BUCK
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Pennsylvania Public School Employees' Retirement System

Actuarial Valuation Report

June 30, 2023

April 22, 2024

Board of Trustees
Pennsylvania Public School Employees' Retirement System
5 North 5th Street
Harrisburg, PA 17101

Ladies and Gentlemen:

This report presents the results of the annual actuarial valuation of the Pennsylvania Public School Employees' Retirement System (Retirement System or PSERS) as of June 30, 2023.

The valuation takes into account all of the promised benefits to which members are entitled as of June 30, 2023, including pension and survivor benefits, and, as required by the Public School Employees' Retirement Code, 24 Pa. C.S. §8101 et. seq. (Retirement Code), is the basis for the contribution rate for fiscal year 2024/2025. In addition, the contribution rate indicated in the report includes a rate for anticipated employer contributions to the Pennsylvania Employees' Defined Contribution plan (DC Plan) for anticipated Class T-G, Class T-H and Class DC-only participants on or after July 1, 2024 and prior to July 1, 2025.

As required under Section 8502(j) of the Retirement Code, experience studies are performed once in every five-year period. This valuation was prepared on the basis of the demographic and economic assumptions that were recommended on the basis of an Experience Review covering the period from July 1, 2015 to June 30, 2020 and adopted by the Board of Trustees at its March 5, 2021, June 11, 2021 and August 6, 2021 meetings. The valuation also reflects the recommended changes to the administrative option factors, which were adopted by the Board at its August 6 meeting and implemented July 1, 2022. As mandated by the Retirement Code, these assumptions will remain in effect for valuation purposes until such time as the Board of Trustees adopts revised assumptions and/or administrative option factors.

This report addresses the funding requirements of PSERS only. Financial reporting required under applicable standards of the Governmental Accounting Standards Board (GASB) are addressed in separate reports.

Assets and Membership Data

The Retirement System provided the individual data for members and DC Plan participants used in the valuation. While we did not audit the data, we did perform tests for internal consistency and reasonableness. The amount of assets in the trust fund taken into account in the valuation was based on statements furnished by the Retirement System. The accuracy of the results presented in this report is dependent on the accuracy of the data provided.

Funding Adequacy

The valuation results indicate that the employer contribution rate for fiscal year 2024/2025 is 33.90%, which includes a rate of 0.35% for employer contributions to the DC Plan. This is an estimated average DC contribution rate. The actual employer DC contribution rate applicable to each participating employer will be based on the employer's Class T-G, Class T-H, and Class DC-only membership.

As of June 30, 2023, the total funded ratio of the plan (for Pensions and Health Insurance Premium Assistance combined) is 63.6%, based on the accrued liability and actuarial value of assets calculated under the funding requirements of Section 8328 of the Retirement Code.

For the ninth consecutive year, the PSERS Board has certified the full employer contribution rate calculated by the actuary. This follows 15 years in which contributions to the Retirement System were statutorily constrained to be less than the actuarially determined amounts. Receipt of the full actuarially determined employer contribution is an essential step to bring PSERS back to a fully funded status. Full actuarial funding from employers along with member contributions and investment income are necessary sources of funds for the amortization of the unfunded liability of the Retirement System.

Unless stated otherwise, references to "funded ratio" and "unfunded accrued liability" are measured using the actuarial value of assets. It should be noted that if the same measurements were made using the market value of assets, different funded ratios and unfunded accrued liabilities would result. Moreover, the funded ratio presented is appropriate for evaluating the need and level of future contributions but makes no assessment regarding the funded status of the Retirement System if it were to settle (i.e., purchase annuities to cover) a portion or all of its liabilities. Assuming that contributions are made at the level developed in the actuarial valuation and no future experience gains or losses arise, future expected contributions are expected to remain relatively level as a percent of payroll and the Retirement System's funded status is expected to increase.

Financial Results and Membership Data

Detailed summaries of the financial results of the valuation and membership data used in preparing the valuation are shown in the valuation report. The actuaries prepared supporting schedules included in the Actuarial and Statistical Section of the PSERS Annual Comprehensive Financial Report (ACFR) and also provided historical data schedules included in the Financial Section of the ACFR.

Use of Models

Actuarial Standard of Practice No. 56 (ASOP 56) provides guidance to actuaries when performing actuarial services with respect to designing, developing, selecting, modifying, using, reviewing, or evaluating models. Buck uses the following:

- the GEMS® Economic Scenario Generator from Conning & Company was used to assess the reasonability of the interest rate used for the valuation. GEMS® uses a multifactor model to create internally consistent, realistic economic scenarios (paths) that reflect the current economic environment as a starting point. Asset class correlations may vary from year to year (just as in the real world), as well as from path to path. The model generates results that are not normally distributed, with fatter tails, and should therefore estimate the probabilities of rare events more realistically than a pure mean-variance model.
- third-party software in the performance of annual actuarial valuations and projections to calculate the liabilities associated with the provisions of the Retirement System using data and assumptions as of the measurement date under the funding methods specified in this report.
- an internally developed model that applies applicable funding methods and policies to the liabilities derived from the output of the third-party software and other inputs, such as System assets and contributions, to generate many of the exhibits found in this report.

Buck has an extensive review process whereby the results of the liability calculations are checked using detailed sample output, changes from year to year are summarized by source, and significant deviations from expectations are investigated. Other outputs and the internal model are similarly reviewed in detail and at a high level for accuracy, reasonability, and consistency with prior results. Buck also reviews the third-party model when significant changes are made to the software or model. The review is performed by experts within the company who are familiar with applicable funding methods as well as the manner in which the model generates its output. If significant changes are made to the internal model, extra checking and review are completed. Significant changes to the internal model that are applicable to multiple clients are generally developed, checked, and reviewed by multiple experts within the company who are familiar with the details of the required changes.

Future actuarial measurements may differ significantly from current measurements due to Retirement System experience differing from that anticipated by the economic and demographic assumptions, increases or decreases expected as part of the natural operation of the methodology used for these measurements, and changes in Retirement System provisions or applicable law. Liability models necessarily rely on the use of actuarial assumptions, approximations, and estimates and are sensitive to changes in these actuarial assumptions, approximations and estimates. Small variations in these actuarial assumptions, approximations and estimates may lead to significant changes in actuarial measurements. An analysis of the potential range of such future differences is beyond the scope of this valuation. However, Actuarial Standard of Practice No. 51 (ASOP 51) applies to funding calculations such as those presented in this report and requires certain disclosures of potential risks. Exhibit XI contains an assessment of the key risks applicable to the Retirement System.
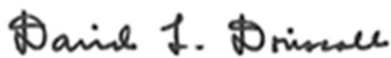
Reasonability of Assumptions

Actuarial Standards of Practice ("ASOPs") 27 and 35 ask the actuary to disclose the information and analysis used to support the actuary's determination that the assumptions selected by the Board do not significantly conflict with what, in the actuary's professional judgment, are reasonable for the purpose of the measurement. The Board adopted a new set of economic and demographic assumptions for the June 30, 2021 actuarial valuation based on the recommendations outlined by Buck in their five-year experience study for the period July 1, 2015 to June 30, 2020. Annually, the actuary reviews the assumptions through discussions with the PSERS staff and analyzing actuarial gain/loss experience. In the case of the Board's selection of the valuation interest rate, or expected return on assets ("EROA"), the actuary has also reviewed the analysis provided by the Retirement System's investment advisors, as well as Buck's Financial Risk Management ("FRM") practice, and determined the EROA assumption together with the Retirement System's other economic and demographic assumptions do not conflict with what, in the actuary's professional judgment, is reasonable for the purpose of the measurement.

Use of this report for any other purpose than as stated, or by anyone other than the Board of Trustees or the staff of PSERS or employers or its auditors, may not be appropriate and may result in mistaken conclusions because of failure to understand applicable assumptions, methods, or inapplicability of the report for that purpose. Buck should be asked to review any statement to be made on the basis of the results contained in this report. Buck will accept no liability for any such statement made without prior review by Buck.

David L. Driscoll and Maria E. Simmers are Fellows of the Society of Actuaries and Members of the American Academy of Actuaries. Salvador Nakar is a Member of the American Academy of Actuaries. We meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. This report has been prepared in accordance with all applicable Actuarial Standards of Practice, and we are available to answer questions concerning it.

Buck Global, LLC

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Pennsylvania Public School Employees' Retirement System

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Table/Exhibit

Executive Summary

This report presents the actuarial valuation as of June 30, 2023, for the Pennsylvania Public School Employees' Retirement System.

The principal valuation results include:

- The employer contribution rate for fiscal year 2024/2025, which is 33.90% (32.92% Pension plus 0.63% Premium Assistance plus 0.35% Act 5 DC contribution).

  - The 0.35% Act 5 DC contribution rate is an estimated average employer DC contribution rate. The actual DC contribution rate applicable to each employer will be based on the employer's Class T-G, Class T-H, and Class-DC-only membership.

- The unfunded accrued liability as of June 30, 2023, is $42.3 billion. The decrease in the unfunded accrued liability from $44.0 billion in the June 30, 2022 valuation is primarily attributable to:

  - Actuarial net experience gain of $250 million in the year ending June 30, 2023
  - Contribution gain of $359 million

  An analysis of the change in the unfunded accrued liability as of June 30, 2023, is discussed on page 18.

- The total funded ratio of the Retirement System determined as of June 30, 2023 under the funding requirements of Section 8328 of the Retirement Code is 63.6%, which is based on the accrued liability and the actuarial value of assets for Pensions and Health Insurance Premium Assistance as of that date. The funded ratio as of June 30, 2022 was 61.6%.

- The Act 120 minimum employer pension rate is the normal cost rate of 5.68%.

- For the ninth consecutive year, the PSERS Board has certified the full employer contribution rate calculated by the actuary. This follows 15 years in which contributions to the Retirement System were statutorily constrained to be less than the actuarially determined amounts. This is an essential step to bring PSERS back to a fully funded status. Full actuarial funding from employers, along with member contributions and investment income, are necessary sources of funds for the amortization of the unfunded liability of the Retirement System.

- In accordance with the Act 5-2017 Class T-E, Class T-F, Class T-G, and Class T-H "shared-risk" contribution provision, the contribution rates for Class T-E, Class T-F, Class T-G, and Class T-H members will return to the basic rates of 7.50%, 10.30%, 5.50% and 4.50%, respectively, for the period July 1, 2024 to June 30, 2027, since:

  - The June 30, 2020 shared-risk valuation increased the contribution rate of Class T-E and Class T-F members by 0.50% and the contribution rate of Class T-G and Class T-H members by 0.75%, effective July 1, 2021.
  - As of the June 30, 2023 shared-risk valuation, the geometric average time-weighted market rate of return, net of fees, of 7.46% is greater than 7.22% (geometric average of the annual interest rates adopted by the Board over the same ten-year period) by less than 1.00%.
  - Therefore, the shared-risk contribution rate of Class T-E and Class T-F members will decrease by 0.50% and the shared-risk contribution rate for Class T-G and Class T-H members will decrease by 0.75%, resulting in a shared-risk contribution rate of 0.00% for these classes.

The next Class T-E, Class T-F, Class T-G and Class T-H shared-risk valuation is to be performed for the ten-year period ending June 30, 2026. The Act 5-2017 member shared-risk contribution rates are discussed on page 9.

- Annual disclosures as of June 30, 2023 in accordance with the Governmental Accounting Standards Board (GASB) Statements No. 67 and 68 for Pensions and Statements No. 74 and 75 for the Health Insurance Premium Assistance Program have been provided in separate reports.

The valuation was completed based upon membership and financial data submitted by the Retirement System. Detailed summaries of the financial results of the valuation and membership data used in preparing the valuation are included in the valuation report. The actuaries prepared supporting schedules included in the Actuarial and Statistical Section of the PSERS Annual Comprehensive Financial Report (ACFR) and also provided historical data schedules included in the Financial Section of the ACFR.

Changes Since Last Year

Legislative and Administrative Changes

The benefit provisions and contribution provisions are summarized in Table 12. There were no legislative or administrative changes since the prior valuation.

Actuarial Assumptions and Methods

The actuarial assumptions and methods are outlined in Table 11. As required under Section 8502(j) of the Retirement Code, experience studies are performed once in every five-year period. This valuation was prepared using demographic, economic and administrative option factors assumptions that were recommended on the basis of the Experience Review covering the period from July 1, 2015 to June 30, 2020 and adopted by the Board at its March 5, 2021, June 11, 2021, and August 6, 2021 meetings.

There have been no changes in the actuarial assumptions and methods from those used in the prior valuation.

The following is an overview of the economic assumptions since their adoption effective with the June 30, 2021 actuarial valuation:

- Expected rate of return on assets (EROA) of 7.00% - Based on Verus' Capital Market Assumptions, the expected return is 7.4%. Based on Buck's 2022 fourth-quarter Capital Market Assumptions, an expected return of approximately 7.7% was developed. Both rates exceed the current 7.00% EROA.

- Payroll growth assumption of 3.25% - The actual increase in the total payroll assumption for the last two valuation years are as follows:

Valuation Year	Contribution for Fiscal Year	Total Payroll	Increase
June 30, 2023	2024/2025	$15.590 Bil	2.2%
June 30, 2022	2023/2024	$15.260 Bil	5.3%
June 30, 2021	2022/2023	$14.497 Bil	

- Salary increase assumption of an average of 4.5% - The actual average salary increase among continuing actives for the fiscal year 2022/2023 was 5.4%

- While we recognize the System's policy of completing an experience study every five years, these assumptions will be monitored to determine that they do not significantly differ from what the actuary deems reasonable for the purpose of the measurement.

We have reviewed the assumptions and methods used in completing the June 30, 2023 actuarial valuation along with recent experience. We have determined that these assumptions do not significantly conflict with what, in our professional judgement, are reasonable for the purpose of the measurement and are in compliance with the applicable standards. In our professional judgement, the combined effect of the assumptions is expected to have no significant bias.

Contribution Rates

The results of the valuation as of June 30, 2023 determine the employer contribution rate for fiscal year 2024/2025. The calculated employer contribution rate for the 2024/2025 fiscal year is 33.90% and the Board of Trustees certified this rate at its December 14, 2023 meeting. The 33.90% Employer rate includes a rate of 0.35% for employer DC contributions, which is an average estimated rate based on the assumptions outlined in Table 11 for future Class T-G, Class T-H and Class DC only membership. Actual employer DC contributions will be based on each employer's actual Class T-G, Class T-H, and Class DC-only membership.

The average base contribution rate payable by the members is 7.37%. The average base member contribution rate of 7.37% is a pay-weighted average of member rates that vary based on date of hire and Class membership. Effective January 1, 2002, the employee base contribution rate for members who elected to have prior school service and intervening military service converted to Class T-D service increased by 1.25% to 7.50%. Anyone who enrolled after July 1, 2001 and before July 1, 2011 is a member of Class T-D. Any employee who becomes a member after June 30, 2011 and prior to July 1, 2019 is a Class T-E member or, alternatively, may elect to become a Class T-F member. The base contribution rate for Class T-E members is 7.50% of compensation. The base contribution rate for Class T-F members is 10.30% of compensation. Any employee who becomes a member after June 30, 2019, is a Class T-G member or, alternatively, may elect to become a Class T-H member or a DC-only participant. The base contribution rate for Class T-G members is 5.50% for the defined benefit plan and 2.75% for the defined contribution plan and for Class T-H members is 4.50% for the defined benefit plan and 3.00% for the defined contribution plan. DC-only participants contribute 7.50% to the defined contribution plan.

In accordance with the Act 5-2017 Class T-E, Class T-F, Class T-G, and Class T-H shared-risk contribution provision:

- The June 30, 2020 shared-risk valuation increased the contribution rate of Class T-E and Class T-F members by 0.50% and the contribution rate of Class T-G and Class T-H members by 0.75%, effective July 1, 2021.
- The June 30, 2023 shared-risk valuation decreased the contribution rate of Class T-E and Class T-F members by 0.50% and the contribution rate of Class T-G and Class T-H members by 0.75% resulting in a shared-risk contribution rate of 0.00% for these classes, effective July 1, 2024.

The Act 5-2017 shared-risk provisions are discussed on page 9.

Reasons for Change in the Employer Rate Calculated by the Actuary

The employer contribution rate calculated by the actuary decreased from 34.00% for fiscal year 2023/2024 to 33.90% for fiscal year 2024/2025. The reconciliation of the employer contribution rates by source is as follows:

- FY 2023/2024 employer contribution rate   34.00%
- Decrease due to change in normal rate   (0.18)
- Net decrease due to total employer payroll growth and liability experience[1]   (0.15)
- Increase due to actuarial loss on assets   0.16
- Increase in Act 5 DC employer contribution rate   0.08
- Change in health insurance premium assistance contribution rate   (0.01)
- FY 2023/2024 employer contribution rate   33.90%

    1. Reflects increase in total employer payroll and liability gains.

Summary of Principal Results

Summarized below are the principal financial results for the Public School Employees' Retirement System based upon the actuarial valuation as of June 30, 2023. Comparable results from the June 30, 2022 valuation are also shown.

Item	June 30, 2023	June 30, 2022
Demographics		
Active Members		
• Number[1]	251,732	248,393
• Average Annual Pay	$ 59,709	$ 58,036
Annuitants		
• Number[2]	249,724	246,901
• Average Annual Benefit Payment	$ 26,197	$ 26,078
Contribution Rates (as a Percentage of Payroll)	(Fiscal Year 2024/2025)	(Fiscal Year 2023/2024)
Employer Contribution Rate:		
• Total Pension Rate Calculated by Actuary[3]	32.92%	33.09%
• Health Insurance Premium Assistance Contribution Rate	0.63	0.64
• Act 5 DC Employer Contribution Rate[4]	0.35	0.27
• Total Contribution Rate	33.90%	34.00%
• Total Contribution Rate Certified by Board	33.90%	34.00%
• Member Average Base Contribution Rate	7.37	7.44
• Total Rate	41.27%	41.44%
Funded Status[5]		
• Accrued Liability	$ 116,383.9 Mil	$ 114,612.3 Mil
• Actuarial Value of Assets	74,044.1	70,646.8
• Market Value of Assets	72,253.0	70,663.7
• Unfunded Accrued Liability		
• Actuarial Value of Assets	$ 42,339.8	$ 43,965.5
• Market Value of Assets	44,130.9	43,948.6
• Funded Ratio		
• Actuarial Value of Assets	63.6%	61.6%
• Market Value of Assets	62.1%	61.7%

1. Includes 912 and 520 DC-only participants as of June 30, 2023 and June 30, 2022, respectively.
2. Excludes 2,433 and 1,776 beneficiaries as of June 30, 2023 and June 30, 2022, respectively, who are only entitled to a pending lump sum distribution.
3. The Act 120 minimum pension rate is 5.68% for the June 30, 2023 valuation and is 5.86% for the June 30, 2022 valuation.
4. Average DC contribution rate. Actual rate will vary by employer based on Class T-G, Class T-H, and Class DC-only memberships.
5. Pensions and Health Insurance Premium Assistance combined.

Five-Year History of Principal Financial Results

Five-Year History of Contribution Rates
(As a % of Payroll)

Fiscal Year	Member Contributions	Employer Contributions					
		Normal Cost	Unfunded Accrued Liability	Health Insurance Premium Assistance	Act 5 DC Employer Rate[1]	Preliminary Employer Contribution	Final Employer Contribution[2]
2024/2025	7.37%	5.68%	27.24%	0.63%	0.35%	33.90%	33.90%
2023/2024	7.44	5.86	27.23	0.64	0.27	34.00	34.00
2022/2023	7.52	6.07	28.24	0.75	0.20	35.26	35.26
2021/2022	7.56	7.20	26.79	0.80	0.15	34.94	34.94
2020/2021	7.61	7.37	26.14	0.82	0.18	34.51	34.51

1. Average DC contribution rate. Actual rate will vary by employer based on Class T-G, Class T-H and Class DC-only membership.
2. Certified by the Board.

The following chart shows a five-year history of employer contribution rates:

Five-Year History of Employer Contribution Rates
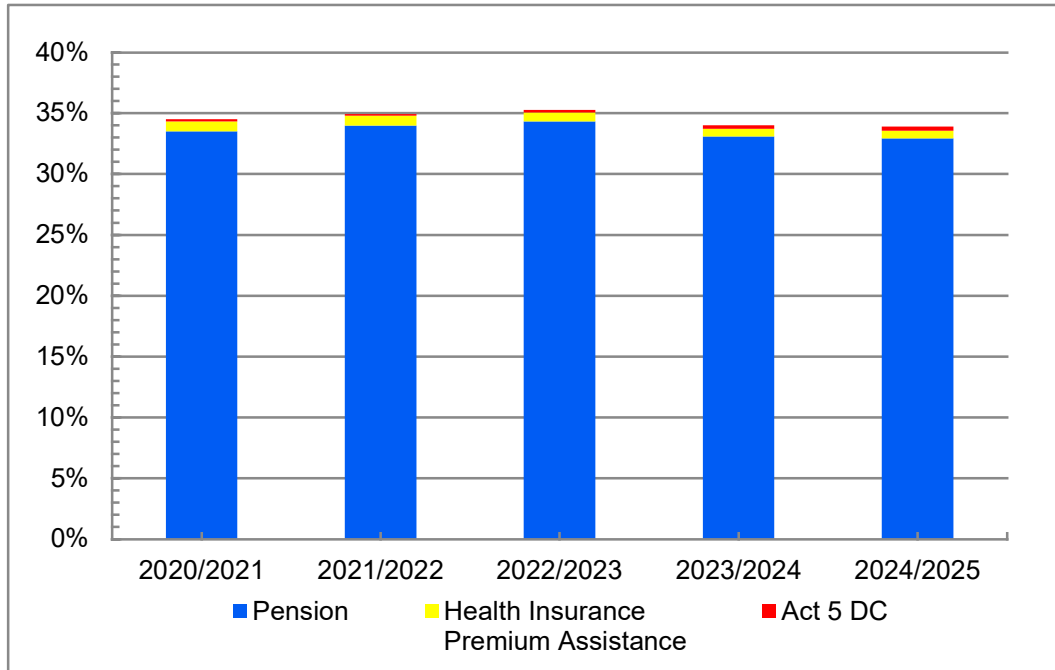
Funded Ratio

The financing objective of the Retirement System is to:

- Fully fund all current costs based on the normal contribution rate determined under the funding method; and

- Liquidate the unfunded accrued liability based on level-percent-of-pay amortization schedules required by the Retirement Code as amended by Act 120-2010, i.e., a schedule of 24 years for the unfunded accrued liability as of June 30, 2010 and each change in the unfunded accrued liability due to actuarial experience after the June 30, 2010 valuation. Any legislation after June 30, 2010, that increases the liability due to benefit enhancements will be funded over 10 years based on level-percent-of-pay amortization.

- As directed by Act 120-2010, the minimum employer pension contribution rate will be the normal cost rate.

- Fully fund the employer contribution to the DC Plan.

The total contribution rate of 33.90% of payroll payable by employers, when taken together with the contributions payable by the members, current assets, and expected future asset returns, is sufficient to achieve the financing objective.

The Retirement System's total funded ratio on this funding basis is measured by comparing the actuarial value of assets (based on a 10-year moving average market value) to the accrued liability. The accrued liability for pensions is the present value of benefits accumulated to date under the Retirement System's funding method and reflects future pay increases for active employees. The accrued liability for Health Insurance Premium Assistance equals the assets in the Health Insurance account.

On this basis, the Retirement System's total funded ratio (for Pensions and Health Insurance Premium Assistance combined) is 63.6% as of June 30, 2023. This funded ratio is based on an actuarial value of assets of $74.04 billion and an accrued liability of $116.38 billion. The funded ratio for Pensions alone is 63.6% as of June 30, 2023, based on an actuarial value of assets of $73.90 billion and an accrued liability of $116.24 billion.

Reasons for Change in the Total Funded Ratio

The total funded ratio increased from 61.6% as of June 30, 2022, to 63.6% as of June 30, 2023. Employers have been contributing the full actuarially determined contributions since the fiscal year ending June 30, 2017. In addition, the Retirement System experienced a net actuarial gain due to demographic experience and greater than anticipated contribution amounts, which were offset by returns less than expected on assets measured at actuarial value.

Table 6 provides an analysis of the change in the unfunded accrued liability as of June 30, 2023.

Five-Year History of Total Funded Ratio[1]
($ Amounts in Millions)

Valuation as of June 30	Accrued Liability	Actuarial Value of Assets	Unfunded Accrued Liability	Funded Ratio
2023	$ 116,383.9	$ 74,044.1	$ 42,339.8	63.6%
2022	114,612.3	70,646.8	43,965.5	61.6
2021	112,783.3	67,248.7	45,534.6	59.6
2020	107,963.8	63,929.4	44,034.4	59.2
2019	105,324.7	61,190.5	44,134.2	58.1

1. For Pensions and Health Insurance Premium Assistance (under the funding provisions of the Retirement Code).

The following chart shows a five-year history of the accrued liability and the actuarial value of assets:

Five-Year History of Accrued Liability and Actuarial Value of Assets
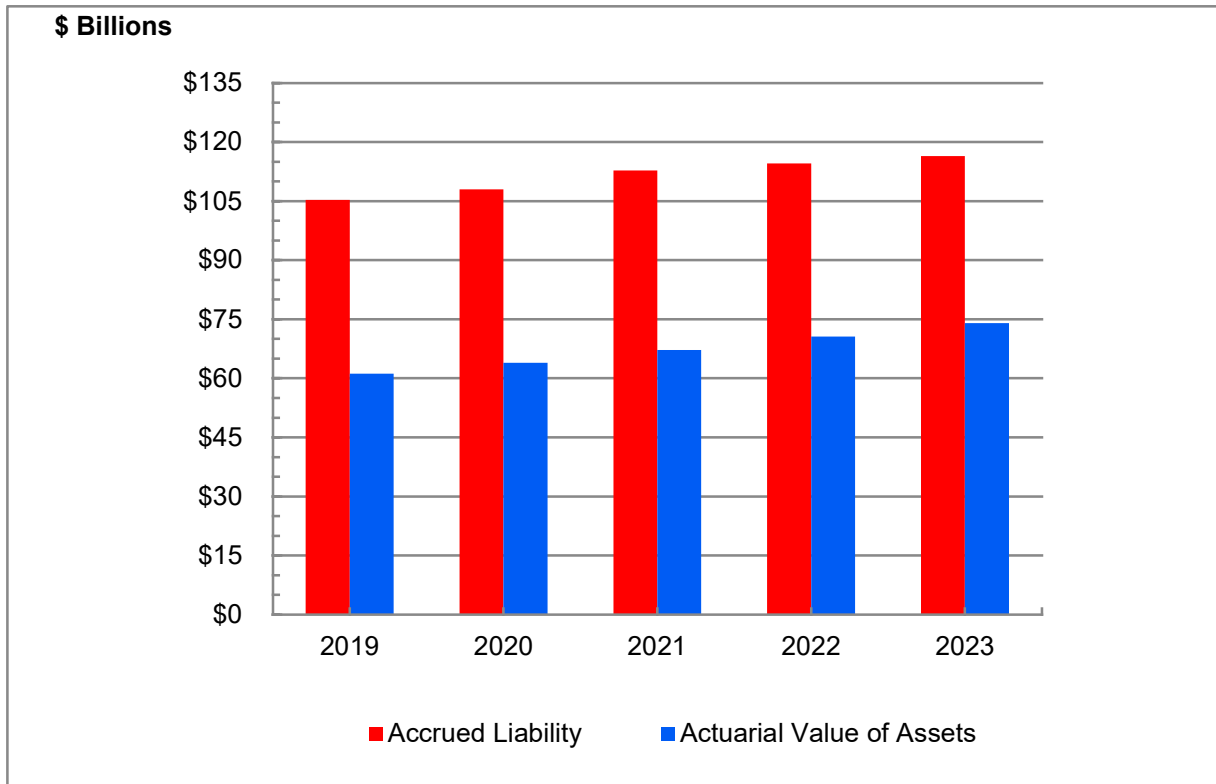
The following chart shows a ten-year history of the total funded ratio based on actuarial value of assets for Pensions and Health Insurance Premium Assistance:

Ten-Year History of Total Funded Ratio (2014 – 2023)
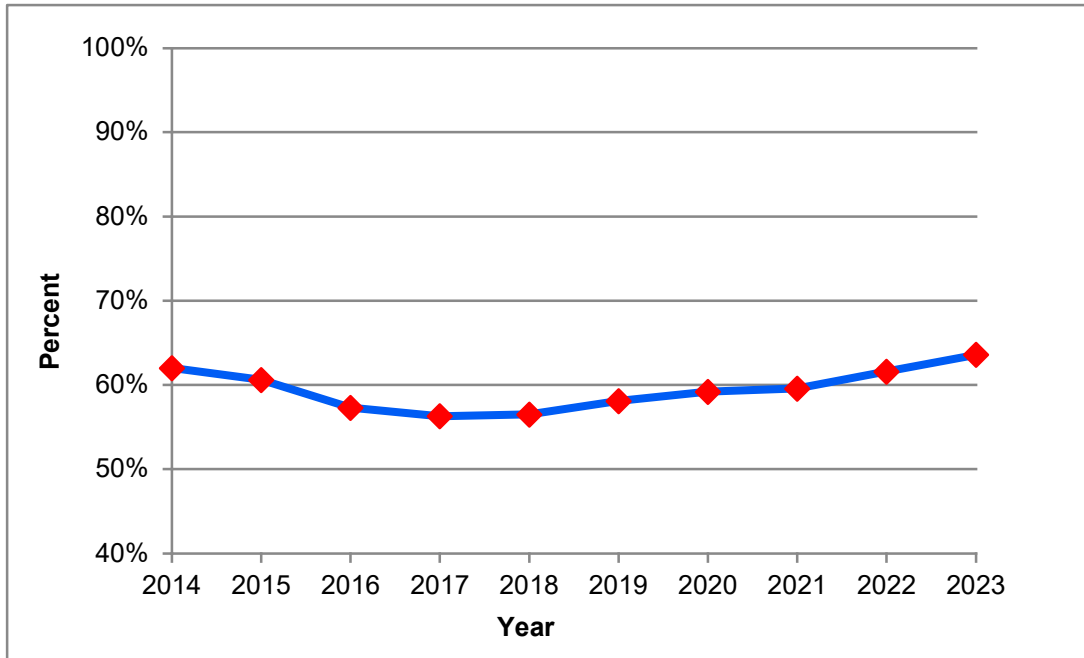
Act 5-2017 Class T-E, Class T-F, Class T-G and Class T-H shared-risk contributions

Commencing with the annual actuarial valuation for the period ending June 30, 2014, and every three years thereafter, the Board compares the actual investment rate of return, net of fees, to the annual interest rate adopted by the Board for the calculation of the normal contribution rate, based on the market value of assets, for the prior ten-year period. Until the Retirement System has accumulated a ten-year period of investment rate of return experience following June 30, 2011, the look-back period used in this calculation will begin not earlier than June 30, 2011. If the annual interest rate adopted by the Board for the calculation of the normal contribution rate is changed during the period used to determine the shared-risk contribution rate, the Board, with the advice of the actuary, shall determine the applicable rate during the entire period, expressed as an annual rate.

The shared-risk contribution rates of Class T-E, Class T-F, Class T-G, and Class T-H members are determined as follows:

- If the actual time-weighted investment rate of return, net of fees, is less than the annual interest rate adopted by the Board by an amount of 1.00% or more, the shared-risk contribution rate of Class T-E and Class T-F members will increase by 0.50% and the shared-risk contribution rate for Class T-G and Class T-H members will increase by 0.75%.

  If the actual time-weighted investment rate of return, net of fees, is equal to or exceeds the annual interest rate adopted by the Board by less than 1.00%, the shared-risk contribution rate of Class T-E and Class T-F members will decrease by 0.50% and the shared-risk contribution rate for Class T-G and Class T-H members will decrease by 0.75% provided the total member contribution rate on the date of the actuarial valuation is above the member's basic contribution rate.

- If the actual time-weighted investment rate of return, net of fees, is more than the annual interest rate adopted by the Board by an amount of 1.00% or more, the shared-risk contribution rate of Class T-E and Class T-F members will decrease by 0.50% and the shared-risk contribution rate for Class T-G and Class T-H members will decrease by 0.75%.

  If the actual time-weighted investment rate of return, net of fees, is equal to or below the annual interest rate adopted by the Board by less than 1.00%, the shared-risk contribution rate of Class T-E and Class T-F members will increase by 0.50% and the shared-risk contribution rate for Class T-G and Class T-H members will increase by 0.75% provided the total member contribution rate on the date of the actuarial valuation is below the member's basic contribution rate.

The total member contribution rate for Class T-E members shall not be less than 5.50%, nor more than 9.50%. The total member contribution rate for Class T-F members shall not be less than 8.30%, nor more than 12.30%. The total member pension contribution rate for Class T-G members shall not be less than 2.50% nor more than 8.50% and the total member pension contribution rate for Class T-H members shall not be less than 1.50% nor more than 7.50%.

If the Retirement System's total funded ratio based on the actuarial value of assets is at least 100% as of the shared-risk valuation date, the shared-risk contribution rate shall not be greater than zero. There shall be no increase in the member contribution rate if there has not been an equivalent increase to the employer contribution rate over the previous three-year period ending on the shared-risk valuation date. For any fiscal year in which the employer contribution rate is lower than the final contribution rate under section 8328(h), the total member contribution rate for Class T-E, T-F, T-G, and T-H members shall be prospectively reset to the basic contribution rate provided the total member contribution rate is at or above the basic contribution rate. Shared-risk member contributions for Class T-E, Class T-F, Class T-G, and Class T-H service shall not be made in any fiscal year in which the Commonwealth fails to make the annually required contribution to the Retirement System as provided under section 8328.

In accordance with Section 8328 of the Retirement Code, member shared-risk contributions cannot be used to offset the employer normal contribution rate. Instead, any increase or decrease in the unfunded accrued liability due to member shared-risk contributions shall be recognized as part of the System's actuarial experience and amortized as a level percentage of compensation over a period of 24 years beginning with the second July 1 following the actuarial valuation in which the shared-risk contribution was recognized.

The geometric average time-weighted rate of return, net of fees, for the ten-year period ending June 30, 2023, is 7.46% per annum, as calculated by Aon.

The annual interest rate adopted by the Board for the ten-year period ending June 30, 2023 were as follows:

Valuation as of June 30	Annual Interest Rate Adopted by the Board
2023	7.00%
2022	7.00
2021	7.00
2020	7.25
2019	7.25
2018	7.25
2017	7.25
2016	7.25
2015	7.50
2014	7.50
Ten-Year Geometric Average	7.22%

The June 30, 2020 shared-risk valuation increased the contribution rate of Class T-E and Class T-F members by 0.50% and the contribution rate of Class T-G and Class T-H members by 0.75%, effective July 1, 2021. The contribution rates for Class T-E, Class T-F, Class T-G, and Class T-H members increased to 8.00%, 10.80%, 6.25% and 5.25%, respectively, effective July 1, 2021 through June 30, 2024.

As of the June 30, 2023 shared-risk valuation date, since the geometric average of the time-weighted rate of return, net of fees, for the ten-year period ending June 30, 2023 of 7.46% is greater than the geometric average of the annual interest rate adopted by the Board over the same ten-year period of 7.22% and the total member contribution rate is currently above the member's basic contribution rate, the shared-risk contribution rate of Class T-E and Class T-F members will decrease by 0.50% and the shared-risk contribution rate for Class T-G and Class T-H members will decrease by 0.75%. Therefore, the contribution rates will return to the basic rates of 7.50%, 10.30%, 5.50% and 4.50%, respectively, for the period July 1, 2024 to June 30, 2027.

The next Class T-E, Class T-F, Class T-G, and Class T-H shared-risk valuation is to be performed for the ten-year period ending June 30, 2026.

Rate of Return

The investment return of the trust fund (i.e., total return including both realized and unrealized gains and losses) for fiscal years 2013/2014 through 2022/2023 is shown in the table below.

The rate of return on market value reflects the investment earnings on the market value of assets from the beginning of the fiscal year to the end of the fiscal year.

Fiscal Year	Rate of Return Based on Market Value[1]
2022/2023	3.5%
2021/2022	2.2
2020/2021	24.6
2019/2020	1.1
2018/2019	6.7
2017/2018	9.3
2016/2017	10.2
2015/2016	1.3
2014/2015	3.1
2013/2014	14.8

1. Provided by PSERS' investment consultant.

Table 1
Summary of Results of Actuarial Valuation as of June 30, 2023
($ Amounts in Thousands)

Item	June 30, 2023	June 30, 2022
Member Data		
1. Number of Members		
a) Active Members	250,820	247,873
b) DC-Only Participants	912	520
c) Vestees[1]	26,776	26,836
d) Annuitants, Beneficiaries and Survivor Annuitants[2]	249,724	246,901
e) Total	528,232	522,130
2. Annualized Salaries ($ Amounts in Thousands)[3]	$ 15,030,750	$ 14,415,795
3. Annual Annuities ($ Amounts in Thousands)	$ 6,542,014	$ 6,438,598
Valuation Results		
4. Present Value of Future Pension Benefits		
a) Active Members	$ 67,251,381	$ 66,333,616
b) Inactive Members	424,535	383,991
c) Vestees	2,713,915	2,549,763
d) Annuitants, Beneficiaries and Survivor Annuitants	62,344,050	61,869,159
e) Total	$132,733,881	$131,136,529
5. Present Value of Future Pension Normal Cost		
a) Active Members	$ 9,786,472	$ 9,737,095
b) Employer	6,704,196	6,922,633
c) Total	$ 16,490,668	$ 16,659,728
6. Pension Accrued Liability		
a) Active Members (4a) - (5c)	$ 50,760,713	$ 49,673,888
b) Inactive Members	424,535	383,991
c) Vestees	2,713,915	2,549,763
d) Annuitants, Beneficiaries and Survivor Annuitants	62,344,050	61,869,159
e) Total	$116,243,213	$114,476,801
7. Health Insurance Assets for Premium Assistance	$ 140,716	$ 135,476
8. Total Accrued Liability for Funding (6) + (7)	$116,383,929	$114,612,277
9. Actuarial Value of Assets	$ 74,044,124	$ 70,646,769
10. Funded Status (9) / (8)	63.6%	61.6%
11. Unfunded Accrued Liability (8) - (9)	$ 42,339,805	$ 43,965,508
12. Total Normal Cost Rate	13.05%	13.30%
13. Member Contribution Rate	7.37%	7.44%
14. Employer Normal Cost Rate (12) - (13)	5.68%	5.86%
Employer Annual Funding Requirement		
15. Employer Contribution Rate Calculated by Actuary		
a) Normal Cost	5.68%	5.86%
b) Unfunded Accrued Liability	27.24	27.23
c) Preliminary Pension Rate	32.92%	33.09%
d) Health Insurance Premium Assistance	0.63	0.64
e) Act 5 DC[4]	0.35	0.27
f) Total Rate[5] = (15c) + (15d) + (15e)	33.90%	34.00%

1. Excludes 156,636 and 148,999 inactive members and non-members as of June 30, 2023 and June 30, 2022, respectively, who are no longer participating and are valued for their accumulated deductions only.
2. Excludes 2,433 and 1,776 beneficiaries as of June 30, 2023 and June 30, 2022, respectively, who are only entitled to a pending lump sum distribution.
3. The salaries shown represent an annual rate of pay for members and DC-only participants who were in active service on the valuation date.
4. Average DC contribution rate. Actual rate will vary by employer based on Class T-G, Class T-H, and Class DC-only memberships.
5. The Act 120 minimum pension rate is 5.68% for the June 30, 2023 valuation and is 5.86% for the June 30, 2022 valuation.

Table 2

Summary of Sources of Employer Contribution Rate as of June 30, 2023
($ Amounts in Thousands)

		Funding Period (Years)	Beginning July 1	Initial Liability	6/30/2023 Outstanding Balance	Annual Payment	
						Amount	Percent[1]
1.	Amortization of:						
a)	Act 120 Fresh Start Unfunded Accrued Liability and Asset Method Change	24	2011	$ 16,279,283	$ 16,262,845	$ 1,808,074	11.60 %
b)	2010 Experience	24	2011	3,419,297	3,402,732	378,310	2.43 %
c)	2011 Experience	24	2012	564,642	572,604	59,743	0.38 %
d)	2011 Assumption Changes	24	2012	4,592,397	4,657,161	485,905	3.12 %
e)	2012 Experience	24	2013	2,372,550	2,460,609	242,335	1.55 %
f)	2013 Experience	24	2014	2,707,494	2,857,391	266,969	1.71 %
g)	2014 Experience	24	2015	2,170,432	2,320,812	206,604	1.33 %
h)	2015 Experience	24	2016	1,941,277	2,095,193	178,396	1.14 %
i)	2016 Experience	24	2017	2,666,236	2,888,098	235,991	1.51 %
j)	2016 Assumption Changes	24	2017	2,521,326	2,731,130	223,165	1.43 %
k)	2017 Experience	24	2018	1,433,915	1,559,161	122,630	0.79 %
l)	2017 Act 5	24	2018	(6,867)	(7,466)	(587)	0.00 %
m)	2018 Experience	24	2019	348,881	379,786	28,829	0.18 %
n)	2019 Experience	24	2020	(527,527)	(573,533)	(42,118)	(0.27)%
o)	2020 Experience	24	2021	291,214	315,527	22,465	0.14 %
p)	2021 Experience	24	2022	(785,001)	(843,990)	(58,374)	(0.37)%
q)	2021 Assumption Changes	24	2022	2,772,127	2,980,440	206,141	1.32 %
r)	2022 Experience	24	2023	(1,036,865)	(1,109,446)	(74,676)	(0.48)%
s)	2023 Experience	24	2024	(609,249)	(609,249)	(42,498)	(0.27)%
	Total				42,339,805	4,247,304	27.24 %
2.	Employer Normal Cost Rate						5.68 %
3.	Pension Rate (1) + (2)[2]						32.92 %
4.	Health Insurance Premium Assistance Rate						0.63 %
5.	Act 5 DC Rate[3]						0.35 %
6.	Final Total Employer Contribution Rate Calculated by Actuary: (3) + (4) + (5)						33.90 %

1. Based on Estimated Employer Payroll for Fiscal Year Ending 2025 of $15,590,000.
2. Cannot be less than the Act 120 Fiscal Year 2025 Minimum Employer Pension Rate (Employer Normal Cost Rate) of 5.68%.
3. Average DC contribution rate. Actual rate will vary by employer based on Class T-G, Class T-H, and Class DC-only memberships.

Table 3

Determination of Health Insurance Premium Assistance Contribution Rate for Fiscal Year 2024/2025
($ Amounts in Thousands)

Item				
1.	June 30, 2023 Balance in Health Insurance Premium Assistance Account		$	140,716
2.	Estimated Fiscal 2023/2024 Contribution			
	(a) Contribution Rate Certified in 2022 Valuation			0.64%
	(b) Estimated Fiscal 2023/2024 payroll		$	15,474,000
	(c) Estimated Contribution = (a) x (b)		$	99,034

3.	Estimated Number of Annuitants who:	Are Eligible	Elect Percent	Elect Coverage
	(a) Fiscal 2023/2024	156,200	60.00%	93,720
	(b) Fiscal 2024/2025	157,700	60.00%	94,620
	(c) Fiscal 2025/2026	159,200	60.00%	95,520

4.	Estimated Disbursements:	Administration		Assistance		Total	
	(a) Fiscal 2023/2024	$	1,269	$	112,464	$	113,733
	(b) Fiscal 2024/2025		1,307		113,544		114,851
	(c) Fiscal 2025/2026		1,346		114,624		115,970
	(d) Total	$	3,922	$	340,632	$	344,554

5.	Required Fiscal 2024/2025 Contribution		$	97,331
	(4d) - (1) - (2c); includes interest through 6/30/2024			

6.	Required Health Insurance Premium Assistance Contribution Rate		
	(a) Estimated 2024/2025 Payroll		$15,590,000
	(b) Required Health Insurance Premium Assistance Contribution Rate (5) / (6a) (rounded up)		0.63%

Notes:

1. Current estimates of fiscal 2023/2024 membership payroll and administrative expenses, and of fiscal 2024/2025 and fiscal 2025/2026 administrative expenses, were provided by PSERS staff.
2. Beginning in fiscal year 2023/2024, 60% of eligible annuitants are assumed to elect coverage.
3. Premium Assistance payments equal $100 per month per eligible annuitant.

Table 4

Summary of Market Value of Plan Assets as of June 30, 2023
($ Amounts in Thousands)

Market Value		
1. Market Value of Assets as of June 30, 2022	$	70,663,718
2. Contributions During Fiscal 2022/2023		6,538,319
3. Disbursements During Fiscal 2022/2023		7,693,853
4. Investment Return During Fiscal 2022/2023		
a) Investment Return (Net of Investment Expenses)	$	2,799,770
b) Administrative Expenses		54,908
c) Investment Return After Expenses (a) - (b)	$	2,744,862
5. Market Value of Assets as of June 30, 2023 (1) + (2) - (3) + (4c)	$	72,253,046
6. Rate of Return[1]		3.54%
Asset Allocation by Account		
1. Members' Savings Account	$	19,188,548
2. Annuity Reserve Account		62,344,050
3. State Accumulation Account		(9,420,268)
4. Health Insurance Account		140,716
5. Total (1) + (2) + (3) + (4)	$	72,253,046

1. The rate of return is provided for informational purposes only. The source of the investment return is PSERS's audited financial statements.

Table 5

Derivation of Actuarial Value of Assets as of June 30, 2023
($ Amounts in Thousands)

1. Market Value of Assets as of June 30, 2023 $ 72,253,046

2. Determination of Deferred Gain (Loss)

		Return on Assets			
Fiscal Year	Actual	Expected	Difference	Recognized Amount	% Deferred	Deferred Amount
2022/2023	$ 2,744,862	$ 4,904,830	$ (2,159,968)	$ (215,997)	90.00%	$ (1,943,971)
2021/2022	(317,211)	4,668,244	(4,985,455)	(498,546)	80.00%	(3,988,364)
2020/2021	14,704,125	4,588,063	10,116,062	1,011,606	70.00%	7,081,243
2019/2020	955,651	4,395,438	(3,439,787)	(343,979)	60.00%	(2,063,872)
2018/2019	3,580,178	4,179,951	(599,773)	(59,977)	50.00%	(299,887)
2017/2018	4,666,466	4,115,904	550,562	55,056	40.00%	220,225
2016/2017	4,948,659	4,101,830	846,829	84,683	30.00%	254,049
2015/2016	426,974	4,220,500	(3,793,526)	(379,353)	20.00%	(758,706)
2014/2015	1,284,258	4,202,212	(2,917,954)	(291,795)	10.00%	(291,795)
2013/2014	7,057,089	4,193,490	2,863,599	286,361	0.00%	0
			$ (3,519,411)	$ (351,941)		$ (1,791,078)

3. Preliminary Actuarial Value of Assets[1,2] (1) - (2) $ 74,044,124

4. 70% of the Market Value of Assets (1) x 70% $ 50,577,132

5. 130% of the Market Value of Assets (1) x 130% $ 93,928,960

6. Actuarial Value of Assets: (3) not less than (4) and not greater than (5) $ 74,044,124

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1. The amounts reported include assets for both Pension and Health Insurance Premium Assistance.
2. The rate of return on the actuarial value of assets was 6.50%. This investment return is based on the change in the actuarial value of assets from the June 30, 2022 valuation to the June 30, 2023 valuation. The actuarial value of assets developed above is a rolling ten-year average. The impact of investment gains and losses is not fully realized in the year the gain or loss arose but is gradually recognized over a ten-year period.

Table 6

Analysis of Change in Unfunded Accrued as of June 30, 2023[1]
($ Amounts in Thousands)

Item	Amount
1. Unfunded Accrued Liability at June 30, 2022	$ 43,965,508
2. Interest Credit to June 30, 2023	3,077,586
3. Expected Contributions Toward Unfunded Accrued Liability	4,094,041
4. Expected Unfunded Accrued Liability at June 30, 2023 (1) + (2) - (3)	$ 42,949,053
5. Actual Unfunded Accrued Liability at June 30, 2023	42,339,805
6. Increase (Decrease) from Expected (5) - (4)	$ (609,248)
7. Reasons for Increase (Decrease)	
(a) Experience Losses (Gains)	
(i) Loss from Investment Return on Actuarial Value of Assets	$ 351,941
(ii) Loss from New Entrants and Pickups	351,140
(iii) Gain from Salary Increases Less than Expected	(598,772)
(iv) Gain from Mortality Experience	(46,035)
(v) Gain from Terminations (retirement/disability/terminations) Experience	(207,364)
(vi) Gain from Data/Miscellaneous	(100,744)
(vii) Subtotal - Experience Losses (Gains)	$ (249,834)
(b) Actual contributions greater than expected	(359,414)
(c) Total	$ (609,248)

1. The amounts reported include assets and liabilities for Pensions only.

Table 7

Schedule of Funding Progress for Pensions[1]
($ Amounts in Thousands)

Valuation as of June 30	Actuarial Value of Assets	Actuarial Accrued Liability	Unfunded Actuarial Accrued Liability	Funded Ratio	Covered Payroll[2]	Unfunded Accrued Liability as a Percentage of Covered Payroll
2023	$ 73,903,408	$ 116,243,213	$ 42,339,805	63.6 %	$ 14,995,870	282.3 %
2022	70,511,293	114,476,801	43,965,508	61.6	14,397,002	305.4
2021	67,116,157	112,650,825	45,534,668	59.6	14,057,526	323.9
2020	63,798,937	107,833,399	44,034,462	59.2	13,974,295	315.1
2019	61,065,304	105,199,505	44,134,201	58.0	13,671,927	322.8
2018	58,135,539	102,990,908	44,855,369	56.4	13,379,041	335.3

1. The amounts reported above include assets and liabilities for Pensions.
2. The salaries shown represent an annual rate of pay for the year ended June 30th for members who were in active service on June 30th.

The above schedule is not required by current GASB standards for pension plans. The information is provided for historical perspective as PSERS has transitioned to GASB Statement No. 67.

Table 8

Solvency Test for Pensions
Comparative Summary of Accrued Liability and
Actuarial Value of Assets
($ Amounts in Thousands)

Valuation as of June 30	(1) Active Member Contributions	(2) Retirees and Beneficiaries	(3) Active Member Employer Financed	Actuarial Value of Assets	Portion of Accrued Liability Covered by Valuation Assets		
					(1)	(2)	(3)
2023	$ 19,188,548	$ 62,344,050	$ 34,710,615	$ 73,903,408	100%	88%	0%
2022	18,802,945	61,869,159	33,804,697	70,511,293	100	84	0
2021	18,156,350	61,168,172	33,326,303	67,116,157	100	80	0
2020	17,558,412	58,415,383	31,859,604	63,798,937	100	79	0
2019	16,839,956	57,413,088	30,946,461	61,065,304	100	77	0
2018	16,120,538	56,742,925	30,127,445	58,135,539	100	74	0

Table 9

Schedule of Employer Contributions for Pensions
($ Amounts in Thousands)

Fiscal Year Ended June 30	Actuarially Determined Contribution	Actual Contributions Related to the Actuarially Determined Contribution	Contribution Deficiency (Excess)	Percentage Contributed
2023	$ 5,237,092	$ 5,237,092	$ 0	100.0%
2022	4,985,571	4,985,571	0	100.0%
2021	4,752,338	4,752,338	0	100.0%
2020	4,671,931	4,671,931	0	100.0%
2019	4,478,236	4,478,236	0	100.0%

Valuation date: Actuarially determined contributions are calculated as of the June 30 preceding the fiscal year in which contributions are made. That is, the contribution calculated as of the June 30, 2023 actuarial valuation will be made during the fiscal year ended June 30, 2025.

**Schedule of Employer Contributions For
Postemployment Benefits Other Than Pensions**
($ Amounts in Thousands)

Fiscal Year Ended June 30	Actuarially Determined Contribution	Actual Contributions Related to the Actuarially Determined Contribution	Contribution Deficiency (Excess)	Percentage Contributed
2023	$ 119,084	$ 114,358	$ 4,726	96.0%
2022	147,312	116,773	30,539	79.3%
2021	133,971	116,365	17,606	86.9%
2020	138,776	117,723	21,053	84.8%
2019	139,484	114,571	24,913	82.1%

Valuation date: Actuarially determined contributions are calculated as of the June 30 preceding the fiscal year in which contributions are made. That is, the contribution calculated as of the June 30, 2023 actuarial valuation will be made during the fiscal year ended June 30, 2025.

The Actuarially Determined Contribution is based on the Entry Age Normal Accrued Liability and assets as of the valuation date and a 30-year amortization of the unfunded accrued liability. See the Information Required Under Governmental Accounting Standards Board Statement No. 74 as of June 30, 2023 (published September 12, 2023) for additional information.

Table 10

History of Contribution Rates and Funded Ratios

Fiscal Year Ending June	Budgeted Total Employer Payroll (thousands)	Contribution Rates[1]								Funded Ratio
		Employee	Employer Normal Cost	Employer Unfunded Liability	Preliminary Employer Pension	Final Employer Pension[2]	Act 5 Employer DC[6]	Employer Health Insurance	Total Employer	
2014[3]	$ 13,720,000	7.43%	8.57%	15.25%	23.82%	16.00%		0.93%	16.93%	62.0%
2015	13,482,000	7.46	8.46	17.51	25.97	20.50		0.90	21.40	60.6
2016	13,375,000	7.49	8.38	19.44	27.82	25.00		0.84	25.84	57.3
2017	13,549,000	7.52	8.31	20.89	29.20	29.20		0.83	30.03	56.3
2018[4]	13,449,000	7.54	7.70	24.04	31.74	31.74		0.83	32.57	56.5
2019	13,775,000	7.57	7.59	25.01	32.60	32.60		0.83	33.43	58.1
2020	13,880,000	7.59	7.49	25.87	33.36	33.36	0.09%	0.84	34.29	59.2
2021	14,078,000	7.61	7.37	26.14	33.51	33.51	0.18	0.82	34.51	59.6
2022	14,289,000	7.56	7.20	26.79	33.99	33.99	0.15	0.80	34.94	61.6
2023[5]	14,497,000	7.52	6.07	28.24	34.31	34.31	0.20	0.75	35.26	**63.6**
2024	15,260,000	7.44	5.86	27.23	33.09	33.09	0.27	0.64	34.00	
2025	**15,590,000**	**7.37**	**5.68**	**27.24**	**32.92**	**32.92**	**0.35**	**0.63**	**33.90**	

1. In general, the Preliminary Employer Pension Rate equals the sum of the rates for the Employer Normal Cost and the Unfunded Liability; and the Final Employer Pension Rate is the greater of the Preliminary Pension Rate and any Pension Rate Floor or Collar stated in the Retirement Code. The Total Employer Rate is the sum of the Final Employer Pension Rate, Act 5 Employer DC Rate and the Employer Health Insurance Premium Assistance Rate.
2. The Final Employer Pension rate is limited by the Act 2010-120 pension rate collars for fiscal years 2014 through 2016.
3. Actuarial assumptions based on a five-year experience review ended June 30, 2010, were used to determine the contributions for the fiscal years ending June 30, 2014, and thereafter, which include an interest rate of 7.50%.
4. Revised actuarial assumptions based on a five-year experience review ended June 30, 2015, were used to determine the contributions for the fiscal years ending June 30, 2018, and thereafter, which include an interest rate of 7.25%.
5. Revised actuarial assumptions based on a five-year experience review ended June 30, 2020, were used to determine the contributions for the fiscal years ending June 30, 2023, and thereafter, which include an interest rate of 7.00%.
6. Act 5 new member assumptions for new members after June 30, 2020:

Valuation	Class T-G	Class T-H	DC Only
Before 2020	65%	30%	5%
After 2019	98%	1%	1%

The above rate is an average DC contribution rate. Actual rate will vary by employer based on Class T-G, Class T-H, and Class DC only memberships.

Table 11

Description of Actuarial Assumptions and Methods

Assumptions

Interest Rate: 7.00% per annum, compounded annually. The components are 2.50% for inflation and 4.50% for the real rate of return. Actuarial equivalent benefits are determined based on an interest rate of 4.00% per year (since 1960) except, in accordance with Act 5-2017, an interest rate of 7.00% per year is used for Class T-E, Class T-F, Class T-G, and Class T-H members' Option 4 partial withdrawal of accumulated member contributions and certain Class T-G and Class T-H early retirement factors.

Separation from Service: Illustrative rates of assumed separation from service are shown in the following table.

Age	Class T-C and Class T-D Annual Rate of:						
	Withdrawal						
	Less Than Five Years of Service	Five Years but Less Than 10 Years of Service	10 or More Years of Service	Death[1]	Disability	Early Retirement[2]	Superannuation Retirement
MALES							
25	21.83%	9.22%	4.55%	.022%	.01%		
30	14.93	3.84	4.55	.029	.01		
35	15.17	3.77	1.68	.038	.04		
40	16.04	4.44	1.42	.053	.06		
45	15.12	5.17	1.41	.082	.11		19.0%
50	15.81	4.96	1.89	.129	.23		19.0
55	15.54	4.96	3.63	.194	.37	14.5%	25.0
60	13.85	6.37	5.49	.289	.37	14.5	29.0
65				.447	.11		23.0
70				.699	.08		20.0
75				1.076	.08		25.0
79				1.701	.08		25.0
FEMALES							
25	18.33%	7.47%	3.90%	.008%	.01%		
30	15.16	5.92	3.90	.013	.02		
35	14.66	5.68	2.83	.019	.03		
40	12.86	5.16	1.67	.030	.06		
45	12.82	5.25	1.60	.046	.11		16.0%
50	13.02	5.23	2.08	.069	.18		16.0
55	13.43	5.31	3.66	.102	.29	14.5%	16.0
60	13.81	7.53	5.94	.154	.24	15.0	31.0
65				.251	.07		28.0
70				.431	.09		23.0
75				.766	.09		25.0
79				1.239	.09		25.0

1. These base mortality tables will then be projected on a generational basis using the Buck Modified scale MP-2020. Refer to the pre-retirement mortality description below.
2. Early Retirement – Age 55 with 25 years of service, but not eligible for Superannuation retirement.

	Class T-E, Class T-F, Class T-G and Class T-H Annual Rate of:					
	Withdrawal					
Age	Less Than 10 Years of Service	10 or More Years of Service	Death[1]	Disability	Early Retirement[2]	Superannuation Retirement
MALES						
25	17.02%	4.55%	.022%	.01%		
30	11.25	4.55	.029	.01		
35	12.09	1.68	.038	.04		
40	13.14	1.42	.053	.06		
45	13.87	1.41	.082	.11		
50	13.67	1.89	.129	.23		
55	11.91	3.63	.194	.37	14.5%	16.3%
60	11.19	5.49	.289	.37	14.5	16.3
65	11.19		.447	.11		16.3
70	11.19		.699	.08		16.3
75	11.19		1.076	.08		16.3
79	11.19		1.701	.08		16.3
FEMALES						
25	14.54%	3.90%	.008%	.01%		
30	11.68	3.90	.013	.02		
35	12.39	2.83	.019	.03		
40	11.53	1.67	.030	.06		
45	10.99	1.60	.046	.11		
50	10.72	2.08	.069	.18		
55	10.75	3.66	.102	.29	14.5%	19.5%
60	11.62	5.94	.154	.24	15.0	19.5
65	11.62		.251	.07		19.5
70	11.62		.431	.09		19.5
75	11.62		.766	.09		19.5
79	11.62		1.239	.09		19.5

1. These base mortality tables will then be projected on a generational basis using the Buck Modified scale MP-2020. Refer to the pre-retirement mortality description below.
2. Early Retirement – prior to eligibility for Superannuation retirement.

Death before Retirement:

Male participants: 50% PubT-2010 Employee (Total Teacher dataset) and 50% PubG-2010 Employee (Total General Employees dataset) Amount Weighted Male Tables, with a 99.0% adjustment, generationally projected with Buck Modified scale MP-2020.

Female participants: 50% PubT-2010 Employee (Total Teacher dataset) and 50% PubG-2010 Employee (Total General Employees dataset) Amount Weighted Female Tables, with an 88.6% adjustment, generationally projected with Buck Modified scale MP-2020.

Death after Retirement:

Male annuitants: 50% PubT-2010 Retiree (Total Teacher dataset) and 50% PubG-2010 Retiree (Total General Employees dataset) Amount Weighted Male Tables, with a 99.7% adjustment, generationally projected with Buck Modified scale MP-2020.

Female annuitants: 50% PubT-2010 Retiree (Total Teacher dataset) and 50% PubG-2010 Retiree (Total General Employees dataset) Amount Weighted Female Tables, with a 95.4% adjustment, generationally projected with Buck Modified scale MP-2020.

Male disabled annuitants: Pub-2010 Disability Mortality Non-Safety Amount Weighted Male Table, with a 105.4% adjustment, generationally projected with Buck Modified scale MP-2020.

Female disabled annuitants: Pub-2010 Disability Mortality Non-Safety Amount Weighted Female Table, with a 95.0% adjustment, generationally projected with Buck Modified scale MP-2020.

Male contingent annuitants: Pub-2010 Contingent Survivor Amount Weighted Male Table, with a 106.0% adjustment, generationally projected with Buck Modified scale MP-2020.

Female contingent annuitants: Pub-2010 Contingent Annuitant Amount Weighted Female Table, with a 116.2% adjustment, generationally projected with Buck Modified scale MP-2020.

For determination of actuarial equivalence, a unisex table based on 25% males and 75% females blend of the Board approved base mortality tables to be used for actuarial valuations beginning June 30, 2021, generationally projected to 2025 with the Buck Modified MP-2020 improvement scale.

Salary Increase: Effective average of 4.50% per annum, compounded annually. The components are 2.50% for inflation, and 2.00% for real wage growth and merit or seniority increases. Representative values are as follows:

Age	Annual Rate of Salary Increase
20	9.65%
30	7.15
40	5.15
50	3.15
55	2.75
60	2.75
65	2.75
Over 65	2.75

Payroll Growth: A 3.25% per annum payroll growth assumption is used to liquidate the unfunded accrued liability based on level-percent-of-pay amortization schedules required by the Retirement Code as amended by Act 2010-120 and Act 2017-5, i.e., a schedule of 24 years for the unfunded accrued liability as of June 30, 2010, and each change in the unfunded accrued liability due to actuarial experience after the June 30, 2010 valuation. Any legislation after June 30, 2010 that increases the liability due to benefit enhancements will be funded over 10 years based on level-percent-of-pay amortization.

MISCELLANEOUS:

Option 4 - Refund of Contributions Elections: 75% of Class T-C and Class T-D and 50% of Class T-E, Class T-F, Class T-G, and Class T-H members are assumed to elect a refund of contributions and a reduced annuity.

Withdrawal Annuity: 50% of members are assumed to commence payment immediately and 50% are assumed to defer payment to superannuation age.

Optional Forms of Annuity Payment at Retirement: Anticipated active member elections of optional forms of payment at retirement as follows:

- 45% will elect Maximum Straight Life Annuity (MSLA)
- 25% will elect OPTION 1 (Straight life annuity with guaranteed payments equal to present value of MSLA)
- 20% will elect OPTION 2 (100% Joint and Survivor with males 3 years older than females)
- 10% will elect OPTION 3 (50% Joint and Survivor with males 3 years older than females)
- 0% will elect OPTION 4 annuity

Optional Forms of Payment Factors: Actuarial equivalent benefits are determined based on a statutorily specified interest rate of 4.00% per year or 7.00% per annum, as applicable. The mortality basis is a blend of 25% males and 75% females blend of the Board approved base mortality tables to be used for actuarial valuations beginning June 30, 2021, generationally projected to 2025 with the Buck Modified MP-2020 improvement scale.

Health Insurance Premium Assistance:

Elections: 60% of eligible retirees are assumed to elect premium assistance.

Administrative Expenses: Assumed equal to $1,269,000 for fiscal year 2023/2024, $1,307,000 for fiscal year 2024/2025 and $1,346,000 for fiscal year 2025/2026.

Summary of Changes since the June 30, 2022 Valuation:

Beginning in fiscal year 2024/2025, 60% of eligible retirees are assumed to elect premium assistance.

Assumed adminstrative expenses for the Health Insurance Premium Assistance Plan changed from $1,054,000 to $1,269,000 for fiscal year 2023/2024, from $1,085,000 to $1,307,000 for fiscal year 2024/2025, and the amount of $1,346,000 was added for the fiscal year 2025/2026.

Methods

Calculations: The actuarial calculations were performed by qualified actuaries in accordance with accepted actuarial procedures, based on the current provisions of the Retirement System, and on actuarial assumptions that are internally consistent and reasonable based on the actual experience of the System.

Asset Valuation Method: A ten-year moving market average value of assets that recognizes the 7.00% (7.25% prior to June 30, 2021 and 7.50% prior to June 30, 2016) actuarial expected investment return immediately and spreads the difference between the actual return on the market value of assets and the expected return on the actuarial value of assets over a period of ten years. The actuarial value of assets can be no less than 70% and no more than 130% of the market value of assets.

Actuarial Cost Method for Pension Funding: Entry Age Normal Cost Method (modified slightly as of June 30, 2005 to use a pay-weighted average normal contribution rate). The gross normal cost rate is determined as of the valuation date. It is the ratio of the gross normal cost amount to the anticipated total salary during the first year, which is adjusted to the beginning of the year by one-half of the effective average salary increase assumption of 4.50% per annum. This method produces a gross normal cost rate that is consistent with the Retirement System's past annual valuations.

The results of each June 30 valuation determine the employer contribution rate for the second succeeding fiscal year. Act 120 revised the funding method effective with the June 30, 2010 valuation. Act 120 mandated that the outstanding balance of the unfunded accrued liability as of June 30, 2010, including changes in the unfunded accrued liability due to the funding reforms of Act 120, be amortized over a 24-year period, as a level percent of pay, beginning July 1, 2011. Future valuation gains and losses, and changes in the unfunded accrued liability resulting from changes in actuarial assumptions and methods, are amortized over a 24-year period, as a level percent of pay. As provided by Act 5-2017, future increases in the unfunded accrued liability due to benefit enhancement legislation will be amortized over 10-year periods, as a level percent of pay. Act 120 also modified the employer pension contribution requirements by imposing collars on the rate for fiscal years ending June 30, 2012, June 30, 2013, and on or after June 30, 2014; the pension contribution rate was limited to 3.0%, 3.5% and 4.5%, respectively, of total compensation of all active members, greater than the prior year's final contribution rate. Beginning with the fiscal year ending June 30, 2017, the actuarially required contribution rate was less than the collared rate and the final contribution rate was the actuarially determined contribution rate. However, as provided by Act 120, the final contribution rate cannot be less than the employer normal contribution rate.

In accordance with Act 5-2017, member shared-risk contributions cannot be used to offset the employer normal contribution rate. Instead, any increase or decrease in the unfunded accrued liability due to member shared-risk contributions shall be recognized as part of the Retirement System's actuarial experience and amortized as a level percentage of compensation over a period of 24 years beginning with the July 1 second succeeding the actuarial valuation in which the shared-risk contribution was recognized.

In the actuary's professional judgment, the Retirement System's funding policy meets the Actuarial Standard of Practice No. 4 standards for a reasonable Actuarially Determined Contribution.

Actuarial Cost Method for Health Insurance Premium Assistance Funding: The actuarial liability equals the assets in the health insurance account, and the results of the June 30 valuation determine the contribution rate for the second succeeding fiscal year. The rate so determined is the rate necessary to establish reserves sufficient to cover administrative expenses and provide premium assistance payments for all participating eligible annuitants during the third fiscal year that follows the valuation date.

Employer DC contributions: An average DC contribution rate is determined based on the anticipated employer contributions for DC participants and Retirement System appropriation payroll for the second succeeding fiscal year after the June 30 valuation date. It is assumed that among new employees hired on or after July 1, 2023 that 98% will become Class T-G members, 1% will become Class T-H members and 1% will become Class DC-only participants. The actual rate will vary by employer based on Class T-G, Class T-H, and Class DC-only memberships.

Data

Census and Assets: The pension valuation was based on members of the Retirement System as of June 30, 2023 and does not take into account future members. All census data was supplied by the Retirement System and was subject to reasonable consistency checks. The actuaries adjust the data to account for service and pay earned by members on or before the valuation that is not reported by the Retirement System until after the actuarial valuation is performed. Asset data was supplied by the Retirement System.

30-Year Historical Interest Rate Assumption:

June 30 Valuation	Interest Rate	June 30 Valuation	Interest Rate	June 30 Valuation	Interest Rate
2022	7.00%	2012	7.50%	2002	8.50%
2021	7.00%	2011	7.50%	2001	8.50%
2020	7.25%	2010	8.00%	2000	8.50%
2019	7.25%	2009	8.00%	1999	8.50%
2018	7.25%	2008	8.25%	1998	8.50%
2017	7.25%	2007	8.50%	1997	8.50%
2016	7.25%	2006	8.50%	1996	8.50%
2015	7.50%	2005	8.50%	1995	8.50%
2014	7.50%	2004	8.50%	1994	8.50%
2013	7.50%	2003	8.50%	1993	8.50%

Table 12

Summary of Benefit and Contribution Provisions

Membership

For valuation purposes, all employees are considered to be full coverage members. All employees who become members on and after January 1, 1966 are members of the dual coverage group. Dual coverage members contribute to both PSERS and to Social Security.

Benefits

Superannuation Annuity

Eligibility	Age 62, or age 60 with 30 years of service, or 35 years of service regardless of age. For Class T-E and Class T-F members, age 65 with a minimum of three years of service credit, or any combination of age and service that totals 92 with at least 35 years of credited service. For Class T-G members, age 67 with a minimum of three years of service, or any combination of age and service that totals 97 with at least 35 years of credited service. For Class T-H members, age 67 with a minimum of three years of service credit.

Amount

Class	Accrual	Final Average Salary
T-C	2.00%	For any 3 years of service
T-D	2.50%	For any 3 years of service
T-E	2.00%	For any 3 years of service
T-F	2.50%	For any 3 years of service
T-G	1.25%	For any 5 years of service
T-H	1.00%	For any 5 years of service

Based on the above table, Accrual Rate times the Final Average Salary times years of school service and intervening military service. Minimum of $100 per year of service. The "final average salary" means the highest average annual salary.

Annual salary is subject to a limit of $200,000, as adjusted under Section 401(a)(17) of the Internal

Revenue Code. As of June 30, 2023, the adjusted limit is $330,000.

For members who elect coverage under Class T-D, the maximum benefit is equal to the limit established by Section 415 of the Internal Revenue Code.

For Class T-E, Class T-F, Class T-G and Class T-H members, the maximum benefit is equal to the lesser of the limit established by Section 415 of the Internal Revenue Code or 100% of final average salary.

Early Retirement Annuity

Eligibility	Age 55 with 25 years of service. For Class T-G members, age 57 with 25 years of service.
Amount	Accrued benefit as of date of retirement, reduced 1/4% for each month by which commencement of payments precedes Superannuation Age.

For members who elect coverage under Class T-D, the maximum benefit is equal to the limit established by Section 415 of the Internal Revenue Code.

For Class T-E, Class T-F, Class T-G and Class T-H members, the maximum benefit is equal to the lesser of the limit established by Section 415 of the Internal Revenue Code or 100% of final average salary.

Withdrawal Annuity

Eligibility	5 years of service. For Class T-E, Class T-F, Class T-G and Class T-H members, ten years of service.
Amount	Accrued benefit deferred to superannuation retirement age or an actuarially reduced benefit payable immediately. For Class T-C, Class T-D, Class T-E and Class T-F members, PSERS early retirement factors are based on the statutory interest rate of 4%. For Class T-G and T-H members with less than 25 years of service, PSERS early retirement factors from age 62 to superannuation are based on the statutory interest rate of 4.00%. From commencement age to age 62, PSERS early retirement factors are based on the assumed long-term return on plan assets as adopted by the Board.

Disability Annuity

Eligibility	5 years of service.
Amount	The standard single life annuity if the total number of years of credited service is greater than 16.667,

otherwise the standard single life annuity multiplied by the lesser of the following ratios: (Y^*/Y) or $(16.667/Y)$ where Y is the number of years of credited service and Y^* is the total years of credited service if the member were to continue as a school employee until superannuation retirement age (or at current age, if later). For Class T-G and Class T-H members, the standard single life annuity for this provision is based on a 2.00% accrual rate. Minimum of $100 per year of service.

Return of Contributions

Eligibility | Death or separation from service and member does not qualify for other benefits.

Amount | Refund of accumulated deductions includes interest (less annuity payments received prior to death in the case of a retired member).

Death Benefit

Eligibility | Death of an active member or vestee who was eligible to receive an annuity.

Amount | The present value of the annuity that would have been effective if the member retired on the day before death. Option 1 assumed payable if no other option elected.

Normal and Optional Forms of Benefits

Normal Form (Maximum): | Life annuity with a guaranteed payment equal to member contributions with interest.

Option 1: | Reduced benefit with refund of balance of present value of annuity at retirement over payments received. If balance is less than $5,000, benefit is paid in lump sum; otherwise, beneficiary may elect annuity and/or lump sum.

Option 2: | Joint and 100% survivorship annuity.

Option 3: | Joint and 50% survivorship annuity.

Option 4: | Benefit of equivalent actuarial value, including lump sum payment of member contributions.

Contributions

By Members

Regular member contribution:

Class	Enrollment	Contribution Rate
Members who did not elect Class T-D	Prior to July 22, 1983	5.25%
Members who did not elect Class T-D	After to July 21, 1983 but prior to July 1, 2001	6.25%
T-D	Prior to July 22, 1983	6.50%
T-D	After to July 21, 1983	7.50%
T-E		7.50%
T-F		10.30%
T-G		5.50%
T-H		4.50%

Shared-Risk contribution:

Class T-E, Class T-F, Class T-G and Class T-H members are subject to a shared-risk employee contribution rate. Members benefit when investments of the fund are doing well and share some of the risk when investments underperform. The member contribution rate will stay within the specified range allotted for Class T-E, Class T-F, Class T-G or Class T-H members but could increase or decrease every three years starting July 1, 2015, depending on investment performance.

1. If the investment rate of return (less investment fees) is equal to or exceeds the assumed rate of return by more than 1.00% based on the prior ten-year period:

Class	Decrease in Contribution Rate	Minimum Contribution Rate
T-E	0.50%	5.50%
T-F	0.50%	8.30%
T-G	0.75%	2.50%
T-H	0.75%	1.50%

Provided the total member contribution rate is less than the member's basic contribution rate, if the investment rate of return (less investment fees) is less than the assumed rate of return by less than 1.00% based on the prior ten-year period:

Class	Increase in Contribution Rate
T-E	0.50%
T-F	0.50%
T-G	0.75%
T-H	0.75%

2. If the investment rate of return (less investment fees) is less than assumed rate of return by more than 1.00% based on the prior ten-year period:

Class	Increase in Contribution Rate	Maximum Contribution Rate
T-E	0.50%	9.50%
T-F	0.50%	12.30%
T-G	0.75%	8.50%
T-H	0.75%	7.50%

Provided the total member contribution rate is greater than the member's basic contribution rate, if the investment rate of return (less investment fees) is equal to or exceeds the assumed rate of return by less than 1.0% based on the prior ten-year period:

Class	Decrease in Contribution Rate
T-E	0.50%
T-F	0.50%
T-G	0.75%
T-H	0.75%

If the Retirement System is fully funded at the time of the comparison, the increase in member contribution rate shall not be greater than zero. There shall be no increase in the member contribution rate if there has not been an equivalent increase in the employer contribution rate over the previous three-year period. For any fiscal year in which the employer contribution rate is lower than the final contribution rate under section 8328(h), the total member contribution rate shall be prospectively reset to the basic contribution rate provided the total member contribution rate is at or above the basic contribution rate. Shared-risk member contributions shall not be made in any fiscal year in which the Commonwealth fails to make the annually required contribution to the Retirement System as provided under section 8328.

Until a full ten-year look back period is available, the investment return measurement period will begin on July 1, 2011.

By Commonwealth and School Districts

Balance of required contribution determined as normal contribution, accrued liability contribution, supplemental annuity contribution, experience adjustment factor, premium assistance contribution and the DC Plan contribution, is funded by the Commonwealth and the School Districts.

Defined Contribution (DC) Plan

Eligibility

All employees who become members on or after July 1, 2019 also become participants of the DC Plan.

Eligibility Point

A participant earns one eligibility point for each fiscal year (12-month period beginning July 1) in which school service is rendered and the participant makes a DC participant contribution to the PSERS DC Plan.

Participant and Employer Contribution Rate:

Class	Participant	Employer
T-G	2.75%	2.25%
T-H	3.00%	2.00%
DC-Only	7.50%	2.00%

Vesting

Participant contribution: 100% vested

	Employer contribution: 100% vested after accumulating three eligibility points
Benefit	Based on the amount of contributions in the account and any investment performance less expenses.
Death Benefit	Beneficiary will be entitled to receive a distribution of the participant's vested balance in the DC Plan account.

Health Insurance Premium Assistance

Eligibility	Retired members who: (a) have 24½ or more years of service, or (b) are disability annuitants, or (c) have 15 or more years of service and who both terminated school service and retired after attaining superannuation age and (d) participate in the PSERS health options program or in an employer-sponsored health insurance program. DC-only participants who terminate employment, are eligible for Medicare, have received all or part of their individual investment account and who: (a) have 24½ or more eligibility points, or (b) have 15 or more eligibility points and who both terminated school service and retired after attaining age 67 and (c) participate in the PSERS health options program or in an employer-sponsored health insurance program.
Amount	Participating eligible annuitants receive health insurance premium assistance payments from the Health Insurance Account equal to the lesser of $100 per month or the actual monthly premium. All administrative expenses necessary to operate the health insurance premium assistance program are to be funded by the Health Insurance Account. The Health Insurance Account is credited with contributions of the Commonwealth and the employers.

Exhibit I
Member Reconciliation as of June 30, 2023

	Active Members and DC-Only Participants	Annuitants, Beneficiaries, and Survivor Annuitants[1]	Vestee and Inactive Members	Total
Counts as of June 30, 2022	248,393	246,901	175,835	671,129
Changes due to:				
Termination	(3,000)	0	3,000	0
Inactive	(11,387)	0	11,387	0
Refund	(1,718)	0	(5,515)	(7,233)
Retirements	(7,294)	9,163	(1,869)	0
Disability	(197)	207	(10)	0
Deaths	(246)	(7,421)	(59)	(7,726)
Rehire	6,837	(200)	(6,637)	0
Benefits expired/Waived	(2)	(6)	0	(8)
Transfers to SERS	(2)	(1)	(40)	(43)
New Records	20,375	1,226	7,351	28,952
Data corrections	(27)	(145)	(31)	(203)
Total changes	3,339	2,823	7,577	13,739
Counts as of June 30, 2023	251,732	249,724	183,412	684,868

[1] Excludes 2,433 and 1,776 beneficiaries as of June 30, 2023 and June 30, 2022, respectively, who are only entitled to a pending lump sum distribution.

Exhibit II

History of Annuitants, Beneficiaries, Survivor Annuitants and Active Members

Valuation as of June 30	Annuitants	Beneficiaries and Survivor Annuitants	Total Annuitants, Beneficiaries and Survivor Annuitants	Active Members*
2014	203,756	10,144	213,900	263,312
2015	209,266	10,509	219,775	259,868
2016	214,019	10,809	224,828	257,080
2017	218,886	11,128	230,014	255,945
2018	221,879	11,409	233,288	256,362
2019	225,479	11,860	237,339	255,749
2020	227,542	12,072	239,614	256,246
2021	230,135	12,704	242,839	248,091
2022	233,801	13,100	246,901	247,873
2023	**236,286**	**13,438**	**249,724**	**250,820**

* Does not include DC-only participants.

Exhibit III

Summary of Membership Data as of June 30, 2023
($ Amounts in Thousands)

Total Active Members[1] and DC-Only Participants

Item	Male		Female		Total	
Number of Members/Participants		69,194		182,538		251,732
Total Annual Salaries[8]	$	4,424,234	$	10,606,516	$	15,030,750
Average Age[9]		45.6		45.3		45.4
Average Service[9]		12.2		11.9		11.9

1. Excludes 183,412 inactive members, non-members and vestees.

Class T-C Members[2]

Item	Male		Female		Total	
Number of Members		568		1,560		2,128
Total Annual Salaries[8]	$	45,122	$	99,841	$	144,963
Average Age[9]		53.9		55.7		55.2
Average Service[9]		25.6		24.3		24.6

2. Excludes 26,574 inactive members, non-members and vestees.

Class T-D Members[3]

Item	Male		Female		Total	
Number of Members		35,685		96,156		131,841
Total Annual Salaries[8]	$	2,969,387	$	6,925,833	$	9,895,220
Average Age[9]		49.5		50.0		49.9
Average Service[9]		19.6		18.4		18.7

3. Excludes 76,539 inactive members, non-members and vestees.

Class T-E Members[4]

Item	Male		Female		Total	
Number of Members		13,499		36,272		49,771
Total Annual Salaries[8]	$	647,175	$	1,688,651	$	2,335,826
Average Age[9]		43.6		42.3		42.7
Average Service[9]		6.0		6.5		6.4

4. Excludes 46,136 inactive members and non-members.

Class T-F Members[5]

Item	Male		Female		Total	
Number of Members		3,584		8,944		12,528
Total Annual Salaries[8]	$	224,109	$	506,050	$	730,159
Average Age[9]		42.7		40.9		41.4
Average Service[9]		7.2		6.9		7.0

5. Excludes 3,843 inactive members and non-members.

Exhibit III

(Continued)

Summary of Membership Data as of June 30, 2023
($ Amounts in Thousands)

Class T-G Members[6]

Item	Male		Female		Total	
Number of Members		15,559		38,722		54,281
Total Annual Salaries[8]	$	526,576	$	1,351,866	$	1,878,442
Average Age[9]		38.8		37.2		37.6
Average Service[9]		1.3		1.5		1.4

6. Excludes 30,233 inactive members and non-members.

Class T-H Members[7]

Item	Male		Female		Total	
Number of Members		47		224		271
Total Annual Salaries[8]	$	2,175	$	9,085	$	11,260
Average Age[9]		36.6		37.3		37.1
Average Service[9]		2.9		2.7		2.8

7. Excludes 87 inactive members and non-members.

DC-Only Participants

Item	Male		Female		Total	
Number of Participants		252		660		912
Total Annual Salaries[8]	$	9,690	$	25,190	$	34,880
Average Age[9]		44.0		41.3		42.1
Average Service[9]		2.1		2.1		2.1

8. The salaries shown in the table above represent an annual rate of pay for the year ended June 30, 2023 for members who were in active service on June 30, 2023.
9. Average completed years of age and service.

Normal Cost Rate by Class

	Class Membership	T-C	T-D	T-E	T-F	T-G	T-H	DC-Only
1.	Total DB Normal Cost	11.91%	15.08%	10.01%	12.81%	6.27%	5.01%	n/a
2.	Member Normal Cost	6.24%	7.50%	7.50%	10.30%	5.50%	4.50%	n/a
3.	Employer DC Normal Cost	n/a	n/a	n/a	n/a	2.25%	2.00%	2.00%
4.	Total Employer Normal Cost [1. - 2. + 3.]	5.67%	7.58%	2.51%	2.51%	3.02%	2.51%	2.00%

Exhibit III

(Continued)

Summary of Membership Data as of June 30, 2023
($ Amounts in Thousands)

Total Annuitants and Beneficiaries[1]

Item	Number	Annual Annuities[2]	Average Annuities	Average Age
Annuitants				
Normal	130,061	$ 3,847,875	$ 29,585	74.3
Early and Withdrawal	97,610	2,284,208	$ 23,401	68.8
Total	227,671	$ 6,132,083	$ 26,934	72.0
Survivors and Beneficiaries	13,438	220,769	$ 16,429	75.9
Disabled Annuitants	8,615	189,162	$ 21,957	66.7
Total	249,724	$ 6,542,014	$ 26,197	72.0

New Annuitants and Beneficiaries

Who Retired Between July 1, 2022 and June 30, 2023

Item	Number[3]	Annual Annuities[2]	Average Annuities	Average Age
Annuitants (Normal, Early and Withdrawal)	9,185	$ 248,088	$ 27,010	61.8
Survivors and Beneficiaries	1,166	22,073	$ 18,931	72.4
Disabled Annuitants	255	7,803	$ 30,600	53.3
Total	10,606	$ 277,964	$ 26,208	62.8

1. The median annual benefit payable to all annuitants and beneficiaries is $20,880.
2. The annuities shown in the tables above represent the annual amount payable as of July 1, 2023 for participants who were in payment on June 30, 2023.
3. Excludes 12 members who retired after June 30, 2022 but died prior to June 30, 2023.

Exhibit III

(Continued)

**Distribution of Annuitants, Beneficiaries, and Survivors by Annual Pension Amount
As of June 30, 2023**

1. All annuitants, beneficiaries, and survivors

Annual Pension Amount	Number	Average Years of Service
Under $10,000	85,103	12
$10,000 - $19,999	36,125	21
$20,000 - $29,999	27,454	26
$30,000 - $39,999	30,214	29
$40,000 - $49,999	30,460	32
$50,000 - $59,999	20,999	33
$60,000 - $69,999	10,713	35
$70,000 - $79,999	4,881	35
$80,000 - $89,999	1,857	36
$90,000 - $99,999	905	36
$100,000 or more	1,013	38
Total	249,724	23

2. Excludes annuitants, beneficiaries, and survivors with no service on file

Annual Pension Amount	Number	Average Years of Service
Under $10,000	83,840	12
$10,000 - $19,999	35,629	21
$20,000 - $29,999	27,231	26
$30,000 - $39,999	30,140	29
$40,000 - $49,999	30,423	32
$50,000 - $59,999	20,994	33
$60,000 - $69,999	10,708	35
$70,000 - $79,999	4,879	35
$80,000 - $89,999	1,857	36
$90,000 - $99,999	905	36
$100,000 or more	1,013	38
Total	247,619	23

Exhibit III

(Continued)

Distribution of Annuitants, Beneficiaries, and Survivors by Class Membership
As of June 30, 2023

Status	Class Membership							Total
	TC	**TD**	**TE**	**TF**	**TG**	**TH**	**Missing Class**	**Total**
Annuitants (Normal, Early and Withdrawal)	43,321	181,988	1,979	370	13	0	0	227,671
Disabled Annuitants	2,134	6,360	93	27	0	0	1	8,615
Survivors and Beneficiaries*	N/A	N/A	N/A	N/A	N/A	N/A	13,438	13,438
Total	45,455	188,348	2,072	397	13	0	13,439	249,724

* Class membership for survivors and beneficiaries is not provided on the data used for the valuation.

Exhibit IV

Active Membership Data as of June 30, 2023
Number and Average Annual Salary*

Age	Years of Service									Total
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	
Under 25	8,107	71								8,178
	$32,264	$36,972								$32,305
25-29	14,069	3,668	29							17,766
	$42,510	$57,633	$48,233							$45,641
30-34	9,521	10,651	3,106	41						23,319
	$39,541	$61,814	$68,412	$56,770						$53,590
35-39	8,451	6,393	10,948	5,315	24					31,131
	$35,021	$60,127	$73,681	$81,477	$73,667					$61,733
40-44	8,516	5,034	5,256	14,663	4,176	20				37,665
	$31,761	$52,942	$72,020	$86,137	$93,020	$70,770				$68,191
45-49	7,141	4,643	3,501	6,278	11,292	2,732	18			35,605
	$29,311	$46,425	$63,421	$82,099	$93,606	$97,291	$81,760			$69,838
50-54	6,177	4,661	3,997	5,179	6,706	9,091	2,093	19		37,923
	$29,702	$42,015	$53,840	$70,095	$87,506	$96,349	$96,139	$60,464		$69,156
55-59	4,571	3,669	3,625	5,078	4,553	3,585	3,524	473	17	29,095
	$28,221	$39,142	$46,387	$58,173	$70,817	$86,867	$93,047	$86,375	$71,321	$59,803
60-64	3,328	2,642	2,486	3,829	3,699	2,044	940	527	135	19,630
	$25,244	$35,965	$42,403	$51,511	$57,629	$67,008	$77,947	$84,754	$67,975	$48,850
Over 64	3,260	1,875	1,295	1,282	1,202	779	400	213	202	10,508
	$18,192	$28,045	$35,753	$46,212	$48,508	$55,796	$56,689	$68,520	$80,786	$35,478
Total	73,141	43,307	34,243	41,665	31,652	18,251	6,975	1,232	354	250,820
	$33,738	$51,398	$62,967	$75,092	$83,026	$89,583	$89,825	$82,195	$75,446	$59,787

* Does not include 912 DC-only participants.

Exhibit V

The Number of Average Annual Annuity as of June 30, 2023

Retired on Account of Superannuation, Early Retirement and Those
in Receipt of Withdrawal Annuities

Age	Years of Service									Total
	0-4	5-9[1]	10-14	15-19	20-24	25-29	30-34	35-39	40+	
Under 50		3,797	1,328	454	156	11	1			5,747
		$966	$3,150	$7,939	$15,303	$22,989	$18,449			$2,456
50-54		1,983	941	477	298	211	88	12		4,010
		$1,130	$3,261	$8,281	$17,761	$31,628	$55,338	$44,247		$6,640
55-59		1,998	1,409	899	649	1,260	2,386	660	5	9,266
		$1,452	$3,950	$9,900	$17,479	$38,063	$52,968	$60,454	$60,762	$26,252
60-64	63	3,079	3,335	3,144	3,013	3,181	4,454	2,305	153	22,727
	$7,744	$2,554	$6,363	$14,335	$23,714	$36,909	$50,241	$59,507	$55,026	$27,846
65-69	529	4,685	5,719	6,128	6,365	6,169	7,999	4,665	636	42,895
	$2,234	$3,538	$7,258	$14,729	$23,606	$34,244	$48,336	$59,054	$62,482	$28,276
70-74	1,207	4,133	6,338	5,822	6,008	6,947	13,332	9,651	1,093	54,531
	$1,435	$3,912	$6,609	$14,171	$22,956	$33,168	$46,539	$58,789	$68,760	$32,525
75-79	1,542	2,784	4,958	4,229	4,038	4,903	11,857	7,615	958	42,884
	$1,274	$3,781	$5,386	$11,850	$19,934	$29,506	$40,066	$53,909	$67,377	$29,489
80-84	1,098	1,573	2,722	2,663	2,534	3,084	6,188	3,989	676	24,527
	$1,021	$3,098	$4,774	$9,657	$15,981	$24,455	$34,054	$44,230	$58,875	$23,957
85-89	556	731	1,648	1,432	1,776	1,837	2,311	2,054	587	12,932
	$910	$2,467	$3,865	$7,310	$12,516	$19,890	$28,562	$36,845	$45,764	$19,058
Over 89	329	421	1,063	1,128	1,280	1,349	1,245	826	511	8,152
	$810	$2,047	$3,429	$6,626	$11,365	$17,107	$25,100	$32,970	$42,505	$15,956
Total	5,324	25,184	29,461	26,376	26,117	28,952	49,861	31,777	4,619	227,671
	$1,364	$2,680	$5,673	$12,438	$20,539	$30,867	$43,023	$53,823	$59,871	$26,934

1. Includes 39 annuitant records with no service information provided.

Exhibit VI

The Number and Average Annual Annuity as of June 30, 2023

Beneficiaries and Survivor Annuitants

Age	Years of Service								Total
	0-9[1]	10-14	15-19	20-24	25-29	30-34	35-39	40+	
Under 50	104	56	50	35	35	51	37	2	370
	$3,860	$3,440	$5,067	$8,410	$10,833	$11,895	$14,929	$27,873	$7,394
50-54	42	32	32	29	32	24	15	3	209
	$4,406	$4,185	$6,887	$10,425	$13,055	$13,509	$11,299	$18,685	$8,656
55-59	95	42	47	51	74	81	49	11	450
	$7,417	$4,130	$6,046	$10,133	$16,676	$17,208	$19,871	$18,711	$12,192
60-64	128	78	76	93	112	143	128	18	776
	$5,329	$5,594	$8,549	$12,440	$15,241	$19,356	$23,101	$23,435	$13,890
65-69	229	148	166	138	165	306	263	50	1,465
	$5,628	$5,829	$9,978	$14,897	$19,516	$24,776	$27,247	$22,443	$17,033
70-74	306	169	178	213	245	548	474	75	2,208
	$8,072	$6,122	$10,888	$15,128	$20,288	$28,577	$31,773	$36,720	$21,336
75-79	464	237	200	229	226	563	520	108	2,547
	$10,141	$6,033	$10,881	$14,359	$19,475	$24,889	$32,751	$35,222	$19,964
80-84	532	198	197	185	207	458	398	124	2,299
	$10,737	$5,646	$9,000	$14,275	$17,533	$20,490	$24,758	$32,200	$16,574
85-89	475	160	141	151	146	275	252	96	1,696
	$9,115	$4,581	$7,914	$10,359	$13,767	$17,388	$21,320	$26,964	$13,264
Over 89	548	104	97	124	111	178	192	64	1,418
	$8,389	$5,251	$8,175	$9,968	$12,293	$14,444	$19,524	$24,872	$11,600
Total[2]	2,923	1,224	1,184	1,248	1,353	2,627	2,328	551	13,438
	$8,579	$5,442	$9,173	$13,043	$17,246	$22,491	$27,012	$30,114	$16,429

1. Includes 1,977 beneficiary or survivor annuitant records with no service information provided.
2. In addition, there are 2,433 beneficiaries who are only entitled to a pending lump sum distribution.

Exhibit VII

The Number and Average Annual Annuity as of June 30, 2023

Retired on Account of Disability

Age	Years of Service								Total
	5-9[1]	10-14	15-19	20-24	25-29	30-34	35-39	40+	
Under 50	126 $16,823	122 $24,225	89 $30,058	50 $43,812	1 $36,069	1 $53,808			389 $25,786
50-54	118 $14,582	129 $19,146	130 $28,819	108 $39,359	72 $59,343	7 $45,453			564 $29,749
55-59	214 $13,506	219 $15,956	208 $24,497	190 $36,471	128 $48,078	30 $64,637			989 $26,797
60-64	336 $11,220	378 $14,340	325 $20,306	249 $31,503	174 $42,553	62 $46,625	3 $42,591		1,527 $22,303
65-69	426 $10,294	408 $13,455	331 $18,728	316 $26,855	225 $39,599	83 $48,302	1 $53,592		1,790 $20,968
70-74	289 $8,801	331 $12,711	252 $17,688	274 $25,979	300 $36,992	136 $48,628	1 $62,196	2 $22,352	1,585 $22,804
75-79	181 $7,897	194 $10,314	184 $13,765	173 $22,605	192 $30,338	73 $41,556	1 $13,560	2 $29,508	1,000 $18,804
80-84	81 $5,917	120 $8,608	95 $11,560	91 $17,192	57 $25,789	11 $33,791		1 $10,189	456 $13,216
85-89	43 $5,040	57 $6,919	53 $7,971	35 $16,759	26 $22,662	3 $33,626	2 $42,997		219 $10,942
Over 89	22 $3,197	29 $6,884	20 $9,475	16 $15,126	6 $20,871	3 $20,720			96 $9,259
Total[2]	1,836 $10,689	1,987 $13,923	1,687 $19,571	1,502 $28,711	1,181 $38,852	409 $47,415	8 $42,889	5 $22,782	8,615 $21,957

1. Includes 42 annuitant records with no service information provided.

Exhibit VIII

Annuitant and Beneficiary Membership Data as of June 30, 2023

Number and Average Annual Benefit

Excludes Partial Lump Sum Payments

Age Last Birthday	Number	Annual Benefit (Thousands)	Average Annual Benefit
Annuitants **(Normal, Early and Withdrawal)**			
Under 60	19,023	$ 283,996	$ 14,929
60 - 64	22,727	632,856	27,846
65 - 69	42,895	1,212,890	28,276
70 - 74	54,531	1,773,621	32,525
75 - 79	42,884	1,264,602	29,489
Over 79	45,611	964,119	21,138
Total	227,671	$ 6,132,083	$ 26,934
Survivors and Beneficiaries			
Under 60	1,029	$ 10,031	$ 9,749
60 - 64	776	10,779	13,890
65 - 69	1,465	24,953	17,033
70 - 74	2,208	47,110	21,336
75 - 79	2,547	50,848	19,964
Over 79	5,413	77,048	14,234
Total	13,438	$ 220,769	$ 16,429
Disabled Annuitants			
Under 60	1,942	$ 53,312	$ 27,452
60 - 64	1,527	34,057	22,303
65 - 69	1,790	37,533	20,968
70 - 74	1,585	36,144	22,804
75 - 79	1,000	18,805	18,805
Over 79	771	9,312	12,078
Total	8,615	$ 189,162	$ 21,957
Grand Total **Average Annual Benefit**	249,724	$ 6,542,013	$ 26,197

Exhibit IX

10-Year History of Membership Data

Active Members

Valuation as of June 30	Number of Active Members[1]	Percentage Change in Membership	Total Annualized Payroll (Thousands)[2]	Percentage Change in Payroll
2023	251,732	1.34%	$ 15,030,750	4.27%
2022	248,393	(0.01%)	14,415,795	2.54%
2021	248,410	(3.08%)	14,059,363	0.60%
2020	256,306	0.22%	13,975,907	2.22%
2019	255,749	(0.24%)	13,671,927	2.19%
2018	256,362	0.16%	13,379,041	2.65%
2017	255,945	(0.44%)	13,033,919	1.42%
2016	257,080	(1.07%)	12,851,289	1.37%
2015	259,868	(1.31%)	12,678,213	0.45%
2014	263,312	(1.54%)	12,620,862	0.35%

1. Includes DC-only participants beginning June 30, 2020. Based on discussions with PSERS staff, the 2021 count has been updated to 319 from 54.
2. The salaries shown represent an annual rate of pay for the year ending June 30th for members and DC-only participants who were in active service on June 30th. The June 30, 2021 salaries include annual rate of pay for the original 54 DC-only participants.

Exhibit IX

(Continued)

10-Year History of Membership Data

The Number and Annual Annuities of Annuitant and Survivor Annuitant Members

Year Ended June 30	Number	Annual Annuities[1] (Millions)	Average Annual Annuities	Additions	Annual Annuities (Millions)	Deletions	Annual Annuities (Millions)	Percentage Change in Membership	Percentage Change in Annuities
2023	249,724	$ 6,542.0	$ 26,197	10,606	$ 278.0	7,783	$ 147.2	1.14%	1.61%
2022	246,901	6,438.6	26,078	11,493	309.9	7,431	120.4	1.67%	2.01%
2021	242,839	6,311.8	25,992	11,682	320.2	8,457	135.9	1.35%	2.28%
2020	239,614	6,170.9	25,753	9,708	256.1	7,433	115.6	0.96%	1.97%
2019	237,339	6,051.6	25,498	10,553	246.6	6,502	107.0	1.74%	2.11%
2018	233,288	5,926.7	25,405	11,806	235.2	8,532	98.6	1.42%	1.90%
2017	230,014	5,816.4	25,287	12,876	274.2	7,690	102.1	2.31%	2.65%
2016	224,828	5,666.4	25,203	12,686	267.1	7,633	93.5	2.30%	2.64%
2015	219,775	5,520.6	25,119	15,017	297.3	9,142	91.7	2.75%	3.39%
2014	213,900	5,339.5	24,962	15,225	300.5	8,878	84.9	3.06%	3.74%

1. The annual annuities added and deleted are for the annuitants and survivor annuitants who were added and deleted. Changes in annuities for continuing payees may also occur due to finalization of benefit calculations and due to the commencement of supplemental annuity payments.

The Number and Annual Annuities of Annuitant Members

Year Ended June 30	Number	Annual Annuities[2] (Millions)	Average Annual Annuities	Additions	Annual Annuities (Millions)	Deletions	Annual Annuities (Millions)	Percentage Change in Membership	Percentage Change in Annuities
2023	236,286	$ 6,321.2	$ 26,753	9,452	$ 255.9	6,967	$ 136.6	1.06%	1.48%
2022	233,801	6,229.2	26,643	10,442	288.9	6,776	134.6	1.59%	1.88%
2021	230,135	6,114.5	26,569	10,474	297.9	7,881	152.3	1.14%	2.10%
2020	227,542	5,988.6	26,319	8,841	239.6	6,778	123.5	0.91%	1.92%
2019	225,479	5,875.5	26,058	9,575	228.8	5,975	104.0	1.62%	1.97%
2018	221,879	5,762.3	25,970	10,911	220.2	7,918	93.0	1.37%	1.80%
2017	218,886	5,660.4	25,860	11,942	257.9	7,075	95.8	2.27%	2.54%
2016	214,019	5,520.0	25,792	11,807	249.8	7,054	88.1	2.27%	2.54%
2015	209,266	5,383.3	25,725	12,624	279.2	7,114	86.5		

2. The annual annuities added and deleted are for the annuitants who were added and deleted. Changes in annuities for continuing payees may also occur due to finalization of benefit calculations and due to the commencement of supplemental annuity payments.

Exhibit X

Detailed Tabulations of the Data

Table 1

The Number and Annual Salaries of Members in Active Service Distributed by Age as of June 30, 2023*

	Male		Female		Total	
Age	Number	Salaries	Number	Salaries	Number	Salaries
17	8	$ 74,142	10	$ 71,325	18	$ 145,467
18	38	497,174	47	627,985	85	1,125,159
19	117	2,241,765	169	2,376,366	286	4,618,131
20	223	4,523,006	269	4,058,938	492	8,581,944
21	295	5,729,419	399	6,800,305	694	12,529,724
22	376	8,559,880	734	20,567,041	1,110	29,126,921
23	720	22,216,324	1,784	68,756,854	2,504	90,973,178
24	832	28,369,422	2,157	88,723,290	2,989	117,092,712
25	880	31,583,232	2,365	102,524,142	3,245	134,107,374
26	922	35,267,236	2,528	114,489,396	3,450	149,756,632
27	944	37,371,515	2,498	118,871,564	3,442	156,243,079
28	1,019	44,476,344	2,733	135,764,522	3,752	180,240,866
29	1,017	47,213,208	2,860	143,304,383	3,877	190,517,591
30	1,144	54,367,920	3,015	154,032,240	4,159	208,400,160
31	1,132	57,379,347	3,171	169,093,504	4,303	226,472,851
32	1,265	65,598,502	3,444	186,191,531	4,709	251,790,033
33	1,329	74,092,234	3,703	203,320,530	5,032	277,412,764
34	1,362	75,371,252	3,754	210,220,680	5,116	285,591,932
35	1,416	83,131,163	3,950	223,430,587	5,366	306,561,750
36	1,556	96,110,373	4,379	260,306,663	5,935	356,417,036
37	1,683	109,042,791	4,654	279,848,581	6,337	388,891,372
38	1,764	118,661,597	4,869	306,841,222	6,633	425,502,819
39	1,781	122,226,235	5,079	322,225,861	6,860	444,452,096
40	1,781	124,485,892	5,370	346,646,323	7,151	471,132,215
41	2,029	147,846,815	5,592	368,106,892	7,621	515,953,707
42	2,059	151,297,758	5,618	375,015,459	7,677	526,313,217
43	2,044	153,326,570	5,628	375,690,688	7,672	529,017,258
44	2,057	155,659,104	5,487	370,343,675	7,544	526,002,779
45	2,002	153,621,020	5,254	352,132,923	7,256	505,753,943
46	2,086	159,527,421	5,253	352,669,652	7,339	512,197,073
47	2,020	157,803,722	4,963	333,245,456	6,983	491,049,178
48	1,962	152,273,435	5,092	338,951,849	7,054	491,225,284
49	2,001	155,380,503	4,972	330,980,030	6,973	486,360,533
50	2,043	159,071,850	5,060	336,262,826	7,103	495,334,676
51	2,135	170,061,770	5,430	359,648,270	7,565	529,710,040
52	2,357	181,766,477	5,908	394,422,075	8,265	576,188,552
53	2,049	159,195,072	5,747	378,750,262	7,796	537,945,334
54	1,954	150,100,528	5,240	333,334,205	7,194	483,434,733
55	1,767	132,587,119	4,758	289,980,045	6,525	422,567,164
56	1,628	116,375,070	4,476	264,652,193	6,104	381,027,263
57	1,548	106,070,016	4,104	230,885,505	5,652	336,955,521
58	1,410	93,645,011	4,103	215,671,956	5,513	309,316,967
59	1,379	89,414,293	3,922	200,690,972	5,301	290,105,265
60	1,211	73,839,916	3,690	181,580,670	4,901	255,420,586
61	1,112	64,394,820	3,444	166,671,828	4,556	231,066,648

Table 1
(Continued)

**The Number and Annual Salaries of Members in Active Service Distributed
by Age as of June 30, 2023***

	Male		Female		Total	
Age	Number	Salaries	Number	Salaries	Number	Salaries
62	1,015	$ 55,392,881	2,906	$ 131,998,247	3,921	$ 187,391,128
63	886	45,603,228	2,451	107,763,669	3,337	153,366,897
64	807	40,446,139	2,108	91,238,453	2,915	131,684,592
65	679	31,728,648	1,527	62,113,970	2,206	93,842,618
66	511	22,654,724	1,136	42,536,383	1,647	65,191,107
67	416	16,762,626	806	29,670,162	1,222	46,432,788
68	397	14,835,110	671	23,536,060	1,068	38,371,170
69	325	10,999,893	555	17,858,180	880	28,858,073
70	253	8,592,646	424	13,018,527	677	21,611,173
71	245	7,708,594	336	10,449,477	581	18,158,071
72	180	5,874,223	250	6,434,186	430	12,308,409
73	136	4,377,343	243	7,680,855	379	12,058,198
74	146	4,023,465	193	4,716,345	339	8,739,810
75	111	3,263,877	140	3,570,121	251	6,833,998
76	106	2,998,593	125	2,782,295	231	5,780,888
77	56	1,504,906	82	2,043,913	138	3,548,819
78	62	1,776,097	62	1,593,145	124	3,369,242
79	39	1,069,746	44	942,126	83	2,011,872
80	37	1,010,332	35	679,352	72	1,689,684
81	24	818,829	31	592,384	55	1,411,213
82	17	406,495	27	481,269	44	887,764
83	12	288,227	15	279,076	27	567,303
84	11	248,063	6	142,807	17	390,870
85	9	230,879	15	232,833	24	463,712
86	4	51,560	5	129,735	9	181,295
87	1	28,732	3	61,076	4	89,808
Total	68,942	$4,414,544,119	181,878	$10,581,325,910	250,820	$14,995,870,029

* Does not include 912 DC-only participants.

Table 2

**The Number and Annual Salaries of Members in Active Service Distributed by
Years of Credited Service as of June 30, 2023***

	Male		Female		Total	
Service	**Number**	**Salaries**	**Number**	**Salaries**	**Number**	**Salaries**
0	5,480	$ 77,836,568	8,669	$ 154,000,748	14,149	$ 231,837,316
1	6,949	217,336,251	16,605	554,689,448	23,554	772,025,699
2	3,905	152,306,996	9,872	387,316,876	13,777	539,623,872
3	2,687	114,321,901	7,996	322,225,040	10,683	436,546,941
4	2,725	131,588,886	8,253	356,021,412	10,978	487,610,298
5	2,406	121,408,770	7,546	345,954,498	9,952	467,363,268
6	2,219	120,800,745	6,807	325,088,783	9,026	445,889,528
7	2,012	114,269,862	6,721	335,606,844	8,733	449,876,706
8	1,896	113,679,067	6,097	319,640,683	7,993	433,319,750
9	1,828	112,782,398	5,775	316,667,087	7,603	429,449,485
10	1,844	119,502,569	5,392	305,290,108	7,236	424,792,677
11	1,488	97,460,968	4,661	270,406,965	6,149	367,867,933
12	1,445	99,466,656	4,651	280,018,404	6,096	379,485,060
13	1,640	118,433,001	5,401	339,951,950	7,041	458,384,951
14	1,858	138,549,419	5,863	387,107,787	7,721	525,657,206
15	2,028	155,100,533	6,326	430,117,904	8,354	585,218,437
16	2,081	165,871,672	6,562	459,373,765	8,643	625,245,437
17	2,063	169,292,309	6,272	456,592,881	8,335	625,885,190
18	2,139	182,940,068	6,176	465,647,811	8,315	648,587,879
19	2,171	190,517,669	5,847	453,265,250	8,018	643,782,919
20	1,796	160,638,644	4,912	381,131,565	6,708	541,770,209
21	1,755	161,904,645	4,795	377,206,858	6,550	539,111,503
22	1,698	154,920,363	4,547	360,028,662	6,245	514,949,025
23	1,607	148,652,490	4,533	364,807,509	6,140	513,459,999
24	1,981	188,209,526	4,028	330,441,576	6,009	518,651,102
25	1,596	152,462,381	3,294	275,282,083	4,890	427,744,464
26	1,527	150,409,920	2,769	235,352,131	4,296	385,762,051
27	1,188	115,148,788	2,303	199,100,808	3,491	314,249,596
28	1,025	99,623,439	2,008	174,843,653	3,033	274,467,092
29	810	78,748,778	1,731	154,001,231	2,541	232,750,009
30	937	91,517,793	1,424	125,030,459	2,361	216,548,252
31	524	50,319,808	964	83,483,733	1,488	133,803,541
32	389	36,891,736	851	73,617,421	1,240	110,509,157
33	386	36,732,142	693	59,433,150	1,079	96,165,292
34	304	28,086,974	503	41,419,292	807	69,506,266
35	157	14,323,530	276	22,981,231	433	37,304,761
36	108	9,411,340	213	16,689,805	321	26,101,145
37	79	6,183,279	137	11,220,103	216	17,403,382
38	55	4,802,024	104	8,249,655	159	13,051,679
39	35	2,858,039	68	4,545,056	103	7,403,095
40	32	2,709,688	39	2,961,259	71	5,670,947
41	21	1,611,383	33	2,114,371	54	3,725,754
42	19	1,169,983	30	2,285,276	49	3,455,259
43	15	1,163,110	26	1,964,848	41	3,127,958

Table 2
(Continued)

The Number and Annual Salaries of Members in Active Service Distributed by
Years of Credited Service as of June 30, 2023*

| | Male | | Female | | Total | |
Service	Number	Salaries	Number	Salaries	Number	Salaries
44	15	$ 869,324	17	$ 1,500,416	32	$ 2,369,740
45	6	671,488	16	1,036,645	22	1,708,133
46	2	158,917	11	724,790	13	883,707
47	4	298,841	13	1,042,189	17	1,341,030
48	1	55,876	12	846,164	13	902,040
49	1	75,895	7	678,480	8	754,375
50	2	214,356	11	1,049,184	13	1,263,540
51	1	95,252	4	384,639	5	479,891
52			5	317,552	5	317,552
53			4	220,610	4	220,610
54			1	85,960	1	85,960
55			1	99,394	1	99,394
56	1	40,420	2	121,474	3	161,894
57	1	97,639	1	42,434	2	140,073
Total	68,942	$4,414,544,119	181,878	$10,581,325,910	250,820	$14,995,870,029

* Does not include 912 DC-only participants.

Table 3

**The Number and Annual Annuities of Annuitants on the Retired List
as of June 30, 2023**

**Retired on Account of Superannuation, Early Retirement and
Those in Receipt of Withdrawal Annuities**

	Male		Female		Total	
Age	Number	Annuities	Number	Annuities	Number	Annuities
30	1	$ 3,650			1	$ 3,650
31	4	7,012	1	$ 870	5	7,882
32	13	20,330	6	3,948	19	24,278
33	24	21,881	11	7,366	35	29,247
34	17	16,685	28	33,387	45	50,072
35	36	49,851	65	68,668	101	118,519
36	48	48,794	85	108,145	133	156,939
37	86	128,031	142	182,408	228	310,439
38	95	162,189	156	209,986	251	372,175
39	83	137,554	175	286,871	258	424,425
40	118	166,499	250	414,428	368	580,927
41	141	311,320	219	395,327	360	706,647
42	144	312,422	242	483,249	386	795,671
43	168	381,402	290	635,649	458	1,017,051
44	168	419,548	301	673,686	469	1,093,234
45	174	540,276	291	689,511	465	1,229,787
46	167	484,697	335	916,290	502	1,400,987
47	155	576,748	364	986,644	519	1,563,392
48	198	891,158	380	1,213,620	578	2,104,778
49	143	693,092	423	1,431,894	566	2,124,986
50	208	1,086,422	441	1,630,684	649	2,717,106
51	216	1,180,860	490	1,939,863	706	3,120,723
52	226	1,479,316	596	2,835,382	822	4,314,698
53	241	1,867,498	622	3,649,550	863	5,517,048
54	301	4,447,056	669	6,509,229	970	10,956,285
55	361	8,078,996	899	16,318,028	1,260	24,397,024
56	437	11,782,678	1,076	23,545,300	1,513	35,327,978
57	560	17,876,464	1,262	31,003,729	1,822	48,880,193
58	604	19,892,204	1,582	41,494,799	2,186	61,387,003
59	723	26,592,734	1,762	46,670,218	2,485	73,262,952
60	826	28,949,812	2,011	58,372,780	2,837	87,322,592
61	958	34,089,922	2,579	69,511,527	3,537	103,601,449
62	1,208	41,669,285	3,753	95,130,079	4,961	136,799,364
63	1,285	43,287,691	4,018	97,832,242	5,303	141,119,933
64	1,515	48,753,207	4,574	115,259,165	6,089	164,012,372
65	1,732	56,871,207	5,588	143,088,372	7,320	199,959,579
66	1,964	64,870,048	6,246	160,559,516	8,210	225,429,564
67	2,039	65,129,514	6,463	170,504,829	8,502	235,634,343
68	2,286	72,872,441	6,892	188,070,974	9,178	260,943,415
69	2,336	76,712,093	7,349	214,210,554	9,685	290,922,647
70	2,717	94,902,214	7,783	238,810,566	10,500	333,712,780
71	2,953	106,024,400	8,314	259,823,398	11,267	365,847,798

Table 3
(Continued)

The Number and Annual Annuities of Annuitants on the Retired List
as of June 30, 2023

Retired on Account of Superannuation, Early Retirement and
Those in Receipt of Withdrawal Annuities

Age	Male Number	Male Annuities	Female Number	Female Annuities	Total Number	Total Annuities
72	3,093	$ 114,561,546	8,135	$ 257,284,069	11,228	$ 371,845,615
73	3,148	116,720,727	7,702	236,712,568	10,850	353,433,295
74	3,324	123,820,417	7,362	224,960,591	10,686	348,781,008
75	3,599	127,948,904	7,111	207,519,923	10,710	335,468,827
76	4,033	138,742,456	7,484	210,476,608	11,517	349,219,064
77	2,655	89,814,028	4,590	124,187,832	7,245	214,001,860
78	2,431	76,777,882	4,458	115,968,178	6,889	192,746,060
79	2,369	73,123,670	4,154	100,042,202	6,523	173,165,872
80	2,544	79,001,243	4,296	99,827,080	6,840	178,828,323
81	1,937	57,217,935	3,431	75,884,720	5,368	133,102,655
82	1,591	45,705,467	3,059	63,294,462	4,650	108,999,929
83	1,348	36,060,999	2,695	53,652,695	4,043	89,713,694
84	1,153	31,067,554	2,473	45,870,746	3,626	76,938,300
85	1,031	25,368,434	2,245	40,490,302	3,276	65,858,736
86	905	23,819,682	1,987	34,038,404	2,892	57,858,086
87	816	20,012,764	1,840	28,989,377	2,656	49,002,141
88	720	17,449,498	1,527	23,531,844	2,247	40,981,342
89	562	13,372,791	1,299	19,388,208	1,861	32,760,999
90	457	11,605,769	1,138	16,330,671	1,595	27,936,440
91	409	10,029,095	1,108	16,776,507	1,517	26,805,602
92	331	7,901,873	956	13,885,504	1,287	21,787,377
93	223	5,044,568	721	9,629,336	944	14,673,904
94	148	3,242,553	620	8,562,419	768	11,804,972
95	121	2,703,523	511	6,276,857	632	8,980,380
96	85	1,794,150	358	4,349,836	443	6,143,986
97	58	1,131,706	257	3,241,281	315	4,372,987
98	40	724,062	188	2,125,919	228	2,849,981
99	26	495,832	119	1,274,636	145	1,770,468
100	12	193,389	89	923,017	101	1,116,406
101	5	60,203	63	557,434	68	617,637
102	3	44,758	48	501,174	51	545,932
103	2	41,012	28	264,549	30	305,561
104	2	35,616	12	208,280	14	243,896
105			4	32,975	4	32,975
106	1	92	1	27,757	2	27,849
107			4	30,730	4	30,730
108			2	5,588	2	5,588
112	1	15,242	1	6,825	2	22,067
Total	66,862	$ 2,089,438,641	160,809	$ 4,042,643,835	227,671	$ 6,132,082,476

Table 3
(Continued)

The Number and Annual Annuities of Annuitants on the Retired List
as of June 30, 2023

Retired on Account of Superannuation, Early Retirement and
Those in Receipt of Withdrawal Annuities

OPTION	MALE		FEMALE	
	<u>Count</u>	<u>Annual Annuity</u>	<u>Count</u>	<u>Annual Annuity</u>
Maximum	28,349	$ 870,064,552	85,058	$ 2,133,827,379
1	10,998	267,047,557	37,828	754,395,037
2	18,030	552,121,219	22,740	614,442,186
3	7,856	322,824,020	13,845	485,184,662
4	<u>1,629</u>	<u>77,381,293</u>	<u>1,338</u>	<u>54,794,571</u>
Total	66,862	$ 2,089,438,641	160,809	$ 4,042,643,835

DEFINITION OF OPTIONS

Option 1 A life annuity to the member with a guaranteed payment to the beneficiary equal to the present value of the total maximum single life annuity less any amounts paid to the member prior to death.

Option 2 A joint and one hundred percent (100%) survivor annuity payable during the lifetime of the member with the full amount of such annuity payable thereafter to the designated survivor annuitant, if living at the member's death.

Option 3 A joint and fifty percent (50%) survivor annuity payable during the lifetime of the member with one-half of such annuity payable thereafter to the designated survivor annuitant, if living at the member's death.

Option 4 A life annuity to the member with a special death benefit other than the normal option 1, 2, or 3 death benefit.

Note: The Option 4 totals above only reflect annuity elections that differ from the Maximum annuity or Options 1, 2 or 3. The Option 4 totals do not reflect Option 4 elections to withdraw accumulated deductions.

Table 4

**The Number and Annual Annuities of Beneficiaries and Survivor Annuitants
as of June 30, 2023**

| Age | | Male | | | Female | | | Total |
	Number	Annuities	Number	Annuities	Number	Annuities
10	1	$ 571			1	$ 571
11			1	$ 702	1	702
13	1	1,534			1	1,534
16	1	3,741			1	3,741
17			1	1,534	1	1,534
18	1	3,730			1	3,730
19			1	21,875	1	21,875
21			1	11,840	1	11,840
22	4	22,836			4	22,836
23	2	3,939	7	65,888	9	69,827
24	3	9,461	4	29,243	7	38,704
25	2	12,542	2	13,822	4	26,364
26	2	3,275			2	3,275
27	1	9,869	5	23,676	6	33,545
28	1	2,775	3	13,061	4	15,836
29	4	25,135	2	14,045	6	39,180
30	2	4,500	3	17,646	5	22,146
31	3	18,924	5	33,501	8	52,425
32	3	14,123	6	41,854	9	55,977
33	6	46,752	5	17,180	11	63,932
34	5	19,205	5	22,198	10	41,403
35	6	55,147	7	59,222	13	114,369
36	8	72,360	4	15,358	12	87,718
37	5	25,704	6	10,399	11	36,103
38	8	37,739	8	89,357	16	127,096
39	7	39,761	9	128,851	16	168,612
40	7	53,075	5	28,749	12	81,824
41	5	63,486	5	31,893	10	95,379
42	10	66,809	7	33,999	17	100,808
43	6	26,588	3	33,122	9	59,710
44	13	69,237	18	118,429	31	187,666
45	17	162,285	12	64,302	29	226,587
46	7	27,776	17	132,743	24	160,519
47	9	102,246	18	179,349	27	281,595
48	9	127,933	16	183,827	25	311,760
49	10	49,124	15	115,833	25	164,957
50	14	72,324	18	149,671	32	221,995
51	9	35,265	22	164,108	31	199,373
52	9	113,347	28	208,864	37	322,211
53	12	88,503	40	416,135	52	504,638
54	22	162,917	35	398,047	57	560,964
55	18	156,707	61	666,342	79	823,049
56	22	239,751	64	597,212	86	836,963
57	19	238,396	56	799,873	75	1,038,269
58	21	200,781	76	977,900	97	1,178,681
59	29	442,530	84	1,166,922	113	1,609,452
60	33	290,164	82	1,153,246	115	1,443,410

Table 4
(Continued)

The Number and Annual Annuities of Beneficiaries and Survivor Annuitants
as of June 30, 2023

Age	Male Number	Male Annuities	Female Number	Female Annuities	Total Number	Total Annuities
61	33	$ 418,208	84	$ 1,176,989	117	$ 1,595,197
62	43	529,798	134	1,812,733	177	2,342,531
63	51	627,435	112	1,736,509	163	2,363,944
64	60	728,866	144	2,304,866	204	3,033,732
65	60	773,809	167	2,366,825	227	3,140,634
66	79	997,302	183	3,105,664	262	4,102,966
67	88	1,330,179	207	4,011,828	295	5,342,007
68	95	1,891,056	214	3,695,421	309	5,586,477
69	112	1,666,194	260	5,114,793	372	6,780,987
70	124	2,639,723	249	4,979,429	373	7,619,152
71	146	2,869,269	302	6,009,489	448	8,878,758
72	143	2,822,300	283	6,494,002	426	9,316,302
73	130	2,995,350	327	7,514,950	457	10,510,300
74	152	3,384,206	352	7,401,737	504	10,785,943
75	154	3,134,471	405	8,118,849	559	11,253,320
76	193	4,054,038	473	9,861,116	666	13,915,154
77	100	2,084,080	319	6,491,852	419	8,575,932
78	132	2,466,067	322	6,369,153	454	8,835,220
79	108	2,333,877	341	5,934,302	449	8,268,179
80	151	2,850,913	403	7,207,635	554	10,058,548
81	101	1,861,845	361	5,840,360	462	7,702,205
82	95	2,035,423	383	5,994,907	478	8,030,330
83	94	1,463,896	312	4,696,868	406	6,160,764
84	83	1,344,821	316	4,807,299	399	6,152,120
85	72	1,164,746	315	4,115,767	387	5,280,513
86	73	914,890	331	4,714,108	404	5,628,998
87	71	903,458	270	3,413,423	341	4,316,881
88	43	502,768	261	3,532,729	304	4,035,497
89	46	504,923	214	2,728,633	260	3,233,556
90	26	351,277	218	2,744,099	244	3,095,376
91	45	422,457	183	2,347,730	228	2,770,187
92	43	456,702	174	2,005,151	217	2,461,853
93	27	372,440	157	1,954,252	184	2,326,692
94	17	241,124	136	1,500,278	153	1,741,402
95	16	153,479	105	1,092,891	121	1,246,370
96	17	202,290	83	886,878	100	1,089,168
97	8	86,727	46	582,724	54	669,451
98	3	20,809	36	348,143	39	368,952
99	8	73,684	21	146,406	29	220,090
100	6	51,153	19	190,833	25	241,986
101			11	76,261	11	76,261
102			7	110,499	7	110,499
103			3	10,967	3	10,967
104	2	18,374			2	18,374
105			1	672	1	672
Total	3,427	$ 56,967,294	10,011	$ 163,801,838	13,438	$ 220,769,132

Table 5

**The Number and Annual Annuities of Annuitants on the Retired List
as of June 30, 2023**

Retired on Account of Disability

Age	Male Number	Male Annuities	Female Number	Female Annuities	Total Number	Total Annuities
32			1	$ 13,149	1	$ 13,149
33	1	$ 5,746	1	5,541	2	11,287
35	1	9,646	2	40,153	3	49,799
36			4	98,930	4	98,930
37	2	46,044	7	151,102	9	197,146
38	3	80,621	6	119,224	9	199,845
39	1	19,179	9	204,044	10	223,223
40	6	96,230	9	205,410	15	301,640
41	4	106,627	11	311,036	15	417,663
42	5	102,838	10	221,585	15	324,423
43	11	267,966	16	420,216	27	688,182
44	3	67,763	18	426,550	21	494,313
45	11	377,925	26	674,369	37	1,052,294
46	11	345,477	40	1,074,432	51	1,419,909
47	14	311,220	39	1,239,773	53	1,550,993
48	10	277,887	43	1,194,393	53	1,472,280
49	16	413,853	48	1,101,829	64	1,515,682
50	30	1,049,582	48	1,320,808	78	2,370,390
51	21	684,104	67	1,703,890	88	2,387,994
52	27	940,143	87	2,795,277	114	3,735,420
53	34	1,186,511	93	2,731,039	127	3,917,550
54	42	1,154,601	115	3,212,542	157	4,367,143
55	47	1,528,264	109	2,911,289	156	4,439,553
56	48	1,499,185	116	3,212,784	164	4,711,969
57	52	1,451,702	126	3,442,958	178	4,894,660
58	68	1,947,436	173	4,653,488	241	6,600,924
59	75	1,897,128	175	3,958,156	250	5,855,284
60	77	1,950,507	203	4,729,244	280	6,679,751
61	78	1,821,425	192	3,885,385	270	5,706,810
62	74	1,984,879	225	4,673,950	299	6,658,829
63	85	2,164,724	225	4,990,340	310	7,155,064
64	115	2,699,185	253	5,157,163	368	7,856,348
65	103	2,229,646	229	4,921,554	332	7,151,200
66	105	2,159,295	241	4,949,748	346	7,109,043
67	109	2,232,090	248	4,841,282	357	7,073,372
68	108	2,415,901	269	5,464,854	377	7,880,755
69	105	2,379,650	273	5,938,514	378	8,318,164
70	100	2,124,921	237	5,088,723	337	7,213,644
71	99	2,518,575	241	5,629,525	340	8,148,100
72	88	2,037,390	246	5,731,828	334	7,769,218
73	89	2,067,746	200	4,471,203	289	6,538,949
74	81	2,034,050	204	4,440,474	285	6,474,524
75	78	2,010,110	203	4,057,393	281	6,067,503
76	67	1,367,717	200	3,803,943	267	5,171,660
77	38	711,257	128	2,140,506	166	2,851,763

Table 5

(Continued)

The Number and Annual Annuities of Annuitants on the Retired List
as of June 30, 2023

Retired on Account of Disability

Age	Male Number	Male Annuities	Female Number	Female Annuities	Total Number	Total Annuities
78	35	$ 864,639	105	$ 1,537,832	140	$ 2,402,471
79	38	722,388	108	1,589,155	146	2,311,543
80	28	455,664	100	1,518,777	128	1,974,441
81	21	322,365	88	1,067,127	109	1,389,492
82	21	303,751	74	897,547	95	1,201,298
83	13	164,181	53	595,017	66	759,198
84	17	218,461	41	483,806	58	702,267
85	14	207,993	57	514,929	71	722,922
86	11	139,374	33	520,410	44	659,784
87	11	136,073	27	253,401	38	389,474
88	5	53,378	26	251,332	31	304,710
89	10	124,042	25	195,334	35	319,376
90	6	71,560	17	198,026	23	269,586
91	2	30,748	14	125,262	16	156,010
92	1	7,213	13	79,406	14	86,619
93			12	104,676	12	104,676
94	2	31,510	8	78,561	10	110,071
95			8	60,013	8	60,013
96	1	25,919	7	43,146	8	69,065
97			1	5,107	1	5,107
98			1	17,896	1	17,896
101			1	1,776	1	1,776
103			2	8,052	2	8,052
Total	2,378	$ 56,656,005	6,237	$ 132,506,184	8,615	$ 189,162,189

Exhibit XI: Risk Information

<u>**Actuarial Standard of Practice No. 51 Disclosures**</u>

Funding future retirement benefits prior to when those benefits become due involves assumptions regarding future economic and demographic experience. These assumptions are applied to calculate actuarial liabilities, current contribution requirements and the funded status of the plan. However, to the extent future experience deviates from the assumptions used, variations will occur in these calculated values. These variations create risk to the plan. Understanding the risks to the funding of the plan is important. Actuarial Standard of Practice No. 51 (ASOP 51) requires certain disclosures of potential risks to the plan and provides useful information for intended users of actuarial reports that determine plan contributions or evaluate the adequacy of specified contribution levels to support benefit provisions.

Under ASOP 51, risk is defined as the potential of actual future measurements deviating from expected future measurements resulting from actual future experience deviating from actuarially assumed experience.

It is important to note that not all risk is negative, but all risk should be understood and accepted based on knowledge, judgement and educated decisions. Future measurements may deviate in ways that produce positive or negative financial impacts to the Retirement System.

In the actuary's professional judgment, the following risks may reasonably be anticipated to significantly affect the Retirement System's future financial condition:

- Investment risk – potential that the investment return will differ from the 7.00% expected in the actuarial valuation
- Salary increases – potential that salary increases will differ from those assumed in the actuarial valuation
- Longevity risk – potential that participants' lifespans will differ from those projected on the valuation mortality assumptions
- Declining workforce – potential that future employer contribution rates will differ from those expected
- Contribution risk – potential that contributions will differ from the recommended contributions in the actuarial valuation

The following information is provided to comply with ASOP 51 and furnish beneficial information on potential risks to the plan. This list is not all-inclusive; it is an attempt to identify the most significant risks and how those risks might affect the results shown in this report.

Note that ASOP 51 does not require the actuary to evaluate the ability or willingness of the Retirement System employers to make contributions to the Retirement System when due, or to assess the likelihood or consequences of potential future changes in law. In addition, this valuation report is not intended to provide investment advice or to provide guidance on the management or reduction of risk. Buck welcomes the opportunity to assist in such matters as part of a separate project or projects utilizing the appropriate staff and resources for those objectives.

Assessment of Risks

Investment Risk

Retirement System costs are very sensitive to the market return. Any lower than assumed return on assets will increase costs.

- The lower return will cause the assets to be lower than expected. This decrease in assets will increase the Retirement System cost.
- The Retirement System uses an actuarial value of assets that smooths gains and losses on market returns over a ten-year period to help control some of the volatility in costs due to investment risk.
- Historical actual returns are shown on page 12. This historical experience illustrates how returns can vary over time.
- Act 2020-128 requires annual Retirement System stress testing through 20-year projections, sensitivity analysis and simulations. Buck performed the June 30, 2022 valuation based stress test, while Aon performed the annual testing since the Act's enactment. For more information, please visit the Retirement System's website.

The Retirement System invests in a diversified portfolio with the objective of maximizing investment returns at a reasonable level of risk. However, Actuarial Standard of Practice No. 4 ("ASOP 4") requires the actuary to disclose a Low-Default-Risk Obligation Measure ("LDROM") of System liabilities and provide commentary to help intended users of this report understand the significance of the measure with respect to funded status, contributions, and member benefit security.

The LDROM is to be based on "discount rates derived from low-default-risk fixed income securities whose cash flows are reasonably consistent with the pattern of benefits expected to be paid in the future." The LDROM shown here represents what the Retirement System's liability would be if it invested its assets solely in a portfolio of high-quality bonds whose cash flows approximately match future benefit payments. Consequently, the difference between the LDROM and the Actuarial Accrued Liability can be thought of as representing the expected taxpayer savings / (cost) from investing in the Retirement System's diversified portfolio compared to investing only in high-quality bonds. It may also be thought of as the cost of reducing investment risk.

As of June 30, 2023, the LDROM is $140.2 billion (excluding Health Insurance Premium Assistance) and is based on a 5.15% interest rate. The interest rate used for the LDROM was determined by calculating a single equivalent discount rate using projected benefit payments and the Buck Standard Yield Curve as of June 30, 2023. Note the interest rate used for the LDROM is based on bond yields applicable at the time of the measurement and will therefore vary for different measurement dates. All other assumptions are the same as those used for funding as shown in this report.

Actuaries play a role in helping determine funding methods and policies that can achieve affordable and appropriate contributions and risk management. The funded status based on Actuarial Accrued Liability and the Actuarially Determined Contribution rates are determined using the expected return on assets, which reflects the actual investment portfolio. Since the assets are not invested in an all-bond portfolio, the LDROM does not indicate the Retirement System's funded status or progress, nor does it provide information on necessary Retirement System contributions.

With respect to security of member benefits, if the Retirement System were to be funded on an LDROM basis, member benefits accrued as of the measurement date may be considered more secure as investment risk might be significantly reduced. However, the fact that the System's assets are invested in a diversified portfolio does not mean members' benefits are not secure. Security of member benefits relies on a combination of the assets in the Retirement System, the investment returns generated on those assets, and the promise of future contributions from the participating employers. Reducing investment risk by investing solely in bonds may significantly increase Actuarially Determined Contributions and thereby increase contribution risk by decreasing the ability of employers to make necessary contributions to fund the benefits. Unnecessarily high contribution requirements in the near term may not be affordable and could imperil the Retirement System's sustainability and benefit security.

Exhibit XI: Risk Information (continued)

Member benefits will remain secure if reasonable and appropriate contributions with managed risk are calculated and paid.

Salary increases

Retirement System costs are sensitive to salary increases since benefits at retirement are pay related.

- Salaries greater than expected would lead to higher liabilities, larger unfunded liabilities and larger employer contributions.
- Salaries less than expected would lead to lower liabilities but may increase employer contribution rates due to lower employer payroll.

Longevity Risk

Retirement System costs will be increased as participants are expected to live longer. This is because:

- Benefits are paid over a longer lifetime when life expectancy is expected to increase. The longer duration of payments leads to higher liabilities.
- Health care has been improving, which increases the life expectancy of participants. As health care improves, Retirement System costs will increase.
- The mortality assumption for the Retirement System does assume future improvement in mortality. Any improvement in future mortality greater than that reflected in the current mortality assumption would lead to increased Retirement System costs.

Declining workforce

Employer contributions are based on a percentage of members' and DC plan participants' salaries. If the required dollar amount of contributions remains level or increases, a declining active workforce will result in higher contribution rates in order to meet required contribution levels.

Contribution Risk

The Retirement System contribution is a budgeted amount. There is a risk associated with the employer's contribution when the budgeted amount and recommended amount differ. This is because:

- When the budgeted contribution is lower than the recommended contribution the Retirement System may not be sustainable in the long term.
- Any underpayment of the contribution will increase future contribution amounts to help pay off the additional Unfunded Actuarial Accrued Liability associated with any lower than recommended contribution amounts.
- Historical comparison of actuarially determined contributions to actual contributions are shown on page 20. PSERS employers have taken action to mitigate this risk by contributing the actuarially determined contribution for pensions since the fiscal year ending June 30, 2017.

Act 120 mandated that the outstanding balance of the unfunded accrued liability as of June 30, 2010, including changes in the unfunded accrued liability due to the funding reforms of Act 120, be amortized over a 24-year period, as a level percent of pay, beginning July 1, 2011. Future valuation gains and losses, and changes in the unfunded accrued liability resulting from changes in actuarial assumptions and methods, are amortized over a 24-year period, as a level percent of pay. As provided by Act 5-2017, future increases in the unfunded accrued liability due to benefit enhancement legislation will be amortized over 10-year periods, as a level percent of pay.

Exhibit XI: Risk Information (continued)

The employer contribution rate developed in this report exceeds the normal cost, plus interest on the unfunded actuarial accrued liability. Assuming employer contributions meet or exceed the Actuarially Determined Contribution rate developed in this report, the current unfunded actuarial accrued liability is expected to be fully amortized by fiscal year ending June 30, 2048. Based on analysis prepared for the Governmental Accounting Standards Board Statement No. 67 Disclosures for Fiscal Year Ending June 30, 2023, we expect Retirement System assets and future funding policy contributions to sufficiently cover projected future benefit payments of current members for all future years.

Other Risk Considerations

Other possible risks (but this is not an exhaustive list) to be considered that may impact the Retirement System funding:

- The valuation assumes 75% of Class T-C and Class T-D and 50% of Class TE, Class T-F, Class T-G and Class T-H members are assumed to elect an Option 4 refund of member contributions and a reduced annuity at benefit commencement. Actual experience from this assumption could affect the liquidity of the Retirement System if more retirees elect a lump sum than are expected in the valuation.
- Investment risk is mitigated to some extent by the shared-risk provisions of the Retirement System and its potential impact on the member contribution rates for Class T-E, Class T-F, Class T-G and Class T-H members. Poor asset returns over a period of time could trigger increased member contributions for these classes of members. As of the June 30, 2020 valuation, the shared-risk provisions increased member contributions effective July 1, 2021 through June 30, 2024. These increased member contributions would offset some of the poor asset returns for the Retirement System.
- Members who retire after 25 years of service and are at least age 55 (age 57 for Class T-G members) may commence their benefits prior to their superannuation date with subsidized early retirement factors. If more retirees retire and commence their benefits under this early retirement provision than are assumed based on the assumptions outlined on page 22, the Retirement System may pay out subsidized benefits for a longer period of time thus increasing liabilities and costs.

Plan Maturity Measures

There are certain measures that may aid in understanding the significant risks to the Retirement System.

Ratio of Retired Liability to Total Liability (Pension Only)	June 30, 2019 ($000)	June 30, 2020 ($000)	June 30, 2021 ($000)	June 30, 2022 ($000)	June 30, 2023 ($000)
1. Retirees and Beneficiaries	57,413,088	58,415,383	61,168,172	61,869,159	62,344,050
2. Total Accrued Liability	105,199,505	107,833,399	112,650,825	114,476,801	116,243,212
3. Ratio [(1) / (2)]	54.6%	54.2%	54.3%	54.0%	53.6%

A high percentage of liability concentrated in retirees indicates a mature plan. An increasing percentage may indicate a need for less risky and / or more liquid asset allocation which may lead to increased investment risk, a need to lower the long-term return on asset assumption, and increased costs.

Exhibit XI: Risk Information (continued)

Ratio of Cash Flow to Assets (Pension Only)	June 30, 2019 ($000)	June 30, 2020 ($000)	June 30, 2021 ($000)	June 30, 2022 ($000)	June 30, 2023 ($000)
1. Total Contributions	5,551,563	5,744,370	5,839,890	6,131,963	6,423,598
2. Benefit Payments	6,761,173	6,876,515	7,134,332	7,254,372	7,580,983
3. Cash Flow [(1) – (2)]	(1,209,609)	(1,132,145)	(1,294,442)	(1,122,409)	(1,157,385)
4. Market Value of Assets	58,733,884	58,566,786	71,967,352	70,528,242	72,112,330
5. Ratio [(3) / (4)]	(2.1%)	(1.9%)	(1.8%)	(1.6%)	(1.6%)

When this cash flow ratio is negative more cash is being paid out than deposited in the Retirement System. Negative cash flow means the fund needs to rely on investment returns to cover benefit payments and at the same time may need to invest in more liquid assets to cover the benefit payments. More liquid assets may not garner the same returns as less liquid assets and therefore increase the investment risk. However, the low magnitude of the ratio implies there may already be enough liquid assets to cover the benefit payments, less investment return is needed to cover the shortfall, or only a small portion of assets will need to be converted to cash. Therefore, the investment risk is likely not amplified at this time. This maturity measure should be monitored for continual negative trend with greater magnitude.

Contribution Volatility (Pension Only)	June 30, 2019 ($000)	June 30, 2020 ($000)	June 30, 2021 ($000)	June 30, 2022 ($000)	June 30, 2023 ($000)
1. Market Value of Assets	58,733,884	58,566,786	71,967,352	70,528,242	72,112,330
2. Payroll	13,671,927	13,974,295	14,057,526	14,397,002	14,995,870
3. Asset Volatility Ratio (AVR) [(1) / (2)]	4.3	4.2	5.1	4.9	4.8
4. Accrued Liability	105,199,505	107,833,399	112,650,825	114,476,801	116,243,212
5. Liability Volatility Ratio (LVR) [(4) / (2)]	7.7	7.7	8.0	8.0	7.8

Plans that have higher asset-to-payroll ratios experience more volatile employer contributions (as a percentage of payroll) due to investment return. For example, a plan with an asset-to-payroll ratio of 10 may experience twice the contribution volatility due to investment return volatility than a plan with an asset-to-payroll ratio of 5. Plans that have higher liability-to-payroll ratios experience more volatile employer contributions (as a percentage of payroll) due to changes in liability. For example, if an assumption change increases the liability of two plans by the same percent the plan with a liability-to-payroll ratio of 10 may experience twice the contribution volatility than a plan with a liability-to-payroll ratio of 5.

Exhibit XII

Glossary

Accrued Liability	The difference between (a) the present value of future plan benefits, and (b) the present value of future normal cost. It is the portion of the present value of future plan benefits attributable to service accrued as of the valuation date. Sometimes referred to as "actuarial accrued liability".
Accrued Service	The service credited under the plan that was rendered before the date of the actuarial valuation.
Actuarial Assumptions	Estimates of future plan experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and salary increases. 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 dollar amount of the "present value of future plan benefits" between the present value of future normal cost and the accrued liability. Sometimes referred to as the "actuarial funding method".
Actuarial Equivalent	A series of payments is called an actuarial equivalent of another series of payments if the two series have the same actuarial present value.
Actuarial Value of Assets	The value of current plan assets recognized for valuation purposes. Based on a smoothed market value that recognizes investment gains and losses over a period of ten years.
Amortization	Paying off an interest-bearing liability by means of periodic payments of interest and principal, as opposed to paying it off with a lump sum payment.
Experience Gain (Loss)	A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions during the period between two actuarial valuation dates, in accordance with the actuarial cost method being used.
Normal Cost	The annual cost assumed, under the actuarial funding method, for current and subsequent plan years. Sometimes referred to as "current service cost".
Present Value	The amount of funds presently required to provide a payment or series of payments in the future. The present value is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.
Unfunded Accrued Liability	The difference between the actuarial accrued liability and actuarial value of assets.