



Public Employee Retirement System of Idaho

Actuarial Valuation

July 1, 2022

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October 11, 2022

Public Employee Retirement System of Idaho
P.O. Box 83720
Boise, ID 83720-0078

Dear Members of the Board:

In accordance with your request, we have performed an actuarial valuation of the Public Employee Retirement System of Idaho (“PERSI” or “System”) to determine the System’s financial status as of July 1, 2022. This report reflects the benefit provisions and contribution rates in effect as of July 1, 2022.

Certification

Milliman has developed certain models to estimate the values included in this report. The intent of the models was to estimate pension liabilities and costs. We have reviewed the models, including their inputs, calculations, and outputs for consistency, reasonableness, and appropriateness to the intended purpose and in compliance with generally accepted actuarial practice and relevant actuarial standards of practice (ASOPs).

In preparing this report and using our models, we relied, without audit, on information (some oral and some in writing) supplied by PERSI’s staff. This information includes, but is not limited to, statutory provisions, member census data, and financial information. We found this information to be reasonably consistent and comparable with information used for other purposes. The valuation results depend on the integrity of this information. If any of this information is inaccurate or incomplete our results may be different, and our calculations may need to be revised.

All costs, liabilities, rates of interest, and other factors for the System have been determined based on actuarial assumptions and methods which are individually reasonable (taking into account the experience of the System and reasonable expectations); and which, in combination, offer our best estimate of anticipated experience affecting the System. Further, in our opinion, the actuarial assumptions in the aggregate are reasonable and are related to the experience of the Plan and to reasonable expectations and represent our best estimate of anticipated experience under the Plan.

This valuation report is only an estimate of the System’s financial condition as of a single date. It can neither predict the System’s future condition nor guarantee future financial soundness. Actuarial valuations do not affect the ultimate cost of System benefits, only the timing of System contributions. While the valuation is based on an array of individually reasonable assumptions, other assumption sets may also be reasonable and valuation results based on those assumptions would be different. No one set of assumptions is uniquely correct. Determining results using alternative assumptions is outside the scope of our engagement.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to factors such as, but not limited to, the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan’s funded status); and changes in plan provisions or applicable law. Due to the limited scope of the actuarial assignment, we did not perform an analysis of the potential range of future measurements. The Retirement Board has the final decision regarding the appropriateness of the assumptions and actuarial cost methods.

Actuarial computations presented in this report are for purposes of determining the recommended funding amounts for the System. The calculations in the enclosed report have been made on a basis consistent with our understanding of the System's funding requirements and goals. Determinations for purposes other than meeting these requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.

Milliman's work is prepared solely for the use and benefit of the System. To the extent that Milliman's work is not subject to disclosure under applicable public records laws, Milliman's work may not be provided to third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third-party recipient of its work product. Milliman's consent to release its work product to any third party may be conditioned on the third party signing a release, subject to the following exceptions:

- a) The System may provide a copy of Milliman's work, in its entirety, to the System's professional service advisors who are subject to a duty of confidentiality and who agree not to use Milliman's work for any purpose other than to benefit the System.
- b) The System may provide a copy of Milliman's work, in its entirety, to other governmental entities, as required by law.

No third-party recipient of Milliman's work product should rely upon Milliman's work product. Such recipients should engage qualified professionals for advice appropriate to their own specific needs.

The consultants who worked on this assignment are retirement actuaries. Milliman's advice is not intended to be a substitute for qualified legal, investment, or accounting counsel.

The signing actuaries are independent of the plan sponsor. We are not aware of any relationship that would impair the objectivity of our work.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices which are consistent with the principles prescribed by the Actuarial Standards Board and the Code of Professional Conduct and Qualification Standards for Actuaries Issuing Statements of Actuarial Opinion in the United States of the American Academy of Actuaries. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

We would like to acknowledge the help in the preparation of the data for this valuation given by Don Drum, Executive Director, and members of their staff.



Members of the Board
Public Employee Retirement System of Idaho
October 11, 2022

We respectfully submit the following report, and we look forward to discussing it with you.

Sincerely,

A handwritten signature in black ink, appearing to read "Robert L. Schmidt".

Robert L. Schmidt, FSA, EA, MAAA
Principal and Consulting Actuary

A handwritten signature in black ink, appearing to read "Bret D. Linton".

Bret D. Linton, FSA, EA, MAAA
Principal and Consulting Actuary

A handwritten signature in black ink, appearing to read "Ryan J. Cook".

Ryan J. Cook, FSA, EA, CERA, MAAA
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1. Summary of Findings

Our actuarial valuation of the System as of July 1, 2022, shows that the current scheduled contribution rates will meet the normal costs of the System as they accrue. The current scheduled rates are insufficient to amortize the Unfunded Actuarial Accrued Liability (UAAL) in 25 or fewer years. Therefore, the amortization period is greater than the 25-year maximum permitted under Section 59 1322, Idaho Code. Thus, contribution rates should be increased.

Specifically, based on the current blended contribution rate of 19.44% of pay, the UAAL is not projected to amortize within 100 years if future experience matches the actuarial assumptions, excluding any potential future Discretionary COLAs, gainsharing, contribution rate changes, or benefit changes.

One measure of funding adequacy is the funding ratio, which compares the value of the actuarial assets to the actuarial accrued liability. The following compares the 2021 and the 2022 valuations.

<u>Valuation</u>	<u>Funding Ratio</u>
2021 Valuation	99.8%
2022 Valuation	82.6%

The calculations in this report assume a 1.0% automatic COLA in all future years. The calculations do not reflect any future discretionary COLAs that may be granted by the Board. While the Board has granted discretionary COLAs in the past, the decision whether or not to grant each COLA is made one year at a time. If the COLA assumption used for the actuarial valuation included provision for potential future discretionary COLAs, the impact would be a material increase in the costs and liabilities reported herein. See the risk disclosure section for more details.

The 2022 actuarial valuation indicates that an experience loss of \$3,842.5 million occurred during the fiscal year that just ended. This loss is based on the expected UAAL as of July 1, 2022, of \$234.7 million versus the actual UAAL of \$4,077.2 million. The loss was primarily due to an investment loss, as reflected in the -9.65% investment yield (net of all expenses) for the past year. This and other sources of gains and losses are shown in Table 1.

Table 2 illustrates the gains and losses incurred in the last three fiscal years attributable to both expected and unexpected experiences, as well as changes in assumptions, benefits, and methods.

Change in Assumptions, Benefits or Contribution Rates

At the December 2021 Board meeting, the Board approved a 2.5% discretionary COLA to be granted March 1, 2022. All figures in this report reflect this COLA.

At the December 2021 Board meeting, the Board also approved adjustments to the contribution rates effective July 1, 2023 (see Table 11 for details of the adjustments). All figures in this report reflect this planned change in contribution rates.

There have been no other changes in actuarial assumptions or plan benefits since the July 1, 2021 valuation.

Discretionary COLAs

The System automatically provides a 1.0% increase in retirement benefits each year if the Consumer Price Index (CPI) has increased by at least that amount. The Board is empowered to go beyond 1% and match the full increase in the CPI, up to a total of 6%, subject to rejection or amendment by the Legislature. If the increase is less than 1%, or negative, the COLA is automatic. A negative COLA cannot decrease benefits by more than 6% in one year, and each retiree's benefit cannot be less than the amount of the retirement allowance at the member's commencement date.

The CPI grew at a rate of 8.3% during the last year. The effect of the potential benefit increase beyond 1.0% is not reflected in the balance of this report.

Table 1
Gains and Losses for the Year Ended July 1, 2022

	Actuarial Accrued Liability⁽¹⁾ (in millions)	Market Value of Assets	Unfunded Actuarial Accrued Liability (in millions)	Funded Ratio	Amort. Period (years)
July 1, 2021 Valuation	\$21,819.7	\$21,770.7	\$49.0	99.8%	0.4
Plan Change: 2.5% Discretionary COLA	275.4	-	275.4		
July 1, 2021 Valuation with Plan Change	22,095.1	21,770.7	324.4	98.5%	3.2
Expected Change Between Valuation Dates	871.0	960.7	(89.7)		
Expected at July 1, 2022	\$22,966.1	\$22,731.4	\$234.7	99.0%	2.2
Effect of Actuarial Experience Gains and Losses:					
• Investments [Loss]	-	(3,435.4)	3,435.4		
• Salaries [Loss]	157.9	6.1	151.8		
• Membership Growth [Gain]	34.2	39.6	(5.4)		
• Benefit Payments Lower than Expected	7.8	7.8	-		
• Retired Member Experience [Loss] ⁽²⁾	205.6	-	205.6		
• Active and Inactive Member Experience [Loss]	<u>55.1</u>	<u>-</u>	<u>55.1</u>		
Total Experience Gains and Losses	460.6	(3,381.9)	3,842.5		
Effect of Assumption Changes [none]	-	-	-		
July 1, 2022 Valuation	\$23,426.7	\$19,349.5	\$4,077.2	82.6%	100+

1. Amounts are net of expected future ORP Contributions.

2. Includes re-addition of some retired members that were previously omitted from the retired member data supplied by PERSI.

Table 2
Three-Year History of Actuarial Gains and Losses

(All Dollar Amounts in Millions)

Gain (Loss) for Period

	<u>2021-2022</u>	<u>2020-2021</u>	<u>2019-2020</u>
Investment Income			
Investment income was greater (less) than expected	(3,435.4)	3,641.1	(715.4)
Pay Increases			
Pay increases were less (greater) than expected	(151.8)	(20.2)	38.3
Membership Growth			
New members increased liabilities by less (more) than their contributions increased assets	5.4	1.7	(37.3) ⁽¹⁾
Cost of Living Adjustment (COLA)			
Different automatic COLA than expected	NA	NA	NA
Other Retired Member Experience			
Retirees died younger (lived longer) than expected and miscellaneous retiree gains (and losses) resulting from other causes	(205.6) ⁽²⁾	57.7	20.2
Other Active and Inactive Member Experience			
Members retiring at different times than expected and miscellaneous gains (and losses) resulting from other causes	<u>(55.1)</u>	<u>(9.8)</u>	<u>(14.3)</u>
Total Gain (Loss) During the Period From Actuarial Experience	(3,842.5)	3,670.5	(708.5)
Contribution Income			
Expected contributions and asset returns were greater (less) than the normal cost and interest on the Unfunded Actuarial Accrued Liability	89.7	(121.7)	40.9
Non-Recurring Items			
Changes in actuarial assumptions caused a gain (loss)	None	(1,159.0)	None
Changes in actuarial methods caused a gain (loss)	None	None	None
Changes in plan provisions caused a gain (loss) ⁽³⁾	(275.4)	(5.6)	(374.4)
Change in Future Contribution Rate Increases	<u>None</u>	<u>None</u>	<u>None</u>
Composite Gain (Loss) During the Period	(4,028.2)	2,384.2	(1,042.0)

Note: Effects related to losses are shown in parentheses. Numerical results are expressed as a decrease (increase) in the actuarial accrued liability.

1. As new members enter the plan, they both increase liabilities and contribution income. Prior to the 2020-2021 period, this line item is just highlighting the increased liability side of the equation.

2. 2021-2022 loss includes re-addition of some retired members that were previously omitted from the retired member data supplied by PERSI.

3. For 2021-22, this reflects the 2.50% discretionary COLA, effective March 1, 2022. For 2019-20 this reflects the 0.70% discretionary COLA and ROPP COLA of 4.76%, effective March 1, 2020.

Table 3
Summary of Key Valuation Results

	<u>July 1, 2022</u> <u>Valuation</u>	<u>July 1, 2021</u> <u>Valuation</u>	<u>Percentage</u> <u>Change</u>
1. Total Membership			
A. Contributing Active Members	74,409	73,563	1.2%
B. Members and Beneficiaries Receiving Benefits	53,190	50,891	4.5%
C. Vested Terminated Members	15,489	14,539	6.5%
D. Non-vested Terminated Members	<u>34,714</u>	<u>31,179</u>	11.3%
E. Total Membership	177,802	170,172	4.5%
2. Annual Salaries			
A. Annual Total (\$Thousands)	\$ 3,890,350	\$ 3,654,378	6.5%
B. Annual Average per Active Member	\$ 52,283	\$ 49,677	5.2%
3. Annual Benefits			
A. Annual Benefits (\$Thousands)	\$ 1,140,827	\$ 1,043,514	9.3%
B. Annual Average Benefits	\$ 21,448	\$ 20,505	4.6%
4. Actuarial Accrued Liability (\$Millions)			
A. Contributing Active Members	\$ 9,887.2	\$ 9,455.7	4.6%
B. Members and Beneficiaries Receiving Benefits	12,104.8	11,068.5	9.4%
C. Terminated Members	<u>1,451.1</u>	<u>1,316.5</u>	10.2%
D. Total Actuarial Accrued Liability (AAL)	\$ 23,443.1	\$ 21,840.7	7.3%
E. Less Present Value of Future ORP Contributions	<u>16.4</u>	<u>21.0</u>	-21.9%
F. AAL Funded by PERSI Contributions	\$ 23,426.7	\$ 21,819.7	7.4%
5. Value of System Assets (\$Millions)			
A. Market Value	\$ 19,349.5	\$ 21,770.7	-11.1%
6. Funded Status (\$Millions)			
A. Funding Reserve (Unfunded Actuarial Accrued Liability, UAAL) (5A - 4F)	\$ (4,077.2)	\$ (49.0)	
B. Funded Ratio (5A ÷ 4F)	82.6%	99.8%	
7. Contribution Rates (percent of salaries)			
A. Current Total Blended Contribution Rate	19.44%	19.46%	
B. Total Normal Cost Rate	<u>16.70%</u>	<u>16.68%</u>	
C. Contribution Rate Minus Normal Cost Rate (7A - 7B)	2.74%	2.78%	
D. Ultimate Total Blended Contribution Rate ⁽¹⁾	19.45%	19.46%	
E. Amortization Period for UAAL Based on Currently Scheduled Contribution Rates ⁽¹⁾	100+ years	0.4 years	

1. See Table 11 for details on the scheduled rate changes.

Contribution Rates

In November 2002, the Board approved three 1% contribution rate increases to take effect on July 1, 2004, July 1, 2005, and July 1, 2006. The total rate increase of 1% each year is split between the employer and employee contributions.

On July 1, 2004, the first of three scheduled contribution rate increases went into effect.

Due to the 17.63% investment return in the year ending June 30, 2004, in November 2004, the Board delayed the scheduled contribution rate increases for July 1, 2005 and July 1, 2006 to July 1, 2006 and July 1, 2007 respectively.

Due to the 10.34% investment return in the year ending June 30, 2005, in the fall of 2005, the Board delayed the contribution rate increases again, to July 1, 2007 and July 1, 2008.

Due to the 11.79% investment return in the year ending June 30, 2006, in the fall of 2006, the Board delayed the contribution rate increases again, to July 1, 2008 and July 1, 2009.

Due to continued improvements in the funded status, including exceeding a 100% funded ratio by July 1, 2007, the Board canceled the contribution rate increases in the fall of 2007.

In December 2009, due to a significant drop in funded status because of investment losses in the year ending June 30, 2009, the Board approved three contribution rate increases: 1.5% at July 1, 2011, 1.5% at July 1, 2012, and 2.28% at July 1, 2013.

Due to the 12.01% investment return in the year ending June 30, 2010, in December 2010, the Board delayed the scheduled contribution rate increases for July 1, 2011, July 1, 2012, and July 1, 2013, to July 1, 2012, July 1, 2013, and July 1, 2014, respectively.

Due to the 20.25% investment return in the year ending June 30, 2011, in December 2011, the Board delayed the scheduled contribution rate increases for July 1, 2012, July 1, 2013, and July 1, 2014, to July 1, 2013, July 1, 2014, and July 1, 2015, respectively.

On July 1, 2013, the first of three scheduled contribution rate increases went into effect. The total rate increase of 1.5% is split between the employer and employee contributions.

In October 2013 the Board delayed the scheduled contribution rate increases for July 1, 2014 and July 1, 2015, to July 1, 2015 and July 1, 2016, respectively.

Due to the 16.77% investment return in the year ending June 30, 2014, in September 2014 the Board canceled the contribution rate increases scheduled for July 1, 2015 and July 1, 2016.

In October 2016, due to a drop in funded status because of investment losses in the two preceding fiscal years, the Board approved a contribution rate increase from 18.42% to 19.42%, scheduled to go into effect at July 1, 2018.

In October 2017, due to an increase in funded status from investment gains in the prior fiscal year, the Board approved a delay in the contribution rate increase from July 1, 2018 to July 1, 2019.

On July 1, 2019, the scheduled contribution rate increase went into effect. The total rate increase of 1% was split between the employer and active member contributions.

In December 2021, the Board approved an adjustment to the contribution rates to become effective July 1, 2023. The goal of this adjustment was to separate the teacher contribution rate from that charged for general members and to make each class's contribution rate more in line with the cost of benefits for that class, all while limiting the change in the weighted total contribution rate.

The currently scheduled contribution rates do not amortize the UAAL within 100 years. This is over the 25-year amortization period limit required under Section 59-1322, Idaho Code. Therefore, contribution rates should be increased.

Gain Sharing

Beginning in 2000, under Section 59-1309, Idaho Code, the Board may allocate all or a portion of “extraordinary gains” to active and retired members and employers as Gain Sharing. Extraordinary gains are defined as the excess, if any, at the close of the fiscal year of the Assets over Actuarial Accrued Liabilities plus an amount necessary to absorb a one standard deviation market event without increasing contribution rates, as determined by the Board. Under the Board’s current investment policy, assets in excess of a 113% funded ratio are considered extraordinary gains. Therefore, no assets are available for gain sharing as of July 1, 2022.

2. Scope of the Report

This report presents the actuarial valuation of the Public Employee Retirement System of Idaho as of July 1, 2022. This valuation was requested by the System's Board.

Your particular attention is called for in reading our cover letter, where we refer to the guidelines employed in the preparation of this report. We also comment on the sources and reliability of both the data and the actuarial assumptions upon which our findings depend. Those comments are the basis for our certification that this report is complete and accurate to the best of our knowledge and belief.

A summary of the findings resulting from this valuation is presented in the previous section. Section 3 describes the assets and investment experience of the System. Sections 4 and 5 describe how the obligations of the System are to be met under the actuarial cost method in use. Section 6 of this report shows the estimated cash flow of future retirement benefit payments, based on the actuarial assumptions. Section 7 describes various risks that are material to the Plan.

This report includes several appendices:

- Appendix A A summary of the actuarial procedures and assumptions.
- Appendix B A summary of the current benefit structure based on governing law on July 1, 2022.
- Appendix C Schedules of valuation data classified by various categories; a brief summary of the System's recent experience; and comparative statistics since June 30, 1968.
- Appendix D A glossary of actuarial terms used in this report.

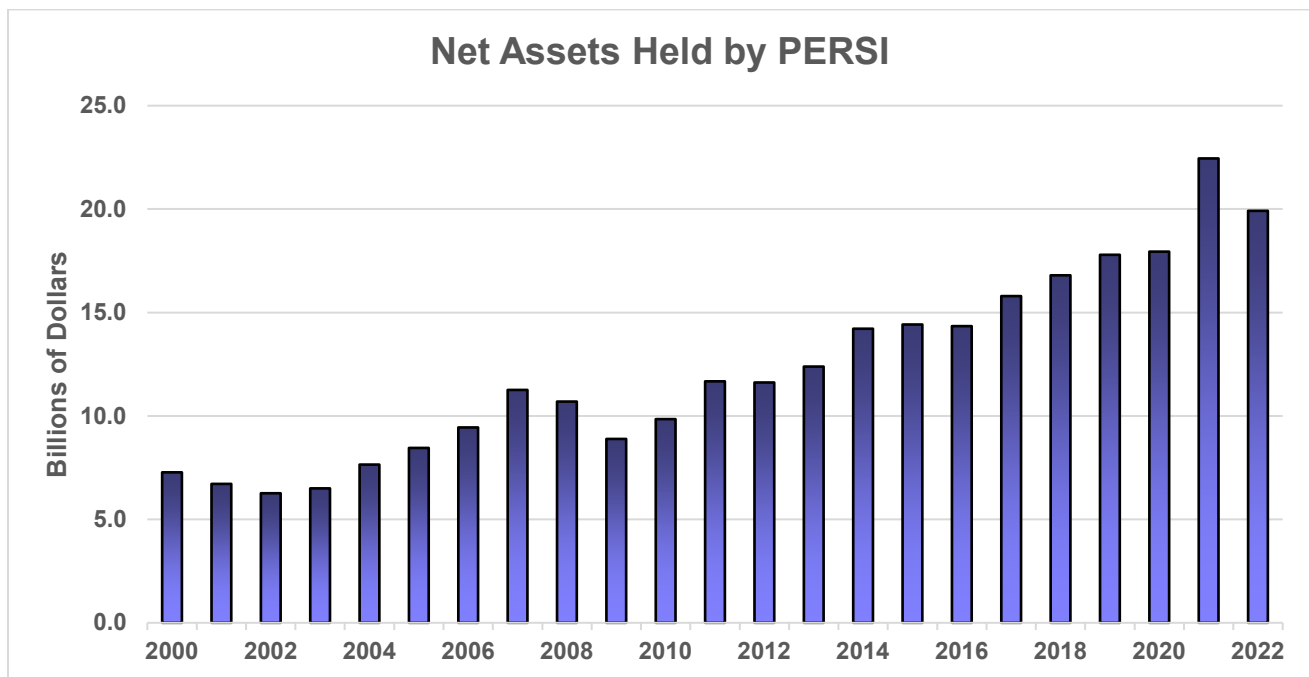
3. Assets

In many respects, an actuarial valuation can be thought of as an inventory process. The inventory is taken as of the actuarial valuation date, which for this valuation is July 1, 2022. On that date, the assets available for the payment of benefits are appraised. These assets are compared with the actuarial liabilities, which are generally well in excess of the assets. The actuarial process thus leads to a method of determining what contributions by members and their employers are needed to strike a balance.

This section of the report deals with the asset determination. In the next section, the actuarial liabilities will be discussed. Section 5 deals with the process for determining required contributions based on the relationship between the assets and actuarial liabilities.

The net assets at July 1, 2022, of \$19,915,745,533 shown below and in Table 4 include assets used in plan operations and assets held for the Firefighters' Retirement Fund, the Judges' Retirement Fund, and the Idaho Falls Policemen's Retirement Fund. The allocation of the fund is shown at the bottom of Table 4. The investments at fair value shown in Table 5 also include assets held for these other funds.

The market value of assets has increased 174% over the value in 2000. The chart below illustrates this growth.



For all years shown in this table, the system has elected to use the market value of assets on the valuation date as the asset value used in calculating its funding requirement (a.k.a. the actuarial value of assets).

Table 4 presents a summary of the System's assets, including the allocation of the assets to the various funds. Table 5 presents an analysis of the investments. Table 6 shows a reconciliation of the market value of assets held for PERSI pension benefits from July 1, 2021, to July 1, 2022. Table 7 shows an analysis of the investment yield of the System's assets for the fiscal year ending June 30, 2022.

Tables 4 through 7 are derived from data furnished to us by the System. We have accepted these tables for use in this report without audit, but we have reviewed them for reasonableness and consistency with previous reports.

The yield rates shown at the top of Table 7 are net of both investment and administrative expenses. The summary at the bottom of Table 7 shows the annual yields before expenses, net of investment expenses, and net of both investment and administrative expenses. Each yield should be compared with the appropriate actuarial assumption shown in the left column. The yield net of all expenses is -9.66% for the year ending June 30, 2022, which is compared with the actuarial assumption, net of all expenses, of 6.30% for the fiscal year ended June 30, 2022.

Table 4
Market Value of Assets

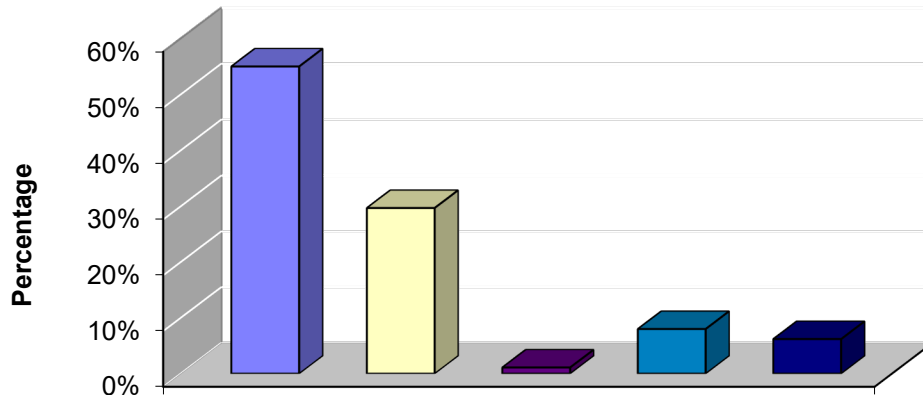
	<u>July 1, 2022</u>	<u>July 1, 2021</u>
Assets		
Cash	\$ 20,061,806	\$ 9,940,410
Investments at Fair Value	19,791,709,553	22,364,860,985
Investments Sold	76,589,145	51,245,576
Contributions Receivable	6,743,783	7,086,895
Interest and Dividends Receivable	63,617,172	61,466,135
Assets Used in Plan Operations, Net	5,649,811	7,249,565
Retiree Payroll in Process	94,033,173	87,429,282
Other Prepaids	-	-
Total Assets	\$ 20,058,404,443	\$ 22,589,278,848
Liabilities		
Accrued Liabilities	\$ 17,042,840	\$ 17,606,875
Benefits and Refunds Payable	-	-
Due to Other Funds	-	-
Investments Purchased	125,616,070	122,721,611
Total Liabilities	\$ 142,658,910	\$ 140,328,486
Net Assets Held by PERSI	\$ 19,915,745,533	\$ 22,448,950,362
Allocation of Net Assets Held by PERSI		
Total Assets Held for PERSI Pension Benefits	\$ 19,349,485,162	\$ 21,770,658,824
Firefighters' Retirement Fund Assets	447,620,207	511,857,776
Judges' Retirement Fund Assets	103,935,720	117,341,440
Idaho Falls Police Retirement Fund Assets	9,054,633	41,842,757
Assets Used in Plan Operations	5,649,811	7,249,565
Net Assets Held by PERSI	\$ 19,915,745,533	\$ 22,448,950,362
Assets for Use in Valuation of PERSI Pension Benefits		
Market Value of Assets held for PERSI		
Pension Benefits	\$ 19,349,485,162	\$ 21,770,658,824

Table 5
Analysis of Investments Held by PERSI

July 1, 2022

	<u>Fair Value</u>	<u>Percentage</u>
Fixed Income Investments		
Domestic	\$ 5,059,212,075	25.6%
International	13,380,011	0.1%
Idaho Commercial Mortgages	<u>789,424,287</u>	<u>4.0%</u>
Total Fixed Income	5,862,016,373	29.7%
Short Term Investments	211,187,153	1.1%
Real Estate	1,229,545,401	6.2%
Equity Securities		
Domestic	8,177,079,036	41.3%
International	<u>2,721,130,302</u>	<u>13.7%</u>
Total Equities	10,898,209,338	55.0%
Private Equity	1,590,751,288	8.0%
Total Investments	\$ 19,791,709,553	100.0%

This table includes investments held for the Firefighters' Retirement Fund, the Judges' Retirement Fund, and the Idaho Falls Policemen's Retirement Fund. The allocation of the net assets in the fund is shown at the bottom of Table 4.



<u>Total Equities</u>	<u>Fixed Income</u>	<u>Short-Term Investments</u>	<u>Private Equity</u>	<u>Real Estate</u>
55.0%	29.7%	1.1%	8.0%	6.2%

Table 6
Reconciliation of Assets

	<u>July 1, 2021 to June 30, 2022</u>	<u>July 1, 2020 to June 30, 2021</u>
Additions:		
Contributions		
Members	\$ 315,161,350	\$ 294,084,814
Employers	<u>476,416,795</u>	<u>450,951,588</u>
Total Contributions	\$ 791,578,145	\$ 745,036,402
Investment Income		
Net Appreciation/(Depreciation) in Fair Value of Investments	\$ (2,359,948,266)	\$ 4,440,401,649
Interest, Dividends and Other Investment Income	348,905,038	350,499,481
Other Revenue, Net	407,053	383,546
Less: Investment Expenses	<u>(64,286,706)</u>	<u>(57,663,406)</u>
Net Investment Income	<u>\$ (2,074,922,881)</u>	<u>\$ 4,733,621,270</u>
Total Additions	\$ (1,283,344,736)	\$ 5,478,657,672
Deductions:		
Benefits and Refunds Paid to Plan Members and Beneficiaries	\$ 1,129,444,374	\$ 1,092,389,237
Administrative Expense	<u>9,984,308</u>	<u>8,972,053</u>
Total Deductions	\$ 1,139,428,682	\$ 1,101,361,290
Other:		
Decrease/(Increase) in Assets Used in Plan Operations	\$ 1,599,756	\$ 1,301,866
Increase/(Decrease) in Market Value of Assets	\$ (2,421,173,662)	\$ 4,378,598,248
Market Value of Assets, Beginning of Year	\$ 21,770,658,824	\$ 17,392,060,576
Market Value of Assets, End of Year	\$ 19,349,485,162	\$ 21,770,658,824

Notes:

1. This table only shows assets held for PERSI pension benefits.

Table 7
Analysis of Investment Yield

	July 1, 2021 to June 30, 2022	
	Total Trust	Individual Plan
Investment Return	\$ (2,071,966,117)	\$ (2,010,636,175)
Less Investment Expenses	66,244,078	64,286,706
Less Administrative Expenses	<u>10,147,224</u>	<u>9,984,308</u>
Net Return	\$ (2,148,357,419)	\$ (2,084,907,189)
Mean Assets for Period	\$ 22,250,076,969	\$ 21,602,525,588
Annual Yield	-9.66%	-9.65%

Analysis of Investment Yield - Net of All Expenses

Expense Basis	Summary of Annual Yields for Year Ending June 30, 2022		
	Actuarial Assumption	Total Trust	Individual Plan
Gross – Before Expenses		-9.33%	-9.32%
Net of Investment Expenses	6.35%	-9.61%	-9.61%
Net of All Expenses	6.30%	-9.66%	-9.65%

Notes:

1. Investment return: See Tables 4, 5, and 6 for data used in this table.
2. Total trust excludes assets used in plan operations.
3. Individual plan only includes assets held for PERSI pension benefits.
4. Mean assets for period = 1/2 (beginning net assets + ending net assets - net return).
5. Annual yield = (net investment return) / mean assets.
6. Mean assets differ for each expense basis, so differences between bases are not comparable.

4. Actuarial Liabilities

In the previous section, an actuarial valuation was compared with an inventory process, and an analysis was given of the inventory of assets of the System as of the valuation date, July 1, 2022. In this section, the discussion will focus on the commitments of the System which are referred to as its actuarial liabilities.

Table 8 contains an analysis of the actuarial present value of all future benefits for contributing members and for former contributing members and their survivors. The analysis is given by type of benefit and by class of membership.

The actuarial liabilities summarized in Table 8 include the actuarial present value of all future benefits expected to be paid with respect to each member. For an active member, this value includes measures of both benefits already earned and future benefits to be earned. For all members, active and retired, the value extends over benefits earnable and payable for the rest of their lives and, if an optional benefit is chosen, for the lives of the surviving beneficiaries.

The economic and demographic assumptions are based on the results of the 2021 Experience Study, which was adopted by the Board effective July 1, 2021.

All liabilities reflect the provisions of governing law in effect as of July 1, 2022, as summarized in Appendix B. No future changes are considered in determining the liabilities shown.

Table 8
Actuarial Present Value of Future Benefits

(All amounts in millions)

July 1, 2022

Contributing Members	Fire & Police	General Employees	Teachers	Grand Total
Service Retirement Including				
Reduced Early Retirement	\$2,689.4	\$6,275.9	\$5,623.5	\$14,588.8
Deferred Vested Retirement	139.1	533.6	270.8	943.5
Disability Retirement	97.4	207.6	156.1	461.1
Death	29.6	108.3	53.9	191.8
Refunds of Member				
Contributions ⁽¹⁾	<u>54.1</u>	<u>142.9</u>	<u>42.1</u>	<u>239.1</u>
Total	\$3,009.6	\$7,268.3	\$6,146.4	\$16,424.3
Former Contributing Members & Survivors				
Service Retirement	\$1,564.6	\$5,401.7	\$4,362.8	\$11,329.1
Disability Retirement	47.8	192.0	104.1	343.9
Survivors' Benefits	59.3	228.7	143.8	431.8
All Other Benefits	<u>150.9</u>	<u>941.7</u>	<u>358.5</u>	<u>1,451.1</u>
Total	\$1,822.6	\$6,764.1	\$4,969.2	\$13,555.9
Grand Total	\$4,832.2	\$14,032.4	\$11,115.6	\$29,980.2

1. Including all benefits provided by voluntary contributions.

5. Employer Contributions

The previous two sections were devoted to a discussion of the assets and actuarial liabilities of the System. Comparison of Tables 4 and 8 indicates that current assets fall short of meeting the actuarial liabilities (specifically the actuarial present value of future benefits). This is expected in all but a fully closed down fund, where no further contributions of any sort are anticipated.

In an active system, there is often a difference between the actuarial assets and liabilities. When liabilities exceed assets, this difference has to be made up out of future contributions and investment returns. An actuarial valuation method sets out a schedule of future contributions that will deal with this difference in an orderly fashion.

The method used to determine the incidence of the contributions in various years is called the actuarial cost method. For this valuation, the individual entry age actuarial cost method has been used. Under this method — or essentially any actuarial cost method — the contributions required to meet the System’s needs are allocated each year between two elements:

- A normal cost amount, which ideally is relatively stable as a percentage of salary over the years; and
- The excess of the contribution rate over the normal cost; this excess is used to amortize what is called the unfunded actuarial accrued liability.

The two items described above — the normal cost and unfunded actuarial accrued liability — are the keys to understanding the actuarial cost method.

Normal Cost

The normal cost is the theoretical contribution rate that will meet the ongoing costs of a group of average new employees. Suppose that a group of new employees was covered under a separate fund from which all benefits and to which all contributions and associated investment returns were paid. Under the individual entry age actuarial cost method, the normal cost contribution rate is that level percentage of pay that would be exactly right to maintain this fund on a stable basis. If experience were to follow the actuarial assumptions precisely, the fund would be completely liquidated when the last payment to the last survivor of the group has been made.

We have determined the normal cost rates for the System separately by class of employee and by type of benefit. These rates are summarized in Table 10. The normal cost rates in Table 10 reflect the actuarial assumptions adopted by the Board, the plan provisions effective July 1, 2022, and the current total blended contribution rate of 19.44%.

Unfunded Actuarial Accrued Liability

The term "fully funded" is often applied to a system in which contributions for everyone at the normal cost rate are sufficient to pay for the benefits of existing employees as well as for those of new employees. Many systems are not fully funded, either because of past benefit improvements that have not been completely paid for or because of actuarial deficiencies that have occurred because experience has not been as favorable as anticipated. Under these circumstances, an unfunded actuarial accrued liability (UAAL) exists.

Amortization of UAAL or Funding Reserve

However, even if a system does not have a positive UAAL, a portion or all of the normal cost contribution payments will need to be continued in order to have sufficient funds to pay future benefits. The use of the term "fully funded" may imply no further contributions are required at all. Therefore, a better term is a "well-funded" plan. This occurs when the value of the assets exceeds the actuarial accrued liability and the difference is referred to in the PERSI funding policy as the Funding Reserve.

Table 9 shows how the UAAL or Funding Reserve was derived for the System. Line A shows the total actuarial liability for all future benefits. The portion of the future liability expected to be paid from future normal cost contributions, both employer and employee, is shown on Line B. The difference between lines A and B is the System's actuarial accrued liability as of the actuarial valuation date.

The UAAL at any date after establishment of a system is affected by any actuarial gains or losses arising when the actual experience of the system varies from the experience anticipated by the actuarial assumptions used in the valuations. To the extent actual experience, as it develops, differs from that expected according to the assumptions used, so also will the emerging costs differ from the estimated costs disclosed in this report.

ORP Contributions

Under Idaho Code 33-107A each institution participating in the optional retirement program (ORP) is required to pay an amount equal to 1.49% of salaries of their ORP participants to PERSI. This amount is to be paid until July 1, 2025. Likewise, under Idaho Code 33-107B each community college and post-secondary vocational education institution was required to pay an amount equal to 3.83% of salaries of their ORP participants to PERSI. This amount was paid until July 1, 2011, and has since expired. These payments from the ORP employers are in lieu of amortization payments and withdrawal contributions otherwise required under PERSI. Table 10 Line D shows the present value of these future ORP contributions. The difference between the future ORP contributions and the computed actuarial accrued liability is the portion of the actuarial accrued liability that is expected to be funded by PERSI assets and contributions.

Line F in Table 9 indicates the market value of assets. The excess of the actuarial accrued liability for PERSI in Line E over the assets is the UAAL for PERSI, as shown on Line G.

Funding Adequacy

A key consideration in determining the adequacy of the funding of the System is how the UAAL is being serviced. If the UAAL amount is positive, that is the actuarial accrued liability to be funded is greater than the assets, then the UAAL is amortized. Idaho law calls for the UAAL to be liquidated in no more than 25 years. Table C-5 (Appendix C) illustrates, for historical comparison purposes only, the contribution rates on a 30-year amortization basis through 1992 and the contribution rates on the 25-year amortization basis beginning in 1993.

From July 1, 1998, to July 1, 2000, there was no UAAL, and the actuarial value of the assets exceeded the value of the actuarial accrued liability to be funded by PERSI, resulting in a Funding Reserve. However, asset losses for the year ending July 1, 2001, resulted in the re-emergence of a UAAL. The UAAL also grew during the years ending July 1, 2002, and July 1, 2003, due to further asset losses. The UAAL decreased during the years ending July 1, 2004, July 1, 2005, and July 1, 2006, due to asset gains. During the year ending July 1, 2007, the asset gain resulted in a Funding Reserve. During the year ending July 1, 2008, the asset loss resulted in the re-emergence of a UAAL. The UAAL grew further during the year ending July 1, 2009, due to asset losses. The UAAL decreased during the years ending July 1, 2010, and July 1, 2011, due to asset gains. During the year ending July 1, 2012, the asset loss resulted in an increase to the UAAL. The UAAL again increased during the year ending June 30, 2013. The UAAL decreased during the year ending June 30, 2014, due primarily to asset gains. The UAAL increased during the years ending June 30, 2015, and June 30, 2016, primarily due to asset losses. The UAAL decreased during the years ending June 30, 2017, June 30, 2018, and June 30, 2019, primarily due to asset gains. The UAAL increased during the year ending June 30, 2020, primarily due to asset losses. The UAAL decreased during the year ending June 30, 2021, primarily due to asset gains. The UAAL increased during the year ending June 30, 2022, primarily due to asset losses. The dollar amount of the UAAL is \$4,077.2 million.

Discretionary COLA Increases

The costs of providing future postretirement increases of 1% per year are included in the liabilities shown in this report. These increases are automatic as long as the increase in the CPI-U is at least 1%. The Board may, subject to modification or rejection by the Legislature, grant discretionary increases of an additional 5% per year, provided that the total percentage increase does not exceed the percentage change in the CPI and that the increase can be supported by the assets of the System. Any future discretionary COLAs will increase the costs of the plan above the liabilities shown in this report. See Section 7 Risk Disclosures for more details.

Gain Sharing

Beginning in 2000, under Section 59-1309, Idaho Code, the Board may allocate all or a portion of “extraordinary gains” to active and retired members and employers as Gain Sharing. Extraordinary gains are defined as the excess, if any, at the close of the fiscal year of the Assets over Actuarial Accrued Liabilities plus an amount necessary to absorb a one standard deviation market event without increasing contribution rates, as determined by the Board. Under the Board’s current investment policy, assets in excess of a 113% funded ratio are considered extraordinary gains. Since the funding ratio as of July 1, 2022, is less than 113%, no assets are available for consideration for Gain Sharing. Note that the values shown in this report, do not reflect any future Gain Sharing allocations. If any are granted, this will increase the costs of the plan above the liabilities shown in this report.

Funding Policy

Table 11 shows the current contribution rates and scheduled increases (if any). These reflect the statutory requirements that member contribution rates must always be a fixed percentage of the employer contribution rate (72% for fire and police and 60% for other employees). There are two exceptions to this:

- The cost of the fire and police line of duty death benefit is paid entirely by fire and police employers. This is currently 0.10% of pay.
- The cost of the fire and police line of duty disability benefits (including catastrophic disability benefits) are paid entirely by fire and police members. This is currently 0.36% of pay.

In addition, the Board must satisfy the statutory requirement that contribution rates are sufficient to amortize the UAAL in no more than 25 years. As shown in Table 12, as of July 1, 2022, the current contribution rates schedule does not meet this requirement. Therefore, the Board must increase contribution rates.

The Board's current Funding Guidelines were adopted January 18, 2022, and establish guidelines for the Board in making annual funding decisions. It outlines the following Board priorities and principles:

- Align actuarial assumptions,
- Maintain predictable rates of contribution,
- Address the purchasing power of retiree benefits, and
- Consider the allocation of extraordinary gains.

These priorities and principles are listed in no particular order of importance. They are regularly evaluated and considered with the goal of maintaining the sustainability of the System.

Table 9
Unfunded Actuarial Accrued Liability

(All amounts in millions)

	Valuation Date: <u>July 1, 2022</u>	<u>July 1, 2021</u>
A. Actuarial Present Value of all Future Benefits	\$ 29,980.2	\$ 27,945.7
B. Actuarial Present Value of Total Future Normal Costs	<u>6,537.1</u>	<u>6,105.0</u>
C. Actuarial Accrued Liability [A - B]	\$ 23,443.1	\$ 21,840.7
D. Present Value of Future ORP Contributions	<u>16.4</u>	<u>21.0</u>
E. Actuarial Accrued Liability Funded by PERSI Contribution [C - D]	23,426.7	21,819.7
F. Market Value of Assets Available for Benefits	<u>19,349.5</u>	<u>21,770.7</u>
G. UAAL (Funding Reserve) [E - F]	\$ 4,077.2	\$ 49.0
H. Amortization Period	100+ years	0.4 years
I. Funded Ratio [F/E]	82.6%	99.8%

Table 10
Normal Cost Rates

July 1, 2022⁽¹⁾

	Fire & Police	General Employees	Teachers	Total Rate
Service Retirement Including Reduced Early Retirement	16.08%	11.17%	14.59%	13.00%
Deferred Vested Retirement	1.82	2.01	1.58	1.84
Disability Retirement	1.00	0.54	0.60	0.63
Death	0.23	0.22	0.17	0.21
Refunds of Member Contributions	1.24	1.20	0.62	1.02
Total	20.37%	15.14%	17.56%	16.70%
Less Member Contributions	9.13	7.16	7.16	7.45
Employer Normal Cost Rate	11.24%	7.98%	10.40%	9.25%

Analysis of Member Contributions

Member Contributions	9.13%	7.16%	7.16%	7.45%
Less Expected Refunds	1.24	1.20	0.62	1.02
	7.89%	5.96%	6.54%	6.43%

1. Total Normal Cost Rates are based on the Individual Entry Age Normal Cost Method adopted by the Board for the July 2013 Actuarial Valuation.

Table 11
Current Contribution Rates

	<u>Rates as of July 1, 2022</u>	<u>Rates as of July 1, 2023</u>
1. <u>Fire & Police</u>		
A. Total Contribution Rate (set by Board)	21.41%	23.09%
B. Benefits Paid Entirely by Employers	0.10%	0.10%
C. Benefits Paid Entirely by Members	0.36%	0.36%
D. Shared Portion of Contribution Rate [A - B - C]	20.95%	22.63%
E. Employer Portion of Shared Contributions [D ÷ 1.72]	12.18%	13.16%
F. Member Portion of Shared Contributions [D - E]	8.77%	9.47%
G. Total Employer Contribution Rate [B + E]	12.28%	13.26%
H. Total Member Contribution Rate [C + F]	9.13%	9.83%
I. Projected FY23 Salary (millions)	\$576.8	\$576.8
J. Projected FY23 Employer Contributions (millions) [G x I]	70.8	76.5
K. Projected FY23 Member Contributions (millions) [H x I]	52.7	56.7
2. <u>General Employees</u>		
A. Total Contribution Rate (set by Board)	19.10%	17.89%
B. Total Employer Contribution Rate [A ÷ 1.60]	11.94%	11.18%
C. Total Member Contribution Rate [A - B]	7.16%	6.71%
D. Projected FY23 Salary (millions)	\$2,045.6	\$2,045.6
E. Projected FY23 Employer Contributions (millions) [B x D]	244.2	228.7
F. Projected FY23 Member Contributions (millions) [C x D]	146.5	137.3
3. <u>Teachers</u>		
A. Total Contribution Rate (set by Board)	19.10%	20.31%
B. Total Employer Contribution Rate [A ÷ 1.60]	11.94%	12.69%
C. Total Member Contribution Rate [A - B]	7.16%	7.62%
D. Projected FY23 Salary (millions)	\$1,240.8	\$1,240.8
E. Projected FY23 Employer Contributions (millions) [B x D]	148.2	157.5
F. Projected FY23 Member Contributions (millions) [C x D]	88.8	94.5
4. <u>Total Aggregate Rate</u>		
A. Projected FY23 Salary (millions) [1I + 2D + 3D]	\$3,863.2	\$3,863.2
B. Projected FY23 Employer Contributions (millions) [1J + 2E + 3E]	463.2	462.6
C. Projected FY23 Member Contributions (millions) [1K + 2F + 3F]	288.0	288.5
D. Aggregate Employer Contribution Rate [B ÷ A]	11.99%	11.98%
E. Aggregate Member Contribution Rate [C ÷ A]	7.45%	7.47%
F. Total Aggregate Contribution Rate [E + F]	19.44%	19.45%

Notes:

1. Projected FY23 salaries and contributions shown in this exhibit do not include projected salaries for future members hired after the valuation date of July 1, 2022.
2. Calculations were done using unrounded values, so results may differ slightly from those performed using the rounded values displayed above.

Table 12
Minimum Contribution Rates

Valuation Date	July 1, 2022				July 1, 2021		
	Funding Basis	Actual Contribution Rates			Minimum Contribution Rate ⁽¹⁾	Actual Contribution Rate	
		Group	Fire & Police	General Employees	Teachers	Total	Total
A. Employer Contribution Rate		12.28%	11.94%	11.94%	11.99%	14.08% ⁽³⁾	11.99%
B. Member Contribution Rate		<u>9.13%</u>	<u>7.16%</u>	<u>7.16%</u>	<u>7.45%</u>	<u>8.75%</u> ⁽³⁾	<u>7.47%</u>
C. Total Contribution Rate [A + B]		21.41%	19.10%	19.10%	19.44%	22.83% ⁽³⁾	19.46%
D. Total Normal Cost Rate		20.37%	15.14%	17.56%	16.70%	16.95% ⁽³⁾	16.68%
E. Amount Available to Amortize Liability [C - D]		1.04%	3.96%	1.54%	2.74%	5.88% ⁽³⁾	2.78%
F. Dollar Amount of UAAL in Millions (if negative, Funding Reserve) ⁽²⁾					\$4,077.2	\$4,025.6	\$49.0
G. Amortization Period					100+ years	25.0 years ⁽⁴⁾	0.4 years

1. Per the Board's policy, the UAAL (if applicable) is amortized over a 25-year period. The minimum contribution rate permitted by statute would not permit the total rate to be less than the normal cost rate.

2. Reflects only the amount funded by PERSI contributions. Excludes the present rate of 1.49% of salaries of university members in the Optional Retirement Plan (ORP) until 2025. The present value of these expected contributions as of July 1, 2022 is \$16.4 million.

3. The Minimum Contribution Rate column shows the adjusted contribution rates (and resulting normal cost rate) as of January 1, 2024, while the other columns all show the current contribution rates (and resulting normal cost rate) as of the valuation date. The ultimate contribution rate based on the current schedule is 19.45%; see Table 11 for details.

4. Calculated as of July 1, 2022, ignoring any previously scheduled contribution rate changes assuming that the contribution rates are changed to the Minimum Contribution Rate effective January 1, 2024.

6. Supplemental Information

Cash Flow Projections

Table 13 summarizes the historical cash flows for PERSI and the projected cash flows for the next 10 years. Contributions include both employer and member contributions. The table shows that net cash flow has been decreasing in recent years. This is a typical pattern in the maturing of a retirement system. Beginning in 2007, contributions were less than benefits and the System began drawing on the fund that has been built. The cash flow is projected to be negative in each of the next ten years.

The projected cash flows include PERSI contributions, benefits, and expenses. They are based on the actuarial assumptions as stated in Appendix A. Expenses are based on the expenses for the year ended June 30, 2022 increased annually with the actuarial inflation assumption of 2.30%. Any increases in future contribution rates will increase net cash flow. The projected cash flows do not include:

- Future discretionary COLA payments
- Future discretionary Gain Sharing allocations

Table 13
Cash Flow History and Projections

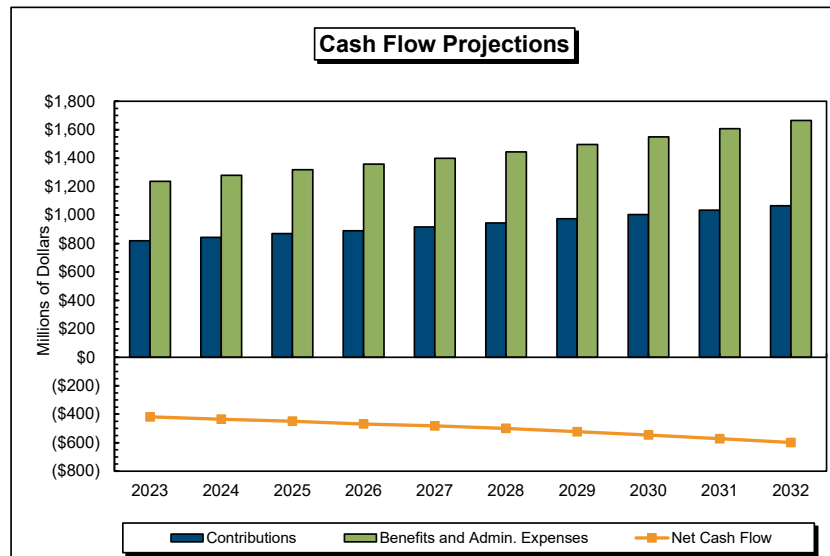
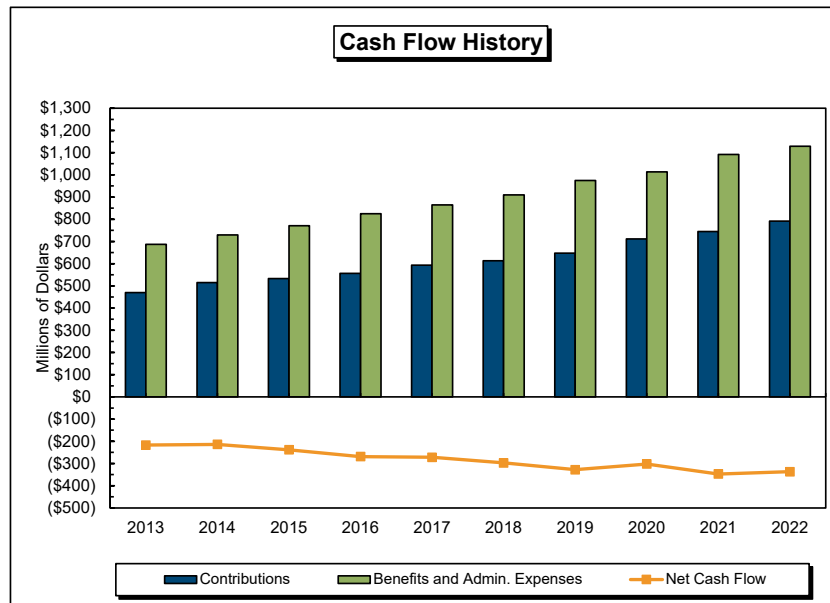
(All dollar amounts in millions)

Year Ending June 30	Historical Cash Flows		
	Contributions	Benefits Paid	Net Cash Flow
2013	\$ 470	\$ 687	\$ (217)
2014	515	729	(214)
2015	533	771	(238)
2016	556	825	(269)
2017	593	865	(272)
2018	613	910	(297)
2019	647	975	(328)
2020	711	1,013	(302)
2021	745	1,092	(347)
2022	792	1,129	(337)

Year Ending June 30	Projected Cash Flows		
	Contributions	Benefits Paid	Net Cash Flow
2023	\$ 819	\$ 1,238	\$ (419)
2024	844	1,279	(435)
2025	870	1,319	(449)
2026	890	1,359	(469)
2027	917	1,399	(482)
2028	945	1,445	(500)
2029	974	1,497	(523)
2030	1,004	1,550	(546)
2031	1,035	1,607	(572)
2032	1,066	1,665	(599)

Notes:

1. This table only shows cash flows for PERSI pension benefits.
2. Projected contributions are based on the currently scheduled contribution rates.
3. A negative cash flow means a portion of the fund's investment income will need to be used to cover expected benefit payments. This could impact the fund's future asset allocations and asset liquidity needs.
4. Projected benefits paid only includes benefits paid to members included in this valuation. No adjustments are made for benefits paid to future new members. Also, these projected benefits paid don't include future payments to members who terminated prior to the valuation date with a non-vested benefit but have not yet taken a refund of their employee contributions.



Notes:

1. This table only shows cash flows for PERSI pension benefits.
2. Projected contributions are based on the currently scheduled contribution rates.
3. A negative cash flow means a portion of the fund’s investment income will need to be used to cover expected benefit payments. This could impact the fund’s future asset allocations and asset liquidity needs.
4. Projected benefits paid only includes benefits paid to members included in this valuation. No adjustments are made for benefits paid to future new members. Also, these projected benefits paid don’t include future payments to members who terminated prior to the valuation date with a non-vested benefit but have not yet taken a refund of their employee contributions.

7. Risk Disclosure

The purpose of this section is to identify, assess, and provide illustrations of risks that are significant to the Plan, and in some cases to the Plan's members.

In addition, as plans mature, they accumulate larger pools of assets and liabilities. This increases the potential risk to plan funding and the finances of those who are responsible for plan funding. As shown by the Asset Volatility Ratio discussed later in this section, the System's assets are now much larger compared to payroll than in the past. The Asset Volatility Ratio example shows that because of this, a 10% investment loss on assets today costs about fifteen times as much, when measured as a percent of payroll, than a 10% investment loss would have cost in 1968. Since pension plans make long-term promises and rely on long-term funding, it is important to consider how mature the plan is today, and how mature it may become in the future.

The results of any actuarial valuation are based on one set of assumptions. Although we believe the current assumptions for the System provide a reasonable estimate of future expectations, it is almost certain that future experience will differ from the assumptions to some extent. It is therefore important to consider the potential impacts of these potential differences between assumptions and experience when making decisions that may affect the future financial health of the Plan, or of the Plan's participants.

Actuarial Standard of Practice No. 51 (ASOP 51) addresses these issues by providing actuaries with guidance for assessing and disclosing the risk associated with measuring pension liabilities and the determination of pension plan contributions. Specifically, it directs the actuary to:

- Identify risks that may be significant to the plan.
- Assess the risks identified as significant to the plan. The assessment does not need to include numerical calculations.
- Disclose plan maturity measures and historical information that are significant to understanding the plan's risks.

This Section uses the framework of ASOP 51 to communicate important information about significant risks to the System, the System's maturity, and relevant historical Plan data.

Identification of Risks

There are a number of factors that affect future valuation results. To the extent actual experience for these factors varies from the assumptions, this will likely cause either increases or decreases in the plan's future funding level and calculated contribution rates. Examples of factors that can have a significant impact on valuation results are:

- Investment return as this will impact the level of assets available to pay benefits.
- COLAs as discretionary COLAs increase the cost of the System.
- Payroll variation as this will impact the ability to finance unfunded amounts as a percent of future pay.
- Salary variation as this will impact the size of benefits members receive as a percent of final earnings.
- Mortality as this will impact how long retirees receive benefits.
- Service retirement as this will impact: how long retirees receive benefits, the size of retiree benefits, the amount of time to receive employer and employee contributions, and the amount of time for investment earnings to accumulate on those contributions.
- Termination (members leaving active employment for reasons other than death, disability, or service retirement) as this will impact the size of those members' benefits.

Investment Return

Of the factors listed above, we believe the factor with the greatest potential risk is future investment returns. For example, in the fiscal year ending June 30, 2022, the Plan had an asset return of -9.65%. This caused the Plan's UAAL to increase by \$3,435.4 million. Table C-11, in the Appendices of this report, shows how investment returns have varied since 1968.

Cost of Living Adjustments (COLAs)

PERSI members receive an automatic COLA each year of up to 1.00%. If CPI-U is greater than 1.00% in a year, the Board has the authority to grant a discretionary COLA to make up the difference (see Appendix B for more details). We performed analysis on how the historical COLAs (as summarized in Table C-7) have compared to full CPI-U over the past 20 years and found that the Board has historically granted COLAs that are actuarially equivalent to CPI-U less 0.23%.

Considering the risk disclosures recommended by ASOP 51, we include the following hypothetical to illustrate the sensitivity of a higher COLA assumption. If the annual COLA assumption used in the liabilities and costs calculated in this report were raised from 1.00% to 2.00% per year (i.e., 2% annual COLA for the entirety of the fund's life), we estimate that it would increase the UAAL as of July 1, 2022, by \$2,347.4 million above the \$4,077.2 million shown in this report. It would take aggregate contribution rates of approximately 29% to fund this hypothetical UAAL over 25 years (compared to the 23% minimum contribution rate shown in Table 12 based on the current 1% annual COLA assumption).

Demographic Experience

While investment returns and discretionary COLAs have historically caused the greatest deviation from expected experience, there are many other assumptions made in an actuarial valuation. For these assumptions, differences between actual and assumed experience will also result in actuarial gains and losses. Table 2, in Section 1 of this report, provides a look at the impact in recent years of actual experience deviating from assumed.

Asset Volatility Ratios and Liability Volatility Ratios

The magnitude of any contribution rate increase or decrease is affected by the System's maturity level. As systems mature, they accumulate larger pools of assets. Gains and losses on these larger pools of assets create more volatility in the contributions needed to fund the System.

One indicator of this potential volatility is the Asset Volatility Ratio (AVR), which is equal to the market value of assets divided by total payroll. As assets grow compared to payroll, any percentage gain or loss on those assets will be larger compared to payroll. This causes any resulting changes in required contributions from those gains or losses to also be larger when measured as a percent of payroll. Therefore, plans with a high AVR will be subject to a greater level of volatility in required contributions. The AVR is a current measure since it is based on the current level of assets and will vary from year to year. The current AVR for PERSI is 5.0, which is significantly higher than the AVR in 1968 of 0.3.

Another measure of a system's maturity is the Liability Volatility Ratio (LVR), which is equal to the AAL divided by the total payroll. This ratio provides an indication of the longer-term potential for contribution volatility for any given level of liability volatility. In addition, this ratio provides an indication of the potential contribution volatility due to liability experience (gains and losses) and liability re-measurements (assumption changes). For PERSI, the current LVR is 6.0.

Historical and Projected Cash Flows

One way to assess future risks is to look at historical measurements. Table 13, in Section 6 of this report, summarizes the System's historical cash flows for the last 10 years and the projected cash flows for the next 10 years. Additional historical information can be found in Appendix C.

Appendix A Actuarial Procedures and Assumptions

The actuarial procedures and assumptions used in this valuation are described in this section. The economic, mortality, and demographic assumptions were changed as of July 1, 2021, based on our 2021 Experience Study.

The mortality assumptions are based on the Pub 2010 Mortality Tables with generational mortality improvement adjustments, as described in this section.

The actuarial assumptions used in the valuations are intended to estimate the future experience of the members of the System and of the System itself in areas that affect the projected benefit flow and anticipated investment earnings. Any variations in future experience from that expected from these assumptions will result in corresponding changes in the estimated costs of the System's benefits.

Table A-1 summarizes the assumptions. The mortality rates are taken from the sources listed. The other rates were developed from the experience of the System and are illustrated in Tables A-2 through A-9, as noted.

Tables A-2 and A-3 present the expected annual percentage increase in salaries. Table A-9 presents the probability of refund of contributions upon termination. The other tables in this section give rates of decrement expressed as percentages. The rates of decrement are referred to in actuarial notation by the general symbol "q".

Actuarial Cost Method

The actuarial valuation is prepared using the individual entry age actuarial cost method. In August 2013 the Board adopted this new cost method. Under the principles of this method, the actuarial present value of the projected benefits of each individual included in the valuation is allocated as a level percentage of the individual's projected compensation between entry age and assumed exit. The portion of this actuarial present value allocated to a valuation year is called the normal cost. The portion of this actuarial present value not provided for at a valuation date by the sum of (a) the actuarial value of the assets, and (b) the actuarial present value of future normal costs is called the unfunded actuarial accrued liability (UAAL). The UAAL, if positive, is amortized as a level percentage of the projected salaries of present and future members of the System (and ORP) during various amortization periods. In effect, this means that UAAL amortization payments are assumed to grow at the same rate as the General Wage increase assumption (currently 3.05%).

The normal cost rates used in this valuation were calculated based on all current active members as of July 1, 2022, for each sex and type of employee in that valuation. The normal cost and projected salaries for fiscal year 2023 for all active members were calculated. The ratio of the two is the aggregate normal cost rate. Separate normal cost rates for each type of employee are shown in Table 10.

Records and Data

The data used in this valuation consist of financial information and the age, service, and income records for contributing and former contributing members and their survivors. All of the data were supplied by the System and are accepted for valuation purposes without audit but were reviewed for reasonableness.

Growth in Membership

For benefit determination purposes, no growth in the membership of the System is assumed. For funding purposes, the total payroll of covered members is assumed to grow due to the combined effects of future wage increases of current active members and the replacement of the current active members by new employees. No growth in the total number of active members is assumed.

Employer Contributions

The employer contribution rate has been set by the Retirement Board effective July 1, 2019, at 12.28% for fire and police members and 11.94% for general members and teachers.

Effective July 1, 2023, the employer contribution rates are scheduled to be adjusted to 13.26% for fire and police members, 11.18% for general members, and 12.69% for teachers.

ORP Contributions

Until July 1, 2025, 1.49% of the university ORP members' salaries will be used to finance the actuarial accrued liability.

Member Contributions

The member contribution rate is set by law to be 60% of the employer contribution rate for all members except fire and police members, whose member contribution rate is set at 72% of the employer rate (prior to the 0.10% increase for the death benefit for fire and police members). After the 72% is applied, the safety member rates are increased by 0.36% for the member-paid duty disability benefit. As of July 1, 2022, the general member and teacher rate is 7.16%, and the fire and police rate is 9.13%.

Effective July 1, 2023, the member contribution rates are scheduled to be adjusted to 9.83% for fire and police members, 6.71% for general members, and 7.62% for teachers.

Valuation of Assets

All assets are valued at market as of the valuation date. The market-value valuation basis for all assets was effective July 1, 1994.

Investment Earnings and Expenses

The future investment earnings of the assets of the System are assumed to accrue at an annual rate (net of investment expenses) of 6.35%, compounded annually. Investment earnings of 0.05% are assumed sufficient to cover the general administrative expenses of the System. These rates were adopted July 1, 2021.

Postretirement Benefit Increases

A nondiscretionary postretirement increase of 1% per year is assumed for the primary valuation.

The purpose of this report is to calculate the statutorily required minimum contribution rates and to compare the current contribution rates to this statutory minimum. Per statute, when calculating this minimum, the cost of additional COLAs (above the 1.00% automatic) are not included in the liabilities until they are granted by the Board. This also allows the Board to consider the cost of each potential additional COLA one year at a time. Therefore, in this valuation report, we assume that future COLAs will be 1.00% per year.

Cash Refund Benefits

Members receiving retirement benefits will not receive less than each member's accumulated member contributions at retirement. For the fraction of active and inactive members who are assumed to elect a joint annuity benefit, this is approximated in the valuation using a three year certain period.

Interest on Employee Contributions

The credited interest rate on employee contributions is assumed to be 8.50%. The actual credited interest rate will depend on the returns earned by the System's assets. The Board's current policy is to credit interest during each calendar year equal to the greater of: 1) 90% of PERSI's actual rate of return, net of expenses for the prior fiscal year (ending June 30), or 2) 1.0%.

Future Salaries

The rates of annual salary increase assumed for the purpose of the valuation are illustrated in Tables A-2 and A-3. The current assumptions for promotions and longevity were adopted July 1, 2021. In addition to increases in salary due to promotions and longevity, 3.05% per annum rate of increase in the general wage level of the membership is assumed, adopted July 1, 2021.

Retirement

After members attain age 55 (50 for fire and police) and have five years of service, they may retire early with a reduced benefit. These early retirement rates are shown in Table A-6.

During the year after first satisfying the age and service requirements for unreduced benefits, whether for service or early retirement, members are assumed to retire at the rates shown in Table A-4. After the first year of eligibility, members are assumed to retire at the rates shown in Table A-5.

All general members who attain or who have attained age 75 in active service and all other members who have attained age 70 in active service are assumed to retire immediately (regardless of service).

The assumptions regarding termination of employment, early retirement, and unreduced service retirement are treated as a single set of decrements with regard to a particular member. For example, a teacher member hired at age 30 could be expected to possibly withdraw from the System due to death, disability, or other termination of employment until age 55. After age 55, the member could still withdraw due to death or disability. From age 55-60, the member could also withdraw with an early retirement and a reduced benefit, as shown in Table A-6. At age 60 (Rule of 90), the member is first eligible to retire with an unreduced benefit. The probability of retiring at age 60 is shown in Table A-4. Thereafter, the probabilities of retirement for this member are indicated in Table A-5. Thus, in no year during the member's projected employment would more than one of the decrements shown in Tables A-8, A-4, A-5, or A-6 be applied.

Tables A-4, A-5, and A-6 were revised July 1, 2021.

Disability

The rates of disability used in the valuation are illustrated in Table A-7. These rates were revised July 1, 2021.

Mortality

Several different sets of mortality rates are used in the valuation for contributing members, members retired for service, and beneficiaries. These rates were adopted July 1, 2021.

Group	Base Mortality Tables + Adjustments
General Male Annuitant & Male Beneficiaries	Pub-2010, general, male, annuitant table increased 11%
General Male Non-Annuitant	Pub-2010, general, male, employee table
General Female Annuitant & Female Beneficiaries	Pub-2010, general, female, annuitant table increased 21%
General Female Non-Annuitant	Pub-2010, general, female, employee table
Teacher Male Annuitant	Pub-2010, teacher, male, annuitant table increased 12%
Teacher Male Non-Annuitant	Pub-2010, teacher, male, employee table
Teacher Female Annuitant	Pub-2010, teacher, female, annuitant table increased 21%
Teacher Female Non-Annuitant	Pub-2010, teacher, female, employee table
Fire & Police Male Annuitant	Pub-2010, safety, male, annuitant table increased 21%
Fire & Police Male Non-Annuitant	Pub-2010, safety, male, employee table
Fire & Police Female Annuitant	Pub-2010, safety, female, annuitant table increased 26%
Fire & Police Female Non-Annuitant	Pub-2010, safety, female, employee table
Disabled Male	Pub-2010, general, male, disabled table increased 38%
Disabled Female	Pub-2010, general, female, disabled table increased 36%

All mortality tables are adjusted with generational projection scales. The projection scales are calculated at each age as the 60-year geometric average of the mortality improvement rates reported by the Social Security Administration from 1957 through 2017 (blended 50% female, 50% male).

Other Employment Terminations

Table A-8 shows the rates assumed in this valuation for future withdrawal from active service for reasons other than death, disability, or retirement with an unreduced benefit. These rates were revised July 1, 2021.

Terminating employees may withdraw their contributions immediately upon termination of employment and forfeit the right to further benefits, or they may leave their contributions with the System. Former contributing members whose contributions are on deposit may later elect to receive a refund, may return to work, or may remain inactive until becoming eligible to receive a retirement benefit. Table A-9 shows the assumed probability, for this valuation, that a member will choose to retain their membership in the System by not withdrawing their contributions upon termination of service. This is referred to as the probability of vesting.

All terminating members who are not eligible for vested benefits are assumed to withdraw their contributions immediately.

Death Benefit Elections

If death occurs in active or disability retirement status, 15% of all members are assumed to have eligible surviving spouses that elect to receive an annuity death benefit (the other 85% are assumed to be paid a lump sum death benefit). The spouse is assumed to be two years younger than the male members and two years older than the female members.

Form of Payment

Upon commencement, members are assumed to elect annuity payment forms at the following rates:

- 29% will elect a 100% contingent annuitant allowance
- 14% will elect a 50% contingent annuitant allowance
- 57% will elect a regular retirement allowance

These rates were adopted July 1, 2021.

Fire and Police Duty - Death and Disability

For the Fire and Police active members, 5% of deaths are assumed to be duty related. 25% of disabilities are assumed to be duty related, with half of these assumed to be catastrophic disabilities. These assumptions were adopted July 1, 2021.

Inactive Members

For vested inactive members not currently receiving benefits, the present value of benefits is determined based on the estimated benefit payable for retirement at the later of the member's current age or age 62 (age 55 for fire and police members). This assumption was adopted July 1, 2021.

For non-vested inactive members not currently receiving benefits, the present value of benefits is equal to the accumulated member contributions.

Table A-1
Summary of Valuation Assumptions
July 1, 2022

- I. Economic Assumptions
 - A. General wage increases 3.05%
 - B. Investment earnings (net of expenses) 6.30
 - C. Growth in membership 0.00
 - D. Postretirement benefit increases 1.00
 - E. Inflation 2.30
 - F. Credited Interest Rate on Employee Contributions 8.50

- II. Demographic Assumptions
 - A. Salary increases Table A-2, A-3
 - B. Retirement Table A-4, A-5, A-6
 - C. Disability Table A-7
 - D. Mortality among contributing members, service retired members, and beneficiaries

Group	Base Mortality Tables + Adjustments
General Male Annuitant & Male Beneficiaries	Pub-2010, general, male, annuitant table increased 11%
General Male Non-Annuitant	Pub-2010, general, male, employee table
General Female Annuitant & Female Beneficiaries	Pub-2010, general, female, annuitant table increased 21%
General Female Non-Annuitant	Pub-2010, general, female, employee table
Teacher Male Annuitant	Pub-2010, teacher, male, annuitant table increased 12%
Teacher Male Non-Annuitant	Pub-2010, teacher, male, employee table
Teacher Female Annuitant	Pub-2010, teacher, female, annuitant table increased 21%
Teacher Female Non-Annuitant	Pub-2010, teacher, female, employee table
Fire & Police Male Annuitant	Pub-2010, safety, male, annuitant table increased 21%
Fire & Police Male Non-Annuitant	Pub-2010, safety, male, employee table
Fire & Police Female Annuitant	Pub-2010, safety, female, annuitant table increased 26%
Fire & Police Female Non-Annuitant	Pub-2010, safety, female, employee table
Disabled Male	Pub-2010, general, male, disabled table increased 38%
Disabled Female	Pub-2010, general, female, disabled table increased 36%

All mortality tables are adjusted with generational projection scales. The projection scales are calculated at each age as the 60-year geometric average of the mortality improvement rates reported by the Social Security Administration from 1957 through 2017 (blended 50% female, 50% male).

- E. Other terminations of employment Table A-8
- F. Probability of Vesting Table A-9

**Table A-2
Future Salaries**

Years of Service	Annual Increase in Salary Due to Promotions and Longevity				
	Fire and Police	General Employees		Teachers	
		Men	Women	Men	Women
0	19.84%	17.50%	19.05%	23.70%	23.71%
1	8.74	6.55	7.75	6.46	6.50
2	5.30	3.81	4.57	4.16	4.27
3	4.65	3.13	3.88	4.15	4.06
4	3.85	2.67	3.31	4.15	3.82
5	3.53	2.51	3.04	4.06	3.82
6	3.20	2.34	2.77	3.96	3.82
7	2.87	2.17	2.50	3.87	3.82
8	2.55	2.01	2.23	3.77	3.82
9	2.22	1.84	1.96	3.68	3.82
10	1.94	1.63	1.85	3.29	3.52
11	1.66	1.43	1.75	2.90	3.22
12	1.38	1.22	1.64	2.51	2.91
13	1.10	1.01	1.54	2.12	2.61
14	0.82	0.80	1.43	1.73	2.31
15	0.82	0.80	1.30	1.53	1.97
16	0.82	0.80	1.17	1.33	1.64
17	0.82	0.80	1.04	1.13	1.30
18	0.82	0.80	0.91	0.93	0.97
19	0.82	0.80	0.78	0.73	0.63
20	0.81	0.75	0.78	0.68	0.63
21	0.80	0.69	0.78	0.64	0.63
22	0.78	0.63	0.78	0.59	0.63
23	0.77	0.57	0.78	0.54	0.63
24	0.76	0.52	0.78	0.50	0.63
25 or more	0.67	0.52	0.65	0.38	0.43

In addition to increases in salary due to promotions and longevity, 3.05% per annum rate of increase in the general wage level of the membership is assumed.

**Table A-3
Future Salaries
(including general wage increases)**

Years of Service	Total Annual Increase in Salary ⁽¹⁾				
	Fire and Police	General Employees		Teachers	
		Men	Women	Men	Women
0	23.49%	21.09%	22.68%	27.48%	27.48%
1	12.05	9.80	11.03	9.70	9.75
2	8.51	6.98	7.75	7.34	7.45
3	7.84	6.28	7.05	7.33	7.24
4	7.02	5.81	6.46	7.33	6.99
5	6.68	5.63	6.18	7.23	6.99
6	6.35	5.46	5.90	7.13	6.99
7	6.01	5.29	5.63	7.04	6.99
8	5.67	5.12	5.35	6.94	6.99
9	5.34	4.95	5.07	6.84	6.99
10	5.05	4.73	4.96	6.44	6.68
11	4.76	4.52	4.85	6.04	6.36
12	4.47	4.31	4.74	5.64	6.05
13	4.19	4.09	4.64	5.24	5.74
14	3.90	3.88	4.53	4.83	5.43
15	3.90	3.88	4.39	4.63	5.08
16	3.90	3.88	4.26	4.42	4.74
17	3.90	3.88	4.12	4.22	4.39
18	3.90	3.88	3.99	4.01	4.05
19	3.90	3.88	3.85	3.80	3.70
20	3.89	3.82	3.85	3.76	3.70
21	3.87	3.76	3.85	3.71	3.70
22	3.86	3.70	3.85	3.66	3.70
23	3.84	3.64	3.85	3.61	3.70
24	3.83	3.58	3.85	3.56	3.70
25 or more	3.74	3.58	3.72	3.44	3.49

1. The total expected increase in salary is the increase due to promotions and longevity, shown in Table A-2, adjusted for an assumed 3.05% per annum increase in the general wage level of the membership. The total result is compounded rather than additive.

**Table A-4
Immediate Retirement**

Age	Retirement Rates in First Year Eligible for Unreduced Benefits				
	Fire and Police	General Employees		Teachers	
		Men	Women	Men	Women
55 ⁽¹⁾	29%	20%	19%	32%	33%
56	25	24	19	32	33
57	27	25	22	34	36
58	24	18	19	27	40
59	24	21	23	40	39
60	14	21	29	36	32
61	16	22	25	32	44
62	16	30	37	56	56
63	16	35	27	42	55
64	16	31	30	59	55
65	34	31	36	36	44
66	34	17	22	20	38
67	34	17	22	20	38
68	34	17	22	20	38
69	34	17	22	20	38
70	(2)	14	18	(2)	(2)
71		14	18		
72		14	18		
73		14	18		
74		14	18		
75		(2)	(2)		

1. 47% rate assumed for fire and police members eligible for age 50, 26% for age 51, 24% for age 52, 23% for age 53, and 28% for age 54.

2. For all ages older than the age indicated, retirement is assumed to occur immediately.

**Table A-5
Service Retirement**

Age	Retirement Rates Among Persons Who Have Been Eligible for Unreduced Benefits for At Least One Year				
	Fire and Police	General Employees		Teachers	
		Men	Women	Men	Women
55 ⁽¹⁾	24%	N/A	N/A	N/A	N/A
56	16	17%	13%	14%	27%
57	20	8	15	18	31
58	18	14	13	23	22
59	20	15	14	21	22
60	25	14	16	33	27
61	16	18	19	21	24
62	26	31	29	51	46
63	21	24	24	40	37
64	17	24	28	41	32
65	37	43	43	41	49
66	33	27	33	37	41
67	27	20	25	32	36
68	35	20	22	26	30
69	31	22	21	22	29
70	(2)	21	25	(2)	(2)
71		20	21		
72		21	20		
73		22	25		
74		22	19		
75		(2)	(2)		

1. 14% rate assumed for fire and police members eligible from age 51, 23% for age 52, 20% for age 53, and 19% for age 54.

2. For all ages older than the age indicated, retirement is assumed to occur immediately.

**Table A-6
Early Retirement**

Age	Retirement Rates Among Persons Eligible for Reduced Early Retirement Benefits				
	Fire and Police	General Employees		Teachers	
		Men	Women	Men	Women
50	4.0%				
51	4.3				
52	4.1				
53	5.7				
54	5.4	(1)	(1)	(1)	(1)
55	6.3	2.2%	2.6%	2.1%	3.2%
56	6.6	2.4	2.2	3.1	3.2
57	6.3	2.8	2.6	4.2	3.8
58	5.7	3.4	2.8	5.2	5.3
59	9.3	3.7	4.2	7.0	6.3
60		4.8	5.7	9.1	9.9
61		6.6	6.7	8.1	10.8
62		16.8	17.0	18.8	18.6
63		11.5	12.7	14.9	14.4
64		13.6	14.2	15.5	16.8

1. Not eligible for retirement.

**Table A-7
Disability**

Age	Annual Rates				
	Fire and Police	General Employees		Teachers	
		Men	Women	Men	Women
20	0.012%	0.007%	0.010%	0.006%	0.028%
25	0.012	0.007	0.010	0.006	0.028
30	0.021	0.007	0.010	0.006	0.028
35	0.047	0.049	0.025	0.027	0.026
40	0.075	0.057	0.060	0.055	0.031
45	0.123	0.091	0.098	0.064	0.097
50	0.285	0.180	0.185	0.150	0.164
55	0.400	0.319	0.261	0.191	0.296
60	0.000	0.392	0.323	0.227	0.324

Table A-8
Other Terminations of Employment

Years of Service	Annual Rates				
	Fire and Police	General Employees		Teachers	
		Men	Women	Men	Women
0	17.1%	21.0%	21.7%	12.8%	12.4%
1	12.8	16.3	18.9	12.8	12.4
2	9.4	13.2	15.0	9.9	10.9
3	8.7	10.9	12.3	7.4	8.6
4	7.5	10.3	11.2	6.4	7.4
5	6.8	9.2	10.4	5.8	6.7
6	6.2	8.1	9.5	5.2	6.0
7	5.5	7.0	8.7	4.6	5.3
8	4.8	5.9	7.8	4.0	4.6
9	4.2	4.8	7.0	3.4	3.9
10	3.9	4.7	6.5	3.2	3.6
11	3.7	4.6	6.0	3.0	3.3
12	3.5	4.5	5.5	2.8	2.9
13	3.2	4.5	5.0	2.5	2.6
14	3.0	4.4	4.5	2.3	2.3
15	2.7	4.0	4.2	2.1	2.1
16	2.4	3.6	3.9	1.9	1.9
17	2.1	3.1	3.6	1.7	1.7
18	1.8	2.7	3.3	1.4	1.5
19	1.5	2.3	3.0	1.2	1.3
20	1.5	2.3	3.0	1.2	1.3
21	1.4	2.3	2.9	1.2	1.2
22	1.4	2.3	2.8	1.1	1.2
23	1.3	2.3	2.8	1.1	1.2
24	1.3	2.3	2.7	1.1	1.1
25	1.3	1.8	2.4	0.9	0.9

**Table A-9
 Probability of Vesting**

Age	Probabilities of Vesting				
	Fire and Police	General Employees		Teachers	
		Men	Women	Men	Women
25	60%	68%	71%	90%	78%
30	57	72	76	84	87
35	60	76	76	80	86
40	69	75	74	83	84
45	76	78	79	85	88
50	N/A	82	87	91	93
55	N/A	N/A	N/A	N/A	N/A

Appendix B Provisions of Governing Law

All actuarial calculations are based on our understanding of the statutes governing the Public Employee Retirement System of Idaho, as contained in Sections 59-1301 through 59-1399, inclusive, of the Idaho Code, with amendments effective through July 1, 2022. The benefit and contribution provisions of this law are summarized briefly below, along with corresponding references to the Idaho Code. This summary does not attempt to cover all the detailed provisions of the law. Only those benefits in effect through July 1, 2022, are considered in this valuation. The items in parentheses are the provisions applicable to firefighters and police officers.

Effective Date

The effective date of the Retirement System was July 1, 1965.

Member Contribution Rate

The member contribution rate effective July 1, 2022, is 7.16% of salary for general members and teachers and 9.13% of salary for firefighters and police officers.

The member contribution rate is fixed at 60% (72%) of the employer contribution rate. For firefighters and police officers, the 72% adjustment is applied after reducing the employer rate by 0.10% for the 2003 addition of a \$100,000 death benefit for fire and police members who die in the line of duty. After the 72% is applied, the resulting rate is increased by 0.36% for the duty disability benefit. Member contributions have been “picked up” on a pre-tax basis by the employer since June 30, 1983 (Sections 59-1331 and 59-1332).

Employer Contribution Rate

The employer contribution rate is set by the Retirement Board (Section 59-1322). The current rates are 11.94% of salary for general members and teachers and 12.28% for firefighters and police officers.

Service Retirement Allowance

Eligibility

Age 65 (60) with five years of service, including six months of membership service (Section 59-1341).

Amount of Allowance

For each year of credited service, the annual service retirement allowance is 2.0% (2.3%) of the highest 42-month average salary (Section 59-1342).

Minimum Benefit

\$60 (\$72) annual allowance for each year of service. The dollar amounts increase after 1974 according to the rate of cost of living increases in retirement allowances (Section 59-1342).

Maximum Benefit

In no case may a member's regular retirement benefit exceed the highest three-year average salary of the member (Section 59 1342).

Normal Form

Straight life retirement allowance plus any death benefit (Section 59-1351)

Optional Form

Members can elect a 100% or 50% Contingent Annuitant Allowance. They may also choose to have their benefit be adjusted such that they receive a greater amount prior to social security normal retirement age and a reduced amount after such age, such that the difference in the two amounts is approximately equal to the social security benefit to be payable at such age. These optional forms are calculated to be actuarial equivalent to the normal form under the options available, according to the mortality and interest basis adopted by the Board (Section 59 1351).

Early Retirement Allowance

Eligibility

Age 55 (50) with five years of service, including six months of membership service (contributing members only) (Section 59-1345).

Amount of Allowance

Full accrued service retirement allowance if age plus service equals 90 (80); otherwise, the accrued service retirement allowance, reduced by 3% for each of the first five years by which the early retirement date precedes the date the member would be eligible to receive the full accrued benefit, and by 5.75% for each additional year (Section 59-1346).

Vested Retirement Allowance

Eligibility

Former contributing members with five years of membership service are entitled to receive benefits after attaining age 55 (50) (Section 59-1345).

Amount of Allowance

Same as early retirement allowance (Section 59-1345).

Disability Retirement Allowance

Eligibility

Five years of membership service. For a police officer or a firefighter hired after July 1, 1993, who is disabled from an occupational cause, there is no service requirement (Section 59 1352).

Amount of Allowance

Projected service retirement allowance based on accrued service plus service projected to age 65 (60) (latter limited to excess of 30 years over accrued service) less any amount payable under workers' compensation law (Section 59-1353).

Normal Form

Temporary annuity to age 65 (60) plus any death benefit. Service retirement allowance becomes payable in the same amount at age 65 (60) (Section 59-1354).

Safety Member Lump Sum Duty Disability Benefit

Fire and Police members who are disabled in the line of duty are eligible for a \$100,000 lump sum benefit, in addition to the annuity benefits discussed above (Section 59-1352A).

Those whose disability is deemed to be "Catastrophic" are instead eligible for a \$500,000 lump sum benefit. In addition, they get an annuity of the greater of the amount described above, or \$75,000. The \$75,000 is adjusted

every four years per changes in average public safety officer benefits. If the member receives this alternative \$75,000 annuity, their benefit will increase per the indexing described in the prior sentence instead of the regular PERSI cost of living adjustments. In addition, a catastrophically disabled member's annuity is paid out as a 100% Contingent Annuitant Allowance without the usual reduction (Section 59 1352B).

Death Benefits

After Retirement

Under the normal form of the retirement allowance, the excess, if any, of the member's accumulated contributions with interest at retirement over all payments received. Otherwise, payable according to the option elected (Section 59-1361).

Before Retirement

- A. If a member with at least five years of service, a lump sum payment is made equal to twice the accumulated contributions with interest:
or
- B. If the member had an eligible spouse at the time of their death, the spouse may elect to forego the lump sum and instead receive an immediate lifetime annuity. The annuity is calculated as the amount the member would have received if they had retired immediately prior to their death and elected the 100% Contingent Annuitant Allowance payment form. If the member was not yet eligible for retirement, then the annuity amount is reduced such to make it actuarially equivalent to an annuity deferred to the earliest eligible retirement age of the member (calculated as if they had separated from service immediately prior to their death) (Section 59-1361).

Fire and police members are entitled to an additional \$100,000 payment if death occurs in the line of duty. (Section 59-1361 A).

Withdrawal Benefits

Accumulated contributions with interest (Section 59-1358). The interest rate is determined by the Board (Section 59-1301(26)).

Postretirement Increases

Postretirement benefit increases are based on changes in the Consumer Price Index. The measurement period for changes in the CPI-U is from August to August. The COLA changes are implemented effective on the March 1 following the measurement period.

If the CPI-U increases by at least 1%, the COLA is at least 1%. If the CPI-U increases by more than 1%, an additional postretirement increase of up to 5% each year (but not more than the increase in the CPI-U) may be authorized by the Board, subject to the approval of the Legislature.

If the CPI-U increases by less than 1% or decreases, the COLA is automatic, based on the change in the CPI. If a negative COLA is applicable, the negative COLA cannot decrease benefits by more than 6%. Additionally, a negative COLA cannot decrease a member's benefit below the amount of the benefit at the initial benefit date.

If a COLA is implemented that is less than the increase in the CPI U, members' benefits will not retain their full inflation-adjusted purchasing power. In such cases, the Board may implement a Restoration of Purchasing Power (ROPP) COLA at a later date to bring those members closer to 100% of inflation-adjusted purchasing power. As with a discretionary COLA, a ROPP is subject to approval of the Legislature (Section 59-1355).

Gain Sharing

Beginning in 2000, under Section 59-1309, Idaho Code, the Board may allocate all or a portion of “extraordinary gains” to active and retired members and employers as Gain Sharing.

Extraordinary gains are defined as the excess, if any, at the close of the fiscal year of the Assets over Actuarial Accrued Liabilities plus an amount necessary to absorb a one standard deviation market event without increasing contribution rates, as determined by the Board. Under the Board’s current investment policy, assets in excess of a 113% funded ratio are considered extraordinary gains. The Board has the authority to rescind the Gain Sharing up to the date of distribution.

Appendix C Valuation Data and Comparative Schedules

This valuation is based on the membership of the System as of June 30, 2022. We relied on data supplied by the System. If there are material defects in the data, it is possible they would be uncovered by a detailed, systematic review and comparison of the data to search for data values that are questionable or relationships that are materially inconsistent. Such a review was beyond the scope of our assignment.

The membership of the System includes employees of the State of Idaho and participating political subdivisions. The membership is divided into three categories:

1. Fire and Police
State police officers, most local police officers and sheriffs, local firefighters, penitentiary employees, employees of the Youth Services Center, and employees of the adjutant general and military department.
2. Teachers
Faculty members of local school districts and institutions of higher learning who are not members of an Optional Retirement Program.
3. General Employees
Other state employees and general employees of the political subdivisions, local school districts, and colleges and universities.

The data for all contributing members, former contributing members, and their survivors are summarized in Table C-1. Table C-2 summarizes their age and service statistics. Table C-3 summarizes the active members by age groups.

Detailed statistics regarding the distributions of members receiving service or disability retirement benefits, beneficiaries of deceased members, and active members in each category of membership have been reported separately to the System.

Tables C-4 through C-7 summarize the experience of the System since June 30, 1968. Earlier data are not comparable, since the Idaho Teachers' Retirement System merged with the Public Employee Retirement System of Idaho just prior to that date.

Table C-4 shows a summary of the active members and the annuitants covered as of the various valuation dates.

Table C-5 summarizes the contribution rates, the amortization period, and the UAAL determined at each annual actuarial valuation.

Table C-6 presents a brief history of the financial experience of the System's investments.

Any review of these comparative schedules should be made in light of Tables C-7 and C-8, which show the significant changes affecting the actuarial valuations in recent years.

Table C-9 summarizes changes in status for active and inactive numbers and annuitants between July 1, 2021, and July 1, 2022.

Table C-10 reconciles the member records received from PERSI with the records used in the valuation.

The total salaries paid to ORP members who are contributing 1.49% for the year ending June 30, 2022, was \$377.5 million. As of July 1, 2012, the ORP members who had been contributing 3.83% of salary are no longer required to contribute anything. These contributions are used to finance the UAAL.

Table C-11 summarizes the yields for various historical periods, net of investment expenses.

Table C-12 shows a history of the funded status of the plan.

**Table C-1
Summary of Membership Data**

	Active Members			Annuitants		
	Number ⁽¹⁾	Annual Salaries in Thousands	Average Annual Salaries	Number	Annual Benefits in Thousands	Average Annual Benefits
<u>July 1, 2021</u>						
Fire and Police	7,765	\$544,584	\$70,133	3,951	\$127,010	\$32,146
General Employees:						
Male	18,339	897,183	48,922	12,947	241,142	18,625
Female	27,808	1,032,168	37,118	19,635	262,875	13,388
Teachers:						
Male	5,023	332,139	66,124	4,563	147,955	32,425
Female	14,628	848,304	57,992	9,795	264,532	27,007
Total	73,563	\$3,654,378	\$49,677	50,891	\$1,043,514	\$20,505
<u>July 1, 2022</u>						
Fire and Police	7,728	\$576,820	\$74,640	4,202	\$144,655	\$34,425
General Employees:						
Male	18,351	954,054	51,989	13,558	264,722	19,525
Female	28,351	1,118,363	39,447	20,683	291,650	14,101
Teachers:						
Male	5,076	346,255	68,214	4,635	156,310	33,724
Female	14,903	894,858	60,045	10,112	283,490	28,035
Total	74,409	\$3,890,350	\$52,283	53,190	\$1,140,827	\$21,448

1. Not included in these figures are the following:

	Vested Inactive Members Not Currently Receiving Benefits			Non-Vested Inactive Members	Other Inactive Members ⁽³⁾	Total Inactive Members
	Number	Annual Benefits in Thousands ⁽²⁾	Average Annual Benefits			
2021	14,517	\$126,735	\$8,730	31,179	22	45,718
2022	15,469	\$139,261	\$9,003	34,714	20	50,203

2. At normal retirement date.

3. These members were active with at least 5 years of service as of the valuation date, but PERSI reported their salary as zero. They were treated as vested inactive members.

Note: In 2022, 69 vested annuitants of the Firefighters' Retirement Fund were not eligible for a PERSI benefit. In 2021, 72 were not eligible.

Table C-2
Summary of Age and Service Statistics

	Active Members			Average Current Age	Average Current Service	Inactive Members Not Currently Receiving Benefits	Members Receiving Service or Early Retirement Benefits ⁽¹⁾			
	Vested	Non-vested	Total				Number	Average Current Age	Average Retirement Age	Average Service
<u>July 1, 2021</u>										
Fire and Police	5,144	2,621	7,765	40.3	10.1	883	3,951	68.9	57.2	19.5
General Employees:										
Male	10,543	7,796	18,339	47.5	9.0	4,045	12,947	73.7	63.2	18.7
Female	15,073	12,735	27,808	46.8	8.6	6,596	19,635	73.5	62.6	18.0
Teachers:										
Male	3,736	1,287	5,023	45.5	12.8	780	4,563	74.2	61.2	25.7
Female	10,043	4,585	14,628	44.5	11.4	2,213	9,795	73.0	61.3	23.6
Total	44,539	29,024	73,563	45.7	9.7	14,517	50,891	73.2	62.0	20.1
<u>July 1, 2022</u>										
Fire and Police	5,076	2,652	7,728	40.2	10.0	973	4,202	68.6	57.1	20.0
General Employees:										
Male	10,393	7,958	18,351	47.2	8.8	4,239	13,558	73.7	63.3	18.8
Female	14,833	13,518	28,351	46.5	8.2	6,994	20,683	73.5	62.7	18.1
Teachers:										
Male	3,775	1,301	5,076	45.5	12.8	823	4,635	74.4	61.2	25.7
Female	10,211	4,692	14,903	44.4	11.3	2,440	10,112	73.3	61.3	23.7
Total	44,288	30,121	74,409	45.5	9.5	15,469	53,190	73.2	62.0	20.1

1. Beneficiaries of Teachers and Fire and Police members are listed under General.

Note: The averages shown in this table are for general information purposes. The valuation results depend upon the personnel data underlying the averages, rather than upon the averages themselves.

Table C-3
Age Distribution of Active Members

	Age Groups					Total
	0-29	30-39	40-49	50-59	60+	
<u>July 1, 2021</u>						
Fire and Police	1,412	2,444	2,213	1,410	286	7,765
General Employees:						
Male	1,828	3,629	4,338	4,785	3,759	18,339
Female	2,899	5,327	7,058	7,733	4,791	27,808
Teachers:						
Male	325	1,196	1,584	1,478	440	5,023
Female	1,564	3,385	4,551	3,867	1,261	14,628
Total	8,028	15,981	19,744	19,273	10,537	73,563
Percentage of Total	10.91%	21.72%	26.84%	26.20%	14.32%	100.00%
<u>July 1, 2022</u>						
Fire and Police	1,386	2,448	2,198	1,406	290	7,728
General Employees:						
Male	1,923	3,650	4,443	4,684	3,651	18,351
Female	3,079	5,498	7,296	7,629	4,849	28,351
Teachers:						
Male	358	1,172	1,574	1,528	444	5,076
Female	1,668	3,326	4,676	3,934	1,299	14,903
Total	8,414	16,094	20,187	19,181	10,533	74,409
Percentage of Total	11.31%	21.63%	27.13%	25.78%	14.16%	100.00%

Total percentages may not add due to rounding.

**Table C-4
Membership Data**

Valuation Date (July 1)	Active Members					Annuitants			
	Number	Annual Salaries in Millions	Average Annual Salary	Average Age	Average Years of Service	Number	Annual Benefits in Thousands	Average Annual Benefit	Average Age
1968	16,014	\$ 95	\$ 5,906	(1)	(1)	2,498	\$ 3,207	\$ 1,284	(1)
1969	19,796	124	6,247	(1)	(1)	2,977	4,351	1,462	(1)
1970	21,048	140	6,672	(1)	(1)	3,565	5,261	1,476	(1)
1971	23,505	160	6,805	(1)	(1)	4,298	6,442	1,499	(1)
1972	29,648	203	6,832	(1)	(1)	4,862	7,255	1,492	(1)
1973	30,174	219	7,255	(1)	(1)	5,659	8,494	1,501	(1)
1974	30,603	243	7,953	41.6	6.3	6,301	12,993	2,062	69.7
1975	32,545	286	8,771	41.2	6.2	7,058	15,098	2,139	69.7
1976	35,658	342	9,596	40.3	6.7	7,745	16,981	2,193	69.3
1977	37,559	381	10,135	40.1	6.7	8,573	20,172	2,353	69.5
1978	38,122	418	10,967	40.8	6.7	9,235	23,176	2,510	70.8
1979	38,848	459	11,826	40.9	6.8	9,982	26,593	2,664	71.0
1980	39,510	497	12,580	41.1	7.0	10,606	29,876	2,817	71.2
1981	40,722	550	13,518	41.2	7.0	11,279	34,073	3,021	71.3
1982	40,537	596	14,700	41.4	7.3	12,035	39,103	3,249	72.3
1983	40,495	630	15,557	41.6	7.6	12,766	44,597	3,493	71.5
1984	41,779	678	16,234	41.8	7.7	13,336	48,784	3,658	71.8
1985	42,626	739	17,336	42.0	7.9	13,955	54,583	3,911	71.9
1986	43,030	768	17,855	42.2	8.1	14,615	59,182	4,049	72.1
1987	43,843	797	18,187	42.4	8.2	15,281	64,558	4,225	72.3
1988	45,262	859	18,969	42.6	8.3	15,801	69,416	4,393	72.5
1989	46,106	911	19,763	42.9	8.4	16,344	74,809	4,572	72.7
1990	48,251	961	19,919	43.0	8.4	16,880	82,262	4,873	72.9
1991	49,854	\$1,039	\$20,842	43.1	8.4	17,464	\$92,040	\$5,270	73.2
1992	51,557	1,134	21,994	43.3	8.6	17,847	100,854	5,651	73.3

1. Not calculated.

Valuation Date (July 1)	Active Members					Annuitants			
	Number	Annual Salaries in Millions	Average Annual Salary	Average Age	Average Years of Service	Number	Annual Benefits in Thousands	Average Annual Benefit	Average Age
1993	52,532	1,191	22,663	43.7	8.9	18,283	111,545	6,101	73.5
1994	53,763	1,254	23,322	43.9	9.0	18,683	124,254	6,651	73.4
1995	55,811	1,388	24,866	43.9	9.0	19,272	136,327	7,074	73.6
1996	56,802	1,452	25,558	44.1	9.2	19,903	148,740	7,473	73.5
1997	57,237	1,511	26,403	44.3	9.5	20,499	160,908	7,850	73.2
1998	57,528	1,562	27,156	44.6	9.7	21,134	173,519	8,210	73.2
1999	59,248	1,673	28,243	44.8	9.8	21,756	193,441	8,891	73.1
2000	60,388	1,798	29,778	45.0	9.8	22,456	209,549	9,332	73.1
2001	62,125	1,924	30,976	45.1	9.7	23,253	235,269	10,118	72.7
2002	62,376	2,036	32,641	45.4	10.0	24,018	255,374	10,633	72.7
2003	62,385	2,064	33,079	45.7	10.2	24,991	279,219	11,173	72.5
2004	63,385	2,124	33,510	45.9	10.2	26,043	307,410	11,804	72.3
2005	64,391	2,197	34,126	46.0	10.2	27,246	343,077	12,592	72.1
2006	64,762	2,294	35,427	46.2	10.4	28,438	381,677	13,421	72.0
2007	65,800	2,397	36,436	46.2	10.3	29,619	422,196	14,254	71.8
2008	66,765	2,541	38,052	46.2	10.3	30,912	459,077	14,851	71.8
2009	67,813	2,645	38,999	46.5	10.4	32,197	491,946	15,279	71.8
2010	67,020	2,622	39,130	46.7	10.6	33,625	526,020	15,644	71.3
2011	65,798	2,572	39,090	46.9	10.8	35,334	567,933	16,073	71.5
2012	65,270	2,568	39,339	46.9	10.8	37,150	611,045	16,448	71.6
2013	65,535	2,635	40,201	46.8	10.7	38,947	651,466	16,727	71.6
2014	66,223	2,676	40,414	46.6	10.5	40,776	694,946	17,043	71.7
2015	67,008	2,757	41,143	46.5	10.4	42,657	754,201	17,681	71.6
2016	68,517	2,833	41,353	46.8	10.1	44,181	793,277	17,955	71.8
2017	70,073	3,041	43,393	46.6	9.9	45,468	836,201	18,391	72.1
2018	71,112	3,188	44,835	46.1	10.0	46,907	884,827	18,863	72.3
2019	72,502	3,356	46,295	45.9	9.8	48,120	922,112	19,163	72.7
2020	73,657	3,521	47,799	45.8	9.7	49,573	999,793	20,168	72.9
2021	73,563	3,654	49,677	45.7	9.7	50,891	1,043,514	20,505	73.2
2022	74,409	3,890	52,283	45.5	9.5	53,190	1,140,827	21,448	73.2

1. Not calculated.

**Table C-5
Contribution Rates**

Valuation Date (July 1)	Calculated Statutory Minimum Employer Rates			GASB Determined ARC ⁽⁹⁾	Actual Rates			Prior to Subsequent Year COLA Adjustment	
	25/30-Year Funding ⁽⁸⁾				Employee ⁽¹⁾			Amortization Period (Years)	Unfunded Actuarial Accrued Liability ⁽⁵⁾ (in Millions)
	Current Normal Cost Rate ⁽¹⁾	Amortization Payment Rate	Total Rate ⁽²⁾		Employer ⁽²⁾	Fire & Police	General & Teacher ⁽¹²⁾		
1968	2.01%	4.68%	6.69%	NA	7.25%	(3)	(4)	under 30 ⁽⁶⁾	\$ 72.2
1969	2.53	5.17	7.70	NA	7.25	(3)	(4)	under 50 ⁽⁶⁾	106.4
1970	2.51	4.71	7.22	NA	7.25	(3)	(4)	under 30 ⁽⁶⁾	110.1
1971	3.26	4.96	7.33	NA	6.80	(3)	(4)	41	132.1
1972	3.40	3.65	7.05	NA	6.80	(3)	(4)	36	123.0
1973	3.31	3.43	6.74	NA	6.78	(3)	(4)	30	125.0
1974	2.45	4.09	6.54	NA	6.80	5.40	4.50	28	216.3
1975	2.43	4.14	6.57	NA	6.80	5.40	4.50	28	256.5
1976	3.38	3.58	6.96	NA	6.81	5.40	4.50	28	306.8
1977	5.76	4.11	9.87	NA	7.11	5.40	4.50	-- (7)	392.2
1978	4.92	4.04	8.96	NA	7.11	5.40	4.50	28	423.1
1979	4.93	4.02	8.95	NA	8.36	5.40	4.50	27	462.9
1980	5.20	4.43	9.63	NA	9.50	5.60	4.67	31	553.1
1981	5.20	4.21	9.41	NA	9.50	5.80	4.84	29	582.8
1982	5.07	4.39	9.46	NA	9.05	6.05	5.05	32	653.5
1983	5.11	4.22	9.33	NA	8.75	6.30	5.26	34	664.6
1984	5.09	4.30	9.39	NA	8.82	6.35	5.30	35	729.4
1985	6.02	3.29	9.31	NA	8.89	6.40	5.34	35	614.8
1986	5.97	2.84	8.84	NA	8.89	6.40	5.34	29	555.7
1987	5.97	2.60	8.67	NA	8.89	6.40	5.34	26	526.7
1988	5.85	3.21	9.01	NA	8.89	6.40	5.34	32	699.1
1989	5.86	2.53	8.54	NA	8.89	6.40	5.34	24	589.1
1990	6.07	2.34	8.41	NA	8.89	6.40	5.34	22	578.7
1991	6.07	2.34	8.41	NA	8.89	6.40	5.34	22	622.7
1992	6.77	2.44	9.21	NA	9.75	7.02	5.84	21	677.3
1993	7.13%	2.94%	10.07%	NA	10.65%	7.82%	6.38%	18	\$ 740.0
1994	7.47	3.91	11.38	NA	11.63	8.53	6.97	22	1,040.6

This work product was prepared solely for PERSI for the purposes described herein and may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. Milliman recommends that third parties be aided by their own actuary or other qualified professional when reviewing the Milliman work product.

Valuation Date (July 1)	Calculated Statutory Minimum Employer Rates				Actual Rates			Prior to Subsequent Year COLA Adjustment	
	25/30-Year Funding ⁽⁸⁾			GASB Determined ARC ⁽⁹⁾	Employer ⁽²⁾	Employee ⁽¹⁾		Amortization Period (Years)	Unfunded Actuarial Accrued Liability ⁽⁵⁾ (in Millions)
	Current Normal Cost Rate ⁽¹⁾	Amortization Payment Rate	Total Rate ⁽²⁾			Fire & Police	General & Teacher ⁽¹²⁾		
1995	7.68	3.23	10.91	NA	11.63	8.53	6.97	18	952.1
1996	8.37	2.25	10.62	10.413	11.64	8.53	6.97	13	639.5
1997	8.98	0.45	9.43	9.80	11.64 ⁽¹⁰⁾	8.53 ⁽¹⁰⁾	6.97 ⁽¹⁰⁾	2	128.9
1998	9.22	(1.40)	9.22	7.82	11.03 ⁽¹⁰⁾	8.10 ⁽¹⁰⁾	6.60 ⁽¹⁰⁾	N/A	(493.9)
1999	9.44	(2.06)	9.44	7.38	11.03 ⁽¹⁰⁾	8.10 ⁽¹⁰⁾	6.60 ⁽¹⁰⁾	N/A	(704.0)
2000	10.04	(2.72)	10.04	7.32	9.80	7.21	5.86	N/A	(998.3)
2001	8.94	0.50	9.44	9.44	9.80	7.21	5.86	10	186.3
2002	7.37	2.94	10.31	10.31	9.80	7.21	5.86	39	1,075.7
2003	7.27	3.23	10.50	10.50	11.04 ⁽¹¹⁾	8.09 ⁽¹¹⁾	6.60 ⁽¹¹⁾	19	1,214.6
2004	7.88	1.80	9.68	9.68	11.66 ⁽¹¹⁾	8.53 ⁽¹¹⁾	6.97 ⁽¹¹⁾	8	671.1
2005	8.03	1.34	9.37	9.37	11.66 ⁽¹¹⁾	8.53 ⁽¹¹⁾	6.97 ⁽¹¹⁾	6	508.6
2006	8.53	1.13	9.66	9.66	10.43	7.65	6.23	10	461.7
2007	9.33	(1.24)	9.33	8.09	10.44	7.65	6.23	N/A	(573.4)
2008	8.37	1.63	10.00	10.00	10.44	7.65	6.23	16	748.9
2009	8.17	6.16	14.33	12.99	10.44	7.69	6.23	Over 100	3,026.6
2010	6.55	5.62	12.17	12.17	13.70 ⁽¹¹⁾	10.04 ⁽¹¹⁾	8.19 ⁽¹¹⁾	18	2,555.8
2011	7.51	2.85	10.36	10.36	13.70 ⁽¹¹⁾	10.04 ⁽¹¹⁾	8.19 ⁽¹¹⁾	8	1,232.6
2012	7.08	4.80	11.88	11.88	13.69 ⁽¹¹⁾	10.03 ⁽¹¹⁾	8.18 ⁽¹¹⁾	15	2,043.5
2013	7.05	4.52	11.57	11.57	13.69 ⁽¹¹⁾	10.03 ⁽¹¹⁾	8.18 ⁽¹¹⁾	13	2,074.1
2014	7.97	2.14	10.11	NA	11.36 ⁽¹¹⁾	8.36 ⁽¹¹⁾	6.79 ⁽¹¹⁾	11.6	1,052.3
2015	7.66	3.10	10.76	NA	11.36 ⁽¹¹⁾	8.36 ⁽¹¹⁾	6.79 ⁽¹¹⁾	17.4	1,490.2
2016	7.66	4.47	11.98	NA	11.38	8.36	6.79	36.6	2,206.1
2017	7.90	3.26	11.16	NA	11.38	8.36	6.79	16.2	1,766.6
2018	8.13	2.78	10.91	NA	11.38	8.36	6.79	13.9	1,580.1
2019	8.41	2.07	10.48	NA	11.99	8.81	7.16	10.6	1,391.2
2020	7.72	3.93	11.65	NA	11.99	8.81	7.16	20.5	2,433.2
2021	10.17	0.00	10.17	NA	11.99	9.13	7.16	0.4	49.0
2022	8.20	5.88	14.08	NA	11.98 ⁽¹¹⁾	9.83 ⁽¹¹⁾	6.71/7.62 ⁽¹¹⁾	Over 100	4,077.2

This work product was prepared solely for PERSI for the purposes described herein and may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. Milliman recommends that third parties be aided by their own actuary or other qualified professional when reviewing the Milliman work product.

Notes on Table C-5

1. Normal cost rates and employee rates prior to 1986 are based on actual employer rates. They would vary from the rates shown if employer rates were changed.
2. Excludes additional administrative contributions required before 1980. Aggregate weighted employer rate since 1993. Cannot be less than the normal cost rate.
3. 3.6% of annual salary up to \$4,800, plus 7.2% of excess.
4. 3.0% of annual salary up to \$4,800, plus 6.0% of excess.
5. Calculated as of the valuation date, prior to any COLA adjustment or Gain Sharing allocation. Beginning in 1991, amounts funded by ORP contributions are not included in the UAAL.
6. For actuarial valuations prior to 1971, an explicit amortization period was not calculated. The current employer contribution rate was compared to a contribution rate based on either a 30 or 50 year amortization period.
7. Based on the results of the 1977 experience study, the valuation results indicated that the employer contribution rate in effect at the time of the valuation would be insufficient to amortize the UAAL over a reasonable period. Subsequent increases in the employer contribution rate in 1979 and 1980 resulted in a reasonable amortization period.
8. Amortization rates in 1992 and before represent 30-year funding. Amortization rates in 1993 and after represent 25-year funding.
9. GASB required an ARC to be computed for all plan years after June 15, 1996. As long as a positive UAAL exists and is being amortized over a reasonable period of time, generally less than 30 years, the ARC is equal to the actual contribution rate set by the Board. If a Funding Reserve exists, GASB requires the amortization of the reserve and a calculated ARC less than the normal cost rate. The actual PERSI rate cannot be less than the normal cost rate under the statutory requirements. The ARC calculated as of the valuation date is applicable to the employer fiscal year commencing October 1 of the calendar year following the valuation date. The ARC includes the discretionary COLA increases if approved by the Board prior to the completion of the valuation report.

Beginning with the 2014 valuation, the ARC will no longer be reported. A separate accounting valuation report will be issued in accordance to the new GASB 67 and 68 reporting standards.
10. Permanent rate is shown; temporary rate of 9.80% was effective November 1, 1997 until Board adopted permanent 9.80% rate April 2000.
11. The latest scheduled contribution rate that is reflected in the valuation is shown.
12. Effective July 1, 2023, general members and teachers pay different contribution rates. This was first reflected in our July 1, 2022, valuation. Therefore, starting in the 2022 row, the rates in this column are listed in the following format: general rate/teacher rate.

**Table C-6
Investments**

(Dollar Amounts in Millions)

Valuation Date (July 1)	Total Investments Held on Valuation Date		Yield Net of Investment Expenses During Previous Year	
	Market Basis	Valuation Basis	Market Basis	Valuation Basis
1968	\$ 30.6	\$ 30.6	8.09%	8.09%
1973	102.4	111.0	(7.39)	4.85
1978	211.2	213.0	1.61	2.80
1983	658.5	628.6	40.36	16.33
1988	1,294.4	1,265.7	(0.60)	(5.60)
1993	2,531.7	2,525.0	12.60	10.66
1994	2,674.7	2,674.7	2.50	2.76
1995	3,237.9	3,237.9	14.34	14.34
1996	3,853.8	3,853.8	17.83	17.83
1997	4,728.5	4,728.5	19.11	19.11
1998	5,741.0	5,741.0	17.19	17.19
1999	6,450.9	6,450.9	11.18	11.18
2000	7,285.3	7,285.3	12.93	12.93
2001	6,732.4	6,732.4	(6.40)	(6.40)
2002	6,256.3	6,256.3	(7.36)	(7.36)
2003	6,544.8	6,544.8	3.32	3.32
2004	7,702.0	7,702.0	17.63	17.63
2005	8,707.5	8,707.5	10.34	10.34
2006	9,800.2	9,800.2	11.79	11.79
2007	11,505.1	11,505.1	19.54	19.54
2008	11,010.0	11,010.0	(4.60)	(4.60)
2009	8,983.7	8,983.7	(16.35)	(16.35)
2010	9,969.1	9,969.1	12.01	12.01
2011	11,754.3	11,754.3	20.25	20.25
2012	11,725.2	11,725.2	1.22	1.22
2013	12,496.2	12,496.2	8.69	8.69
2014	14,230.4	14,230.4	16.77	16.77
2015	14,428.4	14,428.4	2.70	2.70
2016	14,344.6	14,344.6	1.48	1.48
2017	15,713.2	15,713.2	12.25	12.25
2018	16,763.8	16,763.8	8.47	8.47
2019	17,717.5	17,717.5	8.09	8.09
2020	17,836.5	17,836.5	2.71	2.71
2021	22,364.9	22,364.9	27.49	27.49
2022	19,791.7	19,791.7	(9.61)	(9.61)

Table C-7
Changes Affecting Actuarial Valuations – Statistics

Valuation Date ⁽¹⁾	Minimum Benefit ⁽²⁾	Postretirement Increase ⁽¹⁾		Regular Interest ⁽³⁾
		Maximum	Granted	
1967	N/A	N/A	N/A	4.00%
1968	N/A	N/A	N/A	4.25
1969	N/A	3.0%	3.0%	4.375
1970	N/A	3.0	3.0	4.75
1971	N/A	3.0	3.0	5.00
1972	N/A	3.0	3.0	5.00
1973	N/A	3.0	3.0	5.50
1974	\$5.00	3.0	3.0	6.00
1975	5.15	3.0	3.0	6.00
1976	5.30	3.0	3.0	6.00
1977	5.62	5.3	6.0 ⁽⁴⁾	6.50
1978	5.96	6.0	6.0	6.50
1979	6.32	6.0	6.0	6.50
1980	6.70	6.0	6.0	6.50
1981	7.10	6.0	6.0	7.00
1982	7.53	6.0	6.0	7.50
1983	7.92	5.1	5.1	8.00
1984	8.14	2.9	2.9	8.50
1985	8.48	4.2	4.2	9.00
1986	8.57	3.2	1.0	9.00
1987	8.70	1.5	1.5	7.50
1988	8.78	4.5	1.0	6.50
1989	8.87	4.2	1.0	6.50
1990	9.29	4.7	4.7	7.00
1991	9.81	5.6	5.6	7.37
1992	10.59	3.8	3.8	5.75
1993	12.48	3.1	3.1	4.25
1994	14.43	2.8	2.8	4.00
1995	14.85	2.9	2.9	4.75
1996	15.23	2.6	2.6	5.75
1997	15.67	2.9	2.9	5.13
1998	16.02	2.2	2.2	5.38
1999	18.06	1.6	1.6	5.00
2000	18.47	2.3	2.3	7.93
2001	19.10	3.4	3.4	11.985
2002	19.62	2.7	2.7	8.84
2003	19.81	1.8	1.0	3.36
2004	20.25	2.2	2.2	2.56
2005	20.96	2.7	3.5 ⁽⁵⁾	10.365
2006	21.71	3.6	3.6	13.875
2007	22.54	3.8	3.8	10.965

Valuation Date ⁽¹⁾	Minimum Benefit ⁽²⁾	Postretirement Increase ⁽¹⁾		Regular Interest ⁽³⁾
		Maximum	Granted	
2008	22.99	2.0	2.0	14.602
2009	23.22	5.4	1.0	9.257
2010	23.44	-1.48	1.0 ⁽⁶⁾	1.000
2011	23.68	1.15	1.0	5.90
2012	23.92	3.77	1.0	14.52
2013	24.15	1.69	1.0	9.63
2014	24.39	1.52	1.0	4.41
2015	25.37	1.70	4.0 ⁽⁷⁾	11.40
2016	25.62	0.20	1.0 ⁽⁸⁾	8.71
2017	25.90	1.1	1.1	1.84
2018	26.40	1.9	1.9	6.16
2019	26.66	2.7	1.0	9.30
2020	28.40	1.7	6.54 ⁽⁹⁾	7.40
2021	28.69	1.3	1.0	4.78
2022	29.69	5.3	3.5	12.99

1. Valuations as of July 1. Postretirement increase effective previous January 1 for years prior to 1987, previous March 1 for 1987 and after.

2. Minimum monthly benefit per year of service; benefit levels for fire and police members are 20% greater than amount shown.

3. Average rate credited on member contributions during year prior to valuation date, actual rates may vary during the year.

4. 5.3% for 1976 retirees.

5. The March 1, 2005 COLA was 2.70% with a Restoration of Purchasing Power (ROPP) adjustment of 0.80% for a net COLA of 3.50%.

6. The March 1, 2010 COLA was -1.48% with a Restoration of Purchasing Power (ROPP) adjustment of 2.48% for a net COLA of 1%.

7. The March 1, 2015 COLA was 1.70% with a Restoration of Purchasing Power (ROPP) adjustment of 2.3% for a net COLA of 4%.

8. The March 1, 2016 COLA was 0.20% with a Restoration of Purchasing Power (ROPP) adjustment of 0.80% for a net COLA of 1%.

9. The March 1, 2020 COLA was 1.70% with a Restoration of Purchasing Power (ROPP) adjustment of 4.76% for a net COLA of 6.54%

Table C-8
Changes Affecting Actuarial Valuations - Descriptions

Valuation Date	Change
1968	Actuarial assumptions were revised to reflect actual experience for the study period from inception to June 30, 1967.
1969	Discretionary cost-of-living increases and death benefit provisions were adopted.
1971	Vesting, early retirement, and death benefits were improved.
1974	Major changes in actuarial assumptions and a new retirement benefit formula were adopted.
1976	Actuarial assumptions for investment earnings, future salaries, and service retirement were changed. Changes in the compulsory retirement provisions, death benefit eligibility, and the maximum discretionary cost-of-living increases, including funding for an automatic 1% annual increase in postretirement benefits.
1977	Major changes in actuarial assumptions as a result of a study of the System's actual experience. These revisions were tentative, made on the basis of limited experience data.
1978	The termination of employment and the retired mortality assumptions were revised based on an update of the study of the System's actual experience.
1979	Reflects the maximum 40-year funding period enacted in 1979 legislation.
1980	Actuarial assumptions for investment earnings, salary growth, and disabled members' mortality assumptions were changed. Reduction factors for early retirement were modified and employee contribution rates were increased. The bond valuation method was revised, generating a one-time investment gain.
1982	Actuarial assumptions were revised to reflect the results of the System's experience over the three-year period ending June 30, 1981. The early retirement "Rule of 90(80)" and graded increase in both employee and employer contribution rates were implemented.
1983	The asset valuation method for mortgages was changed.
1985	Actuarial assumptions were revised based on the experience study for the period July 1, 1981 through June 30, 1984.
1988	Actuarial assumptions were revised based on the experience study for the period July 1, 1984 through June 30, 1987.
1992	Actuarial assumptions were revised based on the 1992 Investigation of Experience Study. Benefits and contributions were increased effective October 1, 1992. The benefit percentage factor was increased, the averaging period used in determining average monthly salary was decreased, and the early retirement reduction factors were decreased.
1993	Disability eligibility provisions for fire and police members were changed and contribution rates were increased to reflect this change. Benefits and contributions were increased effective October 1, 1993. The benefit percentage factor was increased, the averaging period used in determining average monthly salary was decreased, and the early retirement reduction factors were decreased.

Valuation Date	Change
1994	Actuarial assumptions were revised based on the 1994 Investigation of Experience Study. Benefits and contributions were increased effective October 1, 1994. The benefit percentage factor was increased, the averaging period used in determining average monthly salary was decreased, and the early retirement reduction factors were decreased.
1996	Actuarial assumptions were revised based on the 1996 Investigation of Experience Study.
1998	Mortality and Salary increase assumptions were revised based on the 1998 Investigation of Experience Study. The benefits for all annuitants were restored to 100% of purchasing power at the original retirement date.
2000	The permanent total contribution rate was reduced effective November 1, 2000. Benefits were increased and disability eligibility service requirements were reduced effective July 1, 2000. The interest crediting rate on employee contributions was changed to the actual return of the System. Retirement and disability assumptions were revised based on the 2000 Investigation of Experience Study.
2001	A Gain Sharing allocation of \$155.4 million was granted by the Board.
2002	Salary increase and termination of employment assumptions were revised based on the 2002 Investigation of Experience Study.
2003	Scheduled contribution rate increases at July 1, 2004 and July 1, 2005 reflected. \$100,000 death benefit for Fire and Police duty deaths added along with 0.1% increase in Fire and Police Employer Contribution rate.
2004	Scheduled contribution rate increases at July 1, 2006 reflected. Assumption changes based on 2004 Investigation of Experience Study.
2005	Contribution rate increases scheduled for July 1, 2005 and July 1, 2006, were delayed to July 1, 2008 and July 1, 2009. In addition to a full 2.7% COLA, retirees received a 0.8% Restoration of Purchasing Power benefit on March 1, 2005, to restore the portion of the March 1, 2003 COLA that was not originally granted.
2006	The mortality assumptions were changed to generational mortality as described in the 2006 Investigation of Experience report (dated May 15, 2006). Future scheduled rate increases are not included in the ARC or in the valuation results except where noted.
2007	Final Average Earnings (FAE) used to calculate benefits was changed to the greater of current FAE (provided by the PERSI) and estimated FAE. Future scheduled rate increases are not included in the ARC or in the valuation results. The contribution rate for university members of the optional retirement plan (ORP) was changed to 1.49% of members' salaries through July 1, 2025. In the previous valuation, the rate was 3.03% to be paid through July 1, 2015.
2008	Demographic actuarial assumptions were revised based on the 2009 Investigation of Experience Study.
2009	The contribution rate for Fire & Police Members was changed from 7.65% to 7.69%. \$100,000 disability benefit for Fire and Police duty disabilities added.

Valuation Date	Change
2010	<p>Mortality and economic actuarial assumptions were revised based on the 2010 Investigation of Experience Study. Contribution rate increases were added at July 1, 2011, July 1, 2012, and July 1, 2013.</p> <p>Retirees received a 2.48% Restoration of Purchasing Power benefit on March 1, 2010, to restore a portion of the March 1, 2009 COLA that was not originally granted.</p>
2011	<p>New Contingent Annuitant actuarial equivalence factors were adopted for members retiring on or after July 1, 2011. Scheduled contribution rate increases on July 1, 2011, July 1, 2012, and July 1, 2013, were all delayed one year.</p>
2012	<p>Demographic and Economic actuarial assumptions were revised based on the 2012 Active Experience Study.</p>
2013	<p>Change in the actuarial cost method, from aggregate entry age to individual entry age.</p>
2014	<p>Mortality assumptions were revised based on the 2014 Investigation of Experience Study. Scheduled contribution rate increases were canceled.</p> <p>Retirees were granted a 2.30% Restoration of Purchasing Power benefit, effective on March 1, 2015, to restore a portion of the prior years' COLAs that were not originally granted.</p>
2015	<p>No changes to assumptions or plan provisions.</p>
2016	<p>Demographic actuarial assumptions were revised based on the 2016 Active Experience Study.</p> <p>Retirees were granted a 0.80% Restoration of Purchasing Power benefit, effective on March 1, 2016, to restore a portion of the prior years' COLAs that were not originally granted.</p>
2017	<p>Retirees were granted a 0.10% Discretionary COLA, effective on March 1, 2017.</p> <p>A contribution rate increase was put in place, scheduled to take effect July 1, 2018. This rate change will increase the total (employer plus member) blended contribution rate from 18.42% to 19.42%.</p>
2018	<p>Retirees were granted a 0.90% Discretionary COLA, effective on March 1, 2018.</p> <p>The contribution rate increase scheduled to take effect July 1, 2018, was delayed one year to July 1, 2019.</p>
2019	<p>The scheduled contribution rate increase took effect on July 1, 2019.</p>
2020	<p>Retirees were granted a 0.70% Discretionary COLA and a 4.76% Restoration of Purchasing Power benefit, effective March 1, 2020.</p>
2021	<p>Demographic and economic actuarial assumptions were revised based on the 2021 Experience Study.</p> <p>Catastrophic line of duty disability benefit added for Fire and Police along with a 0.32% increase in Fire and Police member contribution rate.</p>

Valuation Date	Change
2022	<p>Retirees were granted a 2.50% Discretionary COLA, effective on March 1, 2022.</p> <p>A contribution rate increase was put in place, scheduled to take effect July 1, 2023. This rate change will separate the teacher contribution rate from that charged for general members to make each class's contribution rate more in line with the cost of benefits for that class, while limiting the change in weighted total contribution rate. The change is scheduled to increase the total (employer plus member) blended contribution rate from 19.44% to 19.45%.</p>

**Table C-9
Changes in Status**

	Active Contributing Members	Non- Contributing Members	Annuitants	Total
July 1, 2021 Valuation	73,563	45,718	50,891	170,172
Termination without Refund	(6,664)	6,664	0	0
Service Retirement	(2,149)	(901)	3,050	0
Disability Retirement	(20)	(19)	39	0
Death with Beneficiary ⁽¹⁾	(23)	(5)	28	0
Other Death or Departure ⁽²⁾	(1,057)	(1,521)	(1,432)	(4,010)
New Entrants	9,200	1,577	0	10,777
Rehires	1,384	(1,365)	(19)	0
Other ⁽³⁾	<u>175</u>	<u>55</u>	<u>633</u>	<u>863</u>
Total Change	846	4,485	2,299	7,630
July 1, 2022 Valuation	74,409	50,203	53,190	177,802

1. Only deaths of active members and vested inactive members are shown.

2. Includes events such as Termination with Refund and Death without Beneficiary.

3. Includes re-addition of some retired members that were previously omitted from the retired member data supplied by PERSI.

**Table C-10
Reconciliation of Data Records**

	Active	Vested Inactive	Non-Vested Inactive	Annuitants
Original Records Received	74,617	15,798	44,522	54,754
Duplicated Member IDs and Deceased Members	-	(315)	(368)	(1,368)
Annuitants of Firefighters' Retirement Fund Not Eligible for a PERSI Benefit	-	-	-	(69)
Idaho Falls Police Annuitants Not Eligible for a PERSI Benefit	-	-	-	(23)
Other Annuitant Records with Zero PERSI Benefit	-	(14)	-	(104)
Non-Vested Inactive Records with Zero Accumulated Employee Contributions	-	-	(9,494)	-
Active Records with Zero Salary that were Treated as Inactive for the Valuation	(74)	20	54	-
Active Records with Zero Salary and Zero Accumulated Employee Contributions	<u>(134)</u>	<u>-</u>	<u>-</u>	<u>-</u>
Records Used for Valuation	74,409	15,489	34,714	53,190

The table above describes record changes affecting the number of members who were included in the valuation. Milliman made minor data adjustments to correct records with an invalid date of birth, date of hire, gender, or class. There were fewer than 100 records with invalid fields.

Table C-11
Yields for Various Historical Periods, Net of Investment Expenses

<u>Period Ended</u>	<u>1 Year</u>	<u>10 Years</u>	<u>20 Years</u>	<u>Since 1968</u>
1968	8.1			
1969	6.3			
1970	2.9			
1971	3.0			
1972	12.6			
1973	4.9			
1974	-12.4			
1975	-12.6			
1976	14.4			
1977	7.9	3.1		
1978	2.8	2.6		
1979	7.2	2.7		
1980	18.2	4.1		
1981	12.1	5.0		
1982	7.5	4.5		
1983	16.3	5.6		
1984	6.0	7.6		
1985	22.8	11.4		
1986	17.2	11.6		
1987	12.0	12.1	7.5	
1988	-5.6	11.1	6.8	
1989	17.6	12.1	7.3	
1990	10.6	11.4	7.7	
1991	7.9	11.0	7.9	
1992	8.1	11.0	7.7	
1993	10.7	10.5	8.0	
1994	2.8	10.1	8.9	
1995	14.3	9.4	10.4	

Period Ended	1 Year	10 Years	20 Years	Since 1968
1996	17.8	9.4	10.5	
1997	19.1	10.1	11.1	
1998	17.2	12.5	11.8	
1999	11.2	11.9	12.0	
2000	12.9	12.1	11.7	
2001	-6.4	10.5	10.7	
2002	-7.4	8.8	9.9	
2003	3.3	8.1	9.3	
2004	17.6	9.5	9.8	
2005	10.3	9.2	9.3	
2006	11.8	8.6	9.0	
2007	19.5	8.6	9.3	
2008	-4.6	6.4	9.4	
2009	-16.4	3.4	7.6	
2010	12.0	3.3	7.6	
2011	20.3	6.0	8.2	
2012	1.2	6.9	7.9	
2013	8.7	7.4	7.8	
2014	16.8	7.4	8.5	
2015	2.7	6.6	7.9	
2016	1.5	5.6	7.1	
2017	12.3	4.9	6.8	
2018	8.5	6.3	6.3	
2019	8.1	9.0	6.2	
2020	2.7	8.1	5.7	
2021	27.5	8.7	7.3	
2022	-9.6	7.5	7.2	7.6

Notes:

1. Yields shown here are for the total trust (excluding assets used in plan operations).
2. Yields shown here are net of investment expenses but not of administrative expenses.

**Table C-12
Funded Ratio History**

Period Ended	MVA	AVA	UAAL	AVA Funded Ratio
1968	\$30.5	\$30.5	\$72.2	29.7%
1969	40.1	42.5	106.4	28.6
1970	42.7	53.5	110.1	32.7
1971	68.6	66.1	132.1	33.3
1972	93.7	89.8	123.0	42.2
1973	100.6	108.9	125.0	46.6
1974	99.6	110.7	216.3	33.9
1975	128.2	112.8	256.5	30.5
1976	157.2	150.2	306.8	32.9
1977	183.4	182.8	392.2	31.8
1978	208.6	210.3	423.1	33.2
1979	254.0	248.5	462.9	34.9
1980	307.5	324.1	553.1	36.9
1981	385.5	417.5	582.8	41.7
1982	423.5	490.5	653.5	42.9
1983	641.9	613.2	664.6	48.0
1984	642.3	688.9	729.4	48.6
1985	832.8	892.4	614.8	59.2
1986	1,071.9	1,090.7	555.7	66.2
1987	1,224.9	1,262.2	526.7	70.6
1988	1,274.3	1,246.8	699.1	64.1
1989	1,487.7	1,513.4	589.1	72.0
1990	1,691.7	1,723.8	578.7	74.9
1991	1,854.9	1,921.9	622.7	75.5
1992	2,096.6	2,128.1	677.3	75.9
1993	2,444.3	2,437.8	740.0	76.7
1994	2,591.1	2,591.1	1,040.6	71.3
1995	3,079.0	3,079.0	952.1	76.4
1996	3,766.0	3,766.0	639.5	85.5
1997	4,608.8	4,608.8	128.9	97.3
1998	5,480.8	5,480.8	(493.9)	109.9
1999	6,158.1	6,158.1	(704.0)	112.9
2000	7,043.4	7,043.4	(998.3)	116.5
2001	6,501.7	6,501.7	186.3	97.2
2002	6,064.5	6,064.5	1,075.7	84.9
2003	6,294.4	6,294.4	1,214.6	83.8
2004	7,410.5	7,410.5	671.1	91.7

Period Ended	MVA	AVA	UAAL	AVA Funded Ratio
2005	8,192.2	8,192.2	508.6	94.2
2006	9,153.1	9,153.1	461.7	95.2
2007	10,911.6	10,911.6	(573.4)	105.5
2008	10,366.1	10,366.1	748.9	93.3
2009	8,663.8	8,663.8	3,026.6	74.1
2010	9,544.0	9,544.0	2,555.8	78.9
2011	11,379.4	11,379.4	1,232.6	90.2
2012	11,324.1	11,324.1	2,043.5	84.7
2013	12,003.9	12,003.9	2,074.1	85.3
2014	13,849.6	13,849.6	1,052.3	92.9
2015	13,970.7	13,970.7	1,490.2	90.4
2016	13,892.3	13,892.3	2,206.1	86.3
2017	15,300.1	15,300.1	1,766.6	89.6
2018	16,274.8	16,274.8	1,580.1	91.2
2019	17,239.5	17,239.5	1,391.2	92.5
2020	17,392.1	17,392.1	2,433.2	87.7
2021	21,770.7	21,770.7	49.0	99.8
2022	19,349.5	19,349.5	4,077.2	82.6

Note:

Some historical data in this table was estimated and may not exactly match historical reports.

Appendix D Glossary

The following definitions are largely excerpts from a list adopted in 1981 by the major actuarial organizations in the United States. In some cases, the definitions have been modified for specific applicability to the Public Employee Retirement System of Idaho. Defined terms are capitalized throughout this Appendix.

Accrued Benefit

The amount of an individual's benefit (whether or not vested) as of a specific date, determined in accordance with the terms of a pension plan and based on compensation and service to that date.

Actuarial Accrued Liability

That portion, as determined by a particular Actuarial Cost Method, of the Actuarial Present Value of pension plan benefits and expenses which is not provided for by future Normal Costs.

Actuarial Assumptions

Assumptions as to the occurrence of future events affecting pension costs such as: mortality, withdrawal, disability, and retirement; changes in compensation; rates of investment earnings and asset appreciation or depreciation; procedures used to determine the Actuarial Value of Assets; and other relevant items.

Actuarial Cost Method

A procedure for determining the Actuarial Present Value of pension plan benefits and expenses and for developing an actuarially equivalent allocation of such value to time periods, usually in the form of a Normal Cost and an Actuarial Accrued Liability.

Actuarial Gain (Loss)

A measure of the difference between actual experience and that expected based on a set of Actuarial Assumptions during the period between two Actuarial Valuation dates as determined in accordance with a particular Actuarial Cost Method.

Actuarial Present Value

The value of an amount or series of amounts payable or receivable at various times determined as of a given date by the application of a particular set of Actuarial Assumptions.

Actuarial Valuation

The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a pension plan.

Actuarial Value of Assets

The value of cash, investments, and other property belonging to a pension plan as used by the actuary for the purpose of an Actuarial Valuation.

Actuarially Equivalent

Of equal Actuarial Present Value determined as of a given date with each value based on the same set of Actuarial Assumptions.

Amortization Payment

That portion of the pension plan contribution that is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability.

Entry Age Actuarial Cost Method

A method under which the Actuarial Present Value of the Projected Benefits of each individual included in an Actuarial Valuation is allocated on a level basis over the earnings of the individual between entry age and assumed exit ages. The portion of this Actuarial Present Value allocated to a valuation year is called the Normal Cost. The portion of this Actuarial Present Value not provided for at a valuation date by the Actuarial Present Value of future Normal Costs is called the Actuarial Accrued Liability.

Funding Reserve

The excess of the Actuarial Value of Assets over the Actuarial Accrued Liability. Standard actuarial terminology defines this as the "Funding Excess." PERSI uses the term Funding Reserve.

Normal Cost

That portion of the Actuarial Present Value of pension plan benefits and expenses which is allocated to a valuation year by the Actuarial Cost Method.

Projected Benefits

Those pension plan benefit amounts which are expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age and past and anticipated future compensation and service credits.

Restoration of Purchasing Power Benefit

The Board has discretion to provide a Cost of Living Adjustment (COLA) that is less than amount needed to maintain the purchasing power of the retirees' benefits. The Board may then choose to increase the retirees' benefits at a later date to fully or partially restore the benefit level that the retirees would have had if the Board had given them a full discretionary COLA in all previous years. Such an increase is a Restoration of Purchasing Power Benefit (ROPP).

Unfunded Actuarial Accrued Liability

The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets.