



Pennsylvania Public School Employees' Retirement System

Actuarial Valuation Report
June 30, 2022

September 8, 2023

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, 2022.

The valuation takes into account all of the promised benefits to which members are entitled as of June 30, 2022, 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 2023/2024. 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, 2023 and prior to July 1, 2024.

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 2023/2024 is 34.00%, which includes a rate of 0.27% 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, 2022, the total funded ratio of the plan (for Pensions and Health Insurance Premium Assistance combined) is 61.6%, based on the accrued liability and actuarial value of assets calculated under the funding requirements of Section 8328 of the Retirement Code.

For the eighth 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 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 VIII contains an assessment of the key risks applicable to the Retirement System.

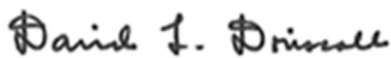
Reasonability of Assumptions

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.

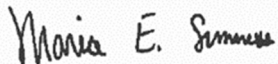
Use of this report for any other purpose than as stated, or by anyone other than the Board of Trustees or the staff of PSERS or employers or its auditors, may not be appropriate and may result in mistaken conclusions because of failure to understand applicable assumptions, methods, or inapplicability 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



David L. Driscoll, FSA, EA, MAAA, FCA
Principal, Consulting Actuary



Maria E. Simmers, FSA, EA, MAAA, FCA
Senior Consultant, Actuary



Salvador Nakar, EA, MAAA, FCA
Senior Consultant, Actuary

Pennsylvania Public School Employees' Retirement System

Table of Contents

Table/Exhibit

Executive Summary.....	1
Table 1 - Summary of Results of Actuarial Valuation as of June 30, 2022.....	12
Table 2 - Summary of Sources of Employer Contribution Rate as of June 30, 2022.....	13
Table 3 - Determination of Health Insurance Premium Assistance Contribution Rate for Fiscal Year 2023/2024.....	14
Table 4 - Summary of Market Value of Plan Assets as of June 30, 2022.....	15
Table 5 - Derivation of Actuarial Value of Assets as of June 30, 2022.....	16
Table 6 - Analysis of Change in Unfunded Accrued Liability as of June 30, 2022.....	17
Table 7 - Schedules of Funding Progress for Pensions.....	18
Table 8 - Solvency Test for Pensions - Comparative Summary of Accrued Liability and Actuarial Value of Assets.....	18
Table 9 - Schedule of Employer Contributions.....	19
Table 10 - History of Contribution Rates and Funded Ratios.....	20
Table 11 - History of Annuitants, Beneficiaries, Survivor Annuitants and Active Members.....	21
Table 12 - Description of Actuarial Assumptions and Methods.....	22
Table 13 - Summary of Benefit and Contribution Provisions.....	27
Table 14 - Summary of Membership Data as of June 30, 2022.....	34
Exhibit I - Active Membership Data as of June 30, 2022 - Number and Average Annual Salary.....	39
Exhibit II - The Number and Average Annual Annuity as of June 30, 2022 - Retired on Account of Superannuation, Early Retirement and Those in Receipt of Withdrawal Annuities.....	40
Exhibit III - The Number and Average Annual Annuity as of June 30, 2022 – Beneficiaries and Survivor Annuitants.....	41
Exhibit IV - The Number and Average Annual Annuity as of June 30, 2022 – Retired on Account of Disability.....	42
Exhibit V - Annuitant and Beneficiary Membership Data as of June 30, 2022.....	43
Exhibit VI - 10-Year History of Membership Data.....	44
Exhibit VII - Detailed Tabulations of the Data.....	46
Exhibit VIII - ASOP 51 Disclosures.....	58
Exhibit IX - Glossary.....	62

Executive Summary

This report presents the actuarial valuation as of June 30, 2022 for the Pennsylvania Public School Employees' Retirement System.

The principal valuation results include:

- The employer contribution rate for fiscal year 2023/2024, which is 34.00% (33.09% Pension plus 0.64% Premium Assistance plus 0.27% Act 5 DC contribution).
 - The 0.27% 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, 2022 is \$44.0 billion. The decrease in the unfunded accrued liability from \$45.5 billion in the June 30, 2021 valuation is attributable to:
 - Actuarial net experience gain of \$715 million in the year ending June 30, 2022
 - Contribution gain of \$322 million
- The total funded ratio of the Retirement System determined as of June 30, 2022 under the funding requirements of Section 8328 of the Retirement Code is 61.6%, 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, 2021 was 59.6%.
- The Act 120 minimum employer pension rate is the normal cost rate of 5.86%.
- For the eighth 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 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 increased to 8.00%, 10.80%, 6.25% and 5.25% and were first recognized in the June 30, 2021 valuation of the Retirement System.

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, 2023. The Act 5-2017 member shared-risk contribution rates are discussed on page 9.

- Annual disclosures as of June 30, 2022 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 13. There were no legislative or administrative changes since the prior valuation.

Actuarial Assumptions and Methods

The actuarial assumptions and methods are outlined in Table 12. 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 Aon's third quarter Capital Market Assumptions, the expected return is 7.84%. Based on Verus' Capital Market Assumptions, the expected return is 7.7%. Based on Buck's second quarter Capital Market Assumptions, an expected return of approximately 8.2% was developed. All the rates exceed the current 7.0% EROA.
- Payroll growth assumption of 3.25% - The assumption for the fiscal year 2022/2023 appropriation payroll was \$14.497 billion. The assumption for the fiscal year 2023/2024 appropriation payroll is \$15.260 billion, which is an increase of 5.3%.
- Salary increase assumption of an average of 4.5% - The actual average salary increase among continuing actives for the fiscal year 2021/2022 was 5.01%
- 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, 2022 actuarial valuation and believe that they are reasonable and in compliance with the applicable standards.

Contribution Rates

The results of the valuation as of June 30, 2022 determine the employer contribution rate for fiscal year 2023/2024. The calculated employer contribution rate for the 2023/2024 fiscal year is 34.00% and the Board of Trustees certified this rate at its December 16, 2022 meeting. The 34.00% Employer rate includes a rate of 0.27% for employer DC contributions. This is an average estimated rate based on the assumptions outlined in Table 12 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 7.44%. The average base member contribution rate of 7.44% 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 contribution rates for Class T-E, Class T-F, Class T-G and Class T-H members increased by 0.50%, 0.50%, 0.75% and 0.75%, respectively, effective July 1, 2021. 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 35.26% for fiscal year 2022/2023 to 34.00% for fiscal year 2023/2024. The reconciliation of the employer contribution rates by source is as follows:

• FY 2022/2023 employer contribution rate	35.26%
• Decrease due to change in normal rate	(0.21)
• Net decrease due to total employer payroll growth and liability experience ¹	(1.08)
• Increase due to actuarial loss on assets	0.07
• Increase in Act 5 DC employer contribution rate	0.07
• Change in health insurance premium assistance contribution rate	<u>(0.11)</u>
• FY 2023/2024 employer contribution rate	34.00%

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, 2022. Comparable results from the June 30, 2021 valuation are also shown.

Item	June 30, 2022	June 30, 2021
Demographics		
Active Members		
• Number ¹	247,873	248,091
• Average Annual Pay	\$ 58,082	\$ 56,663
Annuitants		
• Number ²	246,901	242,839
• Average Annual Benefit Payment	\$ 26,078	\$ 25,992
Contribution Rates (as a Percentage of Payroll)		
	(Fiscal Year 2023/2024)	(Fiscal Year 2022/2023)
Employer Contribution Rate:		
• Total Pension Rate Calculated by Actuary ³	33.09%	34.31%
• Health Insurance Premium Assistance Contribution Rate	0.64	0.75
• Act 5 DC Employer Contribution Rate ⁴	<u>0.27</u>	<u>0.20</u>
• Total Contribution Rate	34.00%	35.26%
• Total Contribution Rate Certified by Board	34.00%	35.26%
• Member Average Base Contribution Rate	<u>7.44</u>	<u>7.52</u>
• Total Rate	41.44%	42.78%
Funded Status⁵		
• Accrued Liability	\$ 114,612.3 Mil	\$ 112,783.3 Mil
• Actuarial Value of Assets	70,646.8	67,248.7
• Market Value of Assets	70,663.7	72,099.9
• Unfunded Accrued Liability		
• Actuarial Value of Assets	\$ 43,965.5	\$ 45,534.6
• Market Value of Assets	43,948.6	40,683.4
• Funded Ratio		
• Actuarial Value of Assets	61.6%	59.6%
• Market Value of Assets	61.7%	63.9%

1. Excludes 520 and 319 DC-only participants as of June 30, 2022 and June 30, 2021, respectively. Based on discussions with PSERS staff, the 2021 amount has been updated from 54.
2. Excludes 1,776 and 1,678 beneficiaries as of June 30, 2022 and June 30, 2021, respectively, who are only entitled to a pending lump sum distribution.
3. The Act 120 minimum pension rate for the June 30, 2022 valuation is 5.86% and is 6.07% for the June 30, 2021 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

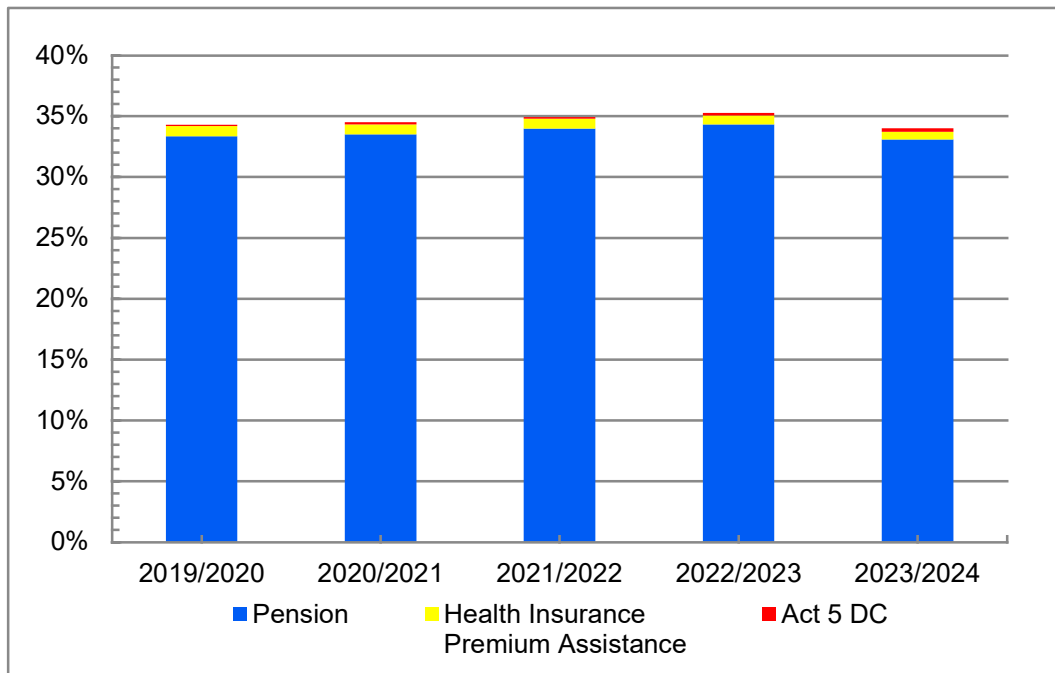
(As a % of Payroll)

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
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
2019/2020	7.59	7.49	25.87	0.84	0.09	34.29	34.29

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 34.00% 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 61.6% as of June 30, 2022. This funded ratio is based on an actuarial value of assets of \$70.65 billion and an accrued liability of \$114.61 billion. The funded ratio for Pensions alone is 61.6% as of June 30, 2022, based on an actuarial value of assets of \$70.51 billion and an accrued liability of \$114.48 billion.

Reasons for Change in the Total Funded Ratio

The total funded ratio increased from 59.6% as of June 30, 2021 to 61.6% as of June 30, 2022. Employers have been contributing the full actuarially determined contributions since the fiscal year ending June 30, 2017, as shown on page 19. 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, 2022.

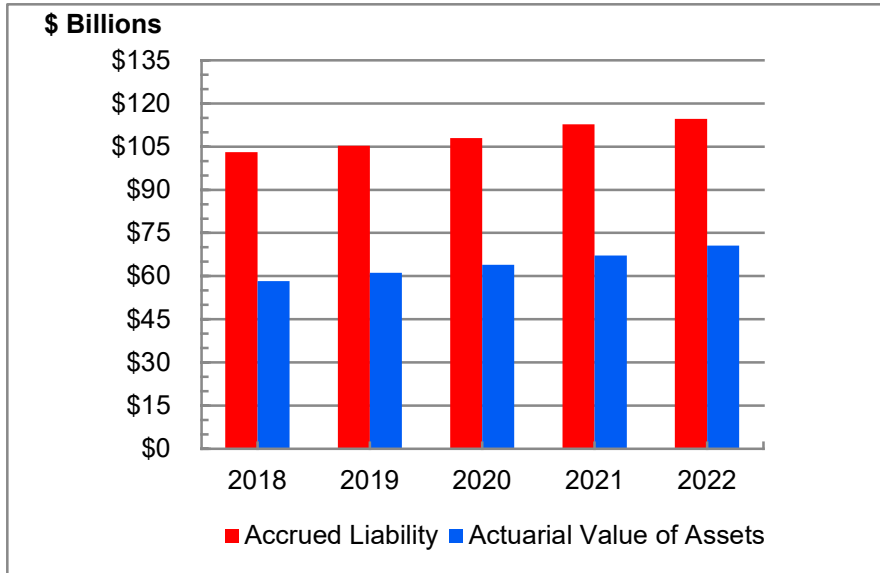
Five-Year History of Total Funded Ratio¹
 (\$ Amounts in Millions)

Valuation as of June 30	Accrued Liability	Actuarial Value of Assets	Unfunded Accrued Liability	Funded Ratio
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
2018	103,113.6	58,258.3	44,855.3	56.5

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

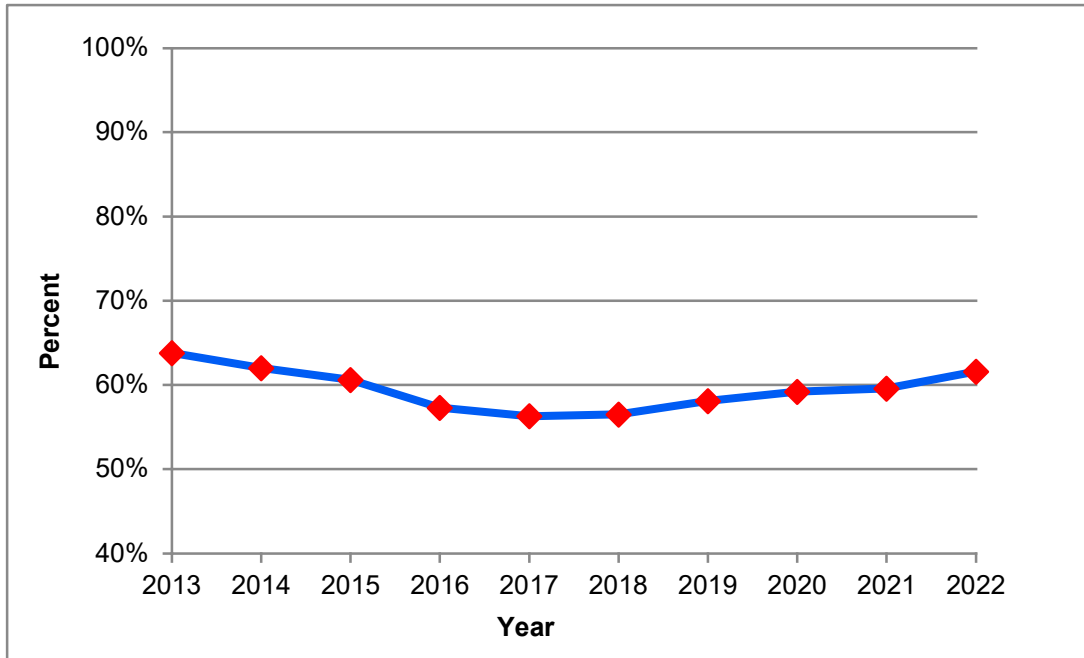
The following chart shows a five-year history of the accrued liability and the actuarial value of assets:

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 (2013 – 2022)



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.

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 5.5%, nor more than 9.5%. The total member contribution rate for Class T-F members shall not be less than 8.3%, nor more than 12.3%. The total member pension contribution rate for Class T-G members shall not be less than 2.5% nor more than 8.5% and the total member pension contribution rate for Class T-H members shall not be less than 1.5% nor more than 7.5%.

If the Retirement System's total funded ratio based on the actuarial value of assets is at least 100% as of the measurement date, the shared risk contribution rate shall not be greater than zero. 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. 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. 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.

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 July 1 second succeeding the actuarial valuation in which the shared-risk contribution was recognized.

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, 2023.

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 2012/2013 through 2021/2022 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 Value¹
2021/2022	2.3%
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
2012/2013	8.0

1. Provided by PSERS' investment consultants (Aon for fiscal years 2013/2014 - 2021/2022 and Wilshire Associates for prior years).

Table 1
Summary of Results of Actuarial Valuation as of June 30, 2022
(\$ Amounts in Thousands)

Item	June 30, 2022	June 30, 2021
Member Data		
1. Number of Members		
a) Active Members ¹	248,393	248,410
b) Vestees ²	26,836	26,892
c) Annuitants, Beneficiaries and Survivor Annuitants ³	<u>246,901</u>	<u>242,839</u>
d) Total	522,130	518,141
2. Annualized Salaries (\$ Amounts in Thousands) ⁴	\$ 14,415,795	\$ 14,059,363
3. Annual Annuities (\$ Amounts in Thousands)	\$ 6,438,598	\$ 6,311,757
Valuation Results		
4. Present Value of Future Pension Benefits		
a) Active Members	\$ 66,333,616	\$ 65,522,561
b) Inactive Members	383,991	335,949
c) Vestees	2,549,763	2,491,779
d) Annuitants, Beneficiaries and Survivor Annuitants	<u>61,869,159</u>	<u>61,168,172</u>
e) Total	\$131,136,529	\$129,518,461
5. Present Value of Future Pension Normal Cost		
a) Active Members	\$ 9,737,095	\$ 9,697,482
b) Employer	<u>6,922,633</u>	<u>7,170,154</u>
c) Total	\$ 16,659,728	\$ 16,867,636
6. Pension Accrued Liability		
a) Active Members (4a) - (5c)	\$ 49,673,888	\$ 48,654,925
b) Inactive Members	383,991	335,949
c) Vestees	2,549,763	2,491,779
d) Annuitants, Beneficiaries and Survivor Annuitants	<u>61,869,159</u>	<u>61,168,172</u>
e) Total	\$114,476,801	\$112,650,825
7. Health Insurance Assets for Premium Assistance	\$ 135,476	\$ 132,515
8. Total Accrued Liability for Funding (6) + (7)	\$114,612,277	\$112,783,340
9. Actuarial Value of Assets	\$ 70,646,769	\$ 67,248,672
10. Funded Status (9) / (8)	61.6%	59.6%
11. Unfunded Accrued Liability (8) - (9)	\$ 43,965,508	\$ 45,534,668
12. Total Normal Cost Rate	13.30%	13.59%
13. Member Contribution Rate	7.44%	7.52%
14. Employer Normal Cost Rate (12) - (13)	5.86%	6.07%
Employer Annual Funding Requirement		
15. Employer Contribution Rate Calculated by Actuary		
a) Normal Cost	5.86%	6.07%
b) Unfunded Accrued Liability	<u>27.23</u>	<u>28.24</u>
c) Preliminary Pension Rate	33.09%	34.31%
d) Health Insurance Premium Assistance	0.64	0.75
e) Act 5 DC ⁵	<u>0.27</u>	<u>0.20</u>
f) Total Rate ⁶ = (15c) + (15d) + (15e)	34.00%	35.26%

1. Includes 520 and 319 DC-only participants as of June 30, 2022 and June 30, 2021, respectively. Based on discussions with PSERS staff, the 2021 amount has been updated from 54. DC-only participants do not have liabilities in the Retirement System. DC-only participants are eligible for premium assistance.
2. Excludes 148,999 and 140,771 inactive members and non-members as of June 30, 2022 and June 30, 2021, respectively, who are no longer participating and are valued for their accumulated deductions only.
3. Excludes 1,776 and 1,678 beneficiaries as of June 30, 2022 and June 30, 2021, respectively, who are only entitled to a pending lump sum distribution.
4. The salaries shown represent an annual rate of pay for members and DC-only participants who were in active service on the valuation date. The June 30, 2021 salaries include annual rate of pay for the original 54 DC-only participants.
5. Average DC contribution rate. Actual rate will vary by employer based on Class T-G, Class T-H, and Class DC-only memberships.
6. The Act 120 minimum pension rate for the June 30, 2022 valuation is 5.86% and is 6.07% for the June 30, 2021 valuation.

Table 2

Summary of Sources of Employer Contribution Rate as of June 30, 2022
(\$ Amounts in Thousands)

	Funding Period (Years)	Beginning July 1	Initial Liability	6/30/2022 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	\$ 16,784,003	\$ 1,751,161	11.48 %
b) 2010 Experience	24	2011	3,419,297	3,511,776	366,402	2.40 %
c) 2011 Experience	24	2012	564,642	587,519	57,862	0.38 %
d) 2011 Assumption Changes	24	2012	4,592,397	4,778,465	470,611	3.08 %
e) 2012 Experience	24	2013	2,372,550	2,512,082	234,707	1.54 %
f) 2013 Experience	24	2014	2,707,494	2,904,503	258,566	1.69 %
g) 2014 Experience	24	2015	2,170,432	2,350,107	200,101	1.31 %
h) 2015 Experience	24	2016	1,941,277	2,114,519	172,781	1.13 %
i) 2016 Experience	24	2017	2,666,236	2,906,044	228,563	1.50 %
j) 2016 Assumption Changes	24	2017	2,521,326	2,748,100	216,141	1.42 %
k) 2017 Experience	24	2018	1,433,915	1,564,666	118,770	0.78 %
l) 2017 Act 5	24	2018	(6,867)	(7,493)	(569)	0.00 %
m) 2018 Experience	24	2019	348,881	380,213	27,921	0.18 %
n) 2019 Experience	24	2020	(527,527)	(572,935)	(40,792)	(0.27)%
o) 2020 Experience	24	2021	291,214	314,579	21,758	0.14 %
p) 2021 Experience	24	2022	(785,001)	(839,951)	(56,537)	(0.37)%
q) 2021 Assumption Changes	24	2022	2,772,127	2,966,176	199,652	1.31 %
r) 2022 Experience	24	2023	(1,036,865)	<u>(1,036,865)</u>	<u>(72,326)</u>	<u>(0.47)%</u>
Total				43,965,508	4,154,772	27.23 %
2. Employer Normal Cost Rate						5.86 %
3. Pension Rate (1) + (2) ²						33.09 %
4. Health Insurance Premium Assistance Rate						0.64 %
5. Act 5 DC Rate ³						0.27 %
6. Final Total Employer Contribution Rate Calculated by Actuary: (3) + (4) + (5)						34.00 %

1. Based on Estimated Employer Payroll for Fiscal Year Ending 2024 of \$15,260,000.

2. Cannot be less than the Act 120 Fiscal Year 2024 Minimum Employer Pension Rate (Employer Normal Cost Rate) of 5.86%.

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 2023/2024
(\$ Amounts in Thousands)

Item				
1.	June 30, 2022 Balance in Health Insurance Premium Assistance Account		\$	135,476
2.	Estimated Fiscal 2022/2023 Contribution			
	(a) Contribution Rate Certified in 2021 Valuation			0.75%
	(b) Estimated Fiscal 2022/2023 payroll		\$	<u>15,072,000</u>
	(c) Estimated Contribution = (a) x (b)		\$	113,040
3.	Estimated Number of Annuitants who:	Are Eligible	Elect Percent	Elect Coverage
	(a) Fiscal 2022/2023	157,000	62.00%	97,340
	(b) Fiscal 2023/2024	158,400	61.00%	96,624
	(c) Fiscal 2024/2025	159,800	61.00%	97,478
4.	Estimated Disbursements:	Administration	Assistance	Total
	(a) Fiscal 2022/2023	\$ 1,113	\$ 116,808	\$ 117,921
	(b) Fiscal 2023/2024	1,054	115,949	117,003
	(c) Fiscal 2024/2025	<u>1,085</u>	<u>116,974</u>	<u>118,059</u>
	(d) Total	\$ 3,252	\$ 349,731	\$ 352,983
5.	Required Fiscal 2023/2024 Contribution (4d) - (1) - (2c); includes interest through 6/30/2023		\$	97,165
6.	Required Health Insurance Premium Assistance Contribution Rate			
	(a) Estimated 2023/2024 Payroll			\$15,260,000
	(b) Required Health Insurance Premium Assistance Contribution Rate (5) / (6a) (rounded up)			0.64%

Notes:

- Current estimates of fiscal 2022/2023 membership payroll and administrative expenses, and of fiscal 2023/2024 and fiscal 2024/2025 administrative expenses, were provided by PSERS staff.
- Beginning in fiscal year 2023/2024, 61% of eligible annuitants are assumed to elect coverage. For fiscal year 2022/2023, the assumption remains at 62%.
- Premium Assistance payments equal \$100 per month per eligible annuitant.

Table 4

Summary of Market Value of Plan Assets as of June 30, 2022
(\$ Amounts in Thousands)

Market Value	
1. Market Value of Assets as of June 30, 2021	\$ 72,099,867
2. Contributions During Fiscal 2021/2022	6,249,141
3. Disbursements During Fiscal 2021/2022	7,368,079
4. Investment Return During Fiscal 2021/2022	
a) Investment Return (Net of Investment Expenses)	\$ (266,934)
b) Administrative Expenses	<u>50,277</u>
c) Investment Return After Expenses (a) - (b)	\$ (317,211)
5. Market Value of Assets as of June 30, 2022 (1) + (2) - (3) + (4c)	\$ 70,663,718
6. Rate of Return ¹	2.28%
Asset Allocation by Account	
1. Members' Savings Account	\$ 18,802,945
2. Annuity Reserve Account	61,869,159
3. State Accumulation Account	(10,143,862)
4. Health Insurance Account	<u>135,476</u>
5. Total (1) + (2) + (3) + (4)	\$ 70,663,718

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

Table 5

Derivation of Actuarial Value of Assets as of June 30, 2022
 (\$ Amounts in Thousands)

1.	Market Value of Assets as of June 30, 2022						\$ 70,663,718
2.	Determination of Deferred Gain (Loss)						
			Return on Assets				
	<u>Fiscal Year</u>	<u>Actual</u>	<u>Expected</u>	<u>Difference</u>	<u>Recognized Amount</u>	<u>% Deferred</u>	<u>Deferred Amount</u>
	2021/2022	\$ (317,211)	\$ 4,668,244	\$ (4,985,455)	\$ (498,546)	90.00%	\$ (4,486,909)
	2020/2021	14,704,125	4,588,063	10,116,062	1,011,606	80.00%	8,092,850
	2019/2020	955,651	4,395,438	(3,439,787)	(343,979)	70.00%	(2,407,851)
	2018/2019	3,580,178	4,179,951	(599,773)	(59,977)	60.00%	(359,864)
	2017/2018	4,666,466	4,115,904	550,562	55,056	50.00%	275,281
	2016/2017	4,948,659	4,101,830	846,829	84,683	40.00%	338,731
	2015/2016	426,974	4,220,500	(3,793,526)	(379,353)	30.00%	(1,138,058)
	2014/2015	1,284,258	4,202,212	(2,917,954)	(291,795)	20.00%	(583,591)
	2013/2014	7,057,089	4,193,490	2,863,599	286,360	10.00%	286,360
	2012/2013	4,086,520	4,239,172	<u>(152,652)</u>	<u>(15,265)</u>	0.00%	<u>0</u>
				\$ (1,512,095)	\$ (151,210)		\$ 16,949
3.	Preliminary Actuarial Value of Assets ^{1,2} (1) - (2)						\$ 70,646,769
4.	70% of the Market Value of Assets (1) x 70%						\$ 49,464,603
5.	130% of the Market Value of Assets (1) x 130%						\$ 91,862,833
6.	Actuarial Value of Assets: (3) not less than (4) and not greater than (5)						\$ 70,646,769

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 6.77%. This investment return is based on the change in the actuarial value of assets from the June 30, 2021 valuation to the June 30, 2022 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 smoothed in over a ten-year period.

Table 6

Analysis of Change in Unfunded Accrued as of June 30, 2022¹
(\$ Amounts in Thousands)

Item	Amount
1. Unfunded Accrued Liability at June 30, 2021	\$ 45,534,669
2. Interest Credit to June 30, 2022	3,296,296
3. Expected Contributions Toward Unfunded Accrued Liability	<u>3,828,589</u>
4. Expected Unfunded Accrued Liability at June 30, 2022 (1) + (2) - (3)	\$ 45,002,376
5. Actual Unfunded Accrued Liability at June 30, 2022	<u>43,965,508</u>
6. Increase (Decrease) from Expected (5) - (4)	\$ (1,036,868)
7. Reasons for Increase (Decrease)	
(a) Experience Losses (Gains)	
(i) Loss from Investment Return on Actuarial Value of Assets	\$ 151,210
(ii) Loss from New Entrants and Pickups	98,449
(iii) Gain from Salary Increases Less than Expected	(181,919)
(iv) Gain from Mortality Experience	(85,818)
(v) Gain from Terminations (retirement/disability/terminations) Experience	(483,064)
(vi) Gain from Data/Miscellaneous	<u>(213,513)</u>
(vii) Subtotal - Experience Losses (Gains)	\$ (714,655)
(b) Actual contributions greater than expected	<u>(322,213)</u>
(c) Total	\$ (1,036,868)

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

Table 7

Schedule of Funding Progress for Pensions¹
(\$ 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
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
2017	57,336,856	101,848,817	44,511,961	56.3	13,033,919	341.5

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)	(2)	(3)	Actuarial Value of Assets	Portion of Accrued Liability Covered by Valuation Assets		
	Active Member Contributions	Retirees and Beneficiaries	Active Member Employer Financed		(1)	(2)	(3)
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
2017	15,500,215	56,184,146	30,164,456	57,336,856	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
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%
2018	4,243,328	4,243,328	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, 2022 actuarial valuation will be made during the fiscal year ended June 30, 2024

**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
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%
2018	134,607	111,724	22,883	83.0%

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, 2022 actuarial valuation will be made during the fiscal year ended June 30, 2024

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, 2022 (published September 13, 2022) 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 ⁷	Employer Health Insurance	Total Employer	
2013 ^{3,4}	\$ 14,297,000	7.40%	8.66%	12.99%	21.65%	11.50%		0.86%	12.36%	63.8%
2014	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 ⁵	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 ⁶	14,497,000	7.52	6.07	28.24	34.31	34.31	0.20	0.75	35.26	
2024	15,260,000	7.44	5.86	27.23	33.09	33.09	0.27	0.64	34.00	

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 2013 through 2016.
3. At its January 2009 meeting, the Board voted to reduce the interest rate from 8.50% to 8.25% for the June 30, 2008 valuation and to 8.00% for subsequent valuations.
4. Revised actuarial assumptions based on a five-year experience review ended June 30, 2010 were used to determine the contributions for the fiscal year ending June 30, 2013 and thereafter, which include an interest rate of 7.50%.
5. Revised actuarial assumptions based on a five-year experience review ended June 30, 2015 were used to determine the contributions for the fiscal year ending June 30, 2018 and thereafter, which include an interest rate of 7.25%.
6. Revised actuarial assumptions based on a five-year experience review ended June 30, 2020 were used to determine the contributions for the fiscal year ending June 30, 2023 and thereafter, which include an interest rate of 7.00%.
7. Act 5 new member assumptions for new members after June 30, 2020:

<u>Valuation</u>	<u>Class T-G</u>	<u>Class T-H</u>	<u>DC Only</u>
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**History of Annuitants, Beneficiaries, Survivor Annuitants and Active Members**

Valuation as of June 30	Annuitants at End of Year	Beneficiaries and Survivor Annuitants at End of Year	Total Annuitants, Beneficiaries and Survivor Annuitants	Active Members*
2013	197,735	11,469	209,204	267,428
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

* Does not include DC-only participants.

Table 12

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% 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			Death ¹	Disability	Early Retirement ²	Superannuation Retirement
	Less Than Five Years of Service	Five Years but Less Than 10 Years of Service	10 or More Years of Service				
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.

Age	Class T-E, Class T-F, Class T-G and Class T-H Annual Rate of:					
	Withdrawal		Death ¹	Disability	Early Retirement ²	Superannuation Retirement
	Less Than 10 Years of Service	10 or More Years of Service				
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% 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: 62% of eligible retirees are assumed to elect premium assistance for fiscal years 2022/2023. Beginning in fiscal year 2023/2024, 61% of eligible retirees are assumed to elect premium assistance.

Administrative Expenses: Assumed equal to \$1,113,000 for fiscal year 2022/2023, \$1,054,000 for fiscal year 2023/2024 and \$1,085,000 for Fiscal year 2024/2025.

Summary of Changes since the June 30, 2021 Valuation:

Beginning in fiscal year 2023/2024, 61% of eligible retirees are assumed to elect premium assistance.

Assumed administrative expenses for the Health Insurance Premium Assistance Plan changed from \$1,415,000 to \$1,113,000 for fiscal year 2022/2023, from \$1,486,000 to \$1,054,000 for fiscal year 2023/2024, and the amount of \$1,085,000 was added for the fiscal year 2024/2025.

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 4.5% 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%, 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.

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, 2022 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, 2022 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
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%
2012	7.50%	2002	8.50%	1992	8.50%

Table 13

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, 2022, the adjusted limit is \$305,000.

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%. 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 2.0% 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 1.0% 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%	2.5%
T-H	0.75%	1.5%

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 1.0% 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 1.0% 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%	8.5%
T-H	0.75%	7.5%

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.

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.

Table 14

Summary of Membership Data as of June 30, 2022
(\$ Amounts in Thousands)

Total Active Members¹ and DC-Only Participants

Item	Male	Female	Total
Number of Members/Participants	68,248	180,145	248,393
Total Annual Salaries ⁸	\$ 4,265,033	\$ 10,150,762	\$ 14,415,795
Average Age ⁹	45.6	45.4	45.4
Average Service ⁹	12.3	11.9	12.0

1. Excludes 175,835 inactive members, non-members and vestees.

Class T-C Members²

Item	Male	Female	Total
Number of Members	624	1,767	2,391
Total Annual Salaries ⁸	\$ 46,648	\$ 104,392	\$ 151,040
Average Age ⁹	53.5	55.3	54.8
Average Service ⁹	24.2	22.9	23.2

2. Excludes 26,910 inactive members, non-members and vestees.

Class T-D Members³

Item	Male	Female	Total
Number of Members	37,578	101,583	139,161
Total Annual Salaries ⁸	\$ 3,004,033	\$ 6,983,141	\$ 9,987,174
Average Age ⁹	49.1	49.6	49.5
Average Service ⁹	19.0	17.8	18.1

3. Excludes 77,645 inactive members, non-members and vestees.

Class T-E Members⁴

Item	Male	Female	Total
Number of Members	14,632	38,742	53,374
Total Annual Salaries ⁸	\$ 638,703	\$ 1,641,823	\$ 2,280,526
Average Age ⁹	42.9	41.6	42.0
Average Service ⁹	5.2	5.6	5.5

4. Excludes 45,400 inactive members and non-members.

Class T-F Members⁵

Item	Male	Female	Total
Number of Members	3,773	9,309	13,082
Total Annual Salaries ⁸	\$ 219,621	\$ 490,401	\$ 710,022
Average Age ⁹	42.0	40.0	40.6
Average Service ⁹	6.2	6.0	6.1

5. Excludes 3,735 inactive members and non-members.

Table 14

Summary of Membership Data as of June 30, 2022
(\$ Amounts in Thousands)

Class T-G Members⁶

Item	Male	Female	Total
Number of Members	11,452	28,203	39,655
Total Annual Salaries ⁸	\$ 348,440	\$ 911,725	\$ 1,260,165
Average Age ⁹	38.4	36.6	37.1
Average Service ⁹	1.0	1.2	1.1

6. Excludes 22,093 inactive members and non-members.

Class T-H Members⁷

Item	Male	Female	Total
Number of Members	45	165	210
Total Annual Salaries ⁸	\$ 1,816	\$ 6,259	\$ 8,075
Average Age ⁹	34.7	37.4	36.8
Average Service ⁹	1.8	2.2	2.1

7. Excludes 52 inactive members and non-members.

DC-Only Participants

Item	Male	Female	Total
Number of Participants	144	376	520
Total Annual Salaries ⁸	\$ 5,772	\$ 13,021	\$ 18,793
Average Age ⁹	45.0	41.2	42.2
Average Service ⁹	2.0	1.9	1.9

8. The salaries shown in the table above represent an annual rate of pay for the year ended June 30, 2022 for members who were in active service on June 30, 2022.

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	11.86%	14.97%	10.03%	12.82%	6.30%	5.02%	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.]	5.62%	7.47%	2.53%	2.52%	3.05%	2.52%	2.00%

Table 14

Summary of Membership Data as of June 30, 2022
(\$ Amounts in Thousands)

Total Annuitants and Beneficiaries¹

Item	Number	Annual Annuities ²	Average Annuities	Average Age
Annuitants				
Normal	127,914	\$ 3,787,329	\$ 29,608	74.1
Early and Withdrawal	<u>97,167</u>	<u>2,254,197</u>	\$ 23,199	68.5
Total	225,081	\$ 6,041,526	\$ 26,842	71.7
Survivors and Beneficiaries	13,100	209,367	\$ 15,982	75.9
Disabled Annuitants	<u>8,720</u>	<u>187,705</u>	\$ 21,526	66.3
Total	246,901	\$ 6,438,598	\$ 26,078	71.7

New Annuitants and Beneficiaries

Who Retired Between July 1, 2021 and June 30, 2022

Item	Number ³	Annual Annuities ²	Average Annuities	Average Age
Annuitants (Normal, Early and Withdrawal)	10,136	\$ 281,158	\$ 27,739	62.0
Survivors and Beneficiaries	1,109	20,998	\$ 18,934	72.9
Disabled Annuitants	<u>248</u>	<u>7,731</u>	\$ 31,173	53.4
Total	11,493	\$ 309,887	\$ 26,963	62.9

1. The median annual benefit payable to all annuitants and beneficiaries is \$20,851.
2. The annuities shown in the tables above represent the annual amount payable as of July 1, 2022 for participants who were in payment on June 30, 2022.
3. Excludes 58 members who retired after June 30, 2021 but died prior to June 30, 2022.

Table 14**Distribution of Annuitants, Beneficiaries, and Survivors by Annual Pension Amount
As of June 30, 2022**

1. All annuitants, beneficiaries, and survivors

Annual Pension Amount	Number	Average Years of Service
Under \$10,000	84,871	12
\$10,000 - \$19,999	35,389	21
\$20,000 - \$29,999	27,252	26
\$30,000 - \$39,999	29,951	29
\$40,000 - \$49,999	29,945	32
\$50,000 - \$59,999	20,533	33
\$60,000 - \$69,999	10,437	35
\$70,000 - \$79,999	4,726	36
\$80,000 - \$89,999	1,879	36
\$90,000 - \$99,999	904	36
\$100,000 or more	1,014	38
Total	246,901	23

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

Annual Pension Amount	Number	Average Years of Service
Under \$10,000	83,465	12
\$10,000 - \$19,999	34,845	22
\$20,000 - \$29,999	27,014	26
\$30,000 - \$39,999	29,875	29
\$40,000 - \$49,999	29,902	32
\$50,000 - \$59,999	20,527	33
\$60,000 - \$69,999	10,433	35
\$70,000 - \$79,999	4,724	36
\$80,000 - \$89,999	1,879	36
\$90,000 - \$99,999	904	36
\$100,000 or more	1,014	38
Total	244,582	23

Table 14

**Distribution of Annuitants, Beneficiaries, and Survivors by Class Membership
As of June 30, 2022**

Status	Class Membership						Missing Class	Total
	TC	TD	TE	TF	TG	TH		
Annuitants (Normal, Early and Withdrawal)	46,432	176,914	1,457	275	3	0	0	225,081
Disabled Annuitants	2,301	6,331	71	16	0	0	1	8,720
Survivors and Beneficiaries*	N/A	N/A	N/A	N/A	N/A	N/A	13,100	13,100
Total	48,733	183,245	1,528	291	3	0	13,101	246,901

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

Exhibit I

**Active Membership Data as of June 30, 2022
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	7,110	68								7,178
	\$30,519	\$36,244								\$30,573
25-29	13,666	3,687	29							17,382
	\$40,805	\$56,017	\$45,170							\$44,039
30-34	9,260	11,132	3,194	40						23,626
	\$38,348	\$59,940	\$67,124	\$48,209						\$52,428
35-39	7,797	6,341	12,155	5,362	20					31,675
	\$34,154	\$57,942	\$71,846	\$79,862	\$66,932					\$61,138
40-44	7,805	4,796	5,576	14,382	4,023	20				36,602
	\$29,958	\$49,974	\$70,453	\$84,193	\$91,175	\$56,150				\$66,803
45-49	6,854	4,462	3,747	6,238	11,126	2,483	20			34,930
	\$27,841	\$44,064	\$61,259	\$79,851	\$91,539	\$95,104	\$65,531			\$67,879
50-54	5,980	4,789	4,384	5,341	6,803	8,478	1,813	22		37,610
	\$27,145	\$39,669	\$51,249	\$68,593	\$85,244	\$94,669	\$92,122	\$54,030		\$66,314
55-59	4,338	3,657	4,013	5,288	4,684	3,345	3,217	505	22	29,069
	\$25,486	\$36,602	\$44,463	\$54,998	\$67,358	\$83,835	\$90,666	\$84,708	\$56,536	\$56,600
60-64	3,303	2,638	2,695	3,966	3,745	2,042	949	504	145	19,987
	\$23,481	\$34,049	\$40,814	\$50,165	\$56,113	\$64,708	\$74,719	\$82,068	\$65,634	\$47,050
Over 64	2,880	1,742	1,281	1,256	1,188	714	386	175	192	9,814
	\$16,960	\$26,032	\$34,923	\$43,963	\$49,247	\$55,466	\$57,991	\$64,833	\$78,045	\$34,743
Total	68,993	43,312	37,074	41,873	31,589	17,082	6,385	1,206	359	247,873
	\$32,177	\$49,385	\$61,208	\$72,851	\$80,745	\$87,346	\$86,655	\$80,161	\$71,714	\$58,082

* Does not include 520 DC-only participants.

Exhibit II

The Number of Average Annual Annuity as of June 30, 2022

**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		4,080	1,337	436	145	13	1			6,012
		\$950	\$3,084	\$7,614	\$15,452	\$36,793	\$22,239			\$2,339
50-54		2,004	973	461	273	203	78	8		4,000
		\$1,169	\$3,165	\$8,275	\$17,144	\$31,041	\$53,521	\$42,557		\$6,184
55-59		1,995	1,472	935	646	1,198	2,205	649	5	9,105
		\$1,581	\$3,890	\$9,941	\$17,750	\$38,882	\$53,050	\$60,745	\$67,000	\$25,585
60-64	78	3,140	3,403	3,180	3,087	3,254	4,667	2,433	189	23,431
	\$3,823	\$2,694	\$6,328	\$14,020	\$24,012	\$36,674	\$50,406	\$59,675	\$61,562	\$28,185
65-69	578	4,514	5,773	6,072	6,279	6,449	9,006	5,577	686	44,934
	\$2,037	\$3,624	\$7,223	\$14,816	\$23,720	\$34,220	\$48,294	\$59,505	\$63,980	\$29,588
70-74	1,310	3,848	6,354	5,670	5,669	6,756	14,071	10,230	1,130	55,038
	\$1,451	\$4,012	\$6,317	\$13,683	\$22,445	\$32,374	\$45,567	\$57,878	\$69,156	\$32,567
75-79	1,511	2,563	4,610	3,990	3,771	4,518	11,261	6,733	922	39,879
	\$1,214	\$3,575	\$5,210	\$11,352	\$19,234	\$28,758	\$38,577	\$52,665	\$66,189	\$28,406
80-84	1,012	1,398	2,468	2,431	2,477	2,881	5,027	3,725	640	22,059
	\$1,004	\$3,047	\$4,601	\$9,233	\$14,984	\$23,404	\$32,705	\$41,362	\$57,046	\$22,604
85-89	515	690	1,607	1,466	1,703	1,773	2,218	1,839	670	12,481
	\$801	\$2,323	\$3,756	\$6,967	\$12,000	\$18,760	\$27,641	\$36,548	\$44,494	\$18,452
Over 89	335	438	1,085	1,134	1,315	1,396	1,169	785	485	8,142
	\$832	\$2,013	\$3,487	\$6,600	\$11,400	\$17,117	\$24,671	\$32,012	\$42,125	\$15,440
Total	5,339	24,670	29,082	25,775	25,365	28,441	49,703	31,979	4,727	225,081
	\$1,296	\$2,656	\$5,553	\$12,182	\$20,255	\$30,471	\$42,684	\$53,470	\$59,612	\$26,842

1. Includes 45 annuitant records with no service information provided.

Exhibit III

The Number and Average Annual Annuity as of June 30, 2022

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	105	52	46	26	19	38	20	42	348
	\$7,037	\$3,870	\$4,800	\$8,751	\$9,409	\$13,499	\$19,789	\$9,511	\$7,332
50-54	44	20	36	27	34	22	16	14	213
	\$11,006	\$3,387	\$6,515	\$9,633	\$14,426	\$10,589	\$16,151	\$7,554	\$8,951
55-59	80	43	43	55	69	76	47	21	434
	\$8,978	\$3,917	\$6,754	\$11,403	\$15,637	\$16,524	\$21,078	\$19,565	\$12,105
60-64	145	86	74	71	101	141	131	36	785
	\$10,635	\$5,665	\$8,261	\$13,663	\$16,221	\$19,966	\$23,313	\$14,293	\$13,921
65-69	229	137	155	137	145	314	263	87	1,467
	\$11,367	\$5,982	\$9,849	\$13,923	\$20,208	\$25,608	\$29,146	\$23,821	\$17,946
70-74	338	173	166	211	228	548	449	118	2,231
	\$15,093	\$6,163	\$10,612	\$14,530	\$19,560	\$26,804	\$31,732	\$33,119	\$20,643
75-79	507	204	197	198	216	493	464	124	2,403
	\$17,808	\$5,880	\$10,705	\$14,382	\$18,988	\$24,200	\$31,622	\$29,531	\$19,170
80-84	534	189	166	181	183	405	347	126	2,131
	\$15,540	\$5,091	\$8,649	\$13,819	\$16,256	\$19,128	\$23,056	\$30,243	\$15,434
85-89	515	153	134	135	150	234	235	89	1,645
	\$12,861	\$5,005	\$7,573	\$9,732	\$13,915	\$16,634	\$21,688	\$25,552	\$12,912
Over 89	605	92	93	133	98	174	183	65	1,443
	\$10,739	\$5,780	\$7,648	\$9,948	\$12,353	\$14,346	\$17,828	\$25,036	\$11,194
Total²	3,102	1,149	1,110	1,174	1,243	2,445	2,155	722	13,100
	\$8,687	\$5,457	\$8,933	\$12,814	\$17,016	\$21,927	\$26,749	\$26,018	\$15,982

1. Includes 2,181 beneficiary or survivor annuitant records with no service information provided.
2. In addition, there are 1,776 beneficiaries who are only entitled to a pending lump sum distribution.

Exhibit IV

The Number and Average Annual Annuity as of June 30, 2022

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	140 \$16,093	134 \$23,534	80 \$29,453	46 \$39,943	5 \$68,161	1 \$53,808			406 \$24,618
50-54	123 \$15,268	136 \$18,794	143 \$28,293	115 \$38,528	62 \$58,478	5 \$50,598			584 \$28,749
55-59	237 \$12,822	249 \$15,263	211 \$22,802	193 \$35,132	144 \$46,752	34 \$61,471	1 \$44,627		1,069 \$25,536
60-64	366 \$10,858	372 \$14,497	357 \$20,289	260 \$30,701	174 \$41,836	64 \$46,323	1 \$43,514		1,594 \$21,882
65-69	414 \$10,165	439 \$13,316	325 \$18,285	320 \$26,666	241 \$39,246	90 \$47,662	1 \$53,592		1,830 \$20,946
70-74	276 \$8,353	300 \$12,097	255 \$17,214	276 \$25,330	325 \$35,205	157 \$47,143	1 \$62,196	4 \$25,930	1,594 \$22,788
75-79	160 \$7,905	191 \$9,938	172 \$13,212	170 \$21,355	156 \$29,268	47 \$41,632	1 \$13,560		897 \$17,392
80-84	93 \$5,477	121 \$8,201	95 \$10,144	79 \$17,017	49 \$24,554	12 \$33,617	1 \$32,798	1 \$10,189	451 \$12,105
85-89	36 \$5,138	46 \$6,312	49 \$8,281	37 \$16,051	25 \$22,642	5 \$25,341	1 \$53,196		199 \$11,160
Over 89	24 \$3,288	35 \$6,394	15 \$10,189	14 \$14,412	6 \$20,048	2 \$14,048			96 \$8,393
Total²	1,869 \$10,538	2,023 \$13,733	1,702 \$19,144	1,510 \$28,030	1,187 \$38,191	417 \$46,924	7 \$43,355	5 \$22,782	8,720 \$21,526

1. Includes 44 annuitant records with no service information provided.

Exhibit V

Annuitant and Beneficiary Membership Data as of June 30, 2022

**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	19,117	\$ 271,748	\$ 14,215
60 - 64	23,431	660,410	28,185
65 - 69	44,934	1,329,512	29,588
70 - 74	55,038	1,792,427	32,567
75 - 79	39,879	1,132,809	28,406
Over 79	42,682	854,619	20,023
Total	225,081	\$ 6,041,526	\$ 26,842
Survivors and Beneficiaries			
Under 60	995	\$ 9,712	\$ 9,761
60 - 64	785	10,928	13,921
65 - 69	1,467	26,326	17,946
70 - 74	2,231	46,054	20,643
75 - 79	2,403	46,065	19,170
Over 79	5,219	70,283	13,467
Total	13,100	\$ 209,367	\$ 15,982
Disabled Annuitants			
Under 60	2,059	\$ 54,082	\$ 26,266
60 - 64	1,594	34,880	21,882
65 - 69	1,830	38,331	20,946
70 - 74	1,594	36,324	22,788
75 - 79	897	15,602	17,393
Over 79	746	8,486	11,375
Total	8,720	\$ 187,705	\$ 21,526
Grand Total Average Annual Benefit	246,901	\$ 6,438,598	\$ 26,078

Exhibit VI

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
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%
2013	267,428	(2.22%)	12,577,105	(1.08%)

1. Includes DC-only participants as of 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 VI
(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
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	235.3	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%
2013	207,553	5,147.1	24,800	16,404	377.6	10,866	83.7	2.74%	5.63%

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
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	2.70%	3.30%
2014	203,756	5,211.4	25,577	12,915	283.9	6,894	80.0		

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 VII

Detailed Tabulations of the Data

Table 1

The Number and Annual Salaries of Members in Active Service Distributed
by Age as of June 30, 2022*

Age	Male		Female		Total	
	Number	Salaries	Number	Salaries	Number	Salaries
17	12	\$ 108,281	12	\$ 81,209	24	\$ 189,490
18	30	416,742	47	499,751	77	916,493
19	128	1,918,770	131	1,753,360	259	3,672,130
20	179	3,091,548	239	3,349,184	418	6,440,732
21	240	4,618,453	304	5,101,885	544	9,720,338
22	353	7,619,872	630	16,595,380	983	24,215,252
23	603	17,443,299	1,585	56,538,559	2,188	73,981,858
24	724	23,716,751	1,961	76,602,776	2,685	100,319,527
25	852	29,687,493	2,248	92,561,167	3,100	122,248,660
26	869	31,456,503	2,302	102,365,122	3,171	133,821,625
27	921	36,912,996	2,560	116,991,376	3,481	153,904,372
28	952	40,523,277	2,712	128,393,237	3,664	168,916,514
29	1,110	47,828,755	2,856	138,766,891	3,966	186,595,646
30	1,105	51,501,375	3,077	156,229,989	4,182	207,731,364
31	1,217	59,114,642	3,319	171,436,824	4,536	230,551,466
32	1,291	67,907,799	3,592	188,707,534	4,883	256,615,333
33	1,277	67,459,591	3,607	193,988,368	4,884	261,447,959
34	1,392	76,504,343	3,749	205,819,060	5,141	282,323,403
35	1,520	89,859,090	4,205	240,555,804	5,725	330,414,894
36	1,659	101,280,518	4,491	261,770,759	6,150	363,051,277
37	1,726	110,794,233	4,638	283,231,106	6,364	394,025,339
38	1,707	113,035,888	4,861	297,738,057	6,568	410,773,945
39	1,736	117,361,410	5,132	320,927,052	6,868	438,288,462
40	1,969	138,360,251	5,392	342,585,221	7,361	480,945,472
41	2,004	142,660,272	5,435	351,231,410	7,439	493,891,682
42	1,991	144,976,763	5,416	352,625,849	7,407	497,602,612
43	2,014	146,709,179	5,298	346,820,466	7,312	493,529,645
44	1,977	146,383,564	5,106	332,772,922	7,083	479,156,486
45	2,052	153,200,223	5,160	336,086,358	7,212	489,286,581
46	1,979	151,222,554	4,879	317,563,332	6,858	468,785,886
47	1,931	146,466,788	4,976	321,820,078	6,907	468,286,866
48	1,967	150,261,756	4,956	319,024,802	6,923	469,286,558
49	2,018	153,872,797	5,012	321,480,956	7,030	475,353,753
50	2,145	164,156,406	5,406	345,580,822	7,551	509,737,228
51	2,313	175,030,748	5,883	378,687,582	8,196	553,718,330
52	2,025	154,690,924	5,764	366,675,560	7,789	521,366,484
53	1,988	148,381,768	5,289	326,016,092	7,277	474,397,860
54	1,835	135,988,333	4,962	298,850,089	6,797	434,838,422
55	1,677	117,808,579	4,664	268,163,148	6,341	385,971,727
56	1,642	112,448,295	4,337	240,830,999	5,979	353,279,294
57	1,485	97,820,081	4,340	227,163,903	5,825	324,983,984
58	1,470	95,743,483	4,195	211,772,271	5,665	307,515,754
59	1,297	79,828,290	3,962	193,713,414	5,259	273,541,704
60	1,210	69,688,316	3,765	180,909,326	4,975	250,597,642
61	1,218	67,167,381	3,674	170,999,495	4,892	238,166,876

Table 1
(Continued)

**The Number and Annual Salaries off Members in Active Service Distributed
by Age as of June 30, 2022***

Age	Male		Female		Total	
	Number	Salaries	Number	Salaries	Number	Salaries
62	975	\$ 50,307,215	2,845	\$ 123,043,375	3,820	\$ 173,350,590
63	927	47,112,840	2,454	106,552,033	3,381	153,664,873
64	851	40,097,043	2,068	84,512,445	2,919	124,609,488
65	628	29,572,021	1,494	58,507,441	2,122	88,079,462
66	467	19,639,307	1,005	39,605,180	1,472	59,244,487
67	430	17,091,709	798	28,611,677	1,228	45,703,386
68	351	12,558,623	638	21,690,854	989	34,249,477
69	296	10,513,922	499	16,405,616	795	26,919,538
70	268	8,094,933	370	11,083,359	638	19,178,292
71	198	6,365,164	303	8,076,856	501	14,442,020
72	160	4,797,900	259	7,975,598	419	12,773,498
73	162	4,450,155	222	4,913,673	384	9,363,828
74	125	3,690,235	158	3,985,142	283	7,675,377
75	122	3,478,074	151	3,487,116	273	6,965,190
76	68	1,754,764	82	2,106,467	150	3,861,231
77	70	1,978,813	65	1,606,496	135	3,585,309
78	51	1,111,579	53	1,063,132	104	2,174,711
79	45	1,141,769	41	792,735	86	1,934,504
80	31	907,444	42	804,581	73	1,712,025
81	18	386,845	29	470,604	47	857,449
82	17	396,878	17	319,146	34	716,024
83	14	322,308	10	190,209	24	512,517
84	8	208,284	14	213,323	22	421,607
85	8	154,210	16	239,116	24	393,326
86	2	54,909	6	90,136	8	145,045
87	2	45,666	1	16,193	3	61,859
Total	68,104	\$4,259,260,990	179,769	\$10,137,741,048	247,873	\$14,397,002,038

* Does not include 520 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, 2022*

Service	Male		Female		Total	
	Number	Salaries	Number	Salaries	Number	Salaries
0	5,451	\$ 73,853,840	8,375	\$ 145,210,942	13,826	\$ 219,064,782
1	5,778	169,825,563	13,519	438,686,376	19,297	608,511,939
2	3,262	115,299,753	9,087	319,362,223	12,349	434,661,976
3	3,207	135,035,089	9,258	356,118,138	12,465	491,153,227
4	2,736	123,569,551	8,320	343,002,717	11,056	466,572,268
5	2,467	120,710,961	7,396	319,809,862	9,863	440,520,823
6	2,200	115,508,099	7,117	325,837,970	9,317	441,346,069
7	2,032	112,041,962	6,497	312,982,280	8,529	425,024,242
8	1,918	109,711,059	6,100	309,905,921	8,018	419,616,980
9	1,968	117,742,484	5,617	294,693,522	7,585	412,436,006
10	1,582	96,612,987	4,959	267,474,848	6,541	364,087,835
11	1,506	97,149,805	4,886	272,482,749	6,392	369,632,554
12	1,738	117,500,576	5,608	330,366,845	7,346	447,867,421
13	1,904	134,072,158	6,116	378,444,970	8,020	512,517,128
14	2,125	152,659,839	6,650	422,446,494	8,775	575,106,333
15	2,160	162,404,902	6,850	448,547,933	9,010	610,952,835
16	2,135	165,472,608	6,585	451,680,974	8,720	617,153,582
17	2,177	177,274,178	6,465	459,671,792	8,642	636,945,970
18	2,280	190,989,287	6,133	448,873,171	8,413	639,862,458
19	1,868	160,265,658	5,220	385,290,423	7,088	545,556,081
20	1,824	160,639,282	5,119	382,248,472	6,943	542,887,754
21	1,762	154,463,410	4,793	363,013,258	6,555	517,476,668
22	1,669	149,457,775	4,788	368,406,861	6,457	517,864,636
23	2,032	187,606,529	4,305	337,647,173	6,337	525,253,702
24	1,694	157,057,236	3,603	290,121,803	5,297	447,179,039
25	1,599	152,989,023	2,995	244,380,463	4,594	397,369,486
26	1,244	117,096,141	2,501	207,637,838	3,745	324,733,979
27	1,094	103,418,807	2,176	182,819,708	3,270	286,238,515
28	867	81,423,966	1,866	160,151,726	2,733	241,575,692
29	1,071	101,440,102	1,669	140,679,427	2,740	242,119,529
30	605	56,212,975	1,136	96,387,229	1,741	152,600,204
31	474	43,352,443	1,018	85,629,290	1,492	128,981,733
32	455	41,305,941	852	72,009,775	1,307	113,315,716
33	399	35,515,086	685	56,311,138	1,084	91,826,224
34	259	23,982,183	502	42,587,044	761	66,569,227
35	152	13,250,534	286	23,117,723	438	36,368,257
36	109	8,874,590	180	14,497,008	289	23,371,598
37	77	6,428,670	143	10,901,283	220	17,329,953
38	55	4,534,275	91	6,307,341	146	10,841,616
39	52	4,350,129	61	4,412,457	113	8,762,586
40	30	2,079,397	46	2,992,907	76	5,072,304
41	22	1,292,376	42	3,226,040	64	4,518,416
42	21	1,511,974	39	2,972,029	60	4,484,003
43	19	1,235,193	24	1,830,228	43	3,065,421

**Table 2
(Continued)**

**The Number and Annual Salaries of Members in Active Service Distributed by
Years of Credited Service as of June 30, 2022***

Service	Male		Female		Total	
	Number	Salaries	Number	Salaries	Number	Salaries
44	7	\$ 720,273	16	\$ 1,029,247	23	\$ 1,749,520
45	2	161,020	12	742,809	14	903,829
46	7	481,754	12	884,636	19	1,366,390
47	1	54,709	16	1,060,836	17	1,115,545
48	2	121,624	7	638,989	9	760,613
49	2	213,173	11	1,019,767	13	1,232,940
50	1	98,979	3	267,435	4	366,414
51			5	315,113	5	315,113
52	1	52,514	3	179,230	4	231,744
53			1	84,609	1	84,609
54			1	106,541	1	106,541
55	1	41,423	2	113,649	3	155,072
56	1	97,125	1	41,198	2	138,323
57			1	78,618	1	78,618
Total	68,104	\$4,259,260,990	179,769	\$10,137,741,048	247,873	\$14,397,002,038

* Does not include 520 DC-only participants.

Table 3

The Number and Annual Annuities of Annuitants on the Retired List
as of June 30, 2022

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

Age	Number	Male Annuities	Number	Female Annuities	Number	Total Annuities
26			1	\$ 171	1	\$ 171
27	1	\$ 26			1	26
28			2	1,637	2	1,637
29	1	3,650			1	3,650
30	3	4,526			3	4,526
31	10	7,949	6	3,473	16	11,422
32	22	18,488	10	6,864	32	25,352
33	16	15,666	22	21,120	38	36,786
34	34	46,965	56	50,525	90	97,490
35	45	43,002	79	89,550	124	132,552
36	77	100,964	124	128,403	201	229,367
37	91	127,419	145	158,390	236	285,809
38	74	107,431	163	246,976	237	354,407
39	112	139,571	234	314,783	346	454,354
40	132	266,935	204	369,055	336	635,990
41	138	257,368	234	435,827	372	693,195
42	165	361,350	268	517,059	433	878,409
43	162	375,772	294	652,038	456	1,027,810
44	166	500,590	282	645,270	448	1,145,860
45	152	359,220	310	698,016	462	1,057,236
46	141	402,472	351	808,243	492	1,210,715
47	188	649,574	345	913,261	533	1,562,835
48	134	560,550	398	1,127,690	532	1,688,240
49	204	1,017,091	416	1,504,486	620	2,521,577
50	206	939,305	466	1,670,471	672	2,609,776
51	210	957,402	563	2,098,252	773	3,055,654
52	232	1,562,169	590	2,943,273	822	4,505,442
53	255	2,294,797	589	3,771,210	844	6,066,007
54	254	3,239,005	635	5,258,161	889	8,497,166
55	375	8,983,295	893	16,620,951	1,268	25,604,246
56	456	12,707,635	1,046	20,967,471	1,502	33,675,106
57	515	15,703,713	1,315	30,301,608	1,830	46,005,321
58	609	20,662,521	1,508	36,626,536	2,117	57,289,057
59	696	23,317,039	1,692	47,064,075	2,388	70,381,114
60	836	29,929,860	2,149	58,069,383	2,985	87,999,243
61	951	33,998,341	2,559	70,463,709	3,510	104,462,050
62	1,191	40,916,107	3,609	89,623,296	4,800	130,539,403
63	1,387	44,963,863	4,173	105,989,916	5,560	150,953,779
64	1,550	53,335,962	5,026	133,119,663	6,576	186,455,625
65	1,843	62,233,951	5,843	153,242,819	7,686	215,476,770
66	1,964	64,371,861	6,246	166,810,305	8,210	231,182,166
67	2,250	72,577,005	6,758	186,478,789	9,008	259,055,794

**Table 3
(Continued)**

**The Number and Annual Annuities of Annuitants on the Retired List
as of June 30, 2022**

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

Age	Number	Male		Female		Total			
		Number	Annunities	Number	Annunities	Number	Annunities		
68	2,309	\$	76,633,269	7,291	\$	213,688,339	9,600	\$	290,321,608
69	2,705		95,045,020	7,725		238,431,065	10,430		333,476,085
70	2,966		107,021,960	8,329		261,172,083	11,295		368,194,043
71	3,090		115,294,282	8,125		258,557,457	11,215		373,851,739
72	3,161		118,056,584	7,712		238,749,006	10,873		356,805,590
73	3,373		125,639,569	7,428		227,489,943	10,801		353,129,512
74	3,657		130,312,153	7,197		210,133,806	10,854		340,445,959
75	4,113		141,801,270	7,578		213,285,019	11,691		355,086,289
76	2,724		92,075,867	4,668		125,706,975	7,392		217,782,842
77	2,500		78,799,411	4,548		118,524,873	7,048		197,324,284
78	2,456		75,619,253	4,252		102,764,251	6,708		178,383,504
79	2,647		82,014,707	4,393		102,217,490	7,040		184,232,197
80	2,031		59,772,979	3,565		78,503,730	5,596		138,276,709
81	1,682		48,340,620	3,167		65,440,718	4,849		113,781,338
82	1,444		38,549,704	2,813		55,851,768	4,257		94,401,472
83	1,259		33,699,469	2,607		48,357,639	3,866		82,057,108
84	1,127		27,560,876	2,364		42,533,884	3,491		70,094,760
85	995		25,878,116	2,120		36,014,438	3,115		61,892,554
86	925		22,602,549	1,981		31,096,241	2,906		53,698,790
87	813		19,448,875	1,691		25,976,202	2,504		45,425,077
88	651		15,403,844	1,458		21,826,162	2,109		37,230,006
89	540		13,575,729	1,307		18,471,441	1,847		32,047,170
90	485		11,704,596	1,283		19,310,909	1,768		31,015,505
91	395		9,464,981	1,116		16,178,874	1,511		25,643,855
92	296		6,679,636	867		11,452,038	1,163		18,131,674
93	203		4,340,273	748		9,908,028	951		14,248,301
94	159		3,480,171	663		8,207,496	822		11,687,667
95	108		2,143,790	480		5,849,891	588		7,993,681
96	94		2,007,354	331		4,352,274	425		6,359,628
97	51		896,635	262		2,954,491	313		3,851,126
98	35		703,509	165		1,718,121	200		2,421,630
99	20		359,319	119		1,183,758	139		1,543,077
100	7		91,075	82		737,933	89		829,008
101	7		157,549	65		679,872	72		837,421
102	3		73,977	47		454,939	50		528,916
103	3		36,791	18		308,535	21		345,326
104				14		134,467	14		134,467
105	1		92	6		81,146	7		81,238
106				4		30,730	4		30,730
107				3		9,037	3		9,037
111	1		15,242	1		6,825	2		22,067
Total	66,884	\$	2,083,361,506	158,197	\$	3,958,164,619	225,081	\$	6,041,526,125

**Table 3
(Continued)**

**The Number and Annual Annuities of Annuitants on the Retired List
as of June 30, 2022**

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

<u>OPTION</u>	<u>MALE</u>		<u>FEMALE</u>	
Maximum	29,053	\$ 899,336,234	85,213	\$ 2,141,048,858
1	10,837	260,405,683	36,647	719,895,081
2	17,534	529,391,574	21,673	580,955,048
3	7,874	319,164,551	13,400	464,588,662
4	<u>1,586</u>	<u>75,063,464</u>	<u>1,264</u>	<u>51,676,970</u>
	66,884	\$ 2,083,361,506	158,197	\$ 3,958,164,619

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, 2022

Age	Male		Female		Total	
	Number	Annuities	Number	Annuities	Number	Annuities
9	1	\$ 571			1	\$ 571
10			1	\$ 702	1	702
12	1	1,534			1	1,534
15	1	3,741			1	3,741
16			1	1,534	1	1,534
18			1	21,875	1	21,875
21	2	4,036			2	4,036
22	1	1,898	6	51,420	7	53,318
23	2	8,502	3	13,992	5	22,494
24	2	12,542	2	13,822	4	26,364
25	2	3,275			2	3,275
26	1	9,869	5	23,676	6	33,545
27	1	2,775	2	6,250	3	9,025
28	2	20,084	2	14,045	4	34,129
29	1	1,149	3	17,646	4	18,795
30	3	18,924	5	33,501	8	52,425
31	3	14,123	5	38,503	8	52,626
32	5	29,675	5	17,180	10	46,855
33	5	19,205	4	18,516	9	37,721
34	6	55,147	5	55,522	11	110,669
35	7	71,525	3	12,479	10	84,004
36	5	25,704	4	5,647	9	31,351
37	8	37,739	7	87,801	15	125,540
38	5	25,088	7	118,886	12	143,974
39	6	50,528	5	28,749	11	79,277
40	4	52,527	6	33,460	10	85,987
41	10	66,809	5	21,444	15	88,253
42	4	12,381	3	33,122	7	45,503
43	13	69,237	16	112,826	29	182,063
44	15	153,688	9	34,658	24	188,346
45	7	27,776	14	119,406	21	147,182
46	7	87,961	17	139,107	24	227,068
47	9	127,933	15	143,531	24	271,464
48	9	37,191	12	101,485	21	138,676
49	13	64,787	14	112,957	27	177,744
50	8	36,462	20	152,798	28	189,260
51	7	57,779	21	149,138	28	206,917
52	11	86,387	35	387,952	46	474,339
53	16	122,535	33	331,433	49	453,968
54	16	121,396	46	460,629	62	582,025
55	20	147,881	57	500,743	77	648,624
56	18	229,833	49	690,570	67	920,403
57	19	169,466	65	758,695	84	928,161
58	26	412,303	74	1,017,476	100	1,429,779
59	30	253,462	76	1,073,233	106	1,326,695
60	25	335,915	81	1,084,764	106	1,420,679
61	35	434,517	116	1,545,917	151	1,980,434

**Table 4
(Continued)**

**The Number and Annual Annuities of Beneficiaries and Survivor Annuitants
as of June 30, 2022**

Age	Male		Female		Total	
	Number	Annuities	Number	Annuities	Number	Annuities
62	39	\$ 464,794	104	\$ 1,617,793	143	\$ 2,082,587
63	50	642,188	133	2,075,389	183	2,717,577
64	48	587,805	154	2,138,764	202	2,726,569
65	68	867,812	167	2,698,571	235	3,566,383
66	81	1,181,649	188	3,576,859	269	4,758,508
67	81	1,552,641	195	3,291,067	276	4,843,708
68	102	1,532,415	242	4,695,458	344	6,227,873
69	108	2,222,202	235	4,707,433	343	6,929,635
70	136	2,682,816	278	5,271,435	414	7,954,251
71	125	2,307,596	266	5,887,675	391	8,195,271
72	119	2,798,941	302	6,767,253	421	9,566,194
73	142	2,973,378	338	7,256,650	480	10,230,028
74	145	2,821,288	380	7,286,778	525	10,108,066
75	176	3,646,449	436	9,049,320	612	12,695,769
76	92	1,941,599	317	6,445,236	409	8,386,835
77	119	2,135,169	312	6,032,571	431	8,167,740
78	109	2,193,574	317	5,423,595	426	7,617,169
79	143	2,547,427	382	6,649,914	525	9,197,341
80	99	1,796,486	346	5,469,105	445	7,265,591
81	102	2,151,410	382	5,826,479	484	7,977,889
82	87	1,280,743	310	4,694,690	397	5,975,433
83	80	1,339,123	331	5,026,191	411	6,365,314
84	71	1,096,072	323	4,209,636	394	5,305,708
85	73	877,357	338	4,735,785	411	5,613,142
86	66	799,611	293	3,762,580	359	4,562,191
87	49	574,633	272	3,617,556	321	4,192,189
88	47	587,260	232	2,930,877	279	3,518,137
89	34	406,216	241	2,948,779	275	3,354,995
90	43	397,549	210	2,705,909	253	3,103,458
91	51	600,391	200	2,357,445	251	2,957,836
92	33	463,248	194	2,368,087	227	2,831,335
93	23	250,315	161	1,722,808	184	1,973,123
94	18	193,407	138	1,396,538	156	1,589,945
95	19	220,129	106	1,119,029	125	1,339,158
96	14	156,681	62	700,701	76	857,382
97	5	39,330	51	435,673	56	475,003
98	10	101,858	35	276,370	45	378,228
99	7	55,849	25	261,494	32	317,343
100	2	12,859	16	119,167	18	132,026
101	1	12,233	11	144,667	12	156,900
102			5	25,840	5	25,840
103	1	3,412	1	10,584	2	13,996
104			1	672	1	672
Total	3,210	\$ 52,041,775	9,890	\$ 157,325,513	13,100	\$ 209,367,288

Table 5

**The Number and Annual Annuities of Annuitants on the Retired List
as of June 30, 2022**

Retired on Account of Disability

Age	Male		Female		Total	
	Number	Annunities	Number	Annunities	Number	Annunities
31			1	\$ 13,149	1	\$ 13,149
32	1	\$ 5,746	1	5,541	2	11,287
34			2	40,153	2	40,153
35			3	68,715	3	68,715
36	2	51,051	5	104,040	7	155,091
37	2	48,462	6	119,366	8	167,828
38			6	117,578	6	117,578
39	6	96,230	6	135,844	12	232,074
40	4	106,627	8	193,598	12	300,225
41	6	132,888	8	176,731	14	309,619
42	10	234,371	12	306,472	22	540,843
43	2	40,630	15	350,384	17	391,014
44	10	324,058	26	649,626	36	973,684
45	10	263,452	36	933,594	46	1,197,046
46	12	249,013	33	844,916	45	1,093,929
47	8	170,180	39	1,031,407	47	1,201,587
48	11	270,125	49	1,096,064	60	1,366,189
49	24	750,932	42	1,063,775	66	1,814,707
50	17	498,617	62	1,488,047	79	1,986,664
51	22	758,322	77	2,418,636	99	3,176,958
52	30	1,011,424	84	2,491,073	114	3,502,497
53	42	1,131,359	106	2,869,387	148	4,000,746
54	45	1,445,414	99	2,676,908	144	4,122,322
55	45	1,332,067	109	2,924,212	154	4,256,279
56	50	1,404,879	124	3,388,659	174	4,793,538
57	67	1,902,175	163	4,301,504	230	6,203,679
58	72	1,821,143	170	3,796,408	242	5,617,551
59	79	1,992,189	190	4,434,535	269	6,426,724
60	78	1,804,720	194	3,946,283	272	5,751,003
61	72	1,960,982	225	4,681,397	297	6,642,379
62	89	2,279,145	229	5,042,021	318	7,321,166
63	118	2,783,771	256	5,203,994	374	7,987,765
64	102	2,229,000	231	4,948,821	333	7,177,821
65	108	2,196,951	242	4,993,609	350	7,190,560
66	113	2,335,522	253	4,925,167	366	7,260,689
67	109	2,442,461	273	5,583,892	382	8,026,353
68	109	2,470,687	280	6,048,733	389	8,519,420
69	103	2,160,215	240	5,174,019	343	7,334,234
70	103	2,589,955	251	5,753,817	354	8,343,772
71	93	2,166,674	255	5,986,675	348	8,153,349
72	96	2,152,435	209	4,702,915	305	6,855,350
73	85	2,091,910	208	4,530,367	293	6,622,277
74	86	2,188,168	208	4,161,222	294	6,349,390
75	71	1,445,321	209	3,982,425	280	5,427,746
76	39	724,001	133	2,220,257	172	2,944,258

Table 5
(Continued)

**The Number and Annual Annuities of Annuitants on the Retired List
as of June 30, 2022**

Retired on Account of Disability

Age	Male		Female		Total	
	Number	Annunities	Number	Annunities	Number	Annunities
77	39	\$ 942,744	115	\$ 1,755,339	154	\$ 2,698,083
78	40	747,676	111	1,611,696	151	2,359,372
79	32	555,793	108	1,616,507	140	2,172,300
80	27	376,489	94	1,155,862	121	1,532,351
81	23	343,995	82	1,056,777	105	1,400,772
82	19	274,665	63	703,095	82	977,760
83	20	264,481	45	508,722	65	773,203
84	16	232,134	62	543,020	78	775,154
85	12	149,405	40	632,108	52	781,513
86	12	141,810	33	293,398	45	435,208
87	5	53,378	29	268,280	34	321,658
88	11	142,894	31	247,059	42	389,953
89	7	75,483	19	217,086	26	292,569
90	2	30,748	20	165,806	22	196,554
91	2	13,402	15	91,369	17	104,771
92	2	13,615	15	122,027	17	135,642
93	3	44,745	11	107,801	14	152,546
94	1	14,144	9	66,946	10	81,090
95	1	25,919	7	43,146	8	69,065
96			1	5,107	1	5,107
97			2	24,372	2	24,372
98			1	6,560	1	6,560
100			1	1,776	1	1,776
102			2	8,052	2	8,052
103			1	20,150	1	20,150
Total	2,425	\$ 56,506,792	6,295	\$ 131,197,997	8,720	\$ 187,704,789

Exhibit VIII: ASOP 51 Disclosures

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 be different than the 7.00% expected in the actuarial valuation
- Salary increases – potential that salary increases will be different from that assumed for the actuarial valuation
- Longevity risk – potential that participants live longer than expected from the valuation mortality assumptions
- Declining workforce – potential that future employer contribution rates will be different from expected
- Contribution risk – potential that the contribution will be different than the recommended contribution 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.

Exhibit VIII: ASOP 51 Disclosures (continued)

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 experience of actual returns is shown on page 11. This historical experience illustrates how returns can vary over time.

The Retirement System's investment consultant, Aon, performs an annual stress test, in accordance with the Act 2020-128 requirement for annual 20-year projections, sensitivity analysis and simulations. For more information, please visit the Retirement System's website.

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 19. This history shows action has been taken to mitigate this risk by contributing the actuarially determined contribution for pensions since the fiscal year ending June 30, 2017.

Exhibit VIII: ASOP 51 Disclosures (continued)

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 are electing 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, 2018 (\$000)	June 30, 2019 (\$000)	June 30, 2020 (\$000)	June 30, 2021 (\$000)	June 30, 2022 (\$000)
1. Retirees and Beneficiaries	56,742,925	57,413,088	58,415,383	61,168,172	61,869,159
2. Total Accrued Liability	102,990,908	105,199,505	107,833,399	112,650,825	114,476,801
3. Ratio [(1) / (2)]	55.1%	54.6%	54.2%	54.3%	54.0%

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 VIII: ASOP 51 Disclosures (continued)

Ratio of Cash Flow to Assets (Pension Only)	June 30, 2018 (\$000)	June 30, 2019 (\$000)	June 30, 2020 (\$000)	June 30, 2021 (\$000)	June 30, 2022 (\$000)
1. Total Contributions	5,275,986	5,551,563	5,744,370	5,839,890	6,131,963
2. Benefit Payments	6,655,146	6,761,173	6,876,515	7,134,332	7,254,372
3. Cash Flow [(1) – (2)]	(1,379,160)	(1,209,609)	(1,132,145)	(1,294,442)	(1,122,409)
4. Market Value of Assets	56,363,714	58,733,884	58,566,786	71,967,352	70,528,242
5. Ratio [(3) / (4)]	(2.4%)	(2.1%)	(1.9%)	(1.8%)	(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, 2018 (\$000)	June 30, 2019 (\$000)	June 30, 2020 (\$000)	June 30, 2021 (\$000)	June 30, 2022 (\$000)
1. Market Value of Assets	56,363,714	58,733,884	58,566,786	71,967,352	70,528,242
2. Payroll	13,379,041	13,671,927	13,974,295	14,057,526	14,397,002
3. Asset Volatility Ratio (AVR) [(1) / (2)]	4.2	4.3	4.2	5.1	4.9
4. Accrued Liability	102,990,908	105,199,505	107,833,399	112,650,825	114,476,801
5. Liability Volatility Ratio (LVR) [(4) / (2)]	7.7	7.7	7.7	8.0	8.0

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 IX

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.