



Commonwealth of Pennsylvania State Employees' Retirement System

2021 Actuarial Report



COMMONWEALTH OF PENNSYLVANIA

STATE EMPLOYEES' RETIREMENT SYSTEM

2021 ACTUARIAL REPORT

DEFINED BENEFIT PLAN

**KORN FERRY
JUNE 10, 2022**



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June 10, 2022

Mr. Joseph A. Torta
Executive Director
State Employees' Retirement System
30 North Third Street - Suite 150
Harrisburg, PA 17101-1716

Dear Mr. Torta:

The purpose of this letter and the enclosed report is to certify the actuarial adequacy of the contributions being made by the Commonwealth of Pennsylvania and other participating agencies to the Pennsylvania State Employees' Retirement System (SERS), and to discuss the approach currently being taken toward meeting the financing objectives of the plan. Use of this letter and the enclosed for purposes other than stated may not be appropriate. The results provided herein are based upon the December 31, 2021 annual actuarial valuation.

The funding objective of the plan is set forth in the State Employees' Retirement Code (SERC). The annual employer contribution is equal to the sum of the following for the commonwealth fiscal year beginning July 1, 2022:

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

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



Mr. Joseph A. Torta

June 10, 2022

The actuarial valuation is based on financial and participant data, which is supplied by SERS staff. We rely on that data and review it for consistency and reasonableness prior to using it in the valuation. The accuracy of the valuation results is dependent on the accuracy of the supplied information.

The actuarial valuation uses various economic and demographic assumptions regarding future plan experience. These assumptions were adopted by the State Employees' Retirement Board (the Board) in July of 2020 based upon the recommendations included in our July 2020 report on the nineteenth investigation of actuarial experience of SERS, covering the years 2015 through 2019. These changes to both the economic and demographic assumptions were implemented with the December 31, 2020 actuarial valuation. To ensure that the investment return assumption remains up-to-date and appropriate for every actuarial valuation, it is reviewed annually by the SERS actuaries and Board. The Board maintained the annual investment return assumption at 7.00% and the inflation assumption at 2.50% during its 2021 review. We will continue to closely monitor the investment return assumption and will recommend changing it if conditions warrant such change.

Apart from the statutory funding requirements set forth in the SERC, there are also separate accounting standards to which SERS is subject for financial reporting purposes. Governmental Accounting Standards Board (GASB) Statement No. 67, *Financial Reporting for Pension Plans*, replaced the requirements of GASB Statement No. 25, *Financial Reporting for Defined Benefit Pension Plans and Note Disclosures for Defined Contribution Plans*, effective for financial statements for the fiscal year ended June 30, 2014. GASB Statement No. 68, *Accounting and Financial Reporting for Pensions*, which establishes standards for accounting and financial reporting by state and local governments for pensions, replaced the requirements of GASB Statement No. 27, *Accounting for Pensions by State and Local Governmental Employers*, effective for the fiscal year ended June 30, 2015. The actuarial information required under Statements No. 67 and 68 is not included in this report. These results were provided separately to SERS for inclusion in their annual financial reporting to the public and to the participating employers of the system.

Based upon the valuation results, it is our opinion that, provided future employer contributions are made in accordance with current law, the Pennsylvania State Employees' Retirement System is, and will continue to be, adequately funded, in accordance with generally accepted actuarial principles and procedures.



Mr. Joseph A. Torta

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It should be noted that, during June of 2017, Governor Tom Wolf signed into law Act 2017-5. Act 2017-5 fundamentally changed retirement options for most new hires beginning January 1, 2019. This legislation introduced two new hybrid defined benefit (DB)/defined contribution (DC) options and a straight DC option. New classes of service now apply to most State employees who first become SERS members on or after January 1, 2019; however, most hazardous duty employees are exempt from the new plan design.

In April 2020, SERS received an advance payment of \$1,061 million from the Pennsylvania State University (PSU), and in April 2021, SERS received an advance payment of \$825 million from the Pennsylvania State System of Higher Education (PASSHE). The advance payments were part of a funding agreement under Act 2019-105 that reduced PSU's and PASSHE's allocated shares of the unfunded liability and created schedules of setoff amounts that reduce the future contributions due from each. These arrangements accelerated the funding of SERS but are not expected to increase the long-term funded status of SERS since the future contributions from PSU and PASSHE will be reduced by the value of the advance payments.

To ensure the expected benefit of the advance payments is allocated to PSU and PASSHE, the value of the future setoff amounts is added to the unfunded liability to determine the Amortization Liability. The Amortization Liability is used to determine the amortization payments due from all employers, prior to recognizing any setoff amounts. This allows the effect of the advance payments to be allocated only to PSU and PASSHE and have no expected effect on the contributions due from the other employers.

Please note that future actuarial measurements can differ significantly from current measurements due to such factors as plan experience differing from that anticipated by the assumptions, changes in future assumptions, and changes in plan provisions or applicable law. It is beyond the scope of our annual actuarial valuation to perform an analysis of the potential range of such future differences in measurement; however, we have performed such an analysis and presented the results in a separate Stress Testing and Risk Assessment report, dated September 28, 2021, which is available on the SERS website.

Actuarial Certification

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

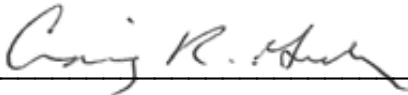


Mr. Joseph A. Torta

June 10, 2022

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

Respectfully submitted,
Korn Ferry

By  _____
Craig R. Graby
Member American Academy of Actuaries
Enrolled Actuary No. 20-7319


By  _____
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State Employees' Retirement System
Valuation Highlights

	<u>December 31, 2021</u>	<u>December 31, 2020</u>
	<u>Valuation</u>	<u>Valuation</u>
Summary of Employer Contributions as a Percent of Total Compensation		
SERS Plan Contribution		
Normal Cost	8.32%	1.50%
Amortization of Liabilities	25.78%	31.64%
Extra Contribution to Return Act 5 Savings	0.00%	0.62%
Total SERS Plan Contribution	34.10%	33.76%
Benefits Completion Plan Contribution	0.06%	0.05%
Total Contribution	34.16%	33.81%
Demographic Characteristics of the Population		
Active Participants:		
Number	97,857	100,962
Average age	46.6	46.5
Average service	11.3	11.3
Average annualized covered compensation	\$ 65,234	\$ 63,802
Total annualized covered compensation	\$ 6,383,604,000	\$ 6,441,578,000
Funding payroll	\$ 6,649,292,000	\$ 6,700,320,000
Annuitants and Beneficiaries:		
Number	134,360	133,334
Average age	70.4	70.1
Total annual pension	\$ 3,293,490,627	\$ 3,190,590,489
Inactive and Vested Participants:		
Number	7,237	6,856
Assets		
Market Value of Assets	\$ 40,225,058,377	\$ 35,022,663,921
Actuarial Value of Assets	\$ 36,846,610,595	\$ 32,703,275,230
Funded Status (Market Assets)	76.0%	63.6%
Funded Status (Actuarial Assets)	69.6%	59.4%

Note: The terms "employee," "member" and "participant" are used interchangeably throughout this report; however, there are distinct differences between them. In general, an "employee" is an individual who is actively employed by the Commonwealth, a "member" is an employee who is covered by the SERS defined benefit (DB) plan and a "participant" is an employee who is covered by the SERS defined contribution (DC) plan.

State Employees' Retirement System

**Employer Contribution Rate by Group
Fiscal Year 2022 - 2023**

	<u>SERS Plan*</u>	<u>Benefits Completion Plan</u>	<u>Legacy Subtotal</u>	<u>Defined Contribution Plan</u>	<u>Total</u>
Class A-5 Members:	16.12%	0.06%	16.18%	2.25%	18.43%
Class A-6 Members:	16.37%	0.06%	16.43%	2.00%	18.43%
DC Plan Only Members:	14.87%	0.00%	14.87%	3.50%	18.37%
Class A-3 and A-4 Members:					
Age 65 Retirement	25.99%	0.06%	26.05%	0.00%	26.05%
Age 55 Retirement	29.25%	0.06%	29.31%	0.00%	29.31%
Park Rangers	26.99%	0.06%	27.05%	0.00%	27.05%
Capitol Police	26.99%	0.06%	27.05%	0.00%	27.05%
State Police	50.14%	0.06%	50.20%	0.00%	50.20%
Class AA Members:					
Age 60 Retirement	38.76%	0.06%	38.82%	0.00%	38.82%
Age 50 Retirement	43.41%	0.06%	43.47%	0.00%	43.47%
Park Rangers	39.67%	0.06%	39.73%	0.00%	39.73%
Capitol Police	39.67%	0.06%	39.73%	0.00%	39.73%
Enforcement Officers	43.41%	0.06%	43.47%	0.00%	43.47%
Class A Members:					
Age 60 Retirement	30.38%	0.06%	30.44%	0.00%	30.44%
Age 50 Retirement	34.28%	0.06%	34.34%	0.00%	34.34%
Park Rangers	32.70%	0.06%	32.76%	0.00%	32.76%
Capitol Police	32.70%	0.06%	32.76%	0.00%	32.76%
State Police	56.53%	0.06%	56.59%	0.00%	56.59%
Enforcement Officers	34.28%	0.06%	34.34%	0.00%	34.34%
Class D-4 Legislators	47.50%	0.06%	47.56%	0.00%	47.56%
Class E Members	50.69%	0.06%	50.75%	0.00%	50.75%

*Includes 0.00% extra contribution to return Act 5 savings for all groups.

The above group rates result in employer contribution rates (expressed as a percentage of total projected covered compensation for active members in fiscal year 2022-2023) of 34.10% for the SERS DB Plan, 0.06% for the Benefits Completion Plan and 34.16% in Total for the DB Plan. The above group rates are applied to all employers prior to any setoff amounts related to an advance payment. The contributions due from PSU will reflect a setoff amount of \$93.3 million related to the 2020 advance payment and the contributions due from PASSHE will reflect a setoff amount of \$79.9 million related to their 2021 advance payment.

State Employees' Retirement System

General Discussion

The liabilities and costs in this report are based upon actuarial assumptions adopted by the State Employees' Retirement Board (the Board) and funding procedures specified in the State Employees' Retirement Code (SERC). The SERC requires that the Board conduct a study of the actuarial experience of SERS every five years as a basis for setting the actuarial assumptions used in the valuation. A five-year study was conducted and delivered to the Board in July of 2020. The Board approved the recommendations of the actuary and the new assumptions were first used in the December 31, 2020 valuation.

The most important actuarial assumptions are the investment return assumption, also known as the valuation interest rate assumption, and the salary growth assumption. The investment return experience is reviewed annually and as a part of the normal five-year experience study cycle. As a result of the review undertaken during July of 2020, the Board approved a reduction in the annual investment return assumption from 7.125% to 7.000%. The Board maintained the annual investment return assumption at 7.00% during its 2021 review.

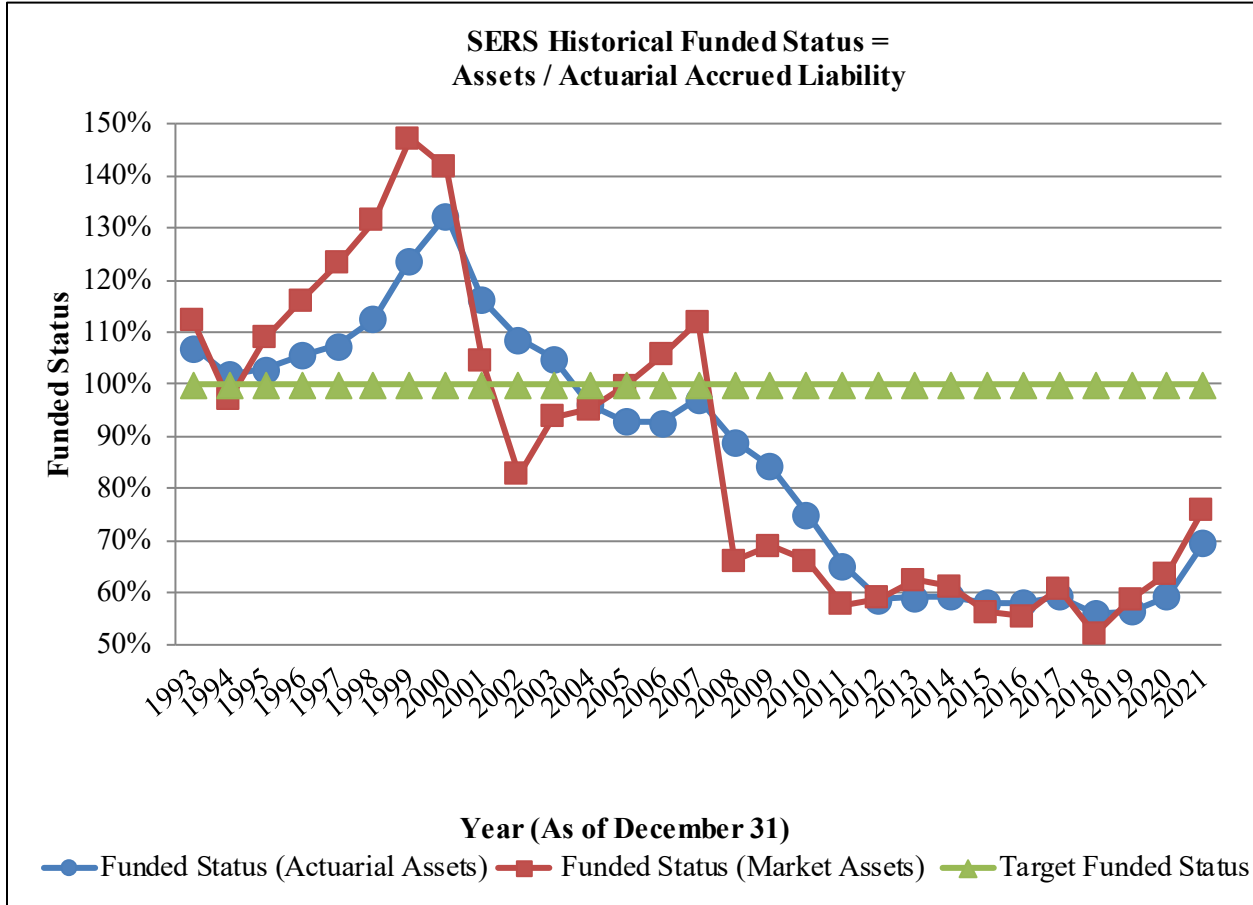
Both the investment return and the salary growth assumptions are based upon an underlying inflation rate assumption of 2.50 percent per year. Salary growth is the total of assumed increases in salary rates and career salary growth. It is generally assumed that the salary rates will increase by 2.8 percent per year due to general salary schedule increases and that career salary growth (promotion and longevity growth) will average an additional 1.78 percent per year. Thus, the total average salary increase for an individual will generally be 4.58 percent per year.

The employer contribution rate is determined as a percent of covered compensation that is the total of (1) the employer normal cost percent and (2) the net amortization of the unfunded liability and (3) the extra contribution to return Act 5 savings, but not less than any applicable minimum contribution prescribed by the SERC. The final total employer contribution rate based on December 31, 2021 data is 34.10 percent of covered compensation, which is the sum of (1) the employer normal cost of 8.32 percent of compensation plus (2) the net amortization of the unfunded liability of 25.78 percent of compensation plus (3) the extra contribution to return Act 5 savings of 0.00 percent. See Schedule P for further discussions of the Act 2010-120 minimum and the Act 2017-5 extra contributions to return savings.

The funded ratio is the ratio of assets to the actuarial accrued liability. As a consequence of the global economic downturn, SERS' funded status, as measured by the funded ratio, declined significantly during 2008. A market return well above expectations in 2019 resulted in an increase in both the market and actuarial value funded ratios from 52.0 percent to 58.7 percent, and from 56.0 percent to 56.5 percent, respectively. In 2020, a second consecutive annual market return well above expectations resulted in an increase in both the market and actuarial value funded ratios from 58.7 percent to 63.6 percent, and from 56.5 percent to 59.4 percent, respectively. A market return well above expectations in 2021 resulted in an increase in both the market and actuarial value funded ratios from 63.6 percent to 76.0 percent, and from 59.4 percent to 69.6 percent, respectively.

State Employees' Retirement System

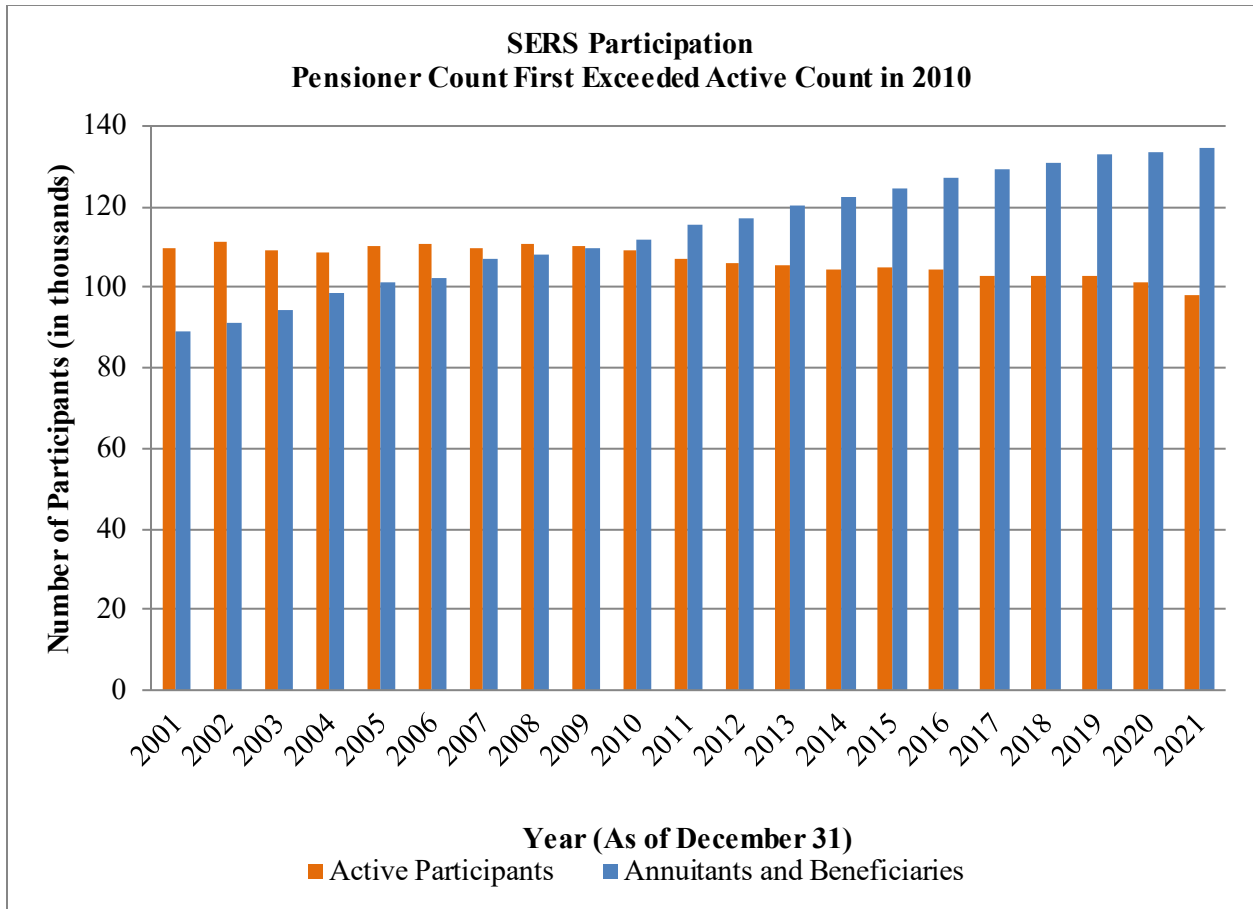
Chart 1 below presents a history of SERS funded ratios, relative to the 100% target funded status.



During 2010, the count of pensioners exceeded the count of active participants for the first time in the history of SERS. As of December 31, 2021, the count of pensioners (134,360) further exceeds the count of active participants (97,857), a clear sign of a mature retirement system. Chart 2 below illustrates the maturing of the SERS population since 2001.

Although it was noted previously that the interest rate and salary growth are the most important actuarial assumptions, the maturity of the SERS population heightens the importance of the mortality assumptions. Thus, the updates to the post-retirement mortality assumptions recommended by the actuary every five years based upon SERS' actual ongoing mortality experience, have become increasingly critical to the annual valuation process.

State Employees' Retirement System



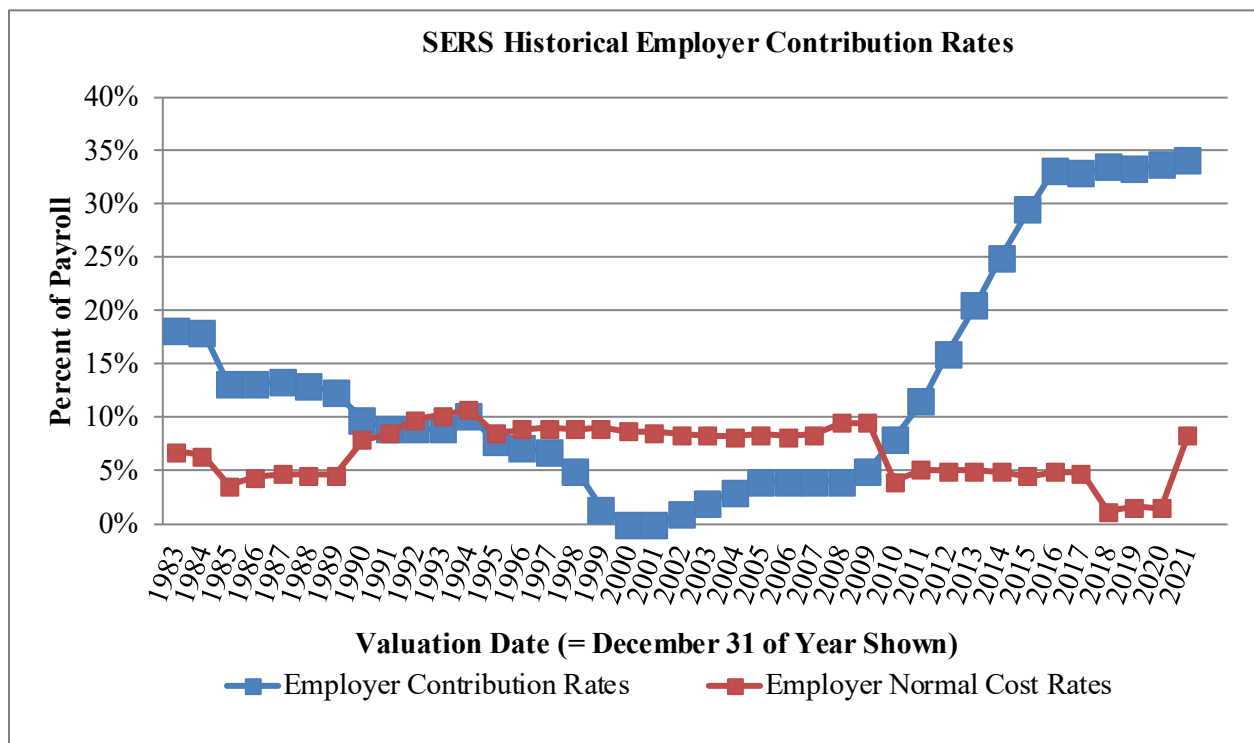
A separate and distinct Benefits Completion Plan provides benefits to certain members whose SERS benefits are limited by IRC Section 415(b) maximum benefit limitations. The Benefits Completion Plan employer contribution requirements for fiscal year 2022-2023, which were determined by a separate December 31, 2021 actuarial valuation, are presented in the Valuation Highlights herein. Otherwise, Benefits Completion Plan costs and liabilities are not included in the schedules of this report.

State Employees' Retirement System

History of the Employer Contribution Rate

Chart 3 below shows the history of the employer contribution rate from 1983 through 2021. With some fluctuations, the general trend from 1984 through 2001 had been downward, with the rate declining from the 18 percent range in the years 1983 and 1984 to zero in 2000 and 2001. The investment returns were below the actuarial assumption (then 8.5 percent) in 2000 through 2002. The changes to the amortizations under Act 2003-40 and subsequent investment gains would have kept the contributions from increasing, if it had not been for legislated floors that caused the employer contributions to increase between 2002 and 2005.

From 2006 through 2015, actual employer contribution rates were at levels prescribed by law, increasing each year since 2009. Effective with the December 31, 2016 valuation, for the first time since 2010, the employer contribution rate was uncollared (that is, no longer limited by the Act 2010-120 rate collars). Note that the current valuation employer contribution rate shown below (34.10 percent as of December 31, 2021) represents a small increase versus the prior valuation contribution rate (33.76 percent as of December 31, 2020).



The total employer cost is the actual contribution rate during the succeeding fiscal year. For instance, the rate of 34.10 percent of covered compensation for the December 31, 2021 valuation date will be the employer contribution rate for the fiscal year beginning July 1, 2022.

State Employees' Retirement System

History of Inflation, Investment Return and Salary Growth

Table 1 below shows the rate of inflation, the nominal and real investment return based on the market value of assets, and the nominal and real salary growth for the past twenty years. The nominal rates are the actual investment rate and salary growth. The real rates are the nominal rates adjusted by removing inflation. The inflation rates shown are based on the Consumer Price Index for All Urban Consumers (CPI-U) data. The nominal rate of salary growth is the percentage increase in general pay levels specified by the predominant collective bargaining agreement. This salary growth includes general pay increases, but excludes career salary growth (that is, pay changes resulting from promotions or longevity growth).

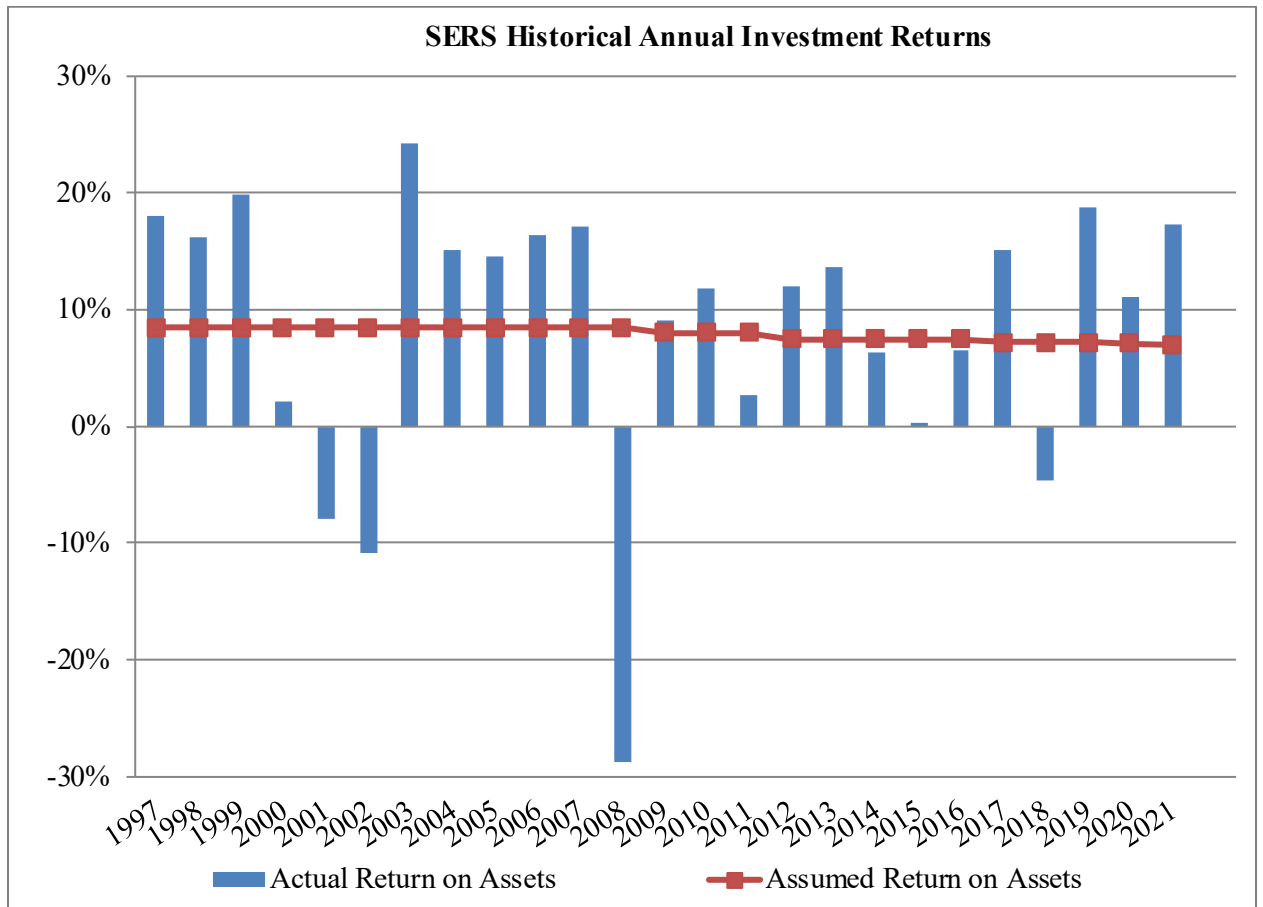
Table 1: Comparison of Annual Rates of Growth					
Year	Inflation	Investment Return		Salary Growth	
		Nominal	Real	Nominal	Real
2002	2.4	(10.9)	(13.0)	3.5	1.1
2003	1.9	24.3	22.0	2.0	0.1
2004	3.3	15.1	11.4	1.9	(1.4)
2005	3.4	14.5	10.7	3.0	(0.4)
2006	2.5	16.4	13.6	3.5	1.0
2007	4.1	17.2	12.6	2.8	(1.2)
2008	0.1	(28.7)	(28.8)	3.0	2.9
2009	2.7	9.1	6.2	3.0	0.3
2010	1.5	11.9	10.2	3.0	1.5
2011	3.0	2.7	(0.3)	3.0	0.0
2012	1.7	12.0	10.1	1.0	(0.7)
2013	1.5	13.6	11.9	2.8	1.3
2014	0.8	6.4	5.6	3.5	2.7
2015	0.7	0.4	(0.3)	3.4	2.7
2016	2.1	6.5	4.3	1.8	(0.3)
2017	2.1	15.1	12.7	4.7	2.5
2018	1.9	(4.6)	(6.4)	5.3	3.3
2019	2.3	18.8	16.1	4.8	2.4
2020	1.4	11.1	9.6	4.9	3.5
2021	7.0	17.2	9.5	3.7	(3.1)
Average 2002-2021	2.3%	7.7%	5.2%	3.2%	0.9%

The averages represent the geometric averages of all of the rates over the 20-year period, not the arithmetic averages.

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Chart 4 below presents a 25-year history of SERS annual investment returns relative to the actuarially assumed returns of:

- 8.5% initially adopted for calendar year 1996 and retained through 2008,
- 8.0% for 2009 through 2011,
- 7.5% for 2012 through 2016,
- 7.25% for calendar year 2017 through 2019,
- 7.125% for calendar year 2020, and
- 7.0% for calendar year 2021 and 2022



State Employees' Retirement System

Comments on Schedules

Employer Contribution Rate

Schedules A and B summarize the development of the employer contribution rate before allocation by group. The employer contribution is equal to the sum of (1) the employer share of the normal cost and (2) amortization of the unfunded liability and (3) the extra contribution to return Act 5 savings.

The normal cost is the level percentage of compensation needed to fund the liability for any prospective benefits earned by all active members over the period of their actual service. Prior to the 2021 valuation, the normal cost calculation used only active members in Classes A-5 and A-6 who had not yet completed one year of credited service. The employer share of the normal cost increased from 1.50 percent in 2020 to 8.32 percent in 2021 primarily as a result of the change to the funding method in which the normal cost calculation used all active members.

Portions of the unfunded liability are amortized over either 10 years or 30 years, as required by the SERC. Under Act 2010-120, the total December 31, 2009 unfunded liability was amortized over 30 years as part of a fresh start that combined all of the unfunded liability amortizations into one amortization. Net losses in 2010 and after were amortized over 30 years. The total unfunded liability as of December 31, 2021 was \$16.08 billion. As of December 31, 2020, the total unfunded liability was \$22.40 billion.

In order to properly reflect the prefunding contribution made by the Pennsylvania State University (PSU) and the Pennsylvania State System of Higher Education (PASSHE), the valuation uses an amortization liability which nets out the present value of the future setoff amounts that will be credited to PSU and PASSHE. The amortization liability is now the basis for determining new amortization amounts and is \$17.95 billion as of December 31, 2021. Additional information relating to the prefunding contribution is included in Schedule Q.

Schedule B shows the allocation of the total amortization liability by year into those liabilities being amortized over 30 years. All amortization payments are level dollar amounts over the applicable amortization period. There are currently no 10-year amortizations. The total net charge for the amortization of the amortization liability is 25.78 percent of the total projected covered compensation for the 2022-2023 fiscal year.

The employer contribution rate is equal to the total of the normal cost and the amortization of the amortization liability and the extra contribution to return Act 5 savings, but not less than the normal cost. The employer contribution rate calculated at 34.10 percent of covered compensation will be applied for the fiscal year beginning July 1, 2022.

Employer Contribution Rates by Group

Schedule C summarizes the development of the employer contribution rate for each group of members with different benefits. The Normal Cost Rate for each group is valued based on the active members of the group. Three adjustments are made to the Normal Cost to develop the employer group rates. The first is to add the Basic Contribution Rate, which funds annual payment of the Amortization Liability. The second is to multiply by the Basic Contribution Rate by the applicable adjustment factor relative to the Class A-5 and A-6 benefit values. Third, the Park Rangers, Capitol

State Employees' Retirement System

Police and State Police Officers are also charged the amount necessary to fund the past service cost of benefit improvements that were effective in prior years. These charges are further explained in Schedule P. The complete schedule of contributions by group is shown in Table 2.

Table 2 Employer Contribution Rate by Group Fiscal Year 2022/2023 (Excluding Benefits Completion and DC Plan Contributions)	
Class A5	
Age 67 Retirement	16.12%
Class A6	
Age 67 Retirement	16.37
DC Plan Only	14.87
Class A3/A4	
Age 65 Retirement	25.99
Age 55 Retirement	29.25
Park Rangers	26.99
Capitol Police	26.99
State Police	50.14
Class AA	
Age 60 Retirement	38.76
Age 50 Retirement	43.41
Park Rangers	39.67
Capitol Police	39.67
Enforcement Officers	43.41
Class A	
Age 60 Retirement	30.38
Age 50 Retirement	34.28
Park Rangers	32.70
Capitol Police	32.70
State Police	56.53
Enforcement Officers	34.28
Class D-4 Legislators	47.50
Class E Members	50.69

Schedule D shows the development of the shared-risk/shared-gain member contributions, in accordance with Act 2010-120. No shared-risk or shared-gain contribution applies for the 2022-2023 fiscal year.

State Employees' Retirement System

Change in Employer Contribution Rate

Schedule E contains an analysis of the change in the employer contribution rate and unfunded liability from the 2020 to the 2021 valuation.

The largest decrease in the unfunded liability – \$3,700.0 million – resulted from a change in the funding method. Under the prior funding method, the Normal Cost Rate was determined using a new entrant group and now it is based on all active members. The decrease in unfunded liability cost of 4.48 percent was offset by a 6.90 percent increase in the normal cost, for a net increase in cost of 2.42 percent of compensation.

Another decrease in the unfunded liability – \$1,383.7 million – resulted from recognition (under the five-year asset smoothing method) of four years of asset gains totaling \$2,082.0 million, which more than offset one year of asset losses equal to \$698.3 million. This net gain of \$1,383.7 million resulted in a 1.68 percent decrease in the total employer cost.

Another decrease in the unfunded liability – \$63.5 million – was due to smaller than expected pay increases and resulted in a decrease in the total employer cost of 0.08 percent of compensation.

Another increase in the unfunded liability – \$52.1 million – resulted from other differences between actual and expected experience of the covered population. This increase in liability resulted in an increase in the total employer cost of 0.08 percent of compensation.

Another increase in the unfunded liability – \$51.6 million – resulted from changes in the demographics of the new entrant population. The increase in unfunded liability cost of 0.06 percent was offset by a 0.08 percent decrease in the normal cost, for a net decrease in cost of 0.02 percent of compensation. This is the final valuation where this change will be shown. Moving to a Normal Cost Rate that is based on all active members removes the need for this step in the future.

Actuarial Balance Sheet and Account Balance Transfers

Schedule F contains the actuarial balance sheet that compares the total assets and liabilities of \$61.1 billion. The assets include current assets and the present value of future contributions. The liabilities include the present value of all benefits to current active and retired members.

Each year the account balances in the three benefit payment accounts are compared to the actuarial liabilities developed in the valuation. If needed, transfers are made to bring the accounts into balance with the liabilities. The accounts go out of balance during the year as a result of differences between actual experience and the reserves set for retirees. In 2021, a transfer of \$357.4 million was made from the State Accumulation Account to the Annuity Reserve Account to keep the latter account in balance. There were also transfers of \$29.7 million from the State Accumulation Account to the State Police Benefit Account and \$1.2 million to the State Accumulation Account from the Enforcement Officers' Benefit Account, to keep these accounts in balance. No other transfers were necessary.

The details of these transfers are shown in Schedule G.

State Employees' Retirement System

Accounting Disclosure Statements

Schedule H addresses disclosure information required by the Governmental Accounting Standards Board (GASB). Major changes have occurred in GASB's reporting and disclosure requirements over recent years. Specifically, GASB Statements No. 67 and 68 have replaced prior GASB Statements No. 25 and 27, respectively.

Over past years, this report presented the disclosure information required under GASB Statement No. 25, including the "Schedule of Funding Progress" and the "Schedule of Employer Contributions," and commentary relating to SERS' annual employer contributions versus the GASB minimum levels. Although these schedules have been discontinued by GASB, the information and our commentary continue to be of interest to readers of this report. Therefore, Schedule H once again includes information as required under the former GASB accounting and disclosure requirements:

Page 2 of Schedule H shows funding progress from December 31, 2002 through December 31, 2021.

Page 3 of Schedule H shows a comparison of the actual contributions to the system over recent years to the Annual Required Contribution (ARC) as defined by GASB Statement No. 25.

GASB Statement No. 25 defined the ARC to be equal to the employer normal cost plus an amount to amortize the unfunded actuarial accrued liability over an acceptable amortization period. During calendar years 2016 through 2019, actual employer contributions were equal to the ARC. In calendar years 2020 and 2021, the employer contributions exceeded the ARC due to prefunding contributions made by PSU and PASSHE. Provided that employer contributions are made in accordance with current law, we expect employer contributions to continue to exceed the GASB Statement No. 25 minimum.

Schedule I shows the results of the solvency test. A short-term solvency test is one means of checking a pension system's progress under its funding program. In this solvency test, the SERS assets are compared with the actuarial accrued liabilities. The liabilities are classified into:

- Liability for active participant contributions in the Fund,
- Liability for future benefits to present annuitants and beneficiaries, and
- Liability for service already rendered by the active participants.

The schedule shows that from 1992 through 2003 the total actuarial accrued liability was fully covered by the assets. In 2004, the funded ratio dropped below 100 percent and it is currently at 69.6 percent. Absent unusual circumstances, the funded status of defined benefit plans will be below 100 percent and gradually approach 100 percent funding as liabilities become fully amortized. The State Employees' Retirement Fund had exceeded 100 percent of liabilities as a result of the high level of investment returns between 1985 and 1999. The funded ratio dropped below 100 percent largely as a result of the low investment returns of 2000 to 2002 and 2008, the Act 2001-9 benefit increases, the 2002-2003 COLAs, underfunded employer contributions, and the amortization schedule. Also, the implementation of Act 2010-120 for the December 31, 2010 valuation led to a lower normal cost and a higher accrued liability (and unfunded accrued liability). The new funding method reversed this and led to a higher normal cost and a lower accrued liability. The reduction in the assumed annual investment return from 8.0 percent to 7.5 percent on

State Employees' Retirement System

December 31, 2011, from 7.5 percent to 7.25 percent on December 31, 2016, from 7.25 percent to 7.125 percent on December 31, 2019, and from 7.125 percent to 7.0 percent on December 31, 2020 further increased the actuarial accrued liability (and unfunded accrued liability).

The current funding policy will eventually restore the funded ratio to 100 percent provided that contributions are made as provided in current law. SERS is being funded in accordance with generally accepted actuarial principles and procedures even though the accrued liabilities are temporarily greater than the assets.

Plan Assets

Schedule J summarizes the development of the actuarial value of assets as of December 31, 2021. The assets are based on the financial statements prepared by SERS. The asset valuation method smooths out year-to-year fluctuations in the market value. The approach gradually recognizes, over a five-year period, the differences between total investment return and the actuarial assumed annual rate of return (8.5 percent prior to 2009; 8.0 percent for 2009 through 2011; 7.5 percent for 2012 through 2016; 7.25 percent for 2017 through 2019; 7.125 percent for 2020; and 7.0 percent effective starting in 2021). This smoothing method recognizes 20 percent of the 2021 asset gain of \$3.4 billion this year, with the remainder to be recognized over the next four years.

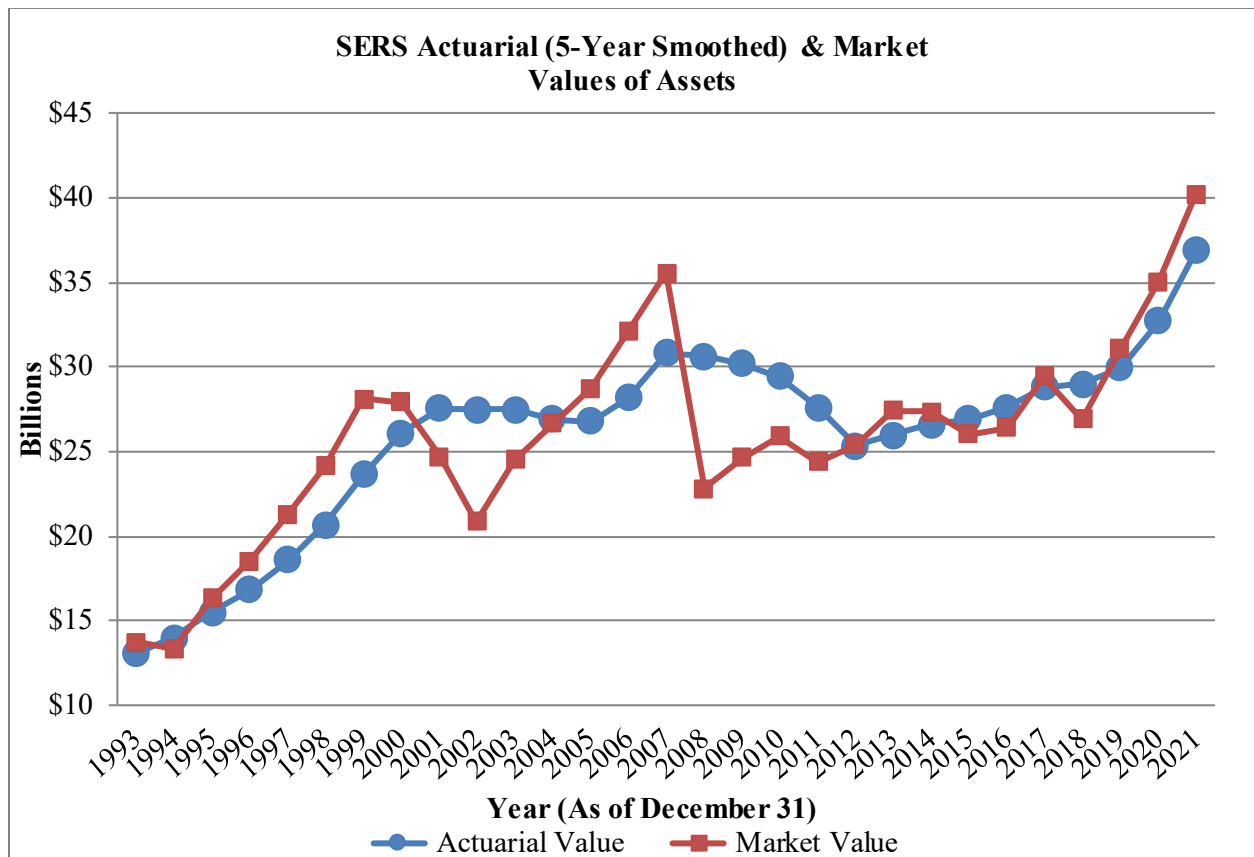


Chart 5 above presents a history since 1993 of SERS asset values, including both the actuarial value and the market value.

State Employees' Retirement System

Projection

Schedule K shows the number of participants, contributions, and benefits from 2003 through 2021 with a projection through 2032. The first page of Schedule K shows new annuitants, annuitant deaths, new beneficiaries, and beneficiary deaths during the year. The second page of Schedule K shows a projection of post-2021 active participants distributed among the plan options that exist under Act 2017-5 and reflects our expectation that, out of all non-exempt new hires after 2021, approximately 93% will elect Class A-5, 4% will elect Class A-6 and 3% will elect defined contribution (DC) only. This 93%/4%/3% expectation is similar to, but does not exactly reflect, SERS' actual election experience to date. In future valuations, these election percentages will be adjusted to reflect actual election experience. The third page of Schedule K shows the projection of employer and employee contributions and a projection of the benefits and expenses. The projected employee and employer contributions are shown in dollars and as a percentage of compensation. Although Act 2017-5 introduced DC plan options effective in 2019, Schedule K (Page 3 of 3) only includes projected defined benefit (DB) plan contributions.

Note: With Act 2017-5 having become effective at the beginning of 2019, eligible employees (other than exempt Hazardous Duty and State Police) hired on or after January 1, 2019 must opt to join one of the two new hybrid DB/DC plans or the DC Only plan. Therefore, the second page of Schedule K is included to show projected counts of post-2021 active participants among the available plan options.

Risk Measurements

Schedule L provides information on the major risks that could affect the future funded position and contribution needs of SERS. Schedule L includes a discussion of the potential for deviations in future measurements and the estimated effect on the annual employer contribution, also referred to as the Actuarially Determined Contribution (ADC).

This information is intended to enhance the reader's understanding of the potential for future deviations in funded position and contribution needs, and how the risk exposure is changing over time. Schedule L, along with further analyses being completed for the SERS Board and staff, are responsive to the requirements of Actuarial Standard of Practice Number 51 (ASOP 51), which provides guidance on the assessment and disclosure of risk associated with retirement systems.

Participant Data

Sections I and II of Schedule M provide a distribution of the total of the active, inactive, and terminated vested participants as of December 31, 2021 by benefit class, sex, age, and length of service. Inactive participants include employees on furlough as well as employees with prior SERS service currently participating in the Pennsylvania Public School Employees' Retirement System (PSERS). The table also shows the average annualized salary in 2021 by age group and sex. Section III of the schedule shows retired annuitants, disabled annuitants, survivors and beneficiaries receiving benefits by age, sex, and benefit amounts.

Although we have made tests to check for reasonableness and consistency, we have not independently audited the data, which was submitted by SERS. As appropriate, we have made certain adjustments to the SERS data, including the use of a minimum annual salary assumption of \$20,000.

State Employees' Retirement System

Section III of Schedule M shows the monthly annuities that were being paid as of December 31, 2021. Total benefits from the fund include lump sum payments and death benefits so these are much higher than the sum of annuities shown in Schedule M and in the highlights.

Plan Provisions

Schedule N contains a summary of the principal provisions of the plan. As a consequence of Act 2017-5 (signed into law in June 2017 and generally effective January 1, 2019), significant changes in plan provisions, including the addition of two new membership classes and the defined contribution plan, have been included effective with the 2018 valuation.

Actuarial Assumptions

Schedule O summarizes the actuarial assumptions used for the valuation. The two types of assumptions are economic assumptions, such as the investment return and salary growth assumptions, and demographic assumptions, such as the assumed rates of retirement and mortality.

As a result of the 2015-2019 actuarial experience study, effective with the December 31, 2020 actuarial valuation, changes were made to most of the actuarial assumptions used for the annual SERS actuarial valuations. As a result of the review undertaken during July of 2020, the Board approved a reduction in the annual investment return assumption from 7.125% to 7.000%. The change was implemented with the December 31, 2020 actuarial valuation.

Actuarial Methods

Schedule P explains the asset valuation and funding method used in the valuation, and the determination of the annual contribution. The asset valuation method spreads investment gains and losses over five years. The funding method provides for reasonable levels of contributions that will fund the cost of future benefits with a credit for amortization of the excess of assets over liabilities. Schedule P also explains how the individual class rates are determined. Section V of Schedule P discusses the plan provisions that are not valued.

Advance Payments of Unfunded Liability Contributions by SERS Employers

As a consequence of Act 2019-105 (signed into law in November of 2019), there is now a mechanism available to eligible SERS employers, whereby an employer can enter into an agreement with the SERS Board to prepay 75% to 100% of their portion of the SERS unfunded accrued actuarial liability. The Pennsylvania State University (PSU) and the Pennsylvania State System of Higher Education (PASSHE) entered into such agreements during 2020 and 2021 respectively. Schedule Q includes additional details regarding this new law and the consequences of the PSU and PASSHE prefunding.

Glossary

Schedule R defines certain terms used in this actuarial report.

State Employees' Retirement System
Unfunded Liability and Normal Cost as of December 31, 2021

I.	Present Value of Benefits:	
	A) Active and Inactive Participants	
	1) Superannuation and Withdrawal	\$ 26,850,989,047
	2) Disability	751,584,804
	3) Death	760,359,797
	4) Refunds	89,746,391
	5) Special Police and Enforcement Officer Benefits	-
	6) Subtotal	\$ 28,452,680,039
	B) Annuitants and Beneficiaries	32,664,860,868
	C) Total	\$ 61,117,540,907
II.	Present Value of Member and Employer Contributions:	
	A) Employer Portion of Normal Cost	\$ 4,388,964,185
	B) Member Contributions	3,801,730,820
	C) Total	\$ 8,190,695,005
III.	Actuarial Accrued Liability: (I) - (II)	\$ 52,926,845,902
IV.	Actuarial Value of Assets	\$ 36,846,610,595
V.	Unfunded Liability (III) - (IV)	\$ 16,080,235,307
VI.	Employer Normal Cost Rate	
	A) Total Normal Cost Rate for new active members to fund:	
	1) Superannuation and Withdrawal	12.60%
	2) Disability	0.57%
	3) Death	0.42%
	4) Refunds	0.44%
	5) Administrative	<u>0.38%</u>
	6) Total	14.41%
	B) Member Contribution Rate	6.09%
	C) Employer Normal Cost Rate (A) - (B)	8.32%

State Employees' Retirement System
Employer Contribution Rate in Fiscal Year 2022 - 2023

	<u>Funding Period</u>		Initial Amount of Liability	Outstanding Balance as of 12/31/21	Annual Payment Amount	Payment as a Percent of Compensation*
	Initial Years	From July 1				
I. Amortization of Liability (Asset) For:						
A) Liability Fresh Start	30	2010	\$5,592,323,524	\$4,584,538,789	\$455,760,928	6.85%
B) Changes in 2010	30	2011	4,192,690,873	3,524,127,458	340,969,957	5.13%
C) Changes in 2011	30	2012	5,018,078,343	4,314,538,111	407,261,875	6.12%
D) Changes in 2012	30	2013	3,244,242,829	2,849,711,196	262,997,001	3.96%
E) Changes in 2013	30	2014	344,271,135	308,361,973	27,877,703	0.42%
F) Changes in 2014	30	2015	482,239,376	439,707,173	39,008,150	0.59%
G) Changes in 2015	30	2016	1,522,849,789	1,411,371,208	123,056,074	1.85%
H) Changes in 2016	30	2017	740,369,408	696,504,315	59,767,396	0.90%
I) Changes in 2017	30	2018	46,940,886	44,789,051	3,787,408	0.06%
J) Changes in 2018	30	2019	3,460,285,687	3,344,921,631	279,052,542	4.20%
K) Changes in 2019	30	2020	635,059,340	621,290,729	51,189,341	0.77%
L) Changes in 2020	30	2021	857,881,396	848,799,517	69,133,576	1.04%
M) Changes in 2021	30	2022	(5,043,505,077)	(5,043,505,077)	(406,437,935)	-6.11%
N) Total Amortization Liability				\$ 17,945,156,074	\$ 1,713,424,016	25.78%
O) Prefunding Setoff				\$ 1,864,920,767	\$ 173,198,531	
P) Total Unfunded Liability = I(N) - I(O)				\$ 16,080,235,307		
Q) Expected Net Amortization Payment = I(N) - I(O)					\$ 1,540,225,485	
II. Employer Normal Cost						8.32%
III. Extra Contribution to Return Act 5 Savings						0.00%
IV. Total Employer Cost = I(N) + II + III						34.10%

* The payment is expressed as a percentage of the total projected covered compensation for active members in fiscal year 2022-2023 of \$6,649,292,000. Percentages may not add due to rounding.

State Employees' Retirement System

**Employer Contribution Rate by Group
(excluding Benefits Completion Plan rate)**

Employer Group (1)	Normal Cost Rate (2)	Base Contribution Rate (3)	Multiplier Adjustment* (4)	Adjustment** (5)	Adjusted Contribution Rate** (6)	Projected 2022-2023 Compensation (7)	Employer Contribution Amount (8)
Class A-5 - Age 67 Retirement	2.27%	16.10%	1.0000	-2.25%	16.12%	\$ 790,897,000	\$ 127,492,596
Class A-6 - Age 67 Retirement	2.27%	16.10%	1.0000	-2.00%	16.37%	30,514,000	4,995,142
DC Plan Only Members****	2.27%	16.10%	1.0000	-3.50%	14.87%	35,292,000	5,247,920
Class A-3 and A-4 - Age 65 Retirement	5.05%	16.10%	1.3004		25.99%	1,358,189,000	352,993,321
Class AA - Age 60 Retirement	8.46%	16.10%	1.8819		38.76%	2,479,569,000	961,080,944
Class A - Age 60 Retirement	6.14%	16.10%	1.5055		30.38%	23,134,000	7,028,109
Class A-3 and A-4 - Age 55 Retirement	8.31%	16.10%	1.3004		29.25%	596,083,000	174,354,278
Class AA - Age 50 Retirement (Including Enforcement Officers)	13.11%	16.10%	1.8819		43.41%	692,612,000	300,662,869
Class A - Age 50 Retirement (Including Enforcement Officers)	10.04%	16.10%	1.5055		34.28%	10,542,000	3,613,798
Class A-3 and A-4 - Park Rangers & Capitol Police	5.55%	16.10%	1.3004	0.50%	26.99%	9,415,000	2,541,109
Class AA - Park Rangers & Capitol Police	8.87%	16.10%	1.8819	0.50%	39.67%	7,847,000	3,112,905
Class A - Park Rangers & Capitol Police	7.96%	16.10%	1.5055	0.50%	32.70%	193,000	63,111
Class A-3 and A-4 - State Police	15.74%	16.10%	1.9147	3.57%	50.14%	226,113,000	113,373,058
State Police - Other	18.43%	16.10%	2.1444	3.57%	56.53%	254,723,000	143,994,912
Class D4	11.14%	16.10%	2.2583		47.50%	5,980,000	2,840,500
Class E	12.28%	16.10%	2.3858		50.69%	128,189,000	64,979,004
Total***						\$ 6,649,292,000	\$ 2,268,373,576

* The multiplier adjustment is the adjustment for the employer group contribution rate. Because the majority of new active members of SERS beginning in 2019 are covered under Class A-5 (67) or A-6 (67), the blended accrual rate for those Classes is used to determine the base contribution rate. Column (4) is the applicable adjustment factor relative to the Class A-5/A-6 benefit value.

** The adjusted contribution rate is (2) + [(3) times (4)] + (5), where (5) is adjustment (i) for employer contribution to DC Plan for Act 5 classes and (ii) for past liability for other classes.

*** The total employer contribution (\$2,268,373,576) is approximately equal to the average employer contribution rate from Schedule B (34.10 percent) times the total projected covered compensation of \$6,649,292,000. The base contribution rate of 16.10 percent was determined as the percentage needed to produce employer contribution amounts by employer group that sum to \$2,268,373,576. The total contribution will be reduced by a prefunding setoff amount of \$173,198,531 for a total net contribution of \$2,095,175,045.

**** While a Normal Cost Rate is shown for the DC Only Plan Members, there is no Normal Cost for these members. The entire Adjusted Rate Contribution for this group is a payment to reduce the unfunded liability.

NOTE: See Schedule P, Section IV for further discussion of this schedule.

State Employees' Retirement System
Development of Shared-Risk/Gain Member Contributions

	<u>Calendar Year</u>	<u>Actual Return</u>	<u>Expected Return</u>	<u>Actual Minus Expected</u>
Shared-Risk/Gain Basis As of: July 1, 2020 (Shared-Gain not applicable prior to the 2019 determination)	2011	2.74%	8.00%	-5.26%
	2012	11.96%	7.50%	4.46%
	2013	13.61%	7.50%	6.11%
	2014	6.35%	7.50%	-1.15%
	2015	0.40%	7.50%	-7.10%
	2016	6.51%	7.50%	-0.99%
	2017	15.08%	7.25%	7.83%
	2018	-4.55%	7.25%	-11.80%
	2019	18.75%	7.25%	11.50%
	2011-2019	7.63%/year [#]	7.47%/year ^{##}	0.16%
Shared-Risk/Gain Basis As of: July 1, 2023	2020	11.11%	7.125%	3.99%
	2021	17.24%	7.00%	10.24%
	2022	TBD	TBD	TBD
	A-3/A-4 - 2013-2022	TBD	TBD	TBD
	A-5/A-6 - 2020-2022	TBD	TBD	TBD

- 1) Shared-Risk Rate for Class A-3 and Class A-4 Members as of July 1, 2017: 0.00%

- 2) Calculation of 9-Year Annualized Returns for 2011-2019:
 - a) [#]Actual: $[(1+0.0274) \times (1+0.1196) \times (1+0.1361) \times (1+0.0635) \times (1+0.0040) \times (1+0.0651) \times (1+0.1508) \times (1-0.0455) \times (1+0.1875)]^{(1/9)} - 1$ 7.63%
 - b) ^{##}Expected: $[(1+0.0800) \times (1+0.0750)^5 \times (1+0.0725)^3]^{(1/9)} - 1$ 7.47%
 - c) = a) - b) 0.16%

- 3) Adjustment to Shared Rate Based on 9-Year Period (2011-2019)

Since 2c) is not less than -1.00%, Adjustment to Shared-Risk Rate = 0.00% 0.00%

Since 2c) is not more than 1.00%, Adjustment to Shared-Gain Rate = 0.00% 0.00%

- 4) New Class A-3/A-4 Shared Rate Effective July 1, 2020 = (1) + (3): 0.00%

See Notes on Next Page for More on Above Calculations and Future Shared-Risk/Gain Measurements.

Note: The actual investment returns, and the average assumption calculation, shown above are rounded to the nearest hundredth of a percent. The actual calculations may reflect greater precision.

State Employees' Retirement System
Development of Shared-Risk/Gain Member Contributions (continued)

NOTE 1: Shared Rate Effective July 1, 2014 and Shared Rate Effective July 1, 2017

Under the Shared-Risk provision of Act 2010-120, higher member contribution rates could have become effective in 2014 and/or in 2017 and/or in 2020 if SERS investments had underperformed.

As of December 31, 2013, the first potential adjustment to the Shared Rate was determined based upon the actual and expected SERS investment returns during the three calendar years 2011 through 2013. The 2011 to 2013 return information on the preceding page was used for this determination. Since the actual annual return over the three-year period 2011-2013 (9.33%) was not lower than the expected annual return (7.67%) minus 1% (i.e., 6.67%), no Shared Rate became effective July 1, 2014, and a 0.0% Shared Rate applied through June 30, 2017.

As of December 31, 2016, the second potential adjustment to the Shared Rate was determined based upon the actual and expected SERS investment returns during the six calendar years 2011 through 2016. The 2011 to 2016 return information on the preceding page was used for this determination. Since the actual annual return over the six-year period 2011-2016 (6.83%) was not lower than the expected annual return (7.58%) minus 1% (i.e., 6.58%), no Shared Rate became effective July 1, 2017, and a 0.0% Shared Rate applied through June 30, 2020.

NOTE 2: Shared Rate Effective July 1, 2020

As of December 31, 2019, the third potential Shared Rate adjustment was determined based upon the returns over the 9 calendar years 2011 through 2019. The 2011 to 2019 return information and Shared Rate calculations shown in Steps 2-4 on the preceding page support the conclusion that no Shared Rate became applicable for the fiscal year beginning July 1, 2020. That is, since the actual annual return over the nine-year period 2011-2019 (7.63%) was not lower than the expected annual return (7.47%) minus 1% (i.e., 6.47%), no Shared Rate became effective July 1, 2020, and a 0.0% Shared Rate will apply through June 30, 2023. For Class A-3 and A-4 members, as of December 31, 2022 and every three years thereafter, the Shared-Risk or Shared-Gain Adjustment (as described below) will be based upon the returns over the preceding 10 calendar years.

NOTE 3: Act 2017-5 Introduced Shared-Gain and Extended Risk-Sharing to New Classes A-5 and A-6

Shared-Gain Adjustments: Lower member contribution rates could become effective in the future for Classes A-3, A-4, A-5 or A-6 if SERS investments overperform. The first potential Shared-Gain Adjustment to the member contribution rate will now be determined as follows:

- For Classes A-3 and A-4, based upon the actual SERS investment returns earned during the 10 calendar year period ending December 31, 2022 and
- For Classes A-5 and A-6, based upon the actual SERS investment returns earned during the 3 calendar year period ending December 31, 2022 (where the Shared Rate adjustment would be in increments of 0.75%, not 0.5% as applicable to Classes A-3 and A-4).

Applicability: Under Act 2017-5, Classes A-5 and A-6 (like Classes A-3 and A-4) will now potentially experience Shared-Risk or Shared-Gain Adjustments to their future member contribution rates. For Classes A-3, A-4, A-5 and A-6, such adjustment could become effective as soon as July 1, 2023.

In no case will the Shared-Risk/Gain Adjustment be greater than (i) 2.0% for Classes A-3 and A-4 or (ii) 3.0% for Classes A-5 and A-6. Also, should the employer contribution level be below the actuarially required contributions in any fiscal year, the Shared-Risk Contribution Rate will revert to zero.

State Employees' Retirement System
Analysis of the Change in Employer Contribution Rate

	Normal <u>Cost</u>	Amortization <u>Liability</u>	<u>Total</u>
I. December 31, 2020 Valuation	1.50%	32.26%	33.76%
II. Changes in the December 31, 2021 Valuation:			
A) Changes in funding method	6.90%	-4.48%	2.42%
B) Gain from investment earnings (net, during 2017-2021)	0.00%	-1.68%	-1.68%
C) Pay increases different than assumptions		-0.08%	-0.08%
D) Other differences between actual and expected experience		0.08%	0.08%
E) Change in demographics of new entrants	-0.08%	0.06%	-0.02%
F) Change in amortization due to change in payroll	0.00%	0.24%	0.24%
G) Change in Extra Contribution to Return Act 5 Savings (current year 0.00% minus prior year 0.62%)	<u>0.00%</u>	<u>-0.62%</u>	<u>-0.62%</u>
H) Total change	6.82%	-6.48%	0.34%
III. December 31, 2021 Valuation: I + II(H)	8.32%	25.78%	34.10%

Analysis of the Change in the Amortization Liability

I. December 31, 2020 Amortization Liability	\$	23,465,909,442
II. Expected Amortization Payment		2,119,861,951
III. Expected Amortization Liability as of December 31, 2021 [(I x 1.070) - II]	\$	22,988,661,151
IV. Change in Liability Due to:		
A) Changes in funding method	\$	(3,699,984,254)
B) Gain from investment earnings (net, during 2017-2021)		(1,383,742,719)
C) Pay increases different than assumptions		(63,450,889)
D) Other differences between actual and expected experience		52,115,056
E) Change in demographics of new entrants		<u>51,557,729</u>
F) Total change		(5,043,505,077)
V. December 31, 2021 Amortization Liability: III + IV(F)	\$	17,945,156,074

Note: The present value of the prefunding setoffs is the difference between the Amortization Liability and the Unfunded Liability. See Schedule B for more information. The calculation is shown in I(N), I(O), and I(P).

State Employees' Retirement System
Actuarial Balance Sheet as of December 31, 2021

ASSETS

Present Assets:

Members' Savings Account	\$ 5,414,329,326
Annuity Reserve Account	29,058,856,282
State Police Benefit Account	3,556,813,829
Enforcement Officers' Benefit Account	49,190,757
State Accumulation Account *	2,145,868,183
Supplemental Annuity Account	-
Total Present Assets (Market Value)	<u>\$ 40,225,058,377</u>
Adjustment to Smooth Market Fluctuations	(3,378,447,782)
Total Present Assets (Actuarial Value)	\$ 36,846,610,595

Present Value of Future Contributions

Normal Cost Contributions (Employer)	\$ 4,388,964,185
Members' Contributions (Employee)	3,801,730,820
Amortization Liability (Employer)	17,945,156,074
Prefunding Setoff (Employer)	(1,864,920,767)
Supplemental Annuity Amortization (Employer)	-
Administrative Expenses	-
Fiscal Year Amortization Payable	-
Total Future Contributions	<u>\$ 24,270,930,312</u>
Total Assets	<u>\$ 61,117,540,907</u>

* Includes \$3,702,417 in directed commissions.

LIABILITIES

Present Value of Benefits Payable to Annuity and Beneficiaries from:

Annuity Reserve Account	\$ 29,058,856,282
State Police Benefit Account	3,556,813,829
Enforcement Officers' Benefit Account	<u>49,190,757</u>
Total for Annuity and Beneficiaries	\$ 32,664,860,868

Present Value of Benefits to Active and Inactive Members from:

Members' Savings Account and State Accumulation Account	
Superannuation and withdrawal	\$ 26,850,989,047
Disability	751,584,804
Death	760,359,797
Refunds	<u>89,746,391</u>
Subtotal	\$ 28,452,680,039
Total Present Value of Benefits to Active and Inactive Members	<u>\$ 28,452,680,039</u>
Total Liabilities	<u>\$ 61,117,540,907</u>

State Employees' Retirement System
Required Transfers Within SERS Accounts

I. Annuity Reserve Account

Balance as reported by SERS	\$ 28,701,457,299
Transfer from State Accumulation Account	357,398,983
Transfer to Supplemental Annuity Account	-
December 31, 2021 balance after transfers	<u>\$ 29,058,856,282</u>

II. State Accumulation Account *

Balance as reported by SERS	\$ 2,531,693,946
Transfer from Enforcement Officers' Benefit Account	1,228,923
Transfer to State Police Benefit Account	(29,655,703)
Transfer to Annuity Reserve Account	<u>(357,398,983)</u>
December 31, 2021 balance after transfers	\$ 2,145,868,183

III. Enforcement Officers' Benefit Account

Balance as reported by SERS	\$ 50,419,680
Transfer to State Accumulation Account	(1,228,923)
Transfer from Supplemental Annuity Account	-
December 31, 2021 balance after transfers	<u>\$ 49,190,757</u>

IV. State Police Benefit Account

Balance as reported by SERS	\$ 3,527,158,126
Transfer from State Accumulation Account	29,655,703
Transfer from Supplemental Annuity Account	-
December 31, 2021 balance after transfers	<u>\$ 3,556,813,829</u>

V. Supplemental Annuity Account

Balance as reported by SERS	\$ -
Transfer from Annuity Reserve Account	-
Transfer to State Police Benefit Account	-
Transfer to Enforcement Officers' Benefit Account	-
December 31, 2021 balance after transfers	<u>\$ -</u>

* Balance includes \$3,702,417 in directed commissions.

State Employees' Retirement System

Accounting Disclosure Statements

Introduction

SERS provides retirement benefits to the employees of the Commonwealth of Pennsylvania and is a cost-sharing, multiple-employer defined benefit pension plan. The Governmental Accounting Standards Board (GASB), pursuant to Statement No. 67, *Financial Reporting for Pension Plans*, and Statement No. 68, *Accounting and Financial Reporting for Pensions* (hereafter Statements 67 and 68), addresses accounting and financial reporting for the activities of pension plans, like SERS, that provide pensions to employees of state governmental employers.

It should be noted that:

- Statement 67 replaced the requirements of GASB Statement No. 25, *Financial Reporting for Defined Benefit Pension Plans and Note Disclosures for Defined Contribution Plans*, effective for financial statements for fiscal years ending on or after June 30, 2014, and
- Statement 68 replaced the requirements of GASB Statement No. 27, *Accounting for Pensions by State and Local Governmental Employers*, effective for fiscal years ending on or after June 30, 2015.

Statement 67 is designed for financial reporting by pension plans and Statement 68 is designed for financial reporting by entities that participate in pension plans. The objective of both statements is to provide more useful, transparent, and comparable financial information related to pensions.

Among the schedules that are no longer required, that had been required disclosures under Statement 25 for many years in the past, are the “Schedule of Funding Progress” and the “Schedule of Employer Contributions.” These schedules, both of which have been included in this actuarial report in past years, remain of interest to many readers of this report. Therefore, we have updated these two schedules to reflect the December 31, 2021 actuarial valuation and they are included on the next two pages, for informational purposes. As well, we have included on the pages that follow these schedules, again for informational purposes, our notes and commentary relating to the disclosures formerly required by GASB Statement No. 25.

NOTE: The actuarial information required under Statements No. 67 and 68 is not included in this report. Rather, these actuarial results are provided separately to SERS for inclusion in their annual financial reporting to the public and to the participating employers of the system.

State Employees' Retirement System
Accounting Disclosure Statements (continued)

I. Schedule of Funding Progress as of December 31, 2021

(Dollars in Thousands)

Note: This table is included in this report **FOR INFORMATIONAL PURPOSES**; it is no longer a required disclosure under GASB.

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded Actuarial Accrued Liability (UAAL) (b-a)	Funded Ratio (a) / (b)	Funding Payroll (c)	Unfunded Actuarial Accrued Liability as a Percentage of Funding Payroll ((b-a)/c)
12/31/2002	27,497,464	25,285,589	(2,211,875)	108.7%	5,093,454	-43.4%
12/31/2003	27,465,615	26,179,761	(1,285,854)	104.9%	4,965,360	-25.9%
12/31/2004	26,900,027	27,999,026	1,099,000	96.1%	5,093,573	21.6%
12/31/2005*	26,793,782	28,851,716	2,057,934	92.9%	5,138,377	40.1%
12/31/2006	28,148,834	30,364,997	2,216,163	92.7%	5,661,675	39.1%
12/31/2007	30,839,877	31,753,971	914,093	97.1%	5,529,069	16.5%
12/31/2008**	30,635,621	34,437,396	3,801,775	89.0%	5,660,319	67.2%
12/31/2009	30,204,693	35,797,017	5,592,324	84.4%	5,935,988	94.2%
12/31/2010*	29,443,945	39,179,594	9,735,649	75.2%	5,851,704	166.4%
12/31/2011***	27,618,461	42,281,862	14,663,401	65.3%	5,890,704	248.9%
12/31/2012	25,302,688	43,055,564	17,752,876	58.8%	5,836,402	304.2%
12/31/2013	25,975,185	43,874,580	17,899,395	59.2%	5,897,627	303.5%
12/31/2014	26,584,948	44,750,670	18,165,722	59.4%	6,021,688	301.7%
12/31/2015*	26,877,127	46,328,929	19,451,802	58.0%	6,255,189	311.0%
12/31/2016****	27,596,048	47,518,964	19,922,916	58.1%	6,187,427	322.0%
12/31/2017	28,776,939	48,439,403	19,662,465	59.4%	6,265,071	313.8%
12/31/2018	28,989,607	51,782,205	22,792,598	56.0%	6,469,401	352.3%
12/31/2019*****	29,934,024	52,972,575	23,038,552	56.5%	6,657,541	346.1%
12/31/2020*****	32,703,275	55,098,758	22,395,483	59.4%	6,700,320	334.2%
12/31/2021	36,846,611	52,926,846	16,080,235	69.6%	6,649,292	241.8%

* Revised economic and demographic assumptions due to experience review.

** Revised interest rate assumption from 8.5% to 8.0%.

*** Revised interest rate assumption from 8.0% to 7.5%.

**** Revised interest rate assumption from 7.5% to 7.25%.

***** Revised interest rate assumption from 7.25% to 7.125%.

***** Revised interest rate assumption from 7.125% to 7.00% and revised economic/demographic assumptions due to experience review.

State Employees' Retirement System
Accounting Disclosure Statements (continued)

II. Schedule of Employer Contributions as of December 31, 2021

(Dollars in Thousands)

Note: This table is included in this report **FOR INFORMATIONAL PURPOSES**; it is no longer a required disclosure under GASB.

Calendar Year	Annual Required Contribution (ARC)	Actual Contribution	Percentage Contributed
2002	22,906	50,831	221.9%
2003	55,079	67,947	123.4%
2004	105,229	105,229	100.0%
2005	319,190	147,163	46.1%
2006	548,745	195,407	35.6%
2007	617,253	242,337	39.3%
2008	584,248	233,138	39.9%
2009	643,861	251,870	39.1%
2010	866,822	272,525	31.4%
2011	913,778	391,189	42.8%
2012	1,044,632	562,883	53.9%
2013	1,314,925	790,996	60.2%
2014	1,407,361	1,081,826	76.9%
2015	1,469,116	1,359,246	92.5%
2016	1,613,626	1,613,626	100.0%
2017	1,883,541	1,883,541	100.0%
2018	2,040,434	2,040,434	100.0%
2019	2,106,138	2,106,138	100.0%
2020	2,164,144	3,174,854	146.7%
2021	2,078,951	2,858,088	137.5%

Notes Pertaining to Governmental Accounting Standards Board Statement No. 25 (Although Statement 25 has been replaced by Statement 67, the Statement 25 notes below and on the following pages are provided FOR INFORMATIONAL PURPOSES.)

The actual contribution amounts in the above table include the employer share of regular contributions, the employer share of purchased service and contributions for employee service under the Public School Employees' Retirement System.

The information presented above was determined as part of the actuarial valuations at the dates indicated. Additional information as of the latest actuarial funding valuation follows.

State Employees' Retirement System

Accounting Disclosure Statements (continued)

Valuation Date	December 31, 2021
Actuarial cost method	Traditional Entry-age Actuarial Cost Method
Amortization method	10-year or 30-year schedule with level payments (on a closed amortization basis)
Remaining amortization period	18 to 30 years (rounded equivalent single amortization period: 20 years)
Asset valuation method	5-year smoothed market
Actuarial Assumptions	
Investment rate of return	7.00 percent
Projected compensation increases	Average increase of 4.6 percent (range: 3.30 to 6.95 percent)
Inflation	2.50 percent
Cost-of-living adjustments	None

The annual employer contribution as set forth in the SERC is equal to the sum of the following:

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

Valuations are performed on December 31 of each year, and the results are presented to the Board as a basis for determining the employer contribution rate for the year beginning July 1 after the valuation date. The Board has adopted the rate from the valuation unless information available after or as part of the valuation supports an adjustment to the valuation rate.

Apart from the statutory funding requirements set forth in the SERC, there are separate accounting standards applicable to SERS. The current reporting requirements of GASB Statements No. 67 and 68 are provided under a separate report.

The former reporting requirements of GASB Statements No. 25 and 27 defined an Annual Required Contribution (ARC) for financial reporting purposes. As long as the statutory annual employer contribution, as defined above, was at least equal to the minimum contribution reported under GASB Statement No. 25, the statutory annual employer contribution was deemed to be the ARC. Whenever the statutory annual employer contribution was less than the minimum contribution reported under GASB, the GASB minimum was deemed to be the ARC.

State Employees' Retirement System

Accounting Disclosure Statements (continued)

GASB Statement No. 25 defined the ARC to be equal to the employer normal cost plus an amount to amortize the unfunded actuarial accrued liability. The Statement prescribed the maximum acceptable period over which the total unfunded actuarial liability should be amortized. The Statement also required that the "equivalent single amortization period" for all combined amortizations should not exceed the maximum acceptable period. Under the contribution collars from Act 2010-120, the contribution level often resulted in an "equivalent single amortization period" in excess of the maximum acceptable period and thus an actual contribution less than the ARC. In those cases, the ARC was determined using a 30-year amortization period.

During 2001, 2002, and 2003, actual contributions exceeded the ARC. For the period July 1, 2001 through June 30, 2003, the ARC was set at zero. However, contributions were made by employers of some special class members for the cost of additional benefits including payment of past liabilities for retroactive benefit enhancements. Collection of those amounts resulted in the actual contributions exceeding the ARC for all or part of calendar years 2001, 2002 and 2003.

In 2020 and 2021, the contributions exceeded the ARC due to two separate employers prefunding a large portion of their Unfunded Liability. In years when an employer prefunds its Unfunded Liability, the actual contribution will exceed the ARC. In years when there is no prefunding lump sum by employers, the contribution will again equal the ARC, even when setoffs apply.

All amortization payments are currently based upon a 30-year schedule of contributions, which remain level during the amortization period. The employer cost is determined as a percent of covered compensation, and the employer contributes that percent of the compensation of all covered members during each fiscal year.

The employer contribution was below the GASB Statement No. 25 minimum from July 1, 2005 through June 30, 2015. However, since July 1, 2015, the actual employer contributions have exceeded the GASB Statement No. 25 minimum.

State Employees' Retirement System
Solvency Test

Valuation Date	Actuarial Accrued Liabilities For			Total Actuarial Accrued Liability (AAL)	Actuarial Value of Assets	Portion of Accrued Liabilities Covered by Reported Assets			Funded Ratio
	(1)	(2)	(3)			(1)	(2)	(3)	
	Active Participant Contributions	Annuitants and Beneficiaries	Active Participants (Employer Financed Portion)						
(Amounts in Thousands)									
December 31, 1992	\$ 1,994,567	\$ 4,621,318	\$ 4,872,529	\$ 11,488,414	\$ 11,769,388	100.0 %	100.0 %	100.0 %	102.4 %
December 31, 1993	2,170,593	4,806,907	5,236,236	12,213,736	13,060,613	100.0	100.0	100.0	106.9
December 31, 1994	2,352,731	5,039,221	6,350,104	13,742,056	13,991,485	100.0	100.0	100.0	101.8
December 31, 1995	2,499,485	5,649,454	6,918,265	15,067,205	15,510,309	100.0	100.0	100.0	102.9
December 31, 1996	2,646,630	6,027,333	7,262,653	15,936,616	16,841,069	100.0	100.0	100.0	105.7
December 31, 1997	2,748,177	6,951,411	7,588,825	17,288,413	18,565,136	100.0	100.0	100.0	107.4
December 31, 1998	2,904,232	7,200,000	8,253,666	18,357,899	20,670,711	100.0	100.0	100.0	112.6
December 31, 1999	2,989,489	7,779,993	8,322,358	19,091,840	23,624,267	100.0	100.0	100.0	123.7
December 31, 2000	3,182,776	8,148,876	8,370,626	19,702,278	26,094,306	100.0	100.0	100.0	132.4
December 31, 2001	3,344,107	8,684,734	11,629,915	23,658,757	27,505,494	100.0	100.0	100.0	116.3
December 31, 2002	3,498,672	10,129,669	12,022,048	25,650,389	27,497,464	100.0	100.0	100.0	107.2
December 31, 2003	3,588,664	11,296,520	11,294,578	26,179,761	27,465,615	100.0	100.0	100.0	104.9
December 31, 2004	3,593,576	12,779,570	11,625,880	27,999,026	26,900,027	100.0	100.0	90.5	96.1
December 31, 2005	3,696,477	14,000,196	11,155,043	28,851,716	26,793,782	100.0	100.0	81.6	92.9
December 31, 2006	3,916,841	14,474,525	11,973,631	30,364,997	28,148,834	100.0	100.0	81.5	92.7
December 31, 2007	3,849,293	16,255,843	11,648,835	31,753,971	30,839,877	100.0	100.0	92.2	97.1
December 31, 2008	4,068,036	17,305,971	13,063,389	34,437,396	30,635,621	100.0	100.0	70.9	89.0
December 31, 2009	4,280,680	17,962,741	13,553,596	35,797,017	30,204,693	100.0	100.0	58.7	84.4
December 31, 2010	4,409,444	18,995,355	15,774,795	39,179,594	29,443,945	100.0	100.0	38.3	75.2
December 31, 2011	4,406,306	21,222,075	16,653,481	42,281,862	27,618,461	100.0	100.0	11.9	65.3
December 31, 2012	4,551,507	22,095,052	16,409,005	43,055,564	25,302,688	100.0	93.9	0.0	58.8
December 31, 2013	4,636,219	23,046,717	16,191,644	43,874,580	25,975,185	100.0	92.6	0.0	59.2
December 31, 2014	4,733,833	23,872,658	16,144,179	44,750,670	26,584,948	100.0	91.5	0.0	59.4
December 31, 2015	4,816,121	25,156,125	16,356,683	46,328,929	26,877,127	100.0	87.7	0.0	58.0
December 31, 2016	4,869,229	26,824,306	15,825,429	47,518,964	27,596,048	100.0	84.7	0.0	58.1
December 31, 2017	4,965,765	27,798,045	15,675,593	48,439,403	28,776,939	100.0	85.7	0.0	59.4
December 31, 2018	5,074,760	28,558,283	18,149,162	51,782,205	28,989,607	100.0	83.7	0.0	56.0
December 31, 2019	5,183,195	29,651,542	18,137,838	52,972,575	29,934,024	100.0	83.5	0.0	56.5
December 31, 2020	5,327,815	31,754,551	18,016,392	55,098,758	32,703,275	100.0	86.2	0.0	59.4
December 31, 2021	5,414,329	32,664,861	14,847,656	52,926,846	36,846,611	100.0	96.2	0.0	69.6

State Employees' Retirement System
Actuarial Value of Assets

I. Development of 12/31/21 Expected Actuarial Value:	
A) Actuarial Value as of 12/31/20	\$ 32,703,275,230
B) Contributions in 2021	3,273,798,236
C) Benefits and Expenses in 2021	(3,753,881,498)
D) Investment return at 7.00% to 12/31/21 on (A)	2,289,229,266
E) Investment return at 7.00% to 12/31/21 on (B) and (C): 7.00% x .5 x ((B) + (C))	<u>(16,802,914)</u>
F) Expected Actuarial Value as of 12/31/21: (A) + (B) + (C) + (D) + (E)	\$ 34,495,618,320
II. Previous Differences Not Yet Amortized:	
A) Unrecognized amount of 12/31/17 Difference: .2 x \$2,103,289,334	\$ 420,657,867
B) Unrecognized amount of 12/31/18 Difference: .4 x (\$3,491,449,868)	(1,396,579,947)
C) Unrecognized amount of 12/31/19 Difference: .6 x \$3,110,737,221	1,866,442,333
D) Unrecognized amount of 12/31/20 Difference: .8 x \$1,786,085,547	<u>1,428,868,438</u>
E) Total	\$ 2,319,388,691
III. Actuarial Gain or Loss from 2021:	
A) Market Value of Assets on 12/31/21	\$ 40,225,058,377
B) Expected Market Value II(E) + I(F)	<u>36,815,007,011</u>
C) Gain (loss) from 2021 Investments (A) - (B)	\$ 3,410,051,366
IV. Development of Actuarial Value of Assets as of 12/31/21:	
A) 20% of \$2,103,289,334 (12/31/17 Difference):	\$ 420,657,867
B) 20% of (\$3,491,449,868) (12/31/18 Difference):	(698,289,974)
C) 20% of \$3,110,737,221 (12/31/19 Difference):	622,147,444
D) 20% of \$1,786,085,547 (12/31/20 Difference):	357,217,109
E) 20% of \$3,410,051,366 (12/31/21 Difference):	<u>682,010,273</u>
F) Total Difference: (A) + (B) + (C) + (D) + (E)	\$ 1,383,742,719
G) Preliminary Actuarial Value at 12/31/21: I(F) + IV(F)	\$ 35,879,361,039
H) Amortization Payment Receivable (January to June)	\$ 967,249,556
I) Actuarial Value at 12/31/21: IV(G) + IV(H)	\$ 36,846,610,595

State Employees' Retirement System
Projection of Population, Benefits, and Contributions

Projection of Annuitants, Beneficiaries and Active Participants
Actual Data Through 2021

Calendar Year	New Annuitants During the Year	Annuitant Deaths During the Year	Total Annuitants (End of Year)	New Beneficiaries During the Year	Beneficiary Deaths During the Year	Total Beneficiaries (End of Year)	Total Annuitants and Beneficiaries	Active Participants	Active Participants (DB Only)
2003			85,808			8,604	94,412	109,018	109,018
2004			89,869			8,858	98,727	108,405	108,405
2005			92,120			9,059	101,179	109,981	109,981
2006			92,879			9,181	102,060	110,972	110,972
2007			97,657			9,473	107,130	109,610	109,610
2008			98,492			9,654	108,146	110,866	110,866
2009			99,776			9,863	109,639	110,107	110,107
2010			101,701			10,012	111,713	109,255	109,255
2011			105,096			10,246	115,342	107,021	107,021
2012			106,673			10,388	117,061	106,048	106,048
2013			109,356			10,696	120,052	105,186	105,186
2014			111,328			10,921	122,249	104,431	104,431
2015			113,537			11,152	124,689	105,025	105,025
2016			115,867			11,471	127,338	104,632	104,632
2017			117,673			11,800	129,473	102,978	102,978
2018			118,977			12,030	131,007	103,007	103,007
2019			120,367			12,364	132,731	103,100	102,850
2020			120,761			12,573	133,334	101,280	100,962
2021			121,436			12,924	134,360	98,312	97,857
2022	4,652	3,232	122,856	646	541	13,029	135,885	98,312	97,719
2023	4,572	3,347	124,081	669	588	13,110	137,191	98,312	97,593
2024	4,501	3,451	125,131	690	632	13,168	138,299	98,312	97,475
2025	4,415	3,549	125,997	710	674	13,204	139,201	98,312	97,367
2026	4,279	3,648	126,628	730	713	13,221	139,849	98,312	97,265
2027	4,206	3,740	127,094	748	749	13,220	140,314	98,312	97,169
2028	4,036	3,827	127,303	765	781	13,204	140,507	98,312	97,079
2029	3,870	3,914	127,259	783	810	13,177	140,436	98,312	96,994
2030	3,712	3,997	126,974	799	836	13,140	140,114	98,312	96,914
2031	3,587	4,080	126,481	816	860	13,096	139,577	98,312	96,839
2032	3,391	4,155	125,717	831	883	13,044	138,761	98,312	96,768

The retirement projections in Schedule K are based upon the current retirement assumptions used for the valuation.

State Employees' Retirement System
Projection of Population

Projection of Active Participants
Actual Data Through 2021

End of Calendar Year	Pre-Act 2017-5 Total	Hybrid DB/DC Class A-5	Hybrid DB/DC Class A-6	Defined Contribution Only	Act 2017-5 Total	Total DB/DC Active Participants	Total DB Active Participants
2018	103,007	-	-	-	-	103,007	103,007
2019	96,286	6,292	272	250	6,814	103,100	102,850
2020	91,043	9,507	412	318	10,237	101,280	100,962
2021	84,869	12,490	498	455	13,443	98,312	97,857
2022	80,282	16,756	681	593	18,030	98,312	97,719
2023	76,065	20,678	850	719	22,247	98,312	97,593
2024	72,147	24,321	1,007	837	26,165	98,312	97,475
2025	68,520	27,695	1,152	945	29,792	98,312	97,367
2026	65,141	30,837	1,287	1,047	33,171	98,312	97,265
2027	61,949	33,805	1,415	1,143	36,363	98,312	97,169
2028	58,939	36,605	1,535	1,233	39,373	98,312	97,079
2029	56,098	39,247	1,649	1,318	42,214	98,312	96,994
2030	53,438	41,721	1,755	1,398	44,874	98,312	96,914
2031	50,924	44,059	1,856	1,473	47,388	98,312	96,839
2032	48,561	46,257	1,950	1,544	49,751	98,312	96,768

Pre-Act 2017-5 totals include exempt Hazardous Duty and State Police

Note: Based upon our preliminary expectations, out of all non-exempt new hires after 2021, approximately 93% will elect Class A-5, 4% will elect Class A-6 and 3% will elect defined contribution (DC) only.

State Employees' Retirement System
Projection of Population, Benefits, and Contributions

Projection of Expected Contributions and Benefits (Defined Benefit Plan Only)
Actual Data Through 2021 (Dollars in Millions)

Year	<u>Contribution Dollars Reduced By Setoffs</u>			<u>Defined Benefit Plan Contributions as a Percent of Pay</u>			
	Calendar Year (After 2021, Based Upon Blended Fiscal Projections)		Fiscal Year (Beginning July 1)	Calendar Year Contributions (Employer Rates Based Upon Blended Fiscal Projections)		Actual Projected Employer Rate (Fiscal Year Beginning July 1)	
	Employee	Employer	Employer	Employee	Employer		
2003	\$ 308	\$ 68					\$ 1,656
2004	302	106					1,880
2005	306	147					1,966
2006	317	196					1,943
2007	334	242					2,361
2008	337	233					2,231
2009	349	252					2,297
2010	349	273					2,473
2011	351	391					2,730
2012	348	563					2,690
2013	352	791					2,862
2014	366	1,082					2,967
2015	372	1,359					3,101
2016	375	1,622					3,249
2017	383	1,897					3,327
2018	394	2,047					3,421
2019	405	2,112					3,533
2020	410	3,184					3,582
2021	405	2,869					3,754
2022	402	2,092	2,094	6.02%	33.93%	34.10%	3,838
2023	403	2,063	2,030	5.97%	33.17%	32.24%	3,981
2024	411	1,971	1,909	5.93%	30.94%	29.64%	4,124
2025	419	1,875	1,837	5.89%	28.74%	27.84%	4,265
2026	428	1,817	1,794	5.84%	27.17%	26.50%	4,401
2027	437	1,801	1,806	5.80%	26.22%	25.94%	4,539
2028	445	1,808	1,807	5.75%	25.60%	25.25%	4,668
2029	454	1,810	1,811	5.71%	24.93%	24.61%	4,793
2030	464	1,815	1,817	5.67%	24.31%	24.01%	4,865
2031	473	1,827	1,834	5.63%	23.72%	23.44%	4,884
2032	483	1,843	1,849	5.58%	23.20%	22.97%	4,841

This projection is based upon these assumptions: a projected investment return of 7.0 percent in 2021 and after; general pay increases of 2.80 percent; no future retirement benefit COLAs. Employer contribution rates are determined before any setoffs while the employer dollar contribution amounts are net of the PSU and PASSHE setoff amounts.

State Employees' Retirement System

Risk Measurements

Risk of Differences in Future Measurements

The liabilities and costs in this report are based upon actuarial assumptions adopted by the State Employees' Retirement Board (the Board) and funding procedures specified in the SERC. These measurements represent a single estimate of the future assets, liabilities and contribution needs of SERS. Since the actual future contribution needs will be determined by the actual future investment and participant experience, there is a risk that future measurements will differ from those presented in this report due to:

- (a) differences in the actual experience of SERS compared to the assumptions used in the measurements, and
- (b) changes in the assumptions and methods used for the measurements.

With each measurement, it is important to understand both the current estimate (baseline scenario) and how future estimates may be affected by alternative scenarios. On a regular basis, especially when actuarial valuation assumptions are being reviewed, analyses of specific alternative scenarios are performed and presented to the SERS Board and staff to assist them in understanding the impact of (a) experience that deviates from what is currently actuarially assumed and (b) alternative actuarial assumptions. Such analyses are not included within this report, however, since the alternative scenarios do not represent the expectations used within the valuation.

This schedule provides information that is intended to enhance the reader's understanding of (i) the potential for deviations in SERS' future contribution needs and (ii) SERS' risk exposure and how it changes over time. This information is responsive to the requirements of Actuarial Standard of Practice Number 51 (ASOP 51), which provides guidance on the assessment and disclosure of risk associated with retirement systems.

Major sources of risk that contribute to deviations in future measurements include:

- (i) fund investment performance and expectations (which impact future asset levels)
- (ii) participant longevity and life expectancy (which impact future liability levels)
- (iii) participant compensation patterns throughout career (which impact future liability levels)
- (iv) participant retirement and termination patterns (which impact future liability levels)

These factors, and others not listed here, can contribute to changes in SERS' assets, liabilities and funding payroll, which, in turn, directly impact SERS' future contribution needs.

Plan Maturity and the Effect on Contribution Needs

Over time, SERS' assets and liabilities have grown relative to the employer contribution base (i.e., active member funding payroll). This natural growth is referred to as "plan maturity" and it can affect the plan's sensitivity to the various risks described above. A simple metric to understand plan maturity is the ratio of retired members to active members. More mature plans have a higher ratio of retired members to active members.

State Employees' Retirement System

Risk Measurements (continued)

As the number of retired members per active member grows, the plan accumulates additional assets and liabilities without increasing the contribution base (i.e., the addition of retired members does not increase the active member funding payroll). This is illustrated by comparing the plan's assets to the funding payroll and by comparing the plan's liabilities to the funding payroll. More mature plans generally have a higher ratio of assets to payroll, and more mature plans generally have a higher ratio of liabilities to payroll.

In general, deviations in plan experience or expectations will have a larger effect on the contribution needs of a more mature plan than a less mature plan. That is, the more mature the plan, the greater the plan's sensitivity to risk. For example, an unfavorable asset return that results in the Actuarial Value of Assets being 1 percent lower than expected would have a larger effect on the employer contribution for a more mature plan than for a less mature plan.

Table 1 below provides historical measurements of plan maturity and the potential effects of changes in assets and liabilities on the employers' Actuarially Determined Contributions (ADC).

Table 1 - Plan Maturity Measures
(Dollars in Millions)

Date of Valuation (December 31) (1)	Ratio of Total # Retirees to Total # Active Members (2)	Ratio of Assets to Funding Payroll (3)	First Year Effect on ADC of a 1 Percent Change in Assets (4)	Ratio of Actuarial Accrued Liability to Funding Payroll (5)	First Year Effect on ADC of a 1 Percent Change in Liabilities (6)
2008	1.0	5.5	\$27.2	6.2	\$30.6
2009	1.0	5.3	\$26.8	6.3	\$31.8
2010	1.0	5.0	\$26.2	6.6	\$34.8
2011	1.1	4.7	\$23.4	7.2	\$35.8
2012	1.1	4.3	\$21.4	7.3	\$36.5
2013	1.1	4.5	\$22.0	7.5	\$37.1
2014	1.2	4.5	\$22.5	7.6	\$37.9
2015	1.2	4.5	\$22.8	7.7	\$39.2
2016	1.2	4.4	\$22.8	7.6	\$39.3
2017	1.3	4.7	\$23.8	7.8	\$40.0
2018	1.3	4.6	\$24.0	8.3	\$42.8
2019	1.3	4.6	\$24.4	8.2	\$43.2
2020	1.3	4.9	\$26.4	8.3	\$44.4
2021	1.4	5.5	\$29.7	7.9	\$42.7

As a plan matures, the ratios provided in Columns (2), (3) and (5) above increase; however, as can be seen above, other factors can, and do, sometimes interrupt that upward trend.

Column (2) Ratio - Retirees to Actives: SERS currently has about 1.4 (134,360/97,857) retirees per active member. This ratio has increased historically, and that is expected to continue. The likelihood of large changes in the ADC increases as the number of retirees increases.

State Employees' Retirement System

Risk Measurements (continued)

Column (3) Ratio – Actuarial Value of Assets to Funding Payroll: Assets are currently about **5.5** times funding payroll. Although this ratio decreased after the 2008 market downturn, it is expected to gradually rise as the plan matures and the funding ratio increases. The effect of changes in assets on the Actuarially Determined Contribution (ADC) increases as this ratio increases.

Column (5) Ratio – Actuarial Accrued Liability to Funding Payroll: Accrued Liability is currently **7.9** times funding payroll. This ratio has increased significantly in recent years as the actuarial assumptions have been revised. The effect of changes in liabilities on the ADC increases as this ratio increases.

Columns (4) and (6) – Effect on ADC of 1 Percent Change in Assets or 1 Percent Change in Liabilities: These metrics illustrate the potential net effect that the various sources of risk (including the four major risks identified previously and others) would have had on the level of SERS' annual ADC.

As a plan matures, the ADC becomes more sensitive to risks. The charts on the following pages provide a graphical representation of the historical and expected future changes in plan maturity and the sensitivity of the ADC to future changes in assets and liabilities. These charts present the measurements for the 10 years prior to the valuation and the projected measurements for the 10 years following the valuation. The projected measurements are based on the results of the current valuation. Future measurements will be affected by future experience and any implemented changes in assumptions or methods.

State Employees' Retirement System

Risk Measurements (continued)

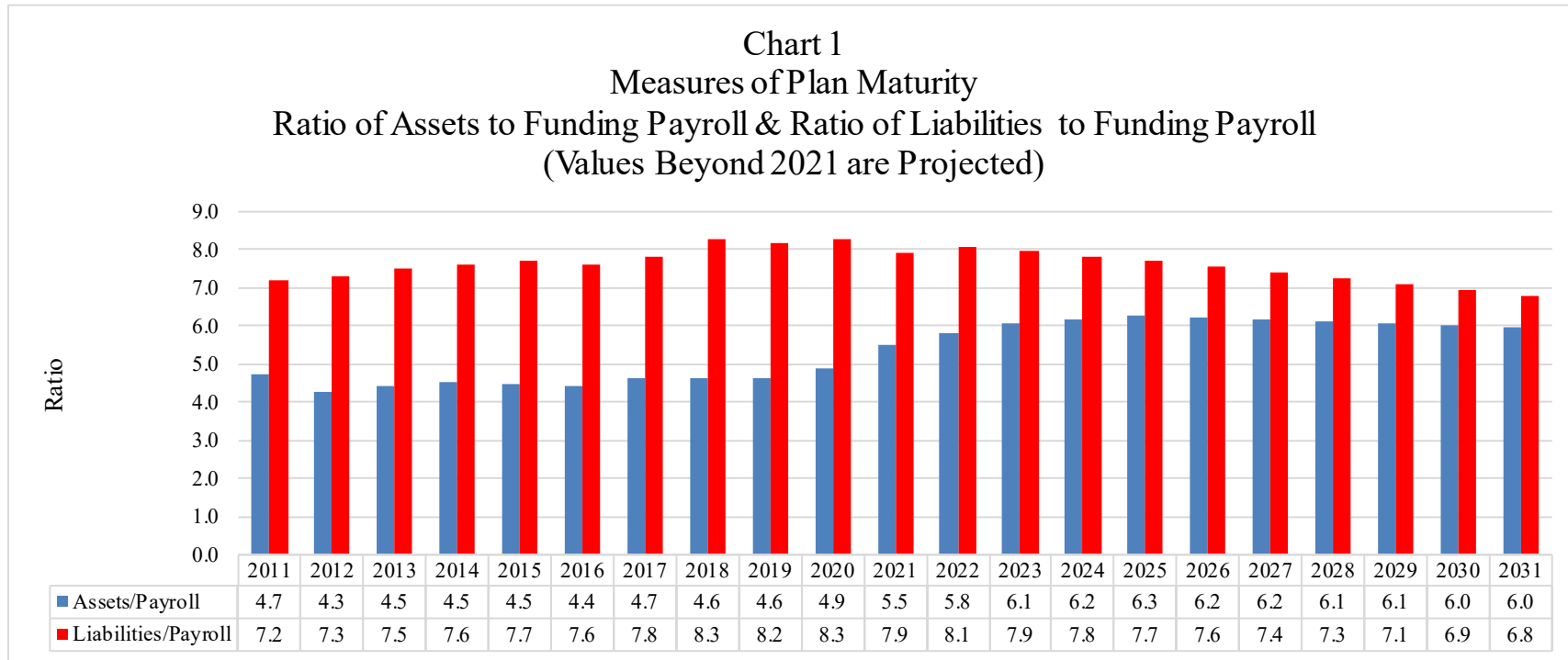


Chart 1 provides a comparison of SERS assets to the members' funding payroll (Assets/Payroll) and a comparison of SERS actuarial liabilities to the members' funding payroll (Liabilities/Payroll). As of **2021**, SERS assets are **5.5** times payroll and SERS liabilities are **7.9** times payroll. This means that each 1.0 percent change in assets represents 5.5 percent of payroll and each 1.0 percent change in liabilities represents 7.9 percent of payroll. These ratios are expected to gradually decline in future years as more active members are covered by the Act 120 and Act 5 benefit classes, which have a less costly benefit structure, giving rise to lower future contribution rates and, thus, slower growing future plan assets and liabilities.

State Employees' Retirement System

Risk Measurements (continued)

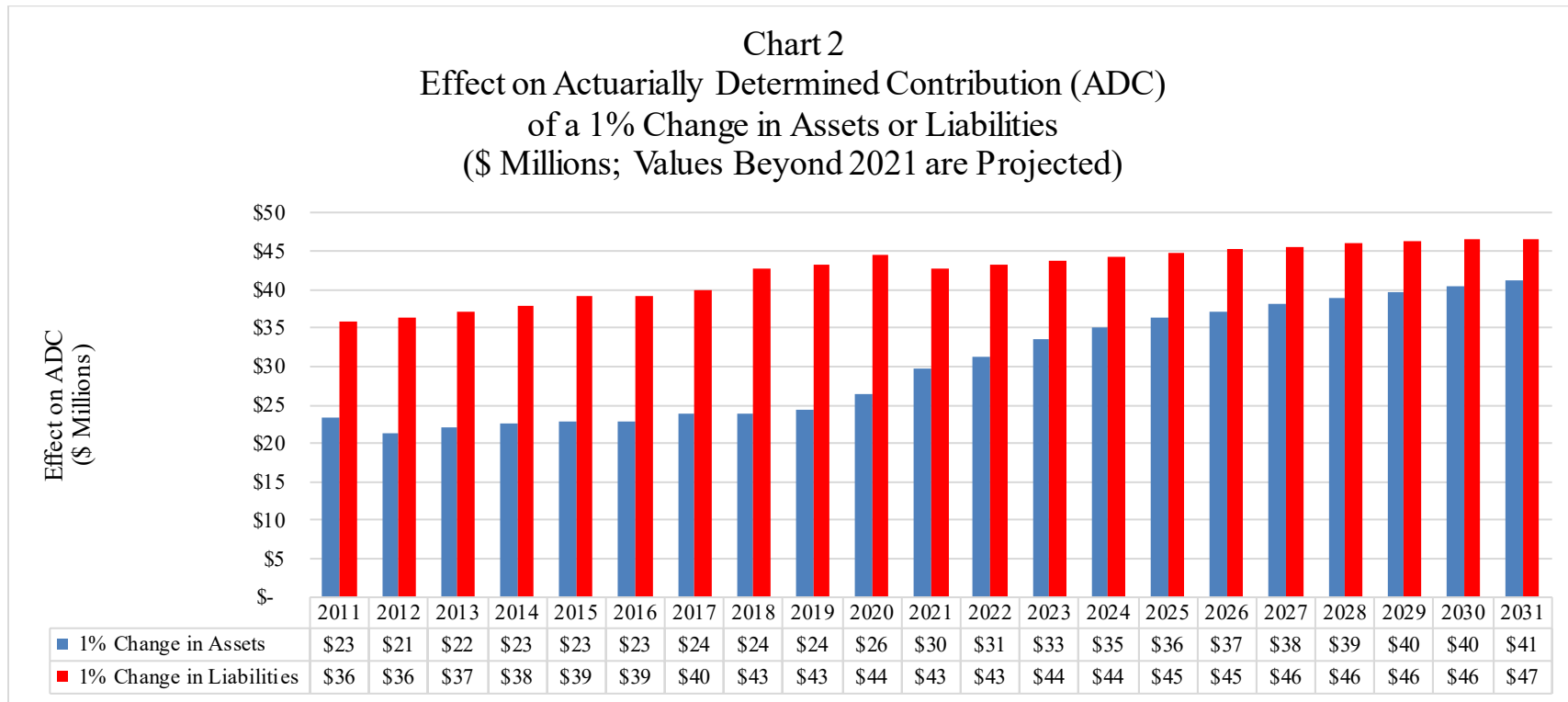


Chart 2 provides the estimated effect on the ADC of a 1 percent change in SERS assets and a 1 percent change in SERS actuarial liabilities:

- The effect on the first year ADC (in millions of dollars) of a “1% Change in Assets” is shown in the top row below the graph for the years 2011 through 2031.
- Similarly, the effect on the first year ADC (in millions of dollars) of a “1% Change in Liabilities” is shown in the bottom row below the graph for the years 2011 through 2031.

For example, an unfavorable asset return that would cause the Actuarial Value of Assets to be 1 percent less than expected (i) would increase the ADC by **\$35** million if it occurred during **2024** but (ii) would increase the ADC by **\$41** million if it occurred in **2031**. A deviation in plan experience that would cause the Actuarial Accrued Liabilities to be 1 percent more than expected (i) would increase the ADC by **\$44** million if it occurred in **2024** but (ii) would increase the ADC by **\$47** million if it occurred in **2031**. These examples further demonstrate the increasing sensitivity to risk of a maturing plan.

State Employees' Retirement System
I. Age, Service and Salary Profile of Active Participants as of December 31, 2021

Active Participants*

Males - Full Years of Service to December 31, 2021

Age Group	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30+	Total	Average Salary
Less than 20	38	0	0	0	0	0	0	38	\$ 32,401
20-24	797	11	0	0	0	0	0	808	37,216
25-29	1,683	444	4	0	0	0	0	2,131	44,583
30-34	1,561	1,369	358	10	0	0	0	3,298	51,353
35-39	1,340	1,174	1,130	407	9	0	0	4,060	58,204
40-44	1,154	1,039	980	1137	276	3	0	4,589	62,707
45-49	1,005	873	879	907	772	208	3	4,647	65,595
50-54	1,095	863	847	977	873	880	322	5,857	68,360
55-59	984	844	801	901	785	675	925	5,915	69,170
60-64	730	709	677	757	445	315	470	4,103	65,551
65+	<u>498</u>	<u>484</u>	<u>438</u>	<u>471</u>	<u>227</u>	<u>119</u>	<u>265</u>	<u>2,502</u>	66,684
Total	10,885	7,810	6,114	5,567	3,387	2,200	1,985	37,948	\$ 62,451

Average Age 47.74

Average Service 11.59

Females - Full Years of Service to December 31, 2021

Age Group	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30+	Total	Average Salary
Less than 20	24	0	0	0	0	0	0	24	\$ 28,620
20-24	561	8	0	0	0	0	0	569	35,564
25-29	1,562	397	3	0	0	0	0	1,962	42,825
30-34	1,601	1,286	297	13	0	0	0	3,197	48,595
35-39	1,478	1,289	1,066	379	21	0	0	4,233	54,567
40-44	1,420	1,120	943	1017	357	16	0	4,873	58,590
45-49	1,193	987	861	850	696	263	28	4,878	60,027
50-54	1,157	1,009	953	974	780	671	434	5,978	62,164
55-59	1,007	915	976	926	768	551	727	5,870	61,082
60-64	618	766	782	829	468	282	343	4,088	59,864
65+	<u>311</u>	<u>363</u>	<u>382</u>	<u>398</u>	<u>224</u>	<u>107</u>	<u>172</u>	<u>1,957</u>	57,997
Total	10,932	8,140	6,263	5,386	3,314	1,890	1,704	37,629	\$ 57,349

Average Age 47.60

Average Service 11.21

* The following three pages contain information on members in special categories. These include selected hazardous duty members, legislators, judges and district justices. The above information is for all other active members. Page five of Schedule M is the total of all active categories. Page six is the total of all active participants and inactive and vested participants.

State Employees' Retirement System

I. Age, Service and Salary Profile of Active Participants as of December 31, 2021

Selected Hazardous Duty*

Males - Full Years of Service to December 31, 2021

Age Group	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30+	Total	Average Salary
Less than 20	0	0	0	0	0	0	0	0	\$ -
20-24	278	2	0	0	0	0	0	280	46,094
25-29	1,492	280	0	0	0	0	0	1,772	61,964
30-34	1,126	1,408	151	2	0	0	0	2,687	71,655
35-39	573	944	915	336	2	0	0	2,770	80,862
40-44	296	461	645	835	247	3	0	2,487	87,078
45-49	226	264	414	606	761	266	2	2,539	93,105
50-54	160	212	311	452	628	467	111	2,341	96,301
55-59	81	122	190	251	261	164	119	1,188	93,260
60-64	49	74	92	115	95	37	50	512	88,554
65+	<u>16</u>	<u>14</u>	<u>46</u>	<u>58</u>	<u>26</u>	<u>18</u>	<u>23</u>	<u>201</u>	89,417
Total	4,297	3,781	2,764	2,655	2,020	955	305	16,777	\$ 82,955

Average Age 41.81

Average Service 11.46

Females - Full Years of Service to December 31, 2021

Age Group	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30+	Total	Average Salary
Less than 20	0	0	0	0	0	0	0	0	\$ -
20-24	77	1	0	0	0	0	0	78	48,269
25-29	383	56	0	0	0	0	0	439	55,938
30-34	359	295	27	0	0	0	0	681	62,143
35-39	222	218	170	39	1	0	0	650	68,649
40-44	168	166	161	152	33	0	0	680	73,753
45-49	134	117	127	150	107	21	0	656	77,738
50-54	82	100	98	109	96	60	6	551	81,844
55-59	68	69	76	88	49	25	10	385	79,340
60-64	28	44	51	51	13	7	10	204	81,701
65+	<u>2</u>	<u>8</u>	<u>17</u>	<u>16</u>	<u>7</u>	<u>4</u>	<u>2</u>	<u>56</u>	81,113
Total	1,523	1,074	727	605	306	117	28	4,380	\$ 71,521

Average Age 42.39

Average Service 9.10

* Enforcement officers, correction officers, psychiatric security aides, and officers of the Pennsylvania State Police and the Delaware River Port Authority

State Employees' Retirement System
I. Age, Service and Salary Profile of Active Participants as of December 31, 2021

Legislators*

Males - Full Years of Service to December 31, 2021

Age Group	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30+	Total	Average Salary
Less than 20	0	0	0	0	0	0	0	0	\$ -
20-24	0	0	0	0	0	0	0	0	-
25-29	2	0	0	0	0	0	0	2	95,432
30-34	3	1	0	0	0	0	0	4	95,432
35-39	4	6	2	0	0	0	0	12	100,372
40-44	2	4	2	1	0	0	0	9	95,432
45-49	1	4	4	2	1	0	0	12	102,062
50-54	1	6	6	4	2	1	0	20	95,432
55-59	3	1	4	3	3	2	0	16	101,647
60-64	3	2	4	5	1	4	2	21	101,060
65+	<u>1</u>	<u>4</u>	<u>4</u>	<u>6</u>	<u>1</u>	<u>4</u>	<u>7</u>	<u>27</u>	101,042
Total	20	28	26	21	8	11	9	123	\$ 99,562

Average Age 54.80
Average Service 13.78

Females - Full Years of Service to December 31, 2021

Age Group	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30+	Total	Average Salary
Less than 20	0	0	0	0	0	0	0	0	\$ -
20-24	0	0	0	0	0	0	0	0	-
25-29	0	0	0	0	0	0	0	0	-
30-34	2	1	0	0	0	0	0	3	99,894
35-39	5	2	2	0	0	0	0	9	101,679
40-44	4	1	0	0	0	0	0	5	95,432
45-49	1	1	0	0	0	0	0	2	102,126
50-54	2	1	3	0	0	0	1	7	100,076
55-59	0	2	1	1	0	1	0	5	95,432
60-64	2	1	1	1	0	1	2	8	97,105
65+	<u>1</u>	<u>2</u>	<u>1</u>	<u>4</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>11</u>	96,649
Total	17	11	8	6	1	3	4	50	\$ 98,278

Average Age 53.10
Average Service 10.90

*Legislators are not required to join the retirement system, therefore the total participant count may not reflect the entire 253-member General Assembly.

State Employees' Retirement System

I. Age, Service and Salary Profile of Active Participants as of December 31, 2021

Judges And Magisterial District Judges

Males - Full Years of Service to December 31, 2021

Age Group	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30+	Total	Average Salary
Less than 20	0	0	0	0	0	0	0	0	\$ -
20-24	0	0	0	0	0	0	0	0	-
25-29	0	0	0	0	0	0	0	0	-
30-34	1	0	0	0	0	0	0	1	93,367
35-39	5	5	0	0	0	0	0	10	102,745
40-44	12	5	4	2	0	0	0	23	122,267
45-49	18	17	8	3	2	0	0	48	119,155
50-54	21	24	33	7	5	2	0	92	131,503
55-59	25	17	36	11	12	5	4	110	132,007
60-64	14	19	31	26	19	9	4	122	135,356
65+	<u>11</u>	<u>18</u>	<u>57</u>	<u>56</u>	<u>54</u>	<u>30</u>	<u>31</u>	<u>257</u>	148,178
Total	107	105	169	105	92	46	39	663	\$ 137,054

Average Age 60.27
Average Service 14.03

Females - Full Years of Service to December 31, 2021

Age Group	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30+	Total	Average Salary
Less than 20	0	0	0	0	0	0	0	0	\$ -
20-24	0	0	0	0	0	0	0	0	-
25-29	0	0	0	0	0	0	0	0	-
30-34	0	1	0	0	0	0	0	1	93,367
35-39	3	1	2	1	0	0	0	7	93,367
40-44	10	2	0	1	0	0	0	13	136,517
45-49	12	6	5	3	1	0	0	27	148,689
50-54	19	10	13	8	7	0	0	57	150,153
55-59	3	14	19	9	8	5	1	59	142,635
60-64	4	8	17	12	10	5	2	58	156,668
65+	<u>3</u>	<u>3</u>	<u>11</u>	<u>13</u>	<u>16</u>	<u>11</u>	<u>8</u>	<u>65</u>	154,366
Total	54	45	67	47	42	21	11	287	\$ 148,540

Average Age 57.26
Average Service 13.65

State Employees' Retirement System
I. Age, Service and Salary Profile of Active Participants as of December 31, 2021

All Active Participants*

Males - Full Years of Service to December 31, 2021

Age Group	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30+	Total	Average Salary
Less than 20	38	0	0	0	0	0	0	38	\$ 32,401
20-24	1,075	13	0	0	0	0	0	1,088	39,501
25-29	3,177	724	4	0	0	0	0	3,905	52,496
30-34	2,691	2,778	509	12	0	0	0	5,990	60,497
35-39	1,922	2,129	2,047	743	11	0	0	6,852	67,503
40-44	1,464	1,509	1,631	1,975	523	6	0	7,108	71,468
45-49	1,250	1,158	1,305	1,518	1,536	474	5	7,246	75,650
50-54	1,277	1,105	1,197	1,440	1,508	1,350	433	8,310	76,995
55-59	1,093	984	1,031	1,166	1,061	846	1,048	7,229	74,157
60-64	796	804	804	903	560	365	526	4,758	69,973
65+	<u>526</u>	<u>520</u>	<u>545</u>	<u>591</u>	<u>308</u>	<u>171</u>	<u>326</u>	<u>2,987</u>	75,536
Total	15,309	11,724	9,073	8,348	5,507	3,212	2,338	55,511	\$ 69,621

Average Age 46.11
Average Service 11.59

Females - Full Years of Service to December 31, 2021

Age Group	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30+	Total	Average Salary
Less than 20	24	0	0	0	0	0	0	24	\$ 28,620
20-24	638	9	0	0	0	0	0	647	37,096
25-29	1,945	453	3	0	0	0	0	2,401	45,223
30-34	1,962	1,583	324	13	0	0	0	3,882	51,023
35-39	1,708	1,510	1,240	419	22	0	0	4,899	56,577
40-44	1,602	1,289	1,104	1,170	390	16	0	5,571	60,656
45-49	1,340	1,111	993	1,003	804	284	28	5,563	62,561
50-54	1,260	1,120	1,067	1,091	883	731	441	6,593	64,610
55-59	1,078	1,000	1,072	1,024	825	582	738	6,319	62,983
60-64	652	819	851	893	491	295	357	4,358	62,243
65+	<u>317</u>	<u>376</u>	<u>411</u>	<u>431</u>	<u>248</u>	<u>123</u>	<u>183</u>	<u>2,089</u>	61,819
Total	12,526	9,270	7,065	6,044	3,663	2,031	1,747	42,346	\$ 59,482

Average Age 47.14
Average Service 11.01

*The statistics above exclude 455 Class 40 (DC Only) active participants.

State Employees' Retirement System

II. Age and Service Profile of Active Participants and Inactive and Vested Participants

As of December 31, 2021

Active Participants and Inactive and Vested Participants*

Males - Full Years of Service to December 31, 2021

Age Group	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30+	Total
Less than 20	38	0	0	0	0	0	0	38
20-24	1,075	13	0	0	0	0	0	1,088
25-29	3,182	724	4	0	0	0	0	3,910
30-34	2,698	2,818	528	14	0	0	0	6,058
35-39	1,938	2,318	2,166	753	11	0	0	7,186
40-44	1,485	1,763	1,783	2,037	530	6	0	7,604
45-49	1,275	1,399	1,468	1,591	1,563	478	5	7,779
50-54	1,318	1,347	1,375	1,508	1,578	1,385	451	8,962
55-59	1,138	1,192	1,194	1,251	1,114	888	1,093	7,870
60-64	832	873	865	938	625	391	586	5,110
65+	<u>630</u>	<u>585</u>	<u>606</u>	<u>631</u>	<u>352</u>	<u>192</u>	<u>359</u>	<u>3,355</u>
Total	15,609	13,032	9,989	8,723	5,773	3,340	2,494	58,960

Average Age 46.44

Average Service 11.6

Females - Full Years of Service to December 31, 2021

Age Group	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30+	Total
Less than 20	24	0	0	0	0	0	0	24
20-24	638	9	0	0	0	0	0	647
25-29	1,957	454	3	0	0	0	0	2,414
30-34	1,979	1,621	346	14	0	0	0	3,960
35-39	1,737	1,727	1,321	435	22	0	0	5,242
40-44	1,645	1,597	1,280	1,208	397	16	0	6,143
45-49	1,393	1,410	1,132	1,071	819	288	28	6,141
50-54	1,341	1,402	1,277	1,177	917	757	455	7,326
55-59	1,156	1,266	1,279	1,086	869	609	774	7,039
60-64	721	913	950	944	549	328	405	4,810
65+	<u>395</u>	<u>439</u>	<u>474</u>	<u>463</u>	<u>284</u>	<u>136</u>	<u>197</u>	<u>2,388</u>
Total	12,986	10,838	8,062	6,398	3,857	2,134	1,859	46,134

Average Age 47.49

Average Service 10.96

*The total participant counts above exclude 455 Class 40 (DC Only) active participants.

State Employees' Retirement System
III. Age and Benefit Profile of Annuitants and Beneficiaries as of December 31, 2021

Superannuation Annuitants

<u>Age</u>	<u>Male</u>		<u>Female</u>		<u>Total</u>	
	<u>Number</u>	<u>Annual Annuity</u>	<u>Number</u>	<u>Annual Annuity</u>	<u>Number</u>	<u>Annual Annuity</u>
Under 25	-	\$ -	-	\$ -	-	\$ -
25-29	-	-	-	-	-	-
30-34	-	-	-	-	-	-
35-39	-	-	-	-	-	-
40-44	-	-	-	-	-	-
45-49	-	-	-	-	-	-
50-54	844	44,837,662	131	5,296,542	975	50,134,204
55-59	2,101	105,491,410	687	30,219,263	2,788	135,710,673
60-64	4,549	182,172,574	3,363	121,467,948	7,912	303,640,522
65-69	7,899	264,735,950	6,869	208,828,523	14,768	473,564,473
70-74	9,620	299,251,959	6,789	187,872,320	16,409	487,124,279
75-79	7,224	229,709,850	4,639	112,202,612	11,863	341,912,462
80-84	4,162	130,025,927	3,098	63,688,927	7,260	193,714,854
85-89	2,291	59,885,889	1,923	30,668,708	4,214	90,554,597
90 & over	1,394	29,923,656	1,648	19,950,516	3,042	49,874,172
Total	40,084	\$ 1,346,034,877	29,147	\$ 780,195,359	69,231	\$ 2,126,230,236

Average Age 72.7
Average Annual Annuity \$30,712

State Employees' Retirement System
III. Age and Benefit Profile of Annuitants and Beneficiaries as of December 31, 2021

Early Retirement Annuitants

<u>Age</u>	<u>Male</u>		<u>Female</u>		<u>Total</u>	
	<u>Number</u>	<u>Annual Annuity</u>	<u>Number</u>	<u>Annual Annuity</u>	<u>Number</u>	<u>Annual Annuity</u>
Under 25	-	\$ -	-	\$ -	-	\$ -
25-29	-	-	-	-	-	-
30-34	54	78,899	65	72,127	119	151,026
35-39	377	831,569	387	550,218	764	1,381,787
40-44	611	1,652,479	659	1,461,316	1,270	3,113,795
45-49	805	9,985,747	803	3,246,366	1,608	13,232,113
50-54	2,199	79,133,067	1,237	10,990,458	3,436	90,123,525
55-59	2,280	68,452,311	1,798	27,695,540	4,078	96,147,851
60-64	2,852	75,819,626	3,043	55,970,825	5,895	131,790,451
65-69	3,074	70,449,841	4,273	75,402,868	7,347	145,852,709
70-74	4,182	99,322,185	4,296	72,332,306	8,478	171,654,491
75-79	3,586	80,977,342	2,402	36,376,652	5,988	117,353,994
80-84	1,474	25,197,399	1,202	13,603,374	2,676	38,800,773
85-89	666	10,475,048	715	6,907,817	1,381	17,382,865
90 & over	306	4,787,432	416	3,632,146	722	8,419,578
Total	22,466	\$ 527,162,945	21,296	\$ 308,242,013	43,762	\$ 835,404,958

Average Age 66.5
Average Annual Annuity \$19,090

State Employees' Retirement System
III. Age and Benefit Profile of Annuitants and Beneficiaries as of December 31, 2021

Disabled Annuitants

<u>Age</u>	<u>Male</u>		<u>Female</u>		<u>Total</u>	
	<u>Number</u>	<u>Annual Annuity</u>	<u>Number</u>	<u>Annual Annuity</u>	<u>Number</u>	<u>Annual Annuity</u>
Under 25	-	\$ -	-	\$ -	-	\$ -
25-29	-	-	2	22,311	2	22,311
30-34	16	273,228	6	101,364	22	374,592
35-39	36	634,999	37	543,506	73	1,178,505
40-44	94	1,820,272	76	1,264,924	170	3,085,196
45-49	162	3,586,616	154	2,568,433	316	6,155,049
50-54	335	6,990,712	291	4,961,385	626	11,952,097
55-59	556	11,334,348	520	9,238,921	1,076	20,573,269
60-64	702	13,774,321	792	13,654,465	1,494	27,428,786
65-69	838	14,761,294	939	15,156,815	1,777	29,918,109
70-74	695	11,069,086	754	11,181,746	1,449	22,250,832
75-79	368	4,721,415	435	5,603,643	803	10,325,058
80-84	163	1,694,483	219	2,012,553	382	3,707,036
85-89	67	637,682	118	1,035,178	185	1,672,860
90 & over	19	216,756	49	359,200	68	575,956
Total	4,051	\$ 71,515,212	4,392	\$ 67,704,444	8,443	\$ 139,219,656

Average Age 65.3
Average Annual Annuity \$16,489

State Employees' Retirement System
III. Age and Benefit Profile of Annuitants and Beneficiaries as of December 31, 2021

Beneficiaries and Survivor Annuitants

<u>Age</u>	<u>Male</u>		<u>Female</u>		<u>Total</u>	
	<u>Number</u>	<u>Annual Annuity</u>	<u>Number</u>	<u>Annual Annuity</u>	<u>Number</u>	<u>Annual Annuity</u>
Under 25	9	\$ 62,060	21	\$ 101,115	30	\$ 163,175
25-29	18	163,173	17	234,261	35	397,434
30-34	22	266,089	25	236,918	47	503,007
35-39	14	100,982	30	273,249	44	374,231
40-44	39	459,364	53	490,967	92	950,331
45-49	33	429,709	120	1,293,244	153	1,722,953
50-54	66	580,520	297	4,209,358	363	4,789,878
55-59	70	707,409	557	8,036,842	627	8,744,251
60-64	135	1,237,765	821	12,311,246	956	13,549,011
65-69	209	2,952,969	1,360	22,078,130	1,569	25,031,099
70-74	293	4,054,900	1,819	31,038,187	2,112	35,093,087
75-79	263	3,490,932	1,878	32,678,872	2,141	36,169,804
80-84	194	2,282,974	1,697	26,860,481	1,891	29,143,455
85-89	132	1,273,506	1,389	19,776,119	1,521	21,049,625
90 & over	85	799,219	1,258	14,155,218	1,343	14,954,437
Total	1,582	\$ 18,861,571	11,342	\$ 173,774,207	12,924	\$ 192,635,778

Average Age 74.7
Average Annual Annuity \$14,905

State Employees' Retirement System

Benefit and Contribution Provisions as of December 31, 2021 **(as embodied in Act 31 of 1974, and amended through Act 128 of 2020)**

The State Employees' Retirement System makes provision for retirement, disability, and death benefits for all State employees, except those specifically excluded under Section 5301 of the SERC, and certain other eligible groups. The major provisions are summarized as follows:

Eligible Employees

- Class A-5 - All eligible members hired after December 31, 2018, except exempt groups (State Police and all hazardous duty, et al.).
- Class A-6 - Same as Class A-5 but this class is for members who elect to pay a lower member contribution amount to the defined benefit plan and receive a lower defined benefit.
- DC Only - Same as Class A-5 but this class is for members who elect to only participate in the Defined Contribution Plan.
- Class A-3 - All eligible employees hired after December 31, 2010 but prior to January 1, 2019, except members of the judiciary. Certain groups have effective dates after December 31, 2010 that are tied to the expiration of collective bargaining agreements. Members of the General Assembly who joined SERS on or after December 1, 2010 are also part of this class. State Police and most hazardous duty hired after December 31, 2018 continue to be eligible.
- Class A-4 - Same as Class A-3 but this class is for members who elect to pay a higher member contribution amount and receive a higher benefit.
- Class AA - All eligible employees hired after June 30, 2001 but prior to January 1, 2011, except State Police Officers, members of the judiciary and legislators, and employees hired before July 1, 2001, who elected Class AA by December 31, 2001.
- Class A - State Police Officers hired on or after March 1, 1974 but prior to July 1, 2012, members of the judiciary who have not elected Class E-1 or E-2, legislators elected and became members before July 1, 2001, who have not elected Class AA or Class D-4 and Class A employees hired before July 1, 2001, who remained in Class A.
- Class D-4 - Legislators coming into service prior to December 1, 2010, who elect to be SERS members, and elected Class D-4.
- Class E-1 - Judges who elect Class E-1.
- Class E-2 - Magisterial District Judges who elect Class E-2.

State Employees' Retirement System

Benefit and Contribution Provisions as of December 31, 2021 (continued) **(as embodied in Act 31 of 1974, and amended through Act 128 of 2020)**

Age and Service Requirements for Superannuation (full formula benefits)

Class A-5 & Class A-6

General Conditions Age 67 with three years of credited state service; or a total attained age and whole years of credited service of 97 (the "Rule of 97") with credited service being at least 35 years.

Class A-3 & Class A-4

General Conditions Age 65 with three years of credited state service; or a total attained age and whole years of credited service of 92 (the "Rule of 92") with credited service being at least 35 years.

Legislators and certain correction officers and enforcement officers Age 55 with three years of credited state service.

Park Rangers & Capitol Police Age 55 with 20 years of Park Ranger or Capitol Police credited service. If total credited service is less than 20 years, General Conditions apply.

State Police Age 55. State Police are eligible for special unreduced benefits after 20 years of credited service, regardless of age; however, age 55 remains their superannuation age.

Class AA & Class A

General Conditions Age 60 with three years of credited state service; or 35 or more years of credited service, regardless of age.

Legislators and certain correction officers and enforcement officers Age 50 with three years of credited state service.

Park Rangers & Capitol Police Age 50 with 20 years of Park Ranger or Capitol Police credited service. If total credited service is less than 20 years, General Conditions apply.

State Police Age 50. State Police are eligible for special unreduced benefits after 20 years of credited service, regardless of age; however, age 50 remains their superannuation age.

Class D-4

Age 50 with three years of credited state service.

Class E-1 & Class E-2

Age 60 with three years of credited state service; or 35 or more years of credited service, regardless of age.

State Employees' Retirement System

Benefit and Contribution Provisions as of December 31, 2021 (continued) **(as embodied in Act 31 of 1974, and amended through Act 128 of 2020)**

Formula for Superannuation Annuity

The single life annuity applicable to members of Class AA and Class A-4 is equal to 2.5 percent of the high three-year final average salary (FAS) of the member multiplied by the years and fractions of credited service. The single life annuity applicable to members of Class A and Class A-3 is equal to two percent of the high three-year final average salary of the member multiplied by the years and fractions of credited service. The single life annuity applicable to members of Class A-5 is equal to 1.25 percent of the high five-year final average salary of the member multiplied by the years and fractions of credited service. The single life annuity applicable to members of Class A-6 is equal to one percent of the high five-year final average salary of the member multiplied by the years and fractions of credited service.

The single life annuity applicable to State Police is 50 percent of the highest full calendar year of compensation, other than the year in which the member retires, if the member has 20 but less than 25 years of service. With more than 25 years of service the benefit is 75 percent of the highest annual salary, other than the year in which the member retires.

The benefit accrual rates for other classes of members are as follows:

<u>Class</u>	<u>Benefit Accrual Rate</u>
D-4	3.0 percent
E-1	4.0 percent for each of the first 10 years of judicial service, dropping to 3.0 percent for each subsequent year of judicial service.
E-2	3.0 percent for each year of judicial service.

Members who have 41 or more years of combined Class A-3, A-4, A-5, A-6, A and AA service are entitled to a supplemental benefit ranging from two percent of the applicable single life annuity for members with 41 years of service to 10 percent of the applicable single life annuity for members with 45 or more years of service.

The benefit for a member who works past age 70 is at least equal to a benefit that is the actuarial equivalent of the prior year's benefit. This determination is made each year after age 70.

In addition to the above benefits, a member who has elected Social Security Integration Coverage is entitled to a single life annuity of two percent of the member's "Average Non-Covered Salary" for each year of Social Security Integration (SSI) coverage. All Class E members can elect SSI coverage. Other members must have elected SSI coverage before March, 1974. "Average Non-Covered Salary" is the average annual salary received while covered by the Retirement System since January 1, 1956 in excess of the maximum covered wages under Social Security.

State Employees' Retirement System

Benefit and Contribution Provisions as of December 31, 2021 (continued) **(as embodied in Act 31 of 1974, and amended through Act 128 of 2020)**

Limitations on Annuity

In almost all cases, SERS benefits are limited to no more than 100 percent of compensation. An exception to this limit is the actuarial increase portion of the benefit for certain members eligible for actuarial increases due to retirement beyond age 70. For such members, the 100 percent of salary limit only applies to the base benefit. Also, the amount of annual retirement benefit a member may receive shall not exceed the dollar limit specified under Section 415(b) of the Internal Revenue Code. Benefits in excess of the 415(b) limit are paid through the Benefits Completion Plan.

Age and Service Requirements for Disability Retirement

A member is eligible for disability retirement, if, as determined by a member of the SERS medical review staff, he or she is unable to perform their current job and has at least five years of credited service. An officer of the State Police or an enforcement officer does not have a minimum service requirement.

Formula for Disability Benefit

The disability benefit is equal to the unreduced benefit calculated as of superannuation age, based on years of credited service at disability, if the result is greater than or equal to 33-1/3 percent of FAS at time of disability. If the benefit so calculated is less than 33-1/3 percent of FAS, the disability benefit is equal to the smaller of:

- (a) the benefit calculated as of superannuation age based on service projected to retirement date, or
- (b) 33-1/3 percent of FAS at time of disability.

For service connected disabilities, the disability benefit payable will be increased, as needed, so that the sum of the plan benefit and the benefits paid or payable under the Workers' Compensation Act, The Pennsylvania Occupational Disease Act, and the Social Security Act equals 70 percent of FAS.

Eligibility for Vested Benefit

All Class A-3, A-4, A-5, and A-6 members have a vested entitlement to an annuity after 10 years of credited service. All other classes are vested after five years of credited service.

Vested Benefit

The vested benefit is equal to the benefit calculated using years of credited service at the time of leaving the plan. The former member can receive the full benefit beginning at superannuation age, or an actuarially reduced withdrawal annuity beginning at any date after separation but before superannuation age.

State Employees' Retirement System

Benefit and Contribution Provisions as of December 31, 2021 (continued) **(as embodied in Act 31 of 1974, and amended through Act 128 of 2020)**

For those not in Classes A-3, A-4, A-5, or A-6, the withdrawal annuity is reduced from the earlier of age 60, or the age at which the member would have 35 years of credited service. Benefits for Park Rangers and Capitol Police who have 20 years of credited service (as Park Rangers and Capitol Police) are reduced from age 50. Benefits for other members who have an age 50 superannuation age are reduced from age 50 irrespective of the amount of credited service they have.

For Classes A-3 and A-4, the withdrawal annuity is reduced from age 65. If prior to age 65 the member has both reached 35 years of credited service and met the conditions of the Rule of 92, then the member is eligible for unreduced benefits. Benefits for Park Rangers and Capitol Police who have 20 years of credited service (as Park Rangers and Capitol Police) are reduced from age 55. Benefits for other members who have an age 55 superannuation age are reduced from age 55 irrespective of the amount of credited service they have. For Classes A-5 and A-6, the withdrawal annuity is reduced from age 67. If prior to age 67 the member has both reached 35 years of credited service and met the conditions of the Rule of 97, then the member is eligible for unreduced benefits.

Eligibility for Death Benefit Prior to Retirement

A member is eligible if the member (1) is under superannuation age with five years (or 10 years under Classes A-3, A-4, A-5, and A-6) of credited service or (2) has attained superannuation age with three years of credited state service.

Amount of Death Benefit Prior to Retirement

An eligible beneficiary receives the full present value of the benefits to which the member would have been entitled had the member retired the day before he or she died and elected Option 1. This death benefit includes the present value associated with benefits, if any, to which the member may not have been entitled because they exceeded the member's highest consecutive twelve months of salary and are limited by appropriate IRS limitations.

Death Benefits After Retirement

A member who elects the maximum single life annuity is entitled to a refund of the unpaid balance of the accumulated member contributions and interest at the time of retirement in excess of annuity payments received. A member may elect one of several optional reduced pensions in lieu of the maximum single life annuity to provide additional death benefit protection. The optional forms of benefit are actuarially equivalent to the maximum single life annuity benefit using 4.0 percent interest per annum compounded annually, and the actuarial equivalence factors described below, except that for a Class A-3, A-4, A-5, or A-6 member who elects to receive a lump sum withdrawal of contributions and interest and an optional form of benefit payment, the reduction in the maximum single life annuity is based upon an interest rate equal to the assumed rate of investment return at the time of retirement, compounded annually.

State Employees' Retirement System

Benefit and Contribution Provisions as of December 31, 2021 (continued) (as embodied in Act 31 of 1974, and amended through Act 128 of 2020)

The beneficiary of a disabled member who did not elect an alternative option receives benefits determined under Maximum Disability. Maximum Disability provides that the beneficiary will receive a benefit equal to the present value of the maximum single life annuity at retirement reduced by any payments received by the annuitant. The Maximum Disability benefit is provided to a disabled member without any reduction in the member's benefit.

A Supplemental Death Benefit is payable to a beneficiary of a member who had a retirement benefit limited by 100 percent of final compensation. The Supplemental Death Benefit is the present value of the excess of the retirement benefit payable to the member before applying the 100 percent of final compensation limit, over the 100 percent of final compensation limit, subject to limits imposed by IRC Section 401(a)(9). If the benefit payable to the member is larger than the IRC Section 415(b) limit, the part of the Supplemental Death Benefit in excess of the IRC Section 415(b) limit will be payable from the Benefits Completion Plan. The Supplemental Death Benefit payment is in addition to any death benefit that may be paid as a result of the optional election.

The "Extra Piece"

The SERC provides for an "extra piece" to be added to the annual benefit if the member's accumulated deductions exceed one-half of the actuarially equivalent value of the annual benefit. The extra piece is equal to the difference between the total accumulated deductions and one-half of the actuarially equivalent value of the annual benefit. This provision does not apply to Classes A-3, A-4, A-5, and A-6.

Cost-of-Living Allowances (COLAs)

Supplemental annuities applying cost-of-living increases to the benefits of annuitants have been instituted from time to time. The last cost-of-living increase was a two-stage increase under Act 2002-38. The first stage was applicable to annuitants who retired on or before July 1, 1990, and it became effective in July of 2002. The second stage provided cost-of-living increases to annuitants who retired after July 1, 1990, but prior to July 2, 2002, and it became effective in July of 2003.

Rate of Member Contribution

(i) Regular member contributions, excluding Social Security Integration contributions

<u>Class A-5</u> -	5.00 percent of total compensation
<u>Class A-6</u> -	4.00 percent
<u>Class A-3</u> -	6.25 percent
<u>Class A-4</u> -	9.30 percent
<u>Class AA</u> -	6.25 percent
<u>Class A</u> -	5.00 percent
<u>Class D-4</u> -	7.50 percent
<u>Class E-1</u> -	10.00 percent during the first 10 years of Class E1 judicial service and 7.50 percent thereafter.
<u>Class E-2</u> -	7.50 percent

State Employees' Retirement System

Benefit and Contribution Provisions as of December 31, 2021 (continued) **(as embodied in Act 31 of 1974, and amended through Act 128 of 2020)**

(ii) **Additional contribution for Social Security Integration Credit**

Any member who elects the Social Security Integration Credit pays 5.00 percent of any salary in excess of the amount of salary covered by Social Security during the year for which contributions are being made. A member electing to end additional contributions is ineligible to make future contributions or accrue future benefits.

Interest Credited on Member Contributions

A rate of four percent compounded annually, the statutory rate of interest, has been credited on the member contributions since the inception of the system.

Refund of Accumulated Member Contributions

On the death of a member not qualifying for death benefits, the accumulated member contributions and interest will be paid to the beneficiary. Upon application, a member terminating service when not eligible for another form of benefit is paid a refund of the accumulated contributions and interest. Other terminating members may elect to receive a lump sum payment of a portion of the present value of their benefit, not to exceed their accumulated contributions and interest under Option 4 as part of the members' option. Their lump sum payment results in a decrease to the annuity benefit otherwise payable. Under Act 120, Classes A-3 and A-4 were not eligible to receive a lump sum and reduced annuity under Option 4. However, Act 5 added a lump sum feature for Classes A-3, A-4, A-5, and A-6 that provided for cost neutral (based on funding interest assumption) lump sums and reduced annuities under Option 4.

Employer Contributions

The employer pays the balance of the cost in excess of the members' contributions with payment schedules determined by law. Act 2017-5 made changes to the SERS plan design and funding rules which have significantly affected the required employer contributions. See Sections III and IV of Schedule P for the details.

Actuarial Equivalence

The actuarial table used to determine optional and early retirement benefits for members who entered service after August 1983 is the 1983 Group Annuity Mortality (1983 GAM) Unisex table.

State Employees' Retirement System

Benefit and Contribution Provisions as of December 31, 2021 (continued) **(as embodied in Act 31 of 1974, and amended through Act 128 of 2020)**

Members who entered service before August 1983 receive the better of benefits based on the 1983 GAM table or a variation of the 1971 Group Annuity Mortality (1971 GAM) male table. The 1971 GAM table that applies in determining the benefits for members who entered service before August 1, 1983 is:

For service before August, 1983:

Males (members or survivors) – 1971 GAM for males

Females (members or survivors) – 1971 GAM for males, set back 6 years

For service after August, 1983:

Members (male or female) – 1971 GAM for males, set back 6 years

Survivors (male or female) – 1971 GAM for males

Military Service

Act 2012-181, effective December 31, 2012, brought SERS into compliance with the federal Heroes Earnings Assistance and Relief Tax Act of 2008 (HEART Act) and Uniformed Services Employment and Reemployment Rights Act of 1994 (USERRA) for State employees who go on military leave, and revised the purchase price formula for nonintervening military service for members seeking to purchase nonstate service credit for military service that does not qualify for USERRA benefits or that was performed before becoming a State employee. The primary impacts of Act 181 are:

- (i) Employees who return from USERRA qualified military leave receive vesting credit, even though they do not make member contributions to purchase credited service for the military leave.
- (ii) Employees who return from USERRA qualified military leave may make the member contributions that they would have made had they not gone on military leave and if they do so will be treated as if they remained in active State service for that time.
- (iii) Employees who die on military leave receive all SERS benefits that they would have received, except benefit accruals, as if they had returned to State service the day before their death.
- (iv) The Pennsylvania Military and Veterans Code provisions allowing State employees on military leave to continue to make member contributions and remain active members of SERS while on military leave have been repealed.

State Employees' Retirement System

Benefit and Contribution Provisions as of December 31, 2021 (continued) **(as embodied in Act 31 of 1974, and amended through Act 128 of 2020)**

- (v) The purchase price for nonintervening military service for Class A-3 and Class A-4 members has been revised from the full actuarial value formula established in Act 2010-120 to the formula used by State employees who are members of the other classes of service, which is based on employee and employer normal contribution rates and the employees' compensation.

Given the past approach to funding the impact of military service-related events among SERS members, and considering the overall changes in benefits related to military service and military leave resulting from Act 181, it was determined that Act 181 had no material impact on the future actuarial funding of SERS and thus did not produce a cost added by legislated benefit improvements that needed to be reflected in the final contribution rate.

Compliance With Federal and State Laws

Act 2015-93, signed into law in December of 2015, instituted several technical, tax-related requirements for SERS in an effort to maintain the SERC's compliance with federal and state laws, including the Internal Revenue Code. Many of these technical changes were transparent to SERS members, and most of the other changes affected only a few State employees.

These changes included:

- Retiree return to service rules, allowing annuitants to return to active service in limited circumstances, were structured to satisfy federal requirements
- Minimum vesting standards were established in the event the SERS pension plan is closed
- Benefit limits for higher salaried or longer service employees and the handling of pickup contributions
- Maximum contribution and minimum distribution rules, and death benefit parameters
- Coordination of retirement benefits between SERS and PSERS to ensure that any combined benefit does not exceed the IRS maximum distribution limit

SERS' actuaries have determined that Act 2015-93 had no material impact on the future actuarial funding of SERS, and thus did not produce a cost added by legislated benefit improvements that needed to be reflected in the final contribution rate.

State Employees' Retirement System

Actuarial Assumptions

This schedule shows the actuarial assumptions used for the valuation. These assumptions were adopted by the Board in July of 2020 based upon a review of SERS experience from 2015 through 2019. Regarding economic assumptions, the Board maintained the annual investment return assumption at 7.00% and the inflation assumption at 2.50% during its 2021 review. To ensure that the investment return assumption remains appropriate for every actuarial valuation, it is reviewed annually by the SERS actuaries and Board.

Schedule O contains an extract of the full set of rates used in the valuation. The full set of rates is in the July 29, 2020 report, *Commonwealth of Pennsylvania State Employees' Retirement System 19th Investigation of Actuarial Experience – January 1, 2015 to December 31, 2019*, which can be referenced on the SERS website. The rates are the probabilities that an event will occur in the year after the valuation and are all assumed to occur at the beginning of the year. For example, the male retirement rate of 20.0 percent at age 60 means that 200 of every 1,000 male employees age 60 and who are eligible for full benefits are expected to retire at the date of the valuation.

Interest Rate (Investment Return): 7.00 percent compounded annually. The assumed interest rate of 7.00 percent is the investment return less investment expenses.

Inflation Rate: 2.50 percent compounded annually.

Mortality After Retirement:

Male Non-disabled Retirees, Beneficiaries and Survivors: PubG-2010 Male Retiree Mortality Table, with post-2010 mortality improvement based on Scale MP-2019 for Males

Female Non-disabled Retirees, Beneficiaries and Survivors: PubG-2010 Female Retiree Mortality Table, set forward 1 year, with post-2010 mortality improvement based on Scale MP-2019 for Females

Male Disabled Retirees: PubNS-2010 Male Disabled Retiree Mortality Table, set forward 2 years, with post-2010 mortality improvement based on Scale MP-2019 for Males

Female Disabled Retirees: PubNS-2010 Female Disabled Retiree Mortality Table, set forward 2 years, with post-2010 mortality improvement based on Scale MP-2019 for Females

Spouse Age Difference: Females are assumed to be 2 years younger than males.

State Employees' Retirement System

Actuarial Assumptions (continued)

Demographic Assumptions for General Employees while Active Members

Rates of Separation for Eligibility for Full Unreduced Benefits
(35 years of credited service under age 60; 3 years of credited service over age 60)

Representative Rates of Separation for Eligibility for Full Unreduced Benefits		
Age	Male	Female
53-54	15.0%	23.0%
55-57	20.0	23.0
58	25.0	23.0
59	25.0	28.0
60	20.0	23.0
61 – 64	20.0	20.0
65 – 67	26.0	26.0
68 – 70	23.0	23.0
71 – 79	20.0	20.0
80	100.0	100.0

Rates of Separation for Eligibility for Reduced Benefits
(only apply to members not eligible for full unreduced benefits)

Representative Rates of Separation for Eligibility for Reduced Benefits				
Age	5 – 14 Years of Credited Service		15 or More Years of Credited Service	
	Male	Female	Male	Female
25	2.2%	4.0%	N/A	N/A
30	2.2	2.0	N/A	N/A
35	1.3	2.0	0.8%	1.4%
40	1.0	1.4	0.6	1.3
45	1.0	1.4	0.6	1.3
50	1.0	1.4	1.1	1.6
55	2.0	2.3	5.0	4.5

State Employees' Retirement System

Actuarial Assumptions (continued)

Rates of Separation Due to Withdrawal

It is assumed that the benefit will be reduced from age 58 for general members (to factor 35 years of service before age 60) and from age 50 for members eligible for age 50 retirement.

Representative Rates of Separation Due to Withdrawal								
Age	Male				Female			
	Years of Credited Service				Years of Credited Service			
	0	5	9	14	0	5	9	14
20	30.0%	N/A	N/A	N/A	40.0%	N/A	N/A	N/A
25	21.0	6.1%	3.0%	N/A	24.8	8.5%	2.4%	N/A
30	18.5	6.1	3.0	1.9%	21.3	7.7	2.3	2.9%
35	18.5	4.9	1.6	1.9	16.6	4.5	2.4	2.1
40	18.2	3.4	2.8	1.9	14.8	4.5	2.3	1.6
45	17.4	3.4	1.6	0.6	17.8	4.3	1.1	1.6
50	19.1	3.1	1.6	0.6	15.8	4.3	1.8	1.6
55	19.1	2.6	0.8	0.4	15.8	4.0	1.3	1.0

Rates of Separation Due to Death and Disability

(Disability rates only apply to members not eligible for full retirement)

Representative Rates of Separation Due to Death and Disability				
Age	Death		Disability	
	Male	Female	Male	Female
20	0.06%	0.03%	N/A	N/A
25	0.06	0.03	0.01%	0.02%
30	0.07	0.03	0.03	0.05
35	0.08	0.04	0.06	0.08
40	0.11	0.05	0.09	0.16
45	0.14	0.08	0.20	0.26
50	0.20	0.11	0.33	0.40
55	0.25	0.12	0.44	0.50
60	0.29	0.19	N/A	N/A

State Employees' Retirement System

Actuarial Assumptions (continued)

For Special Benefit Classes if Different from General Employee Rates:

Rates of Separation Due to Withdrawal			
Years of Service	State Police/ Hazardous Duty	Legislators	Judicial Officers
0	9.0%	4.0%	3.0%
1	5.0	4.0	3.0
2	3.0	4.0	0.4
3	3.0	4.0	0.4
4	2.0	4.0	0.4
5	2.0	4.0	0.4
6	1.0	4.0	0.4
7	0.6	4.0	0.4
8	0.6	4.0	0.4
9	0.6	4.0	0.4
10+	0.3	4.0	0.4

Rates of Separation Due to Early Retirement at Any Age		
State Police/ Hazardous Duty	Legislators	Judicial Officers
1.5%	2.9%	1.0%

Representative Rates of Separation Due to Retirement other than State Police with 19 or More Years of Credited Service			
Age	State Police/ Hazardous Duty	Legislators	Judicial Officers
50	15.0%	7.0%	5.0%
55	12.0	7.0	5.0
60	16.0	7.0	5.0
65	23.0	11.0	10.0
70	20.0	9.0	25.0
75	20.0	9.0	100.0
80	100.0	9.0	100.0

State Employees' Retirement System

Actuarial Assumptions (continued)

Rates of Separation due to Retirement for State Police with 19* or More Years of Credited Service			
Years of Service	Rate	Years of Service	Rate
19* – 23	7.5%	30	25.0%
24*	60.0	31 – 35	25.0
25	60.0	36 – 39	40.0
26 – 29	25.0	40+	100.0

* State Police with 19 and 24 years of service at the beginning of the year are assumed to retire at the point they reach 20 and 25 years respectively during the year and to receive the FOP award.

Years of Service Purchased by Eligible Members

Service	Number of Years Purchased
0	0.08
1	0.06
2	0.04
3	0.02
4+	0.0

It is assumed that the member will elect to pay for the reduction through an actuarial debt and that all purchased service is a two percent accrual.

Form of Payment: Members are assumed to elect the maximum benefit 33 percent of the time, some form of joint and survivor annuity 26 percent of the time, and some form of guaranteed present value (including joint and survivor with a guaranteed present value) 41 percent of the time. Also, 70 percent of members are assumed to elect a full Option 4 withdrawal of contributions and interest.

Career Salary Increases

The career salary scale shown on the following page includes average increases in the employee salary due to promotions and longevity growth. The average career salary growth is generally 1.8 percent per year.

State Employees' Retirement System

Actuarial Assumptions (continued)

In addition, it is assumed that the salary schedules will increase by 2.8 percent per year. The scale below does not include the assumed 2.8 percent general salary increase.

Career Salary Scale for Members			
Years of Credited Service	Annual Increase	Years of Credited Service	Annual Increase
1	4.15%	16	1.25%
2	3.25	17	1.20
3	2.90	18	1.15
4	2.70	19	1.15
5	2.50	20	1.10
6	2.35	21	1.00
7	2.15	22	0.95
8	2.10	23	0.90
9	2.00	24	0.85
10	1.60	25	0.80
11	1.55	26	0.70
12	1.45	27	0.60
13	1.40	28	0.50
14	1.35	29	0.50
15	1.30	30+	0.50

The above scale does not apply to members in Classes D and E. It is assumed that only the general salary increase (2.8 percent per year) would apply to members in these classes.

State Employees' Retirement System

Actuarial Assumptions (continued)

Class A-3 and A-4 Assumptions

The tables below are the early and superannuation retirement rates applicable to Class A-3 and A-4 members.

Early Retirement Rates for Class A-3 and Class A-4 Active Employees with 10 or more Years of Service	
Age	Rate
35	1.5%
40	1.5
45	1.5
50	2.0
55	5.5
60	5.5
61	6.0
62	20.0
63	10.0
64	15.0
65	N/A

Superannuation Retirement Rates for Class A-3 and Class A-4 Employees	
Age	Rate
55	15.0%
56	16.0
57	17.0
58	18.0
59	19.0
60	20.0
61	20.0
62	25.0
63	20.0
64	20.0
65	25.0
66 to 79	20.0
80	100.0

State Employees' Retirement System

Actuarial Assumptions (continued)

Class A-5 and A-6 Assumptions

The tables below are the early and superannuation retirement rates applicable to Class A-5 and A-6 members.

Early Retirement Rates for Class A-5 and Class A-6 Active Employees with 10 or more Years of Service	
Age	Rate
35	1.5%
40	1.5
45	1.5
50	2.0
55	5.5
60	5.5
61	6.0
62	8.0
63	10.0
64	10.0
65	15.0
66	20.0
67	N/A

Superannuation Retirement Rates for Class A-5 and Class A-6 Employees	
Age	Rate
55	15.0%
56	16.0
57	17.0
58	18.0
59	19.0
60	20.0
61	20.0
62	25.0
63	20.0
64	20.0
65	25.0
66 to 79	20.0
80	100.0

State Employees' Retirement System

Actuarial Methods

I. Asset Valuation

The actuarial value of assets is developed by recognizing the difference between the expected actuarial value of assets and the market value of assets over a five-year period. The expected actuarial value is last year's actuarial value brought forward to reflect actual contributions, benefit payments and expenses, and assumed investment income. Each year, 20 percent of the difference between this expected value and the market value is recognized in determining the current actuarial value of assets with the remaining 80 percent to be recognized over the next four years.

II. Funding Method

The State Employees' Retirement System's funding policy provides that the actuary determine employer contribution rates that will amortize liabilities over a ten-year or 30-year period beginning with the July following the measurement of the liability. See Section III below for details regarding the specific liabilities subject to amortization and the applicable amortization periods. This policy assures that SERS is appropriately funded and also that the fund will accumulate sufficient assets to pay benefits when they are due. The policy is set by the State Employees' Retirement Board in conformance with specific legal requirements as to the method of funding.

Effective with the December 31, 2021 valuation, the traditional Entry-Age Actuarial Cost Method is used to determine the liabilities and costs related to all SERS' benefits including retirement, withdrawal, death and disability benefits.

III. Determination of the Annual Contribution

The annual employer contribution is equal to the sum of the following:

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

State Employees' Retirement System

Actuarial Methods (continued)

The amortization payments are level amounts over the remaining applicable amortization period. The employer cost is determined as a percent of compensation, and the employer contributes that percent of the compensation of all covered members during each fiscal year. The employer contribution level for fiscal year 2022/2023 is the total of (1) the employer normal cost percent and (2) the net amortization payment for fiscal year 2022/2023 divided by the projected covered compensation for the fiscal year and (3) the extra contribution to return Act 5 savings.

Act 2017-5 introduced an extra contribution to return the projected savings generated by the legislative changes. These extra contributions are statutory amounts, expressed as a percentage of all SERS covered compensation, that are payable for 13 fiscal years starting July 1, 2019 and ending June 30, 2042. The following table shows the required extra contribution rates:

Extra Contribution to Return Act 5 Savings	
Fiscal Years	Extra Contribution Rates
2020	0.71%
2021	0.66
2022	0.62
2023-2032	0.00
2033	0.10
2034	0.22
2035	0.33
2036	0.43
2037	0.53
2038	0.62
2039	0.71
2040	0.79
2041	0.86
2042	0.93
2043+	0.00

The 2022/2023 employer contribution rate is 34.10 percent. The contribution collars from Act 120 no longer apply. Hereafter, contributions are subject to a minimum employer contribution rate equal to the employer normal cost percent.

The assumptions used in determining the actuarial cost are stated in Schedule O, and the employer cost, as a percent of covered compensation, is determined in Schedules A and B. The assumptions used for the current valuation were based upon an evaluation of SERS experience from 2015 through 2019, and they were adopted by the SERS Board in July 2020.

State Employees' Retirement System

Actuarial Methods (continued)

The annual investment return assumption is 7.0 percent compounded annually. Salary growth is the total of assumed increases in salary rates and career salary growth. It is generally assumed that the total payroll will increase at 2.8 percent per year and that employee career salary growth (promotion and longevity growth) will average an additional 1.78 percent per year. Therefore, the average total salary growth for an individual will generally be 4.58 (2.8 plus 1.78) percent per year. The investment return and the salary rate increase assumptions are based on an assumed underlying inflation of 2.50 percent per year.

All costs and liabilities have been determined in conformance with generally accepted actuarial principles and procedures in accordance with the principles of practice prescribed by the Actuarial Standards Board of the American Academy of Actuaries. The calculations were performed on the basis of actuarial assumptions and methods which are reasonable (taking into account the past experience of SERS and reasonable expectations) and which represent our best estimate of anticipated experience under the plan.

IV. Allocation of the Annual Contribution Among Employer Groups

The annual employer contribution (total employer cost) is expressed as a percentage of the total projected covered compensation for active members. This amount is reflected on Schedule B, line IV, and is referred to as the total employer cost. The total employer cost is the average contribution amount that needs to be received from the employer groups participating in the system. Therefore, some employer groups contribute a higher percent of compensation, and some employer groups contribute a lower percent of compensation.

Schedule C develops the contribution rate for each of the employer groups. The allocation method used to determine the employer rate takes into consideration the cost of additional benefits for special classes of members. For example, the contribution rate for Class E members takes into consideration the additional accrual rate those members receive at retirement. The Normal Cost Rate is determined based on the active members of each group and represents the cost of benefits accruing during the year. The Base Contribution Rate (column 3 on Schedule C) is determined as the percentage needed to produce employer contribution amounts by class that, when added together, equal the annual payment required to fund the Amortization Liability.

The following is an explanation of the elements of Schedule C.

Column (1) is the employer group.

Column (2) is the Normal Cost Rate. The Normal Cost Rate is the amount needed to fund the cost of benefits accruing during the year and is determined separately for each active member in each group.

State Employees' Retirement System

Actuarial Methods (continued)

Column (3) is the Base Contribution Rate. The Base Contribution Rate is the amount needed to fund the annual payment of the amortization liability. The Base Contribution Rate also includes (initially) the employer contribution to the Defined Contribution (DC) Plan; however, the adjustment applied in Column (5) (ultimately) deducts the DC Plan rate.

Column (4) is the multiplier adjustment to the Base Contribution Rate, which is applicable to members in classes that receive a different percent accrual rate than the accrual rate for Class A-5 and A-6 members. The base annual payment on the amortization liability is determined for a blended group of members who would receive the 1.25 percent or 1.0 percent single life annuities set by Act 5 (for Classes A-5 and A-6, respectively). For example, members in Class AA receive an annuity equal to 2.0 times the Class A-5 single life annuity and 2.5 times the Class A-6 single life annuity (which blends to 2.02 based on the expected Class elections). The multiplier adjustment (Column (4)) for Class AA is 1.8819, which consists of the initial 2.02 multiplier adjusted (net downward) for various differences between Classes A-5 and A-6 versus Class AA, including: the Defined Contribution Plan component of Classes A-5 and A-6, differences in the applicable superannuation ages and differences in the handling of the cost of Option 4 withdrawals. There currently are no multiplier adjustments less than the 1.0.

Column (5) is an adjustment for either the employer contribution to the Defined Contribution Plan or the past-service liability component for certain employee groups. For new entrants in Classes A-5 and A-6 or the DC Only Plan, the total employer contribution for each of these groups is intended to be the same (except for the DC Only Plan which does not make a BCP Plan contribution). The adjustment for each of these three employee groups backs out the Defined Contribution Plan contribution so that only the net Defined Benefit Plan contribution remains.

Column (5) also adjusts for employee groups who were granted benefit improvements that were retroactive at the date of passage. Upon establishment of a benefit improvement it was determined by the Board that the employers of the individual employee group, not the Commonwealth, would fund the benefit improvement.

At implementation of the new benefit provision, a liability is established for the members who are eligible for the new benefit provisions, and a schedule is determined to pay off the increase in liability. For example, Park Rangers and Capitol Police Officers were formerly covered under the age 60 retirement provisions. Effective with the valuation at December 31, 1992, Park Rangers and Capitol Police Officers became eligible to retire at age 50 upon attaining 20 years of service (as Park Rangers and Capitol Police Officers). At that valuation, a liability was established that would fund the increase in benefits.

State Employees' Retirement System

Actuarial Methods (continued)

The liability for the increase in benefits for past service is paid off in equal installments by the employers of the member group. Each year, the annual contribution as a percent of payroll is determined as the annual payment divided by the funding payroll for the group. The outstanding balance is carried forward with interest each year.

The following table shows the payment schedule for the two groups of employees who have a past service liability.

Amortization Schedule for Past Liabilities		
Employer Group	Payment	Last Payment (fiscal year beginning)
State Police	\$17,161,221	July 2029
Park Rangers / Capitol Police	\$85,542	July 2027

Column (6) is the adjusted contribution rate and is equal to column (2) plus column (3), multiplied by column (4). Column (5) is added.

Column (7) is the projected compensation for the class of employees. The projected compensation is for the fiscal year to which the contribution rate is applicable.

Column (8) is the dollar amount of the employer group contribution. The sum of the dollar amounts for each group is (approximately) equal to the total employer contribution (as a percent of covered compensation) multiplied by the total projected covered compensation for the active members.

V. Plan Provisions Not Valued

The cost effect of two plan provisions was not included in this valuation because the effect of the provisions is minimal. These are the limit on the amount of retirement benefit imposed by Section 5702(c) (100 percent limit) and the supplemental death benefit payable when the retirement benefit is limited by Section 5702(c).

These two provisions are not valued because they only apply to very few SERS members. Since by definition the liability for the supplemental death benefit is lower than the reduction in liability for the 100 percent limit, the net effect of not including these provisions in the actuarial valuation is a minimal overstatement in the total employer cost.

VI. Determination of Present Value of Benefits for Inactive and Vested Members

The present value of benefits for inactive members not currently receiving benefits is determined using the same methods and procedures as for active members. They are valued using the final average compensation and service as of separation and are assumed to begin receiving benefits in accordance with the active employee assumptions.

State Employees' Retirement System

Actuarial Methods (continued)

VII. Actuarial Model Utilized for This Actuarial Valuation

The valuation results were produced using a proprietary actuarial valuation system, Pension Valuation Language (PVL). PVL has been actively used for over 40 years to perform annual funding/accounting valuations, gain and loss analyses, and cost studies for a wide variety of retirement systems. PVL was created specifically to value pension plan liabilities and uses the applicable assumptions and methods along with the pension plan census data to produce appropriate results. Test lives are generated to review the accuracy of both the input and output, allowing the users to confirm with a high degree of accuracy how the programmed benefit is applied to an individual along with the proposed decrements and other assumptions. The actuarial team loads the participant data, programs the benefit provisions, enters the applicable assumptions into the model, and reviews sample life output and results under the supervision of a credentialed actuary or actuaries who are proficient users of the software. We are not aware of any material limitations in the model nor any material inconsistencies in the assumptions used within the model.

State Employees' Retirement System

Advance Payments of Unfunded Liability Contributions by SERS Employers

In November of 2019, House Bill 1982 was signed into law as Act 2019-105. This law allows eligible employers to enter into an agreement with the SERS Board to make a one-time lump sum payment of 75% to 100% of their respective unfunded liability. Agreements must be entered into by December 31, 2024 with lump sum payments being made no later than May 1, 2025.

Any SERS employer prepaying its unfunded liability will continue to fund future changes in its portion of the overall unfunded liability. The types of future changes the prepaying employer will be responsible for funding include investment gains or losses, actuarial assumption changes, actual experience differing from expected experience, legislative changes, plus any other changes affecting the unfunded liability.

There are mutual advantages/benefits for SERS and any employer seeking to make an advance payment, including:

1. The advance funding would immediately be reflected as a reduction, or potential elimination, of the employer's allocated share of the unfunded liability, reducing future contributions required by the employer,
2. The arrangement would not directly increase nor decrease the expected contributions required of other employers,
3. The arrangement would be reasonably consistent with current plan practices, and
4. The arrangement would be transparent and not too difficult to administer.

It is important to note that the additional contribution is not expected to directly increase nor decrease the contributions required by other SERS employers. To accomplish this we introduced an amortization liability (see Schedule B) that establishes the total unfunded liability amortization cost with the present value of any setoff schedule netted out. Effectively, this produces a total cost as if no advance payment(s) had been made. Any employer making an advance payment will then receive a credit toward their contribution that is prorated over the fiscal year.

The Pennsylvania State University (PSU) made an advance payment of \$1,061,000,000 to SERS in 2020 and the Pennsylvania State System of Higher Education (PASSHE) made an advance payment of \$825,000,000 in 2021. The advance payment resulted in a fixed setoff schedule. The setoff schedule and the present value of the setoffs (used to determine the amortization liability) are shown on the following page.

State Employees' Retirement System

Advance Payments of Unfunded Liability Contributions by SERS Employers (continued)

Combined Setoff Schedule Applicable to PSU and PASSHE

Fiscal Year Beginning July 1	FY Setoff Amount	Setoff Used	Remaining Setoff	End of Calendar Year	Present Value of Setoffs
2020	\$93,258,976	\$93,258,976	\$0	2020	\$1,070,426,371
2021	173,198,531	97,016,962	76,181,569	2021	1,864,920,767
2022	173,198,531	-	173,198,531	2022	1,827,266,389
2023	173,198,531	-	173,198,531	2023	1,776,016,230
2024	173,198,531	-	173,198,531	2024	1,721,178,560
2025	173,198,531	-	173,198,531	2025	1,662,502,253
2026	173,198,531	-	173,198,531	2026	1,599,718,604
2027	173,198,531	-	173,198,531	2027	1,532,540,101
2028	173,198,531	-	173,198,531	2028	1,460,659,102
2029	173,198,531	-	173,198,531	2029	1,383,746,433
2030	173,198,531	-	173,198,531	2030	1,301,449,877
2031	162,686,397	-	162,686,397	2031	1,218,736,786
2032	162,686,397	-	162,686,397	2032	1,135,763,443
2033	162,686,397	-	162,686,397	2033	1,046,981,965
2034	162,686,397	-	162,686,397	2034	951,985,785
2035	162,686,397	-	162,686,397	2035	850,339,871
2036	162,686,397	-	162,686,397	2036	741,578,744
2037	145,517,516	-	145,517,516	2037	633,932,760
2038	145,517,516	-	145,517,516	2038	527,782,848
2039	145,517,516	-	145,517,516	2039	414,202,442
2040	124,811,611	-	124,811,611	2040	303,198,004
2041	79,058,063	-	79,058,063	2041	218,575,588
2042	50,635,882	-	50,635,882	2042	166,546,639
2043	38,675,762	-	38,675,762	2043	131,906,850
2044	36,357,423	-	36,357,423	2044	102,312,232
2045	33,112,940	-	33,112,940	2045	73,514,949
2046	22,876,213	-	22,876,213	2046	49,612,751
2047	17,903,561	-	17,903,561	2047	31,950,220
2048	17,731,077	-	17,731,077	2048	15,754,749
2049	5,019,376	-	5,019,376	2049	4,978,779
2050	2,686,967	-	2,686,967	2050	1,320,950
2051	-	-	-	2051	-

State Employees' Retirement System

Advance Payments of Unfunded Liability Contributions by SERS Employers (continued)

Setoff Schedule Applicable to PSU - Resulting From 2020 Advance Payment

Fiscal Year Beginning July 1	FY Setoff Amount	Setoff Used	Remaining Setoff	End of Calendar Year	Present Value of Setoffs
2020	\$93,258,976	\$93,258,976	\$0	2020	\$1,070,426,371
2021	93,258,976	51,153,379	42,105,597	2021	1,048,291,627
2022	93,258,976	-	93,258,976	2022	1,029,963,122
2023	93,258,976	-	93,258,976	2023	1,005,592,247
2024	93,258,976	-	93,258,976	2024	979,515,410
2025	93,258,976	-	93,258,976	2025	951,613,195
2026	93,258,976	-	93,258,976	2026	921,757,825
2027	93,258,976	-	93,258,976	2027	889,812,579
2028	93,258,976	-	93,258,976	2028	855,631,165
2029	93,258,976	-	93,258,976	2029	819,057,053
2030	93,258,976	-	93,258,976	2030	779,922,752
2031	93,258,976	-	93,258,976	2031	738,049,051
2032	93,258,976	-	93,258,976	2032	693,244,191
2033	93,258,976	-	93,258,976	2033	645,302,990
2034	93,258,976	-	93,258,976	2034	594,005,906
2035	93,258,976	-	93,258,976	2035	539,118,025
2036	93,258,976	-	93,258,976	2036	480,387,993
2037	93,258,976	-	93,258,976	2037	417,546,859
2038	93,258,976	-	93,258,976	2038	350,306,845
2039	93,258,976	-	93,258,976	2039	278,360,030
2040	72,553,071	-	72,553,071	2040	211,903,535
2041	57,057,036	-	57,057,036	2041	159,564,915
2042	38,542,164	-	38,542,164	2042	121,126,627
2043	26,582,044	-	26,582,044	2043	95,817,337
2044	25,313,881	-	25,313,881	2044	75,672,456
2045	23,538,866	-	23,538,866	2045	55,686,914
2046	17,937,760	-	17,937,760	2046	38,083,615
2047	15,216,594	-	15,216,594	2047	23,577,820
2048	15,044,110	-	15,044,110	2048	9,575,713
2049	2,332,409	-	2,332,409	2049	1,146,644
2050	-	-	-	2050	-
2051	-	-	-	2051	-

State Employees' Retirement System

Advance Payments of Unfunded Liability Contributions by SERS Employers (continued)

Setoff Schedule Applicable to PASSHE - Resulting From 2021 Advance Payment

Fiscal Year Beginning July 1	FY Setoff Amount	Setoff Used	Remaining Setoff	End of Calendar Year	Present Value of Setoffs
2020	\$0	\$0	\$0	2020	\$0
2021	79,939,555	45,863,583	34,075,972	2021	816,629,140
2022	79,939,555	-	79,939,555	2022	797,303,266
2023	79,939,555	-	79,939,555	2023	770,423,983
2024	79,939,555	-	79,939,555	2024	741,663,150
2025	79,939,555	-	79,939,555	2025	710,889,058
2026	79,939,555	-	79,939,555	2026	677,960,780
2027	79,939,555	-	79,939,555	2027	642,727,522
2028	79,939,555	-	79,939,555	2028	605,027,937
2029	79,939,555	-	79,939,555	2029	564,689,380
2030	79,939,555	-	79,939,555	2030	521,527,124
2031	69,427,421	-	69,427,421	2031	480,687,735
2032	69,427,421	-	69,427,421	2032	442,519,252
2033	69,427,421	-	69,427,421	2033	401,678,975
2034	69,427,421	-	69,427,421	2034	357,979,879
2035	69,427,421	-	69,427,421	2035	311,221,846
2036	69,427,421	-	69,427,421	2036	261,190,751
2037	52,258,540	-	52,258,540	2037	216,385,901
2038	52,258,540	-	52,258,540	2038	177,476,003
2039	52,258,540	-	52,258,540	2039	135,842,412
2040	52,258,540	-	52,258,540	2040	91,294,469
2041	22,001,027	-	22,001,027	2041	59,010,673
2042	12,093,718	-	12,093,718	2042	45,420,012
2043	12,093,718	-	12,093,718	2043	36,089,514
2044	11,043,542	-	11,043,542	2044	26,639,776
2045	9,574,074	-	9,574,074	2045	17,828,035
2046	4,938,453	-	4,938,453	2046	11,529,136
2047	2,686,967	-	2,686,967	2047	8,372,401
2048	2,686,967	-	2,686,967	2048	6,179,035
2049	2,686,967	-	2,686,967	2049	3,832,134
2050	2,686,967	-	2,686,967	2050	1,320,950
2051	-	-	-	2051	-

State Employees' Retirement System

Glossary

Accrued Service. Service credited under the system, which was rendered before the date of the actuarial valuation.

Active Members and Participants. Active members and participants who are in a position covered by SERS and on payroll, on leave with pay, or on certain unpaid leave (e.g., military leave). Inactive members and participants on leave without pay are also included as active if there is an expectation they will return to paid service.

Actuarial Accrued Liability. The portion of the actuarial present value of benefits not provided for by the actuarial present value of future normal costs. Also referred to as Past Service Liability.

Actuarial Assumptions. Estimates of future experience with respect to rates of mortality, disability, turnover, retirement, investment income and salary growth. Decrement assumptions (rates of mortality, disability, turnover and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (salary increases and investment income) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation.

Actuarial Cost Method. A mathematical budgeting procedure for allocating the actuarial present value of future benefits between future normal costs and the actuarial accrued liability.

Actuarial Present Value. The amount of funds currently required to provide a payment or series of payments in the future. It is determined by discounting projected future payments at assumed rates of interest and probabilities of payment.

Actuarially Determined Contribution (ADC). The annual employer contribution calculated by the actuary based on a defined actuarial cost method, asset valuation method, and amortization method. The ADC may or may not be the amount actually paid by the employer. The methods used to calculate the ADC are contained in Schedule P.

Amortization. Paying off an amount with periodic payments of interest and principal -- as opposed to paying off with a lump sum payment.

Annuitants. Participants of SERS who are currently receiving benefits for reason of superannuation retirement, early retirement, deferred retirement, or disability retirement.

Beneficiaries and other payment recipients. Beneficiaries, survivors or alternate payees who are receiving benefits as a result of the death of an active member or annuitant or due to a divorce (based upon a domestic relations order).

Funding Payroll. The contribution determinations for the funding of SERS are based on a fiscal year running from July 1 to June 30. The Total Annualized Compensation is adjusted to an appropriate fiscal year Funding Payroll using the salary scale assumption and expected turnover and replacement estimates.

State Employees' Retirement System

Glossary (continued)

Inactive and Vested Participants. In general, inactive and vested participants are former active members who are not expected to return to paid service in a position covered by SERS. Inactive and vested participants include employees on furlough as well as employees with prior SERS service currently participating in the Pennsylvania Public School Employees' Retirement System (PSERS). All inactive and vested participants are entitled to either a refund of accumulated deductions from SERS or a monthly benefit. Inactive and vested participants will eventually change statuses; for example, they may terminate non-vested and receive a refund of their accumulated deductions, they may retire and commence annuity payments, they may return to active membership, etc.

Total Annualized Covered Compensation. The Total Annualized Covered Compensation is a snapshot of compensation on December 31. For full-time employees, it is equal to the compensation during the calendar year ending December 31. For part-time employees, compensation is annualized using the current rate of compensation times the appropriate number of pay periods.

Total Normal Cost. The portion of the actuarial present value of future benefits that is allocated to the current year by the actuarial cost method.

Unfunded Actuarial Accrued Liability. The difference between actuarial accrued liability and the actuarial value of assets.

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