan</b>	1,210 totaling \$214 million
<b>Total Distributions/Withdrawals</b>	29,968 totaling \$261 million

# DEFERRED COMPENSATION PLAN

## Participation, Assets, Performance, and Fund Expense

### Deferred Compensation Plan Investment Options

Participation, Assets, Performance, and Fund Expense

As of December 31, 2019

Fund Name	Participants	Fund Balance	Inception Date	Estimated Calendar Year, Net-of-Fees Returns					Total Investment Fund Expense
				1 Year	3 Year	5 Year	10 Year		
Stable Value Fund	33,576	\$1,097,267,408.23	07-1995	2.59%	2.26%	2.19%	2.61%	0.2870% <sup>2/</sup>	
U.S. Large Company Stock Index Fund	34,391	1,047,631,693.93	10-1988	31.50	15.27	11.70	13.58	0.0150 <sup>1/</sup>	
U.S. Small/Mid Company Stock Index Fund	27,748	421,059,637.01	02-1995	28.18	11.16	9.04	12.92	0.0250 <sup>1/</sup>	
International Company Stock Index Fund	22,820	169,185,421.85	05-2006	22.33	9.97	6.13	5.81	0.0350 <sup>1/</sup>	
U.S. Bond Index Fund	21,768	191,671,089.38	12-1994	8.67	4.00	3.00	3.68	0.0250 <sup>1/</sup>	
60/40 Balanced Stock & Bond Fund	8,275	277,271,250.45	08-1998	22.19	10.94	8.37	9.84	0.0190 <sup>1/</sup>	
Aggressive Portfolio Fund	7,689	178,715,594.34	08-1998	24.63	11.62	8.67	10.20	0.0222 <sup>1/</sup>	
Moderate Portfolio Fund	6,338	199,001,663.68	10-2003	20.60	9.81	7.34	8.70	0.0229 <sup>1/</sup>	
Conservative Portfolio Fund	2,802	85,725,445.98	10-2003	13.19	6.48	4.83	5.62	0.0191 <sup>1/</sup>	
Short-Term Investment Fund	15,392	64,828,095.39	10-2003	2.31	1.82	1.25	0.73	0.0000	

<sup>1/</sup>Maximum possible expense that can be charged.

<sup>2/</sup>The Stable Value Fund expense will fluctuate very little based on the balance of the fund.

The Plan's annual recordkeeping fee is \$59.50 per participant.

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.



