

Maine Public Employees Retirement System

State Employee and Teacher Retirement Program

Actuarial Valuation Report as of June 30, 2020

**Produced by Cheiron
October 2020**

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Letter of Transmittal

October 15, 2020

Board of Trustees
Maine Public Employees Retirement System
PO Box 349
Augusta, Maine 04332-0349

Dear Members of the Board:

We are pleased to submit the June 30, 2020 Actuarial Valuation Report for the State Employee and Teacher Retirement Program (Program) of the Maine Public Employees Retirement System (MainePERS or System).

This report is intended solely for the MainePERS Board and its auditors in preparing financial reports according to applicable law and accounting requirements. This report contains information on assets, liabilities, and contributions of the Program, as well as required accounting statement disclosures under the Governmental Accounting Standards Board (GASB) Statement No. 67.

We prepared this report according to generally recognized and accepted actuarial principles and practices and our understanding of the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board as well as applicable laws and regulations. This includes the use of assumptions and methods for funding purposes that comply with the Actuarial Standards of Practice.

As credentialed actuaries, we meet the Qualification Standards of the American Academy of Actuaries to render the opinion in this report. This report does not address any contractual or legal issues. We are not attorneys, and our firm does not provide any legal services or advice.

In preparing our report, we relied on information, both oral and written, supplied by the System's staff. This information includes, but is not limited to, Program provisions, member data, and financial information. We performed an informal examination of the obvious characteristics of the data for reasonableness and consistency in accordance with Actuarial Standard of Practice No. 23.

The results of this report rely on future Program experience conforming to the underlying assumptions and methods outlined in this report. Future experience may differ significantly from the current experience because of differences from the anticipated assumptions; changes in assumptions or methods; and changes in Program provisions or applicable law.

This report does not contain any adjustments for the potential impact of COVID-19 on either economic or demographic assumptions. We anticipate that the virus may have implications in both the short and long term, but the net impact of these is not determinable at this time.

Sincerely,
Cheiron



Gene Kalwarski, FSA, EA
Principal Consulting Actuary



Fiona E. Liston, FSA, EA
Principal Consulting Actuary



Elizabeth Wiley, FSA, EA
Consulting Actuary

**MAINE PUBLIC EMPLOYEES RETIREMENT SYSTEM
STATE EMPLOYEE AND TEACHER RETIREMENT PROGRAM
ACTUARIAL VALUATION AS OF JUNE 30, 2020**

FOREWORD

Cheiron has completed the Actuarial Valuation Report for the Maine Public Employees Retirement System (MainePERS or System) State Employee and Teacher Program (Program) as of June 30, 2020. The purpose of this report is to:

- 1) Measure and disclose, as of the valuation date, the financial condition of the Program;
- 2) Examine trends, both historical and prospective, in the condition of the Program;
- 3) Assess and disclose actuarial risks of the Program;
- 4) Report on the contribution rates developed in this valuation for informational purposes (Note: the actual contributions paid by the employers for Fiscal Year (FY) 2020 were developed in the budgeting process in July 2018, based on a roll-forward of the June 30, 2017 valuation); and
- 5) Provide specific information required for MainePERS's financial disclosures.

An actuarial valuation establishes and analyzes assets and liabilities on a consistent basis, and tracks the progress of both from one year to the next. It includes measurement of investment performance as well as an analysis of actuarial liability gains and losses.

Section I presents a summary containing our key findings, disclosing important Program trends in recent years, and providing analysis relating to the future status of the Program.

Section II assesses and discloses various actuarial risk measures of the Program.

Section III contains details on various asset measures, together with pertinent performance measurements.

Section IV shows similar information on liability measures for various purposes, including analysis of key changes in the measures.

Section V develops informational employer contribution rates to be compared to those established during the ratemaking process.

Section VI includes financial disclosure information.

Finally, we present appendices containing the following summaries:

- Program membership information at the valuation date (Appendix A);
- Major benefit provisions of the Program (Appendix B);
- Actuarial assumptions and methods used in the current valuation (Appendix C); and
- Terminology used in the Governmental Accounting Standards Board (GASB) disclosures (Appendix D).

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SECTION I – BOARD SUMMARY

General Comments

The annual employer contributions to this Program are determined on a biennial basis in even years. The contributions for fiscal year (FY) 2020 and FY 2021 were developed through this ratemaking process in 2018. The assets used in developing these rates were the preliminary June 30, 2018 assets. These were then combined with liability measures as of June 30, 2018, that were developed as an adjustment (i.e., roll-forward) of the liabilities of the June 30, 2017 actuarial valuation. This adjustment included updating to reflect anticipated growth in benefits, reductions due to benefit payouts, and any changes in assumptions or benefits between the June 30, 2017 valuation date and the June 30, 2018 measurement date. Similarly, the contributions for FY 2022 and FY 2023 were developed in 2020 and were based on estimated assets as of June 30, 2020 and liabilities based on the June 30, 2019 actuarial valuation liabilities adjusted to our best estimate of the June 30, 2020 liabilities.

The results of this June 30, 2020 valuation will be used primarily for accounting disclosures. Next year's June 30, 2021 valuation, adjusted to a June 30, 2022 measurement date and combined with preliminary assets as of June 30, 2022, will be used as the basis for the applicable FY 2024 and FY 2025 employer contributions.

Experience from July 1, 2019 through June 30, 2020 (FY 2020)

The State of Maine composite total employer rate produced by the June 30, 2019 valuation reflecting all Plans in the State Employee and Teacher Retirement Program was 20.06% of payroll. The equivalent rate produced in this June 30, 2020 valuation is 20.15% of payroll. The change in this contribution rate is attributable to several elements, including a loss from investment returns, the addition of the new Fire Marshal Plan, and a very small liability experience loss that consisted primarily of higher salaries than expected.

As of June 30, 2020, the Program had an unfunded actuarial liability (UAL) based on the actuarial value of assets (AVA) of \$2.615 billion. This represents a decrease of \$0.037 billion from the \$2.652 billion AVA UAL measured as of June 30, 2019. The specific factors contributing to this change are presented in Table I-1 that follows. This table has separate columns showing the components of the changes in liabilities and investments during FY 2020 as well as their combined effect on the UAL.

Table I-1			
(Amounts in Billions)			
	Liabilities	Assets*	UAL
Value as of June 30, 2019	\$ 14.547	\$ 11.895	\$ 2.652
Expected Change	0.317	0.458	(0.141)
Impact of Plan Changes	0.001	0.000	0.001
Impact of Assumption Changes	0.000	0.000	0.000
Recognized Investment Loss	0.000	(0.103)	0.103
Recognized Liability Loss	0.000	0.000	0.000
Value as of June 30, 2020	\$ 14.865	\$ 12.250	\$ 2.615

*This table uses actuarial value of assets. Results would be different if the market value was used.

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The remainder of this Board Summary section summarizes the Program’s historical trends, provides baseline projections of the Program’s future status, and summarizes the principal results of the valuation. These principal results compare key results between this year’s and last year’s valuations for member counts, assets and liabilities, and contribution rates.

Trends

It is important to take a step back from the latest results and view them in the context of the Program’s history. On the next few pages, we present a series of graphs that display key historical trends relating to the Program’s condition. In addition to considering the past, examining future possible trajectories of the Program is also vital to understanding the current results. Baseline projections are provided in this Board Summary and the potential variability of these results is explored further in the risk section of this report.

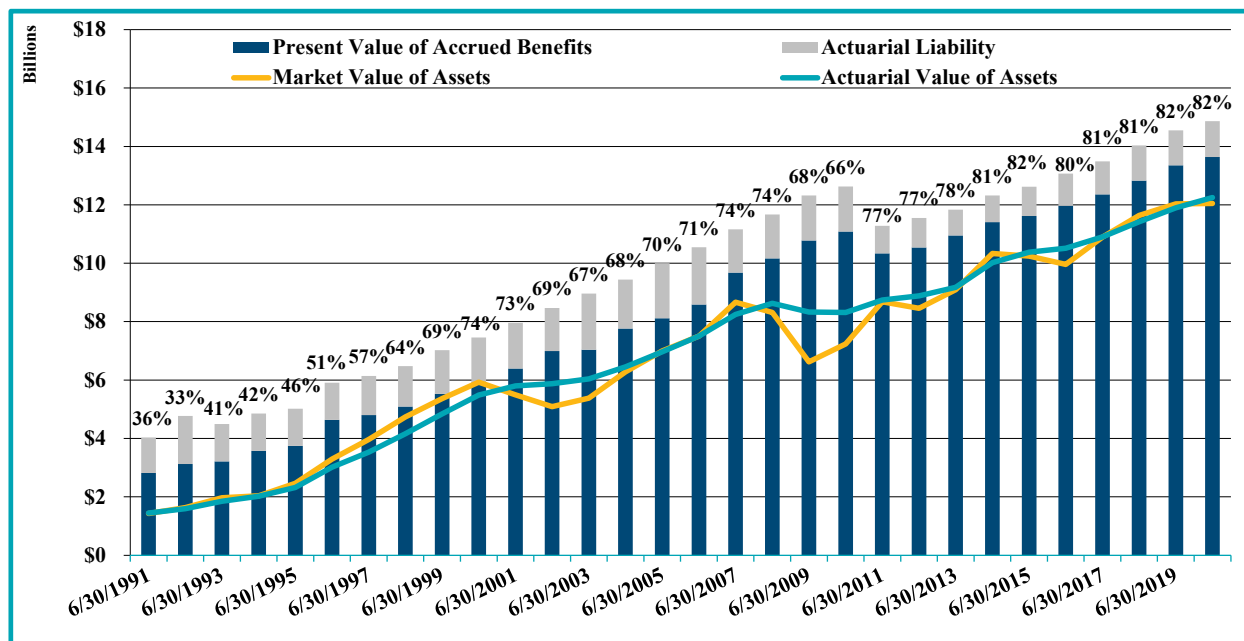
Assets and Liabilities

The following graph illustrates the progress of assets and liabilities for the Program as well as the Program’s funded ratio since June 30, 1991 on an actuarial value of assets (AVA) basis.

Liability measures are shown as bars as of June 30 of the indicated years. The actuarial liability (AL), the liability measure used for the Program’s funding purposes, is represented by the top of the grey bars. The blue bars represent the present value of accrued benefits (PVAB). These liability measures are discussed further in Section IV. Measures of the assets are shown as lines. The AVA is shown with a teal line, while the market value of assets (MVA) is shown as a yellow line. The AVA divided by the AL is the AVA funded ratio that is often used in evaluating the Program’s financial status. The values of this metric as of each valuation date are shown as the percentages in the graph labels.

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SECTION I – BOARD SUMMARY



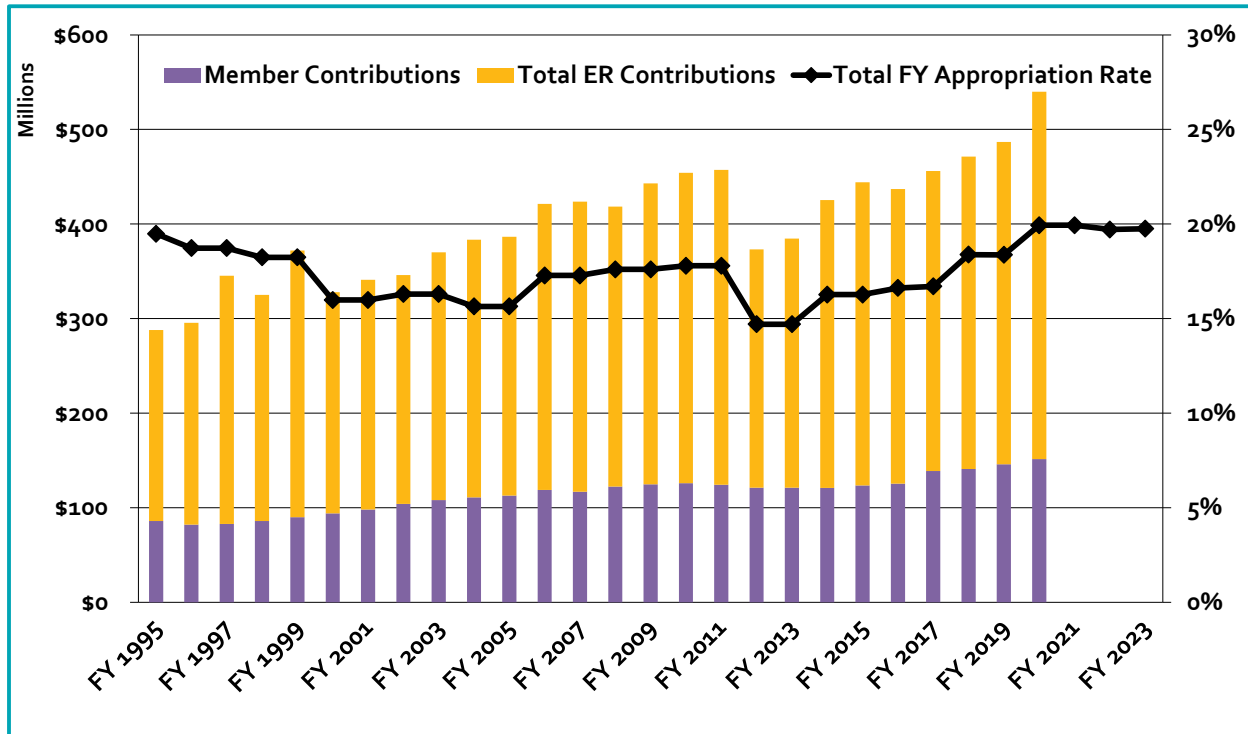
Plan changes were legislated during 2010 and first reflected in the 2011 valuation, resulting in the reduction in liability seen for that year. As of June 30, 2020, the Program is funded 82.4% based on the AVA funded ratio, which represents a slight increase from the 81.8% ratio reported in the prior valuation. The Program has had an AVA funded ratio between 80% and 82% for the last seven years.

Contributions

The next graph shows the history of contributions to the Program, both as dollar amounts and as percentages of payroll. The bars in this graph show the contributions made by both the employers and the members in dollar terms for each fiscal year (FY) as indicated by the horizontal axis since 1995. These bars are read using the left-hand axis. The black line shows the total appropriated employer contribution rate for the FY indicated as a percentage of payroll and references the right-hand axis. The FY 2021 through FY 2023 contribution rates have already been determined based on the ratemaking process, so three additional years of the contribution rate are shown versus dollars received.

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The member contribution rates are set by statute, based on the Plan within the Program in which each member participates. The total employer contribution rate is set by the ratemaking process on a biennial basis. The contribution rate for FY 2020 was based on a roll-forward of the June 30, 2017 valuation to June 30, 2018, as previously described in this Board Summary.

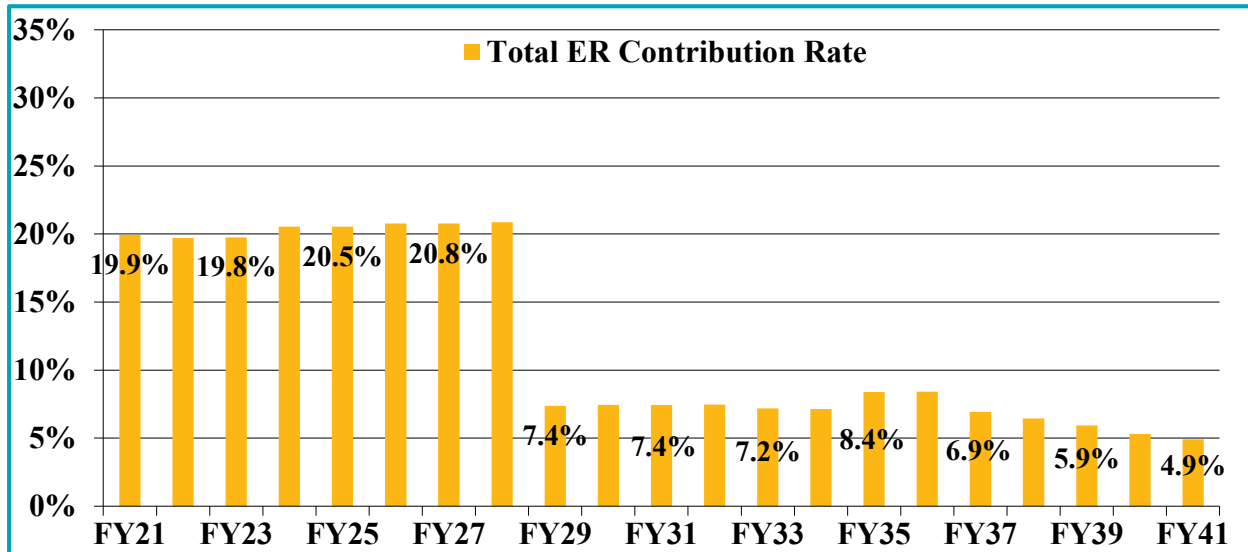
The increase in the employer contribution rates from FY 2018/2019 to FY 2020/2021 was caused by a number of factors including the delayed recognition (because of the biennial budget process) of losses sustained in 2016 and 2017 into the contribution rate and the reduction in the assumed annual rate of investment return from 6.875% to 6.75%. These losses were partially offset by net positive investment experience recognized in 2018 that was a part of the ratemaking process for FY 2020/2021. The employer contributions for FY 2022/2023 stayed relatively stable to those developed for FY 2020/2021 as seen in the black line above.

Baseline Projections

Our analysis of the projected financial trends for the Program is an important part of this valuation. In this section we project future valuation results, focusing on the previously referenced AVA funded ratio (AVA over AL) and the expected employer contributions that will be developed through the ratemaking process. We here present a baseline projection of these metrics based on all actuarial assumptions being exactly met during the projection period, including the assumed 6.75% investment return being achieved each year. In the risk section of the report, we demonstrate how sensitive future valuation results are to deviations in actual returns from the assumed investment returns by presenting similar results with investment returns deviating from those assumed.

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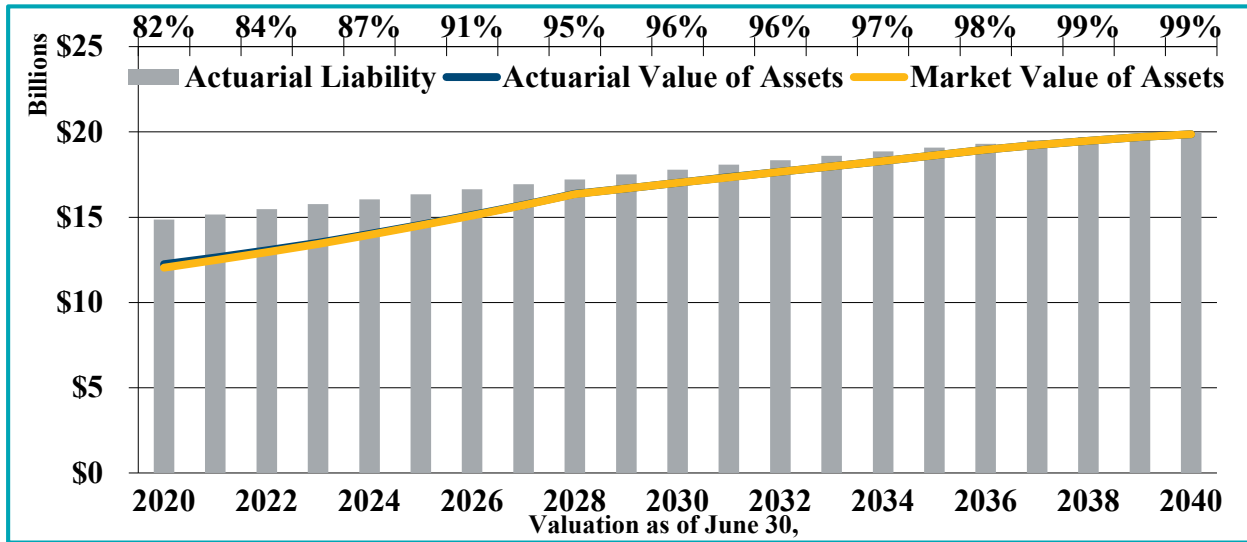
SECTION I – BOARD SUMMARY



The graph above shows the expected progress of the Program's employer contribution rates based on the ratemaking process over the next 20 years assuming that the Program's assets earn 6.75% on their *market value*. In addition, these projected contribution rates also reflect any prior years' actual investment gains or losses that have not been fully recognized in this valuation. This baseline projection shows that the overall composite employer contribution rate for the Program is projected to remain within one percent of the current rate for the next eight years. The initial UAL balance under the current funding method will be paid off in FY 2028. At that point, the employer contribution rates under this baseline scenario drop substantially, initially to 7.4%, with small further changes thereafter with a general downward trend, dropping to 4.9% by the end of the projection period. Note that this baseline projection is based on all assumptions being met each and every year where the reality is that there will be gains and losses each and every year, resulting in new amortization layers (negative or positive) occurring every year. This concept is explored further in the risk section of this report.

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The graph above shows the projected AVA funded ratio (AVA divided by AL) over the next 20 years based on this baseline scenario. It shows that the Program’s AVA funded ratio is projected to improve from the current 82% as of FY 2020 to 95% as of FY 2028 when only unfunded amounts after 1996 remain as this is the year that the Maine Constitution mandates that the Program’s 1996 UAL is to be paid off. Under this baseline scenario where all underlying assumptions are exactly met, the AVA funded ratio increases to and stays at approximately 99% in 2040. The amounts shown are as of June 30 of each year identified in the horizontal axis. Note that if the ratios used market value of assets (MVA), the funded ratios would be different.

Principal Results Summary

The last section of this Board Summary presents a summary of the principal results of the valuation, comparing key results between this year’s and last year’s valuations for member counts, assets and liabilities, and contribution rates. These summary results are shown for the total State Employee and Teacher Program, and then for each of these subgroups as well as the division of the State Employee Program into the Regular and Special Plans.

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SECTION I – BOARD SUMMARY

**Table I-2
Summary of Principal Results
Total State and Teacher Program**

	Valuation as of June 30, 2019	Valuation as of June 30, 2020	% Change	
<u>Member Counts</u>				
Active Members	39,876	40,395	1.3%	
Retired Members	28,071	28,731	2.4%	
Beneficiaries of Retired Members	6,226	6,247	0.3%	
Survivors of Deceased Members	600	584	(2.7)%	
Disabled Members	1,574	1,589	1.0%	
Terminated Vested Members	8,188	8,157	(0.4)%	
Inactives Due Refunds	<u>38,640</u>	<u>37,653</u>	(2.6)%	
Total Membership	123,175	123,356	0.1%	
Annual Payroll of Active Members	\$ 1,979,024,476	\$ 2,060,622,725	4.1%	
Annual Payments to Benefit Recipients	\$ 831,655,042	\$ 859,787,631	3.4%	
<u>Assets and Liabilities</u>				
Actuarial Liability (AL)	\$ 14,547,222,913	\$ 14,865,460,130	2.2%	
Actuarial Value of Assets (AVA)	<u>11,894,672,150</u>	<u>12,249,961,306</u>	3.0%	
Unfunded AL (UAL)	\$ 2,652,550,763	\$ 2,615,498,824	(1.4)%	
AVA Funded Ratio (AVA/AL)	81.8%	82.4%		
MVA Funded Ratio (MVA/AL)	82.7%	81.0%		
Accrued Benefit Liability (PVAB)	\$ 13,354,334,757	\$ 13,638,199,968	2.1%	
Market Value of Assets (MVA)	<u>12,035,563,047</u>	<u>12,044,916,279</u>	0.1%	
Unfunded PVAB	\$ 1,318,771,710	\$ 1,593,283,689	20.8%	
Accrued Benefit Funded Ratio	90.1%	88.3%		
<u>Contributions as a Percentage of Payroll</u>				
Employer Normal Cost Rate	3.98%	3.88%		
UAL Amortization Rate	<u>16.08%</u>	<u>16.27%</u>		
Total Employer Calculated Rate	20.06%	20.15%		
	<u>2018 Ratemaking</u>		<u>2020 Ratemaking</u>	
Total Employer Budgeted Rates	FY 2020	19.93%	FY 2022	19.71%
Total Employer Budgeted Rates	FY 2021	19.93%	FY 2023	19.75%

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SECTION I – BOARD SUMMARY

**Table I-3
Summary of Principal Results
Teacher Program**

Valuation as of:	June 30, 2019	June 30, 2020	% Change
<u>Member Counts</u>			
Active Members	27,441	27,565	0.5%
Retired Members	17,313	17,804	2.8%
Beneficiaries of Retired Members	2,929	2,967	1.3%
Survivors of Deceased Members	280	277	(1.1)%
Disabled Members	667	683	2.4%
Terminated Vested Members	5,161	5,162	0.0%
Inactives Due Refunds	30,670	29,609	(3.5)%
Total Membership	84,461	84,067	(0.5)%
Annual Payroll of Active Members	\$ 1,303,736,188	\$ 1,318,948,228	1.2%
Annual Payments to Benefit Recipients	\$ 524,764,315	\$ 545,719,165	4.0%
<u>Assets and Liabilities</u>			
Actuarial Liability (AL)	\$ 9,469,173,597	\$ 9,636,587,340	1.8%
Actuarial Value of Assets (AVA)	7,909,609,357	8,140,595,773	2.9%
Unfunded Actuarial Liability (UAL)	\$ 1,559,564,240	\$ 1,495,991,567	(4.1)%
AVA Funded Ratio (AVA/AL)	83.5%	84.5%	
MVA Funded Ratio (MVA/AL)	84.5%	83.1%	
Accrued Benefit Liability (PVAB)	\$ 8,612,381,790	\$ 8,772,718,122	1.9%
Market Value of Assets (MVA)	8,003,297,686	8,004,335,042	0.0%
Unfunded PVAB	\$ 609,084,104	\$ 768,383,080	26.2%
Accrued Benefit Funded Ratio	92.9%	91.2%	
<u>Contributions as a Percentage of Payroll</u>			
Employer Normal Cost Rate	3.84%	3.78%	
UAL Rate	14.54%	14.91%	
Total Employer Rate	18.38%	18.69%	
	<u>2018 Ratemaking</u>	<u>2020 Ratemaking</u>	
Total Employer Budgeted Rates	FY 2020 18.49%	FY 2022 18.13%	
Total Employer Budgeted Rates	FY 2021 18.49%	FY 2023 18.13%	

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SECTION I – BOARD SUMMARY

**Table I-4
Summary of Principal Results
State Program (Regular and Special Plans)**

Valuation as of:	June 30, 2019	June 30, 2020	% Change
<u>Member Counts</u>			
Active Members	12,435	12,830	3.2%
Retired Members	10,758	10,927	1.6%
Beneficiaries of Retired Members	3,297	3,280	(0.5)%
Survivors of Deceased Members	320	307	(4.1)%
Disabled Members	907	906	(0.1)%
Terminated Vested Members	3,027	2,995	(1.1)%
Inactives Due Refunds	<u>7,970</u>	<u>8,044</u>	0.9%
Total Membership	38,714	39,289	1.5%
Annual Payroll of Active Members	\$ 675,288,288	\$ 741,674,497	9.8%
Annual Payments to Benefit Recipients	\$ 306,890,727	\$ 314,068,466	2.3%
<u>Assets and Liabilities</u>			
Actuarial Liability (AL)	\$ 5,078,049,316	\$ 5,228,872,790	3.0%
Actuarial Value of Assets (AVA)	<u>3,985,062,793</u>	<u>4,109,365,533</u>	3.1%
Unfunded Actuarial Liability (UAL)	\$ 1,092,986,523	\$ 1,119,507,257	2.4%
AVA Funded Ratio (AVA/AL)	78.5%	78.6%	
MVA Funded Ratio (MVA/AL)	79.4%	77.3%	
Accrued Benefit Liability (PVAB)	\$ 4,741,952,967	\$ 4,865,481,846	2.6%
Market Value of Assets (MVA)	<u>4,032,265,361</u>	<u>4,040,581,237</u>	0.2%
Unfunded PVAB	\$ 709,687,606	\$ 824,900,609	16.2%
Accrued Benefit Funded Ratio	85.0%	83.0%	
<u>Contributions as a Percentage of Payroll</u>			
Employer Normal Cost Rate	4.24%	4.05%	
UAL Rate	<u>19.08%</u>	<u>18.70%</u>	
Total Employer Rate	23.32%	22.75%	
	<u>2018 Ratemaking</u>	<u>2020 Ratemaking</u>	
Total Employer Budgeted Rates	FY 2020 22.54%	FY 2022 22.74%	
Total Employer Budgeted Rates	FY 2021 22.53%	FY 2023 22.88%	

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SECTION I – BOARD SUMMARY

**Table I-5
Summary of Principal Results
State Program – Regular Plans Only**

Valuation as of:	June 30, 2019	June 30, 2020	% Change	
<u>Member Counts</u>				
Active Members	10,698	11,132	4.1%	
Retired Members	9,782	9,924	1.5%	
Beneficiaries of Retired Members	2,943	2,906	(1.3)%	
Survivors of Deceased Members	307	291	(5.2)%	
Disabled Members	830	827	(0.4)%	
Terminated Vested Members	2,714	2,658	(2.1)%	
Inactives Due Refunds	<u>6,992</u>	<u>7,037</u>	0.6%	
Total Membership	34,266	34,775	1.5%	
Annual Payroll of Active Members	\$ 562,792,726	\$ 622,210,265	10.6%	
Annual Payments to Benefit Recipients	\$ 269,104,909	\$ 274,645,703	2.1%	
<u>Assets and Liabilities</u>				
Actuarial Liability (AL)	\$ 4,307,346,025	\$ 4,421,149,900	2.6%	
Actuarial Value of Assets (AVA)	<u>3,379,710,758</u>	<u>3,506,883,155</u>	3.8%	
Unfunded Actuarial Liability (UAL)	\$ 927,635,267	\$ 914,266,745	(1.4)%	
AVA Funded Ratio (AVA/AL)	78.5%	79.3%		
MVA Funded Ratio (MVA/AL)	79.4%	78.0%		
Accrued Benefit Liability (PVAB)	\$ 4,032,335,860	\$ 4,121,895,591	2.2%	
Market Value of Assets (MVA)	<u>3,419,743,008</u>	<u>3,448,183,463</u>	0.8%	
Unfunded PVAB	\$ 612,592,852	\$ 673,712,128	10.0%	
Accrued Benefit Funded Ratio	84.8%	83.7%		
<u>Contributions as a Percentage of Payroll</u>				
Employer Normal Cost Rate	4.07%	3.90%		
UAL Rate	<u>18.53%</u>	<u>18.20%</u>		
Total Employer Rate	22.60%	22.10%		
	<u>2018 Ratemaking</u>		<u>2020 Ratemaking</u>	
Total Employer Budgeted Rates	FY 2020	21.98%	FY 2022	22.11%
Total Employer Budgeted Rates	FY 2021	21.98%	FY 2023	22.24%

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SECTION I – BOARD SUMMARY

**Table I-6
Summary of Principal Results
State Program – Special Plans Only**

Valuation as of:	June 30, 2019	June 30, 2020	% Change
<u>Member Counts</u>			
Active Members	1,737	1,698	(2.2)%
Retired Members	976	1,003	2.8%
Beneficiaries of Retired Members	354	374	5.6%
Survivors of Deceased Members	13	16	23.1%
Disabled Members	77	79	2.6%
Terminated Vested Members	313	337	7.7%
Inactives Due Refunds	978	1,007	3.0%
Total Membership	4,448	4,514	1.5%
Annual Payroll of Active Members	\$ 112,495,562	\$ 119,464,232	6.2%
Annual Payments to Benefit Recipients	\$ 37,785,818	\$ 39,422,763	4.3%
<u>Assets and Liabilities</u>			
Actuarial Liability (AL)	\$ 770,703,291	\$ 807,722,890	4.8%
Actuarial Value of Assets (AVA)	605,352,035	602,482,378	(0.5)%
Unfunded Actuarial Liability (UAL)	\$ 165,351,256	\$ 205,240,512	24.1%
AVA Funded Ratio (AVA/AL)	78.5%	74.6%	
MVA Funded Ratio (MVA/AL)	79.5%	73.3%	
Accrued Benefit Liability (PVAB)	\$ 709,617,107	\$ 743,586,255	4.8%
Market Value of Assets (MVA)	612,522,353	592,397,774	(3.3)%
Unfunded PVAB	\$ 97,094,754	\$ 151,188,481	55.7%
Accrued Benefit Funded Ratio	86.3%	79.7%	
<u>Contributions as a Percentage of Payroll</u>			
Employer Normal Cost Rate	5.09%	4.85%	
UAL Rate	21.74%	21.27%	
Total Employer Rate	26.83%	26.12%	
	<u>2018 Ratemaking</u>	<u>2020 Ratemaking</u>	
Total Employer Budgeted Rates	FY 2020 25.17%	FY 2022 25.82%	
Total Employer Budgeted Rates	FY 2021 25.17%	FY 2023 25.98%	

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SECTION II – RISK ASSESSMENT AND DISCLOSURE

Introduction

The Program's actuarial valuation results are dependent on assumptions about future economic and demographic experience. Based on actuarial standards of practice, the assumptions represent a reasonable estimate for future experience. However, actual future experience will never conform exactly to the assumptions and may differ significantly from the assumptions. This deviation is the risk that pension plan sponsors undertake in relying on a pension plan's actuarial valuation results.

This section of this report is intended to identify the primary drivers of these risks, provide background information and assessments about these identified risks, and communicate the significance of these risks to this Program.

Identification of Risks

For this Program, the three primary valuation results that can significantly differ from those expected are the assets, the liabilities, and the employer contributions. While there are several factors that could lead to these results being different, we believe the primary risks for this Program are:

- Investment risk,
- Longevity and other demographic risks,
- Plan change risk, and
- Assumption change risk.

Other risks that we have not identified may also turn out to be significant.

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Investment Risk is the potential for investment returns to deviate from what is expected. When actual investment returns are lower than the investment assumption used in the actuarial valuation, the unfunded liability will increase from what was expected and will require higher contributions than otherwise anticipated. But when actual returns exceed the assumption, the resulting unfunded liability measurements and actuarially determined contributions will be lower than anticipated. As seen in the historical section that follows, this has been a significant driver of deviations in the actual measurements for this Program from those expected by the prior valuations.

Longevity and Other Demographic Risk is the potential for mortality or other demographic experience to be different than expected. Generally, longevity and other demographic risks emerge slowly over time as the actual experience deviates from expected. In addition, the extensive number of assumptions related to longevity and other demographic experience often result in offsetting factors contributing to the Program's overall liability experience. As such, these risks are often dwarfed by other risks, particularly those due to the investment returns. The historical section shows that this has been true for this Program in individual years, with the magnitude of the gains and losses from investment experience often significantly larger than the gains and losses from liability experience. However, during the past ten years, the offsetting effects of the investment gains and losses have been such that the cumulative effect of this longevity and other demographic risk as seen in the liability gains and losses has been greater than the investment gains and losses.

Plan Change Risk is the potential for the provisions of the Program to be changed such that the funding or benefits are changed materially. In addition to the actual payments to and from the Program being changed, future valuation measurements can also be impacted, with Program changes leading to deviations between actual future measurements and those expected by prior valuations. The historical review section will show that plan change risk has been a significant driver of deviations in the actual measurements for this Program from those expected by the valuations over the ten-year period shown.

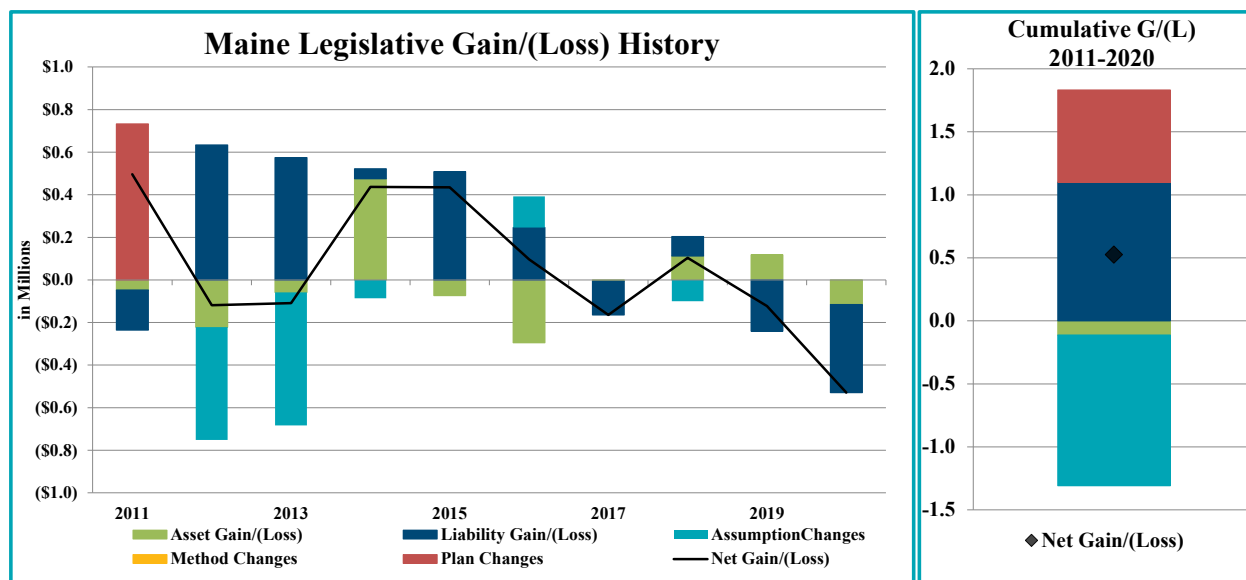
Assumption Change Risk is the potential for the environment to change such that future valuation assumptions are adjusted to be different than the current assumptions. For example, declines in interest rates over time may result in a change in the assumed rates of return used in the valuations. A healthier workforce may result in changes in employee behavior such that retirement rates are adjusted to reflect employees working longer. Assumption change risk is an extension of the risks previously identified, but rather than capturing the risk as it is experienced, it captures the cost of recognizing a change in the environment resulting in the current assumption no longer being reasonable. The historical review section will show that assumption change risk has been a relatively significant risk for this Program. In addition to changes in individual assumptions, changes to the methods used in valuing the Program can have a significant impact on the valuation results as can be seen based on the method change items in the Program's historical experience.

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Historical Experience Deviations

In understanding the impact of some of these risks, it is useful to look at past experience deviations. These deviations are commonly referred to as actuarial gains and losses. The following graph shows the gains/(losses) at each valuation date between the actual and expected experience broken down by cause for the last ten years.



As described previously and is evident in this graph, plan changes and assumption and method changes have been the most significant risks for the Program over this ten-year period. The next two most significant causes of experience deviations are the liability gains/(losses) and the asset gains and losses.

Plan Maturity Measures

As pension plans become more mature, the primary risks of adverse investments, demographic deviations, plan changes, and assumption changes become of more significant concern as the resulting impacts on the Program's condition are more pronounced. As a result, it has become increasingly important to examine measures that indicate a pension plan's maturity level. With shrinking workforces, aging Baby Boomers, and retirees living longer, plans pay out more in benefits than they receive in contributions – leading to negative cash flows, excluding investment income, making it harder for a plan to recover from losses since contributions are generally made only on the basis of the active payroll.

One of the main reasons risks are more amplified with a mature plan is that when plans with negative cash flows suffer investment losses, they need to liquidate enough assets to pay for benefits in excess of contributions. That means these plans will need to earn higher returns to rebuild their assets to the previous levels. Plans with negative cash flows exceeding five percent of assets are especially vulnerable to asset losses.

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The balance of this section discloses and examines three maturity measures: the asset leverage ratio, the support ratio, and the net cash flow ratio.

Asset Leverage Ratio

One of the more important plan maturity measures is the asset leverage ratio – the market value of assets divided by the plan’s payroll, which represents the percentage of payroll that would need to be contributed to make up a given change in the plan’s assets. As a plan matures, its assets increase and a greater proportion of the assets are paid out in benefit payments to members. The greater the plan’s assets are relative to payroll, the more vulnerable the plan is to investment volatility in terms of the resulting contribution requirement changes.

As an example, here are two plans that both experience a 10% investment loss equaling \$500 million on their existing assets of five billion dollars. Plan A’s asset leverage ratio is 10 and Plan B’s ratio is 5 – this means that Plan A has to spread, or amortize, that loss over a payroll that is half as large as Plan B’s. As seen in the chart below, this results in the percentage of payroll that Plan A would have to have contributed to make up the loss being double what would be required for Plan B.

	(\$ in millions)	
	Plan A	Plan B
Plan Assets	\$ 5,000	\$ 5,000
Payroll	\$ 500	\$ 1,000
Asset Leverage Ratio	10.0	5.0
10% Loss	\$ 500	\$ 500
10% Loss as % of Payroll	100%	50%

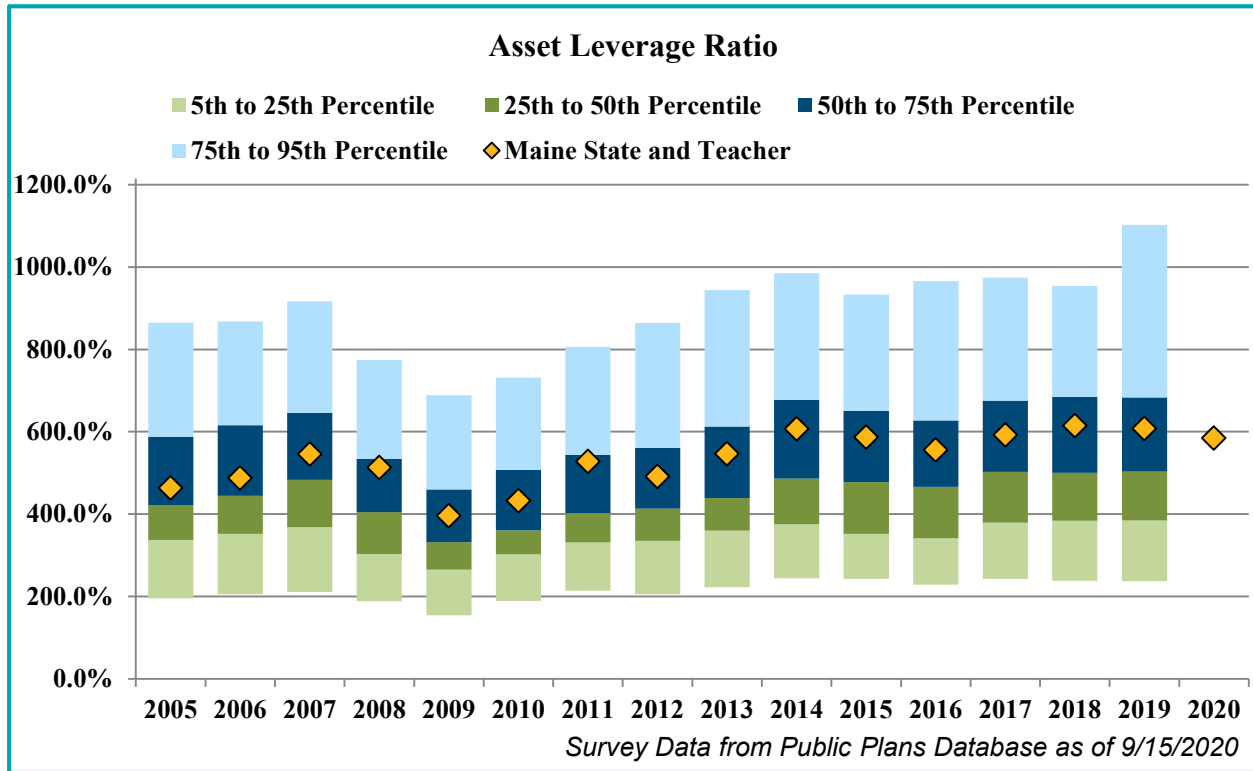
The Boston College’s Center for Retirement Research, NASRA and the Center for State and Local Government Excellence maintain the Public Plan Database that contains the majority of state plans as well as many large municipal plans, covering over 95% of the membership in public plans as well as over 95% of the assets held by public pension plans.

The chart that follows shows the asset leverage ratios for all plans in this database since 2001. The colored bars represent the central 90% of the asset leverage ratios for the plans in the database. The Maine State and Teacher Program is represented by the gold diamonds. This chart shows that the Program’s asset leverage ratio has generally increased over this period, both in absolute terms and relative to the universe of other systems, although it has remained steady at around 600% of salary over the past seven years.

Note that all of the charts showing the Program versus this universe of plans in this section show one more year for the Program than the universe as the 2020 numbers are not yet available for the database.

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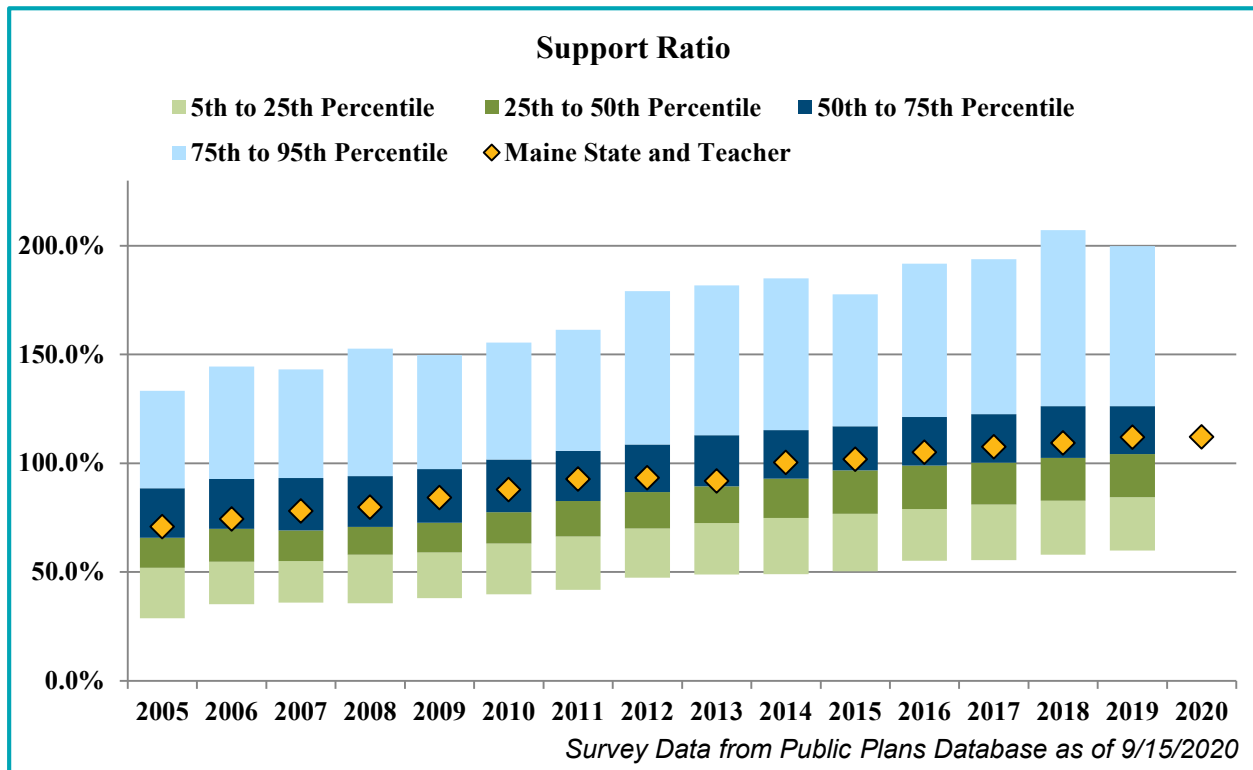
Support Ratios

A commonly used measure of plan maturity is the support ratio – the ratio of retired and inactive members, or those receiving benefits or entitled to a deferred benefit, to the number of active members, or those currently accruing benefits in the plan. The greater this ratio, the more mature a plan is considered to be with the proportion of the plan’s liability represented by actives generally declining.

The graph shows the support ratio over time for the Program compared to the Public Plan Database.

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The gold diamonds in this graph show that the Program's support ratio for each year has generally increased over time in absolute terms while staying in relatively the same position relative to the universe of systems. This indicates that the Program is maturing, as have most plans in this database over the years, and has done so at a rate similar to that of the universe of plans as a whole.

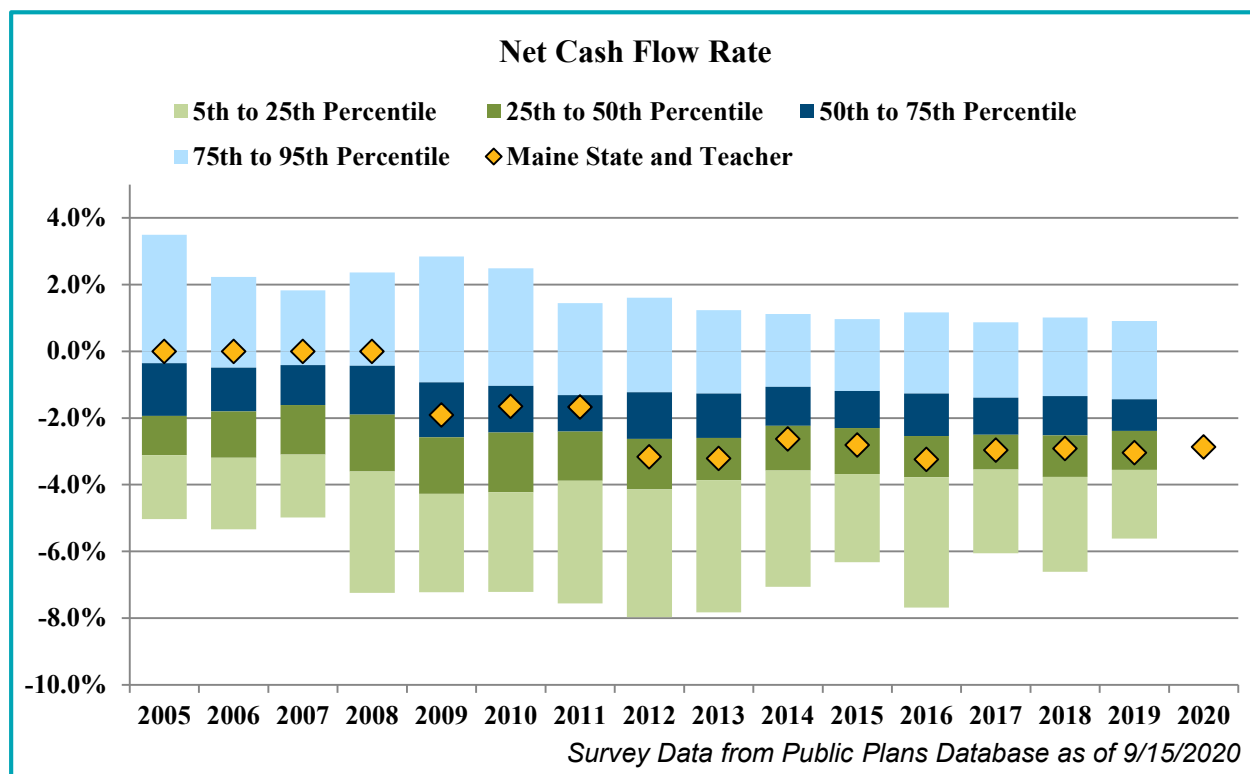
Net Cash Flow Ratio

Another measure of plan maturity is the ratio of the net cash flow out of the plan – contributions less benefits and expenses – divided by the market value of plan assets. When this ratio is significantly negative, a plan is very vulnerable to market declines. This vulnerability increases as this ratio becomes more negative.

This chart shows that the Program's net cash flow ratio in 2005 was about -0.3%, just under 0%, and has become more negative since then, with the value in 2020 just under negative three percent. Relative to the universe, the Program had less negative cash flows than the median plan in the public plan database at the beginning of this period, but in recent years has had net cash flows that are more negative than the median plan in the universe. This measure thus provides some indication that this Program is maturing at a pace faster than the typical public plan.

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Assessing Future Risk

Assessing the future risk that the expected measurements produced by the actuarial valuations will deviate from the actual values over time is complex and can never be exactly known. However, to try to assist the Board in its utilization of this report, we have attempted to develop some basic assessments of this risk in the remainder of this section.

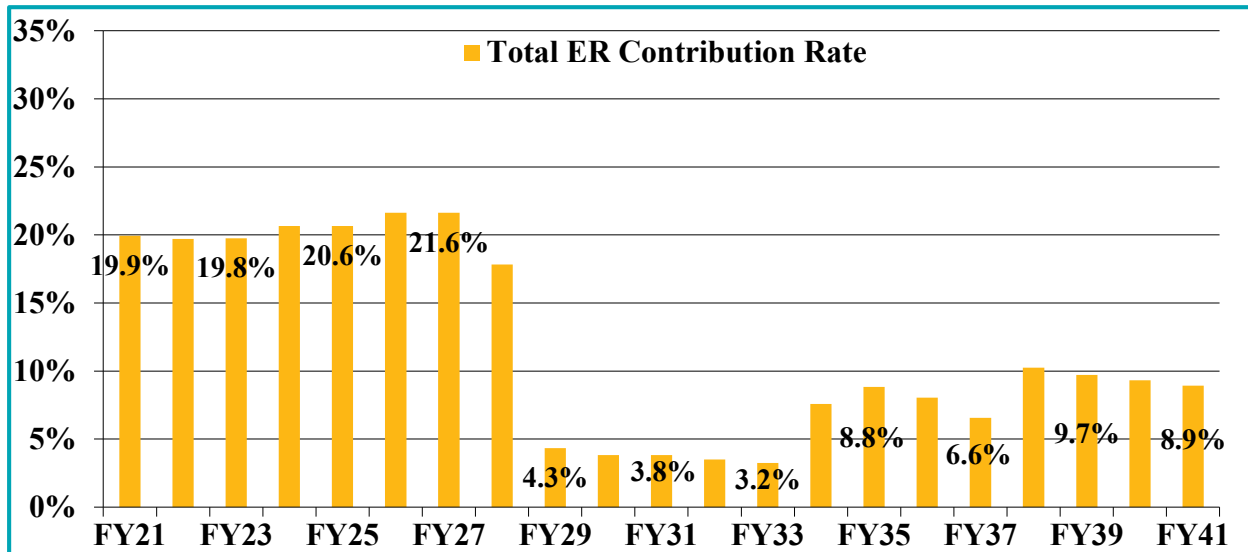
Pages 5-7 have additional detail on the baseline projection produced from this valuation. It is important to note that baseline projections, while valid, **are not going to occur** as experience never conforms exactly to assumptions every year. As discussed in the plan maturity section, as plans become more mature, it typically becomes more difficult for them to recover from market declines even when the average investment return over a long period is equal to the expected return. As a demonstration of this, the following projection is shown, which is based on assuming varying returns in the future. We based this varying return scenario on assuming the returns for the next 20 years would equal what a portfolio invested 75% in the SP-500 and 25% in the Lehman Brothers bond index would have earned for the 20-year period July 1, 1959 through June 30, 1979. This period produced an average return of 6.94% for this hypothetical portfolio. The rates assumed for this scenario are shown below.

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FY	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Return	2.2%	14.3%	-7.7%	24.7%	16.9%	5.5%	2.2%	7.9%	10.3%	0.3%
FY	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Return	-18.8%	36.1%	11.1%	1.3%	-12.7%	15.8%	13.2%	3.5%	0.3%	12.2%

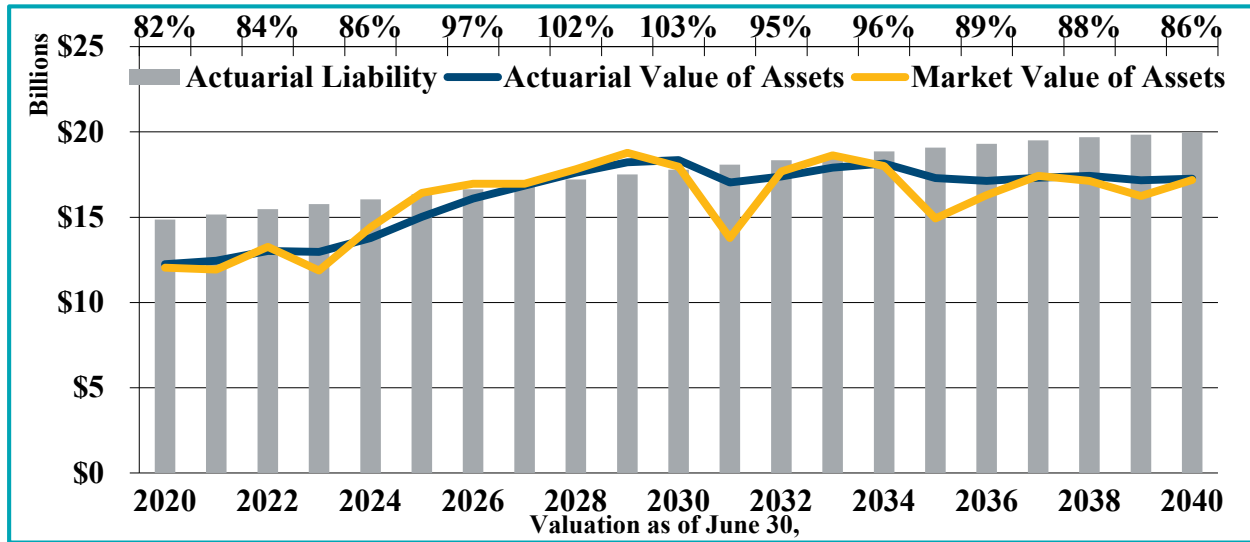
With varying annual earnings, one can see the volatility in the employer contributions in the first chart. Where the contributions in the baseline scenario were relatively stable, staying within one percent of the current rate until the 1996 UAL is paid off, under this scenario with varying returns the contributions during that period are much more volatile and increase by over 13%. Also note that in the period after the 1996 UAL is paid off, the contribution rates are much more volatile in this scenario, including ranging to rates over 25% as well as dropping to 2.2% in the final year, lower than the 4.0% anticipated in the baseline scenario. Note that this chart reflects an illustrative scenario and is not intended to reflect future expectations as the volatility of the contributions will vary with the volatility of the returns. It is provided simply to demonstrate the magnitude and range of this possible volatility.



The funded ratio of the Program is also more volatile with varied returns as seen in the following graph based on this illustrative varying returns scenario. Where the baseline projection has the funded ratio steadily increasing from the current 82% to 100% over the forecasted period, in this varying returns scenario the funded ratio is volatile, reflecting the volatility of the assumed returns. Note also that the timing of contribution development and payment as well as the combination of the amortization layers results in the Plan being funded over 100% at times.

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SECTION III – ASSETS

Pension plan assets play a key role in the financial operation of plans and in the decisions Trustees make with respect to future deployment of those assets. The level of assets, the allocation of assets among asset classes, and the methodology used to measure assets will likely impact benefit levels, employer contribution rates, and the ultimate security of members' benefits.

The assets for all Defined Benefit (DB) Programs administered by MainePERS are invested together. These Programs are the State Employee and Teacher Retirement Program that is valued in this report, the Judicial Retirement Program, the Legislative Retirement Program, and the Participating Local District (PLD) Retirement Program, including both the Consolidated Plan and the several Nonconsolidated PLDs. The assets of all of these Programs are entirely commingled for investment purposes, so the actuarial value of assets (AVA) for each of these Programs is developed by first developing it for the entire asset pool and then subsequently allocating that total AVA to each of the specific Programs.

In this section, we present detailed information on the Program's assets including:

- Disclosure of total MainePERS DB assets at June 30, 2019 and June 30, 2020;
- Statement of changes in total MainePERS DB market values during the year;
- Development of the total MainePERS DB actuarial value of assets;
- Allocation of the total actuarial value to MainePERS DB Programs;
- Assessment of the total MainePERS DB investment performance; and
- Projection of expected cash flows for the Program for the next ten years.

Disclosure

The market value of assets (MVA) represents a “snap-shot” or “cash-out” value, which provides the principal basis for measuring financial performance from one year to the next. However, market values can fluctuate widely with corresponding swings in the marketplace, resulting in volatility in the resulting contributions if the unadjusted market value is used in the valuation process that develops the contributions. Therefore, a smoothed actuarial value of assets is developed for use in the valuation process and for evaluating the Program's ongoing ability to meet its obligations. The actuarial value of the Program's assets is developed by allocating the actuarial value of the total MainePERS DB assets to each Program. This section discloses the market and actuarial values of the MainePERS DB assets both in total and for each Program.

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SECTION III – ASSETS

Table III-1 that follows develops the change in the market value of assets for the total MainePERS DB assets during FY 2020.

Table III-1		
Changes in Market Value of Total MainePERS Defined Benefit (DB) Assets		
Market Value of Total MainePERS DB Assets – June 30, 2019		\$ 15,112,665,834
<u>Additions</u>		
Contributions:		
Employer Contributions	\$ 467,581,406	
Member Contributions	206,329,988	
Transfers	<u>(208,355)</u>	
Total Contributions	\$ 673,703,039	
Investment Income:		
Net Appreciation (Depreciation) in Fair Value of Investments	\$ 574,273,640	
Interest on Bank Balances	<u>1,162,578</u>	
Total Investment Income	\$ 575,436,218	
Investment Activity Expenses:		
Management Fees	\$ (124,480,394)	
Investment Related Expense	(5,342,903)	
Banking Fees	<u>(33,493)</u>	
Total Investment Activity Expenses	\$ (129,856,790)	
Net Income from Investing Activities	\$ 445,579,428	
Total Additions		\$ 1,119,282,467
<u>Deductions</u>		
Retirement Benefits	\$ (983,672,428)	
Disability Benefits	(29,972,239)	
Survivor Benefits	(24,621,431)	
Refunds	(26,788,940)	
Administrative Expenses	<u>(14,244,292)</u>	
Total Deductions		\$ (1,079,299,330)
<u>Total</u>		
Net Increase (Decrease)		\$ 39,983,137
Market Value of Total MainePERS DB Assets – June 30, 2020		\$ 15,152,648,971

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SECTION III – ASSETS

Table III-2 below develops the actuarial value of assets for the total MainePERS DB assets as of June 30, 2020 using the adopted actuarial valuation methodology.

Table III-2 Development of Actuarial Value of Total MainePERS Defined Benefit (DB) Assets as of June 30, 2020		
1.	Actuarial Value of Total MainePERS DB Assets at June 30, 2019	\$ 14,935,753,708
2.	Amount in (1) with Interest to June 30, 2020	15,943,917,083
3.	Employer and Member Contributions for FY 2020	673,703,039
4.	Interest on Contributions in (3), Assuming Received Uniformly throughout FY 2020	22,366,212
5.	Total Disbursements without Administrative Expenses, for FY 2020	(1,065,055,038)
6.	Interest on Disbursements in (5), Assuming Payments made Uniformly throughout FY 2020	<u>(35,358,673)</u>
7.	Expected Value of Total MainePERS DB Assets at June 30, 2020 = (2) + (3) + (4) + (5) + (6)	\$ 15,539,572,623
8.	Actual Market Value of Total MainePERS DB Assets at June 30, 2020	15,152,648,971
9.	Excess of (8) Over (7)	<u>(386,923,652)</u>
10.	Actuarial Value of Total MainePERS DB Assets at June 30, 2020 = (7) + [33⅓% of (9)]	\$ 15,410,598,072

Actuarial Value of Total MainePERS DB Assets

As discussed in the disclosure portion of this section, the actuarial value of assets for the Program represents a “smoothed” value developed by the actuary to reduce, or eliminate, volatility in valuation results, particularly contribution rates, that could develop from short-term fluctuations in the market value of assets. Current actuarial methods employed in this Program use an allocated portion of the total actuarial value of assets for the total MainePERS DB assets based on the Program’s market value of assets to develop the actuarial value of assets for the Program. The methodology for the total MainePERS DB assets sets the actuarial value of assets equal to the expected value of the actuarial value of assets plus one-third of the difference between the actual market value of assets and the expected actuarial value of assets. The expected value of the actuarial value of assets takes the prior year’s actuarial value of assets and adjusts it for contributions, disbursements, and expected interest earnings at the investment return assumption that was in effect for the previous year, 6.75% for this valuation. The previous table, Table III-2, illustrates the calculation of the actuarial value of assets for the total MainePERS DB assets as of June 30, 2020.

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SECTION III – ASSETS

Allocation of Actuarial Value of Assets to the Program

The assets for all of the defined benefit (DB) Programs administered by MainePERS are commingled for investment purposes, with the actuarial value of assets for the total assets allocated to the individual Programs on the basis of the market value of the assets for each Program. An asset ratio (total MainePERS actuarial value of assets divided by total MainePERS market value of assets) is applied to the market value of assets attributable to each of the Programs to determine their actuarial value of assets as of the valuation date. The asset ratio derived in this June 30, 2020 valuation, as shown in Table III-2 above, is 1.017023 ($\$15,410,598,072 \div \$15,152,648,971$). The allocation of actuarial value of the total MainePERS DB assets to each of the MainePERS DB Programs based on this asset ratio is shown in the following chart.

Table III-3 Allocation of Actuarial Value of Total MainePERS DB Assets as of June 30, 2020		
Program	Market Value	Actuarial Value
Teacher	\$ 8,004,335,042	\$ 8,140,595,773
State (Regular & Special)	4,040,581,237	4,109,365,533
Judicial	73,514,720	74,766,188
Legislative	13,450,104	13,679,070
Participating Local Districts (Consolidated & Non-Consolidated)	<u>3,020,767,868</u>	<u>3,072,191,508</u>
Total	\$ 15,152,648,971	\$ 15,410,598,072

Investment Performance

The market value of assets for the total MainePERS DB assets returned a positive 2.89% during FY 2020. This is lower than the assumed return of 6.75% for FY 2020. The equivalent market value returns for the total MainePERS DB assets for FY 2019 and FY 2018 were positive 6.62% and positive 9.95%, respectively.

On an actuarial value of assets basis, the return for FY 2020 was a positive 5.88% for the total MainePERS DB assets. This return is greater than the return on a market value basis, but is still less than the 6.75% assumption for FY 2020. Therefore, this return gave rise to an investment loss on the total MainePERS DB assets this year.

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SECTION III – ASSETS

Cash Flow Projections

Table III-4 Projection of State and Teacher Program Benefit Payments and Contributions				
FY Ending June 30,	Expected Benefit Payments	Expected Employer Contributions	Expected Member Contributions	Total Expected Contributions
2021	\$ 923,183,000	\$ 396,207,000	\$ 161,044,000	\$ 557,251,000
2022	951,080,000	421,216,000	165,472,000	586,688,000
2023	979,099,000	432,831,000	170,023,000	602,854,000
2024	1,006,932,000	465,329,000	174,699,000	640,028,000
2025	1,035,328,000	478,152,000	179,503,000	657,655,000
2026	1,064,003,000	496,725,000	184,439,000	681,164,000
2027	1,092,808,000	510,408,000	189,511,000	699,919,000
2028	1,120,069,000	527,187,000	194,723,000	721,910,000
2029	1,146,416,000	191,482,000	200,078,000	391,560,000
2030	1,172,858,000	198,146,000	205,580,000	403,726,000

In Table III-4 above, we provide a projection of expected cash flows in and out of the Program for the next ten years for informational purposes. The Board may share these projections with its investment advisor for consideration of the gap shown between the cash expected to come into the Program through employer and member contributions and the cash expected to be paid out of the Program to provide benefit payments.

The expected benefit payments in Table III-4 were developed using the data currently included in this valuation and on the assumption that the actuarial assumptions disclosed in Appendix C will be exactly met. Actual benefit payments will vary if members retire sooner or later than assumed, if salary increases and actual future post-retirement COLAs differ from those assumed, or if other assumptions differ from the actual experience seen. These benefit projections exclude any assumption about new Program participants, whose experience will eventually lead to increased benefit payments. However, we do not feel this exclusion will materially impact the projections for the time period shown.

Expected employer contributions in this table use the budgeted contributions for FY 2021 through FY 2023. Future contributions beyond that point are developed based on the assumption that all actuarial assumptions will be exactly met in the projection period, including that the market value of assets will earn 6.75% per year, that payroll grows at 2.75% per year, and that these rates are based on following the biennial budgeting process. These future employer contributions are shown graphically in the baseline projection on page six.

The expected member contributions are similarly based on a 2.75% per year assumed increase in covered payroll multiplied by the current average aggregate member contribution rate of 7.71% for FY 2021.

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SECTION IV – LIABILITIES

In this section, we present detailed information on liabilities including:

- Disclosure of the Program’s liabilities as of June 30, 2019 and June 30, 2020;
- Statement of changes in these liabilities during the year; and
- An allocation of liabilities to the Teacher, State Regular, and State Special Plans.

Disclosure

Several types of liabilities are calculated and presented in this report. Each type is distinguished by the purpose for which the figures are ultimately used.

- **Present Value of Future Benefits (PVB):** Used for analyzing the overall financial obligations of the Program, this represents the amount of money needed today to fully fund all future benefits of the Program, assuming no new members, that active members continue to earn salary increases and accrue benefits under their current Program provisions, and that all actuarial assumptions are exactly met, including the 6.75% per year investment return.
- **Actuarial Liability (AL):** Used for funding calculations and GASB disclosures, this liability is calculated taking the PVB above and subtracting the value of accruals that are assigned to future years on a person-by-person basis. This offset is equal to the present value of future member contributions and future employer normal cost contributions under an acceptable actuarial funding method. For this Program and the other MainePERS Defined Benefit Programs, the method used is referred to as the entry age normal (EAN) funding method, which is the only acceptable actuarial funding method for GASB disclosures.
- **Present Value of Accrued Benefits (PVAB):** Used for communicating the liabilities for benefits accrued as of the valuation date.

Table IV-1 on the following page discloses each of these liabilities for the current and prior year’s valuations. With respect to the actuarial liability and the present value of accrued benefits, a subtraction of the appropriate value of the Program’s assets yields, for each respective type, a net surplus or an unfunded liability. For the PVB measure, it is compared to the market value of assets plus the expected future value of contributions to the Plan. The future employer contributions are calculated as the expected rates for each year times the expected future payroll as of each date. The future member contributions are calculated assuming the current average rate of 7.71% will be continued for all future years and applied to the expected future payroll as of each date. The difference between the PVB and these anticipated resources indicates either an expected shortfall or an expected surplus representing either additional funding required or excess funding and indicates the size of the Program’s stored gains or losses that remain outside of the valuation process currently.

We note that none of the liabilities presented in this report is an appropriate measure of a settlement liability.

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SECTION IV – LIABILITIES

**Table IV-1
Disclosure of Liabilities**

	June 30, 2019	June 30, 2020
Present Value of Benefits (PVB)		
Active Member Benefits	\$ 6,762,906,771	\$ 6,930,514,827
Retired, Disabled, Survivor, and Beneficiary Benefits	8,762,386,474	8,976,604,672
Terminated (Vested & Nonvested) Benefits	<u>698,294,520</u>	<u>691,687,657</u>
Total PVB	\$ 16,223,587,765	\$ 16,598,807,156
 Market Value of Assets (MVA)	 \$ 12,035,563,047	 \$ 12,044,916,279
Future Member Contributions	1,169,497,992	1,218,779,360
Future Employer Contributions	3,256,994,438	3,229,544,488
Projected (Surplus)/Shortfall	<u>(238,467,712)</u>	<u>105,567,029</u>
Total Resources	\$ 16,223,587,765	\$ 16,598,807,156
 Actuarial Liability (AL)		
Present Value of Benefits (PVB)	\$ 16,223,587,765	\$ 16,598,807,156
Present Value of Future Normal Costs (PVFNC)		
Employer Portion	506,866,860	514,567,666
Member Portion	<u>1,169,497,992</u>	<u>1,218,779,360</u>
Actuarial Liability (AL = PVB – PVFNC)	\$ 14,547,222,913	\$ 14,865,460,130
Actuarial Value of Assets (AVA)	<u>11,894,672,150</u>	<u>12,249,961,306</u>
Net (Surplus)/Unfunded (AL – AVA)	\$ 2,652,550,763	\$ 2,615,498,824
 Present Value of Accrued Benefits		
Present Value of Future Benefits (PVB)	\$ 16,223,587,765	\$ 16,598,807,156
Present Value of Future Benefit Accruals (PVFBA)	<u>2,869,253,008</u>	<u>2,960,607,188</u>
Accrued Liability (PVAB = PVB – PVFBA)	\$ 13,354,334,757	\$ 13,638,199,968
Market Value of Assets (MVA)	12,035,563,047	12,044,916,279
Net (Surplus)/Unfunded (PVAB – MVA)	\$ 1,318,771,710	\$ 1,593,283,689

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SECTION IV – LIABILITIES

Changes in Liabilities

Each of the liabilities disclosed in the prior table is expected to change at each subsequent valuation. The components of these changes, depending upon which liability is analyzed, can include:

- New Program members since the last valuation
- Benefits accrued since the last valuation
- Program amendments changing benefits since the last valuation
- Passage of time, which adds interest to the prior liability
- Benefits paid to members since the last valuation
- Members retiring, terminating, or dying at rates different than expected since the last valuation
- Salaries changing at rates different than expected since the last valuation
- A change in actuarial assumptions since the last valuation
- A change in the actuarial funding method since the last valuation

Unfunded liability measurements will change because of all of the above, as well as due to changes in the Program's asset measurements resulting from:

- Contributions being different than expected
- Investment earnings being different than expected
- A change in the method used to measure the Program's assets in developing the unfunded liability measure since the last valuation

In each valuation, we report on those elements of change in the Program's liability measures that are of particular significance, potentially affecting the long-term financial outlook of the Program. In Table IV-2 below, we present key changes in the Program's liability measures since the last valuation.

	Table IV-2		
	Present Value of Future Benefits	Actuarial Liability	Present Value of Accrued Benefits
Liability Measurement – June 30, 2019	\$ 16,223,587,765	\$ 14,547,222,913	\$ 13,354,334,757
Liability Measurement – June 30, 2020	<u>16,598,807,156</u>	<u>14,865,460,130</u>	<u>13,638,199,968</u>
Liability Measurement Increase/ (Decrease) Due to:	\$ 375,219,391	\$ 318,237,217	\$ 283,865,211
Program Amendment	\$ 1,419,989	\$ 1,223,156	\$ 1,173,136
Assumption Change	0	0	0
Actuarial (Gain)/Loss	N/C	162,293	N/C
Benefits Accumulated and Other Sources	\$ 373,799,402	\$ 316,851,768	\$ 282,692,075

N/C = Not calculated

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SECTION IV – LIABILITIES

Table IV-3 below presents the actuarial liability information for the Program in total as well as divided into the Teacher Program, the State Regular Plans, and the State Special Plans.

Table IV-3 Allocation of Actuarial Liability as of June 30, 2020				
	Total Program	Teacher Program	State Regular Plans	State Special Plans
1. Actuarial Liabilities for:				
a. Active Members	\$ 5,197,167,801	\$3,446,968,040	\$ 1,416,188,596	\$ 334,011,165
b. Retired, Disabled, Survivor, and Beneficiary Members	8,976,604,672	5,717,227,510	2,802,596,615	456,780,547
c. Terminated (Vested & Nonvested) Members	691,687,657	472,391,790	202,364,689	16,931,178
2. Total Actuarial Liability [1(a) + 1(b) + 1(c)]	\$ 14,865,460,130	\$9,636,587,340	\$ 4,421,149,900	\$ 807,722,890
3. Actuarial Value of Assets	<u>12,249,961,306</u>	<u>8,140,595,773</u>	<u>3,506,883,155</u>	<u>602,482,378</u>
4. Unfunded Actuarial Liability (2 – 3)	\$ 2,615,498,824	\$1,495,991,567	\$ 914,266,745	\$ 205,240,512

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SECTION V – CONTRIBUTIONS

In this section, we present detailed information on employer contribution rates as developed in this June 30, 2020 valuation for the Program, including:

- Development of the composite total employer contribution rate, including the composite employer normal cost rate and the composite unfunded actuarial liability (UAL) amortization rate (UAL rate);
- Summary of the employer normal cost rate, the UAL rate, and the total employer rate by Plan;
- Derivation and division of the composite UAL rate into the two-component Programs, Teacher and State; and
- Allocation of the UAL rate for the total State Program into each State Regular and Special Plan.

Note that these contribution rates are only informational and the actual contribution rates are set by the budgeting process described in the Board Summary at the beginning of this report.

Description of Rate Components

For the Plans in this Program, the funding methodology employed to determine the employer contribution rates is the entry age normal (EAN) funding method. Under this method, there are two components to the total employer contribution rate: the normal cost rate (NC rate) and the unfunded actuarial liability (UAL) amortization rate (UAL amortization rate). Both of these rates are developed separately for each Plan within the Program, consisting of the Teacher Plan, the State Regular Plan, and several State Special Plans.

An individual EAN cost rate is determined for each active member. The normal cost is determined by the following steps. First, an individual normal cost rate for each member is determined by taking the value of their projected future benefits, as of entry age into the Program. Second, this value is then divided by the value, also at entry age, of the member's expected future salary. Finally, the resulting total normal cost rate is reduced by the member contribution rate to produce the employer's normal cost rate for the member. These rates are then multiplied by each member's salary as of the valuation date and added together to get the total employer normal cost dollars as of the valuation date for the Program, which is then divided by the total payroll at the valuation date for the Program to get the employer normal cost rate for the Program. This process results in specific total and employer normal cost rates for each of the Plans in the Program.

The unfunded actuarial liability under the EAN funding method equals the present value, at the time of valuation, of the future benefit payments less the present value of future employer normal cost contributions, future member contributions, and current assets. The UAL amortization rate determined is the percentage that applied to member payroll, which is assumed to increase 2.75% per year, is expected to amortize the UAL according to the Program's amortization policy. Specifically, the remaining original UAL has nine years of its amortization period left, and all other gains, losses, and changes since then are amortized over individual twenty-year periods beginning on the date as of which they were first measured.

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SECTION V – CONTRIBUTIONS

Contribution Calculations

Table V-1 below presents and compares the composite total employer contribution rate, as well as its two components, for all Plans in the Program in aggregate as developed in this valuation and the prior one.

Table V-1 Composite Total Employer Rate		
Valuation Date	June 30, 2019	June 30, 2020
Composite Employer NC Rate	3.98%	3.88%
Composite UAL Amortization Rate	<u>16.08%</u>	<u>16.27%</u>
Composite Total Employer Rate	20.06%	20.15%

Table V-2 shows the employer NC rate, the UAL amortization rate, and the total employer rate for each Plan in the Program as well as the Program in total and divided into the Teacher and State Programs.

The liability and resulting necessary contributions associated with groups that no longer have any active participants as of the current valuation date are included with the State Regular Program.

Table V-2 Total Employer Contribution Rates by Plan					
Valuation Date	Total	Employee	Employer	UAL	Total
June 30, 2020	NC Rate	Contribution Rate	NC Rate	Contribution Rate	Employer Contribution Rate
Total Program	11.59%	7.71%	3.88%	16.27%	20.15%
Teacher Program	11.43%	7.65%	3.78%	14.91%	18.69%
State Program	11.86%	7.81%	4.05%	18.70%	22.75%
State Regular	11.55%	7.65%	3.90%	18.20%	22.10%
State Police*	20.97%	8.65%	12.32%	33.08%	45.40%
Inland F&W*	21.75%	8.65%	13.10%	34.29%	47.39%
Forest Rangers*	11.28%	8.65%	2.63%	17.77%	20.40%
25 & Out Plan	13.04%	8.65%	4.39%	20.54%	24.93%
1998 Special Plan	13.64%	8.65%	4.99%	21.50%	26.49%
Fire Marshals	18.87%	8.65%	10.22%	29.76%	39.98%

*Closed plan

Table V-3 that follows provides the development of the 16.27% UAL amortization rate for the Program as a whole and divided between the Teacher and State Programs.

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SECTION V – CONTRIBUTIONS

**Table V-3
Derivation of Unfunded Actuarial Liability Rates**

Valuation Date June 30, 2020	Teacher Program	State Program (Regular and Special Plans)	Total Program
1. Actuarial Liability (AL)	\$ 9,636,587,340	\$ 5,228,872,790	\$ 14,865,460,130
2. Actuarial Value of Assets (AVA)	<u>8,140,595,773</u>	<u>4,109,365,533</u>	<u>12,249,961,306</u>
3. Unfunded Actuarial Liability (UAL)	\$ 1,495,991,567	\$ 1,119,507,257	\$ 2,615,498,824
4. Remaining Balances of Prior Amortization Bases			
a. Original UAL Amount	\$ 1,216,460,007	\$ 700,470,424	\$ 1,916,930,431
b. 2012 (Gain)/Loss Base	27,582,578	24,573,418	52,155,996
c. 2013 (Gain)/Loss Base	(121,154,409)	136,176,994	15,022,585
d. 2014 (Gain)/Loss Base	(192,924,733)	(87,247,556)	(280,172,289)
e. 2015 (Gain)/Loss Base	3,654,543	(5,852,443)	(2,197,900)
f. 2016 (Gain)/Loss Base	171,994,066	192,713,688	364,707,754
g. 2017 (Gain)/Loss Base	104,378,501	18,979,258	123,357,759
h. 2018 (Gain)/Loss Base	111,957,300	29,311,576	141,268,876
i. 2019 (Gain)/Loss Base	146,940,856	24,531,072	171,471,928
j. 2020 (Gain)/Loss Base	<u>27,102,858</u>	<u>85,850,826</u>	<u>112,953,684</u>
k. Sum of the Bases	\$ 1,495,991,567	\$ 1,119,507,257	\$ 2,615,498,824
5. UAL Amortizations			
a. Original UAL Amount 8 Years	\$ 178,888,129	\$ 103,008,601	\$ 281,896,730
b. 2012 (Gain)/Loss Base 12 Years	2,904,646	2,587,760	5,492,406
c. 2013 (Gain)/Loss Base 13 Years	(11,985,916)	13,472,114	1,486,198
d. 2014 (Gain)/Loss Base 14 Years	(18,035,109)	(8,156,130)	(26,191,239)
e. 2015 (Gain)/Loss Base 15 Years	324,438	(519,561)	(195,123)
f. 2016 (Gain)/Loss Base 16 Years	14,563,423	16,317,836	30,881,259
g. 2017 (Gain)/Loss Base 17 Years	8,461,744	1,538,608	10,000,352
h. 2018 (Gain)/Loss Base 18 Years	8,718,741	2,282,656	11,001,397
i. 2019 (Gain)/Loss Base 19 Years	11,025,222	1,840,608	12,865,830
j. 2020 (Gain)/Loss Base 20 Years	<u>1,964,520</u>	<u>6,222,801</u>	<u>8,187,321</u>
k. Sum of Amortization Payments	\$ 196,829,838	\$ 138,595,293	\$ 335,425,131
6. Covered Payroll	\$ 1,318,948,228	\$ 741,674,497	\$ 2,060,622,725

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**Table V-3 (continued)
Derivation of Unfunded Actuarial Liability Rates**

Valuation Date June 30, 2020	Teacher Program	State Program (Regular and Special Plans)	Total Program
7. UAL Amortization Rates			
a. Original UAL Amount 8 Years	13.56%	13.89%	13.67%
b. 2012 (Gain)/Loss Base 12 Years	0.22%	0.35%	0.27%
c. 2013 (Gain)/Loss Base 13 Years	(0.91)%	1.82%	0.07%
d. 2014 (Gain)/Loss Base 14 Years	(1.37)%	(1.10)%	(1.27)%
e. 2015 (Gain)/Loss Base 15 Years	0.02%	(0.07)%	(0.01)%
f. 2016 (Gain)/Loss Base 16 Years	1.10%	2.20%	1.50%
g. 2017 (Gain)/Loss Base 17 Years	0.64%	0.21%	0.49%
h. 2018 (Gain)/Loss Base 18 Years	0.66%	0.31%	0.53%
i. 2019 (Gain)/Loss Base 19 Years	0.84%	0.25%	0.62%
j. 2020 (Gain)/Loss Base 20 Years	<u>0.15%</u>	<u>0.84%</u>	<u>0.40%</u>
k. Sum of UAL Amortization Rates	14.91%	18.70%	16.27%

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SECTION V – CONTRIBUTIONS

Table V-4 below shows the development of the UAL amortization rate for each specific Plan within the State Program.

Table V-4 Allocation of Unfunded Actuarial Liability Amortization Rate within State Program (Regular & Special Plans)								
Valuation Date June 30, 2020	Total State Program	State Regular Plan	State Police (Closed)	Inland F&W (Closed)	Forest Rangers (Closed)	25 & Out Plan	1998 Special Plan	Fire Marshals
1. Employer NC Rate	4.05%	3.90%	12.32%	13.10%	2.63%	4.39%	4.99%	10.22%
2. Member Contribution Rate	<u>7.81%</u>	<u>7.65%</u>	<u>8.65%</u>	<u>8.65%</u>	<u>8.65%</u>	<u>8.65%</u>	<u>8.65%</u>	<u>8.65%</u>
3. Total NC Rate	11.86%	11.55%	20.97%	21.75%	11.28%	13.04%	13.64%	18.87%
4. UAL Amortization Rates*								
a. Original UAL Amount	13.89%	13.53%	24.56%	25.47%	13.21%	15.27%	15.97%	22.10%
b. 2012 Loss Base	0.35%	0.34%	0.62%	0.64%	0.33%	0.38%	0.40%	0.56%
c. 2013 Loss Base	1.82%	1.77%	3.22%	3.34%	1.73%	2.00%	2.09%	2.90%
d. 2014 Gain Base	(1.10)%	(1.07)%	(1.94)%	(2.02)%	(1.05)%	(1.21)%	(1.27)%	(1.75)%
e. 2015 Gain Base	(0.07)%	(0.07)%	(0.12)%	(0.13)%	(0.07)%	(0.08)%	(0.08)%	(0.11)%
f. 2016 Loss Base	2.20%	2.14%	3.89%	4.03%	2.09%	2.42%	2.53%	3.50%
g. 2017 Loss Base	0.21%	0.20%	0.37%	0.39%	0.20%	0.23%	0.24%	0.33%
h. 2018 Loss Base	0.31%	0.30%	0.55%	0.57%	0.29%	0.34%	0.36%	0.49%
i. 2019 Loss Base	0.25%	0.24%	0.44%	0.46%	0.24%	0.27%	0.29%	0.40%
j. 2020 Loss Base	<u>0.84%</u>	<u>0.82%</u>	<u>1.49%</u>	<u>1.54%</u>	<u>0.80%</u>	<u>0.92%</u>	<u>0.97%</u>	<u>1.34%</u>
k. Sum of Amortization Rates	18.70%	18.20%	33.08%	34.29%	17.77%	20.54%	21.50%	29.76%

* The 18.70% UAL amortization rate for the State Program in total is allocated to each of the Plans within the Program based on the ratio of that Plan's total NC rate to the 11.86% total NC rate for the State Program in total.

The rates developed in this section are for informational purposes only. Actual budgeted rates are set based on the ratemaking process described in the Board Summary section.

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SECTION VI – FINANCIAL DISCLOSURE INFORMATION

This section contains financial disclosure information regarding the Program developed under a number of accounting standards and guidance.

First, for informational purposes, we show the Program's funded status under the Financial Accounting Standards Board (FASB) ASC Topic 960, which discloses how the market value of assets would compare to accrued liabilities if contributions were to stop and accrued benefit claims had to be satisfied as of the valuation date. However, due to potential legal requirements and the possibility that alternative interest rates would have to be used to determine the liabilities, these values may not be a good indication of the amount of money it would take to buy the benefits for all members if all provisions of the Program were to terminate. We have prepared the following exhibit in this section based on FASB ASC Topic 960:

- Table VI-1: Accrued Benefits information

The Governmental Accounting Standards Board (GASB) Statement Nos. 67 and 68 establish standards for disclosure of pension information by public employee retirement systems (PERS) and governmental employers in financial statements, notes to financial statements, and supplementary information. We have prepared the following exhibits reflecting provisions of GASB Statement Nos. 67 and 68:

- Table VI-2: Schedule of Changes in Net Pension Liability and Related Ratios
- Table VI-3: Sensitivity of Net Pension Liability to Changes in Discount Rate
- Table VI-4: Schedule of Employer Contributions
- Table VI-5: Average Expected Remaining Service Lives

A summary of the terminology used in GASB Statement Nos. 67 and 68 is provided in Appendix D of this report. Note that while much of the information provided in this report under GASB No. 67 is also utilized in GASB No. 68, Table VI-5 included in this section is only applicable to GASB No. 68.

Finally, we have also developed disclosure information in this section based on additional guidance relating to Comprehensive Annual Financial Reports (CAFRs) of PERS provided by the Government Finance Officers Association (GFOA) in their publication, *Governmental Accounting, Auditing, and Financial Reporting* (GAAFR). We have prepared the following exhibits reflecting guidance in the GAAFR:

- Table VI-6: Analysis of Financial Experience
- Table VI-7: Schedule of Funded Liabilities by Type

The present value of accrued benefits, the total pension liability (GASB 67/68), and the actuarial liability (GAAFR) disclosures in this section are all determined assuming that the Program is ongoing and participants continue to terminate employment, retire, etc., in accordance with the actuarial assumptions. Liabilities as of June 30, 2020 are discounted at the assumed valuation interest rate of 6.75% per annum in all of these disclosures.

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SECTION VI – FINANCIAL DISCLOSURE INFORMATION

Table VI-1 below includes the relevant amounts as of June 30, 2019 and June 30, 2020 as well as a reconciliation between the two dates under FASB ASC Topic 960.

Table VI-1 Accrued Benefits Information		
	June 30, 2019	June 30, 2020
FASB ASC Topic 960 Basis		
1. Present Value of Benefits Accrued to Date (PVAB)		
a. Members Currently Receiving Payments	\$ 8,762,386,474	\$ 8,976,604,672
b. Terminated Vested Members	698,294,520	691,687,657
c. Active Members	<u>3,893,653,763</u>	<u>3,969,907,639</u>
d. Total PVAB	\$ 13,354,334,757	\$ 13,638,199,968
2. Market Value of Assets (MVA)	<u>12,035,563,047</u>	<u>12,044,916,279</u>
3. Unfunded Present Value of Accrued Benefits, But Not Less Than Zero	\$ 1,318,771,710	\$ 1,593,283,689
4. Ratio of MVA to PVAB (2)/(1)(d)	90.1%	88.3%
Change in Present Value of Benefits Accrued to Date during FY 2020		
Increase/(Decrease) during Year Attributable to:		
Passage of Time	\$ 872,115,645	
Benefits Paid	(882,617,693)	
Assumption Changes	0	
Program Changes	1,173,136	
Benefits Accrued, Other Gains/Losses	<u>293,194,123</u>	
Net Increase (Decrease)	\$ 283,865,211	

Table VI-2 that follows shows the changes in the total pension liability (TPL), the Program's fiduciary net position (FNP) (i.e., fair value of the Program's net assets), and the net pension liability (NPL) during the measurement year ending June 30, 2020, as well as related ratios calculated under the provisions of GASB Statement No. 67 for the Program.

As of the June 30, 2020 valuation, the fiduciary net position for this Program was projected to be available to make all projected future benefit payments for current program members. As such, the long-term expected rate of return on the Program's investments was applied to all periods of projected benefit payments in determining the total pension liability under GASB Nos. 67 and 68. The projection of cash flows used to determine the discount rate assumed that member contributions will be made at the current contribution rates and the employer contributions will be made according to the actuarial calculations developed in the biennial ratemaking process.

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SECTION VI – FINANCIAL DISCLOSURE INFORMATION

Table VI-2
Schedule of Changes in Net Pension Liability and Related Ratios
FY 2020

	Teacher Program	State Program	Total State and Teacher Program
<u>Total Pension Liability (TPL)</u>			
Service Cost (SC)	\$ 149,793,957	\$ 81,432,146	\$ 231,226,103
Interest (Includes Interest on SC)	630,650,519	337,592,839	968,243,358
Changes of Benefit Terms	0	1,223,156	1,223,156
Differences Between Actual and Expected Experience	(51,874,123)	52,036,416	162,293
Changes of Assumptions	0	0	0
Benefit Payments, Including Refunds of Member Contributions	<u>(561,156,610)</u>	<u>(321,461,083)</u>	<u>(882,617,693)</u>
Net Change in TPL	167,413,743	150,823,474	318,237,217
Beginning of Year (BOY) TPL	<u>9,469,173,597</u>	<u>5,078,049,316</u>	<u>14,547,222,913</u>
End of Year (EOY) TPL	<u>\$9,636,587,340</u>	<u>\$5,228,872,790</u>	<u>\$14,865,460,130</u>
<u>Plan Fiduciary Net Position (FNP)</u>			
Employer Contributions	\$ 236,139,333	\$ 163,663,053	\$ 399,802,386
Member Contributions	99,374,942	52,063,906	151,438,848
Transfers	(1,014,421)	(1,184,686)	(2,199,107)
Net Investment Income	235,237,435	119,035,291	354,272,726
Benefit Payments, Including Refunds of Member Contributions	(561,156,610)	(321,461,083)	(882,617,693)
Administrative Expense	<u>(7,543,323)</u>	<u>(3,800,605)</u>	<u>(11,343,928)</u>
Net Change in FNP	1,037,356	8,315,876	9,353,232
BOY FNP	<u>8,003,297,686</u>	<u>4,032,265,361</u>	<u>12,035,563,047</u>
EOY FNP	<u>\$8,004,335,042</u>	<u>\$4,040,581,237</u>	<u>\$12,044,916,279</u>
EOY Net Pension Liability (NPL)	<u>\$1,632,252,298</u>	<u>\$1,188,291,553</u>	<u>\$ 2,820,543,851</u>
FNP as a Percentage of TPL	83.1%	77.3%	81.0%
Covered Payroll (Payroll)*	1,276,975,312	726,100,501	2,003,075,813
NPL as a Percentage of Payroll	127.8%	163.7%	140.8%

*For FY 2020

Notes to Schedule of Changes in Net Pension Liability and Related Ratios

None

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A ten-year schedule of changes in NPL and related ratios is to be included within the CAFR for PERS. However, based on GASB guidance, this ten-year history can be built one year at a time following implementation. We have shown only the current year of this *Schedule of Changes in Net Pension Liability and Related Ratios* above and believe that you can accumulate the individual years in the MainePERS CAFR to build this schedule to show the full ten-year schedule over time. Notes to this schedule should be included for any factors significantly impacting the trends reported within the period shown in this schedule at that time. As of June 30, 2020, we have not included such a note in the *Notes to Schedule of Changes in Net Pension Liability and Related Ratios* above. However, it is our expectation that the System's staff will make the final determination regarding any notes needed for this schedule and are available to provide any information they may need for this purpose.

Table VI-3 below illustrates the sensitivity of the net pension liability (NPL) to the discount rate. Changes in the discount rate affect the measurement of the total pension liability (TPL) for the Program. Lower discount rates produce a higher TPL, and higher discount rates produce a lower TPL. Because the discount rate does not affect the measurement of assets, the percentage change in the Net Pension Liability (NPL) can be very significant for relatively small changes in the discount rate.

**Table VI-3
Sensitivity of Net Pension Liability to Changes in Discount Rate
FY 2020**

	1% Decrease 5.750%	Discount Rate 6.750%	1% Increase 7.750%
Teacher Program			
Total Pension Liability (TPL)	\$10,835,139,652	\$ 9,636,587,340	\$ 8,637,619,318
Plan Fiduciary Net Position (FNP)	<u>8,004,335,042</u>	<u>8,004,335,042</u>	<u>8,004,335,042</u>
Net Pension Liability (NPL)	<u>\$ 2,830,804,610</u>	<u>\$ 1,632,252,298</u>	<u>\$ 633,284,276</u>
FNP as a Percentage of TPL	73.9%	83.1%	92.7%
State Program			
Total Pension Liability (TPL)	\$ 5,448,670,890	\$ 5,228,872,790	\$ 4,437,485,184
Plan Fiduciary Net Position (FNP)	<u>4,040,581,237</u>	<u>4,040,581,237</u>	<u>4,040,581,237</u>
Net Pension Liability (NPL)	<u>\$ 1,408,089,653</u>	<u>\$ 1,188,291,553</u>	<u>\$ 396,903,947</u>
FNP as a Percentage of TPL	74.2%	77.3%	91.1%
Total State and Teacher Program			
Total Pension Liability (TPL)	\$16,283,810,542	\$14,865,460,130	\$13,075,104,502
Plan Fiduciary Net Position (FNP)	<u>12,044,916,279</u>	<u>12,044,916,279</u>	<u>12,044,916,279</u>
Net Pension Liability (NPL)	<u>\$ 4,238,894,263</u>	<u>\$ 2,820,543,851</u>	<u>\$ 1,030,188,223</u>
FNP as a Percentage of TPL	74.0%	81.0%	92.1%

A one percent decrease in the discount rate increases the TPL for the total Program by approximately 10% and increases the NPL by approximately 50%. A one percent increase in the discount rate decreases the TPL by approximately 12% and decreases the NPL by approximately 63%.

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SECTION VI – FINANCIAL DISCLOSURE INFORMATION

Table VI-4 that follows provides information relating to the employer contributions for the Program. Under GASB Statement No. 67, if an actuarially determined contribution (ADC) or a contractually or statutorily required contribution (CRC) is developed for a single employer or cost-sharing plan, the following schedule is required. For purposes of this schedule, an ADC is a contribution amount determined in accordance with Actuarial Standards of Practice and a CRC is based on statutory or contractual requirements. Both should exclude any amounts to finance specific liabilities of individual employers of the plan. If an ADC is available, the schedule of employer contributions should be developed on that basis. If there is no ADC, but there is a CRC, the schedule should be developed on that basis. Only if neither an ADC nor a CRC is developed can this schedule be omitted from the PERS's CAFR.

The Program's rates set in the ratemaking process meet the definition of an ADC, so for this Program, this schedule should be developed on that basis. Based on GASB guidance, a full ten years of information should be shown in this schedule if it is available, but this ten-year history can be built one year at a time following implementation. We have shown only the current year of this *Schedule of Employer Contributions* below and believe that you can accumulate these in the MainePERS CAFR to build this schedule to show the full ten-year schedule over time.

Only the current year of the *Notes to Schedule of Employer Contributions* below needs to be included in the notes to this schedule. However, any factors that significantly affect trends in the *Schedule of Employer Contributions* at any point in the ten-year period should also be included in the notes to this schedule. We believe such a note may be needed to indicate the change in assumptions that were recognized in the 2017 valuation that was the basis of this ADC, but it is our expectation that the System's staff will make the final determination regarding any notes needed for this schedule and are available to provide any additional information that they may need for this purpose.

**Table VI-4
Schedule of Employer Contributions
FY 2020**

	Teacher Program	State Program	Total State and Teacher Program
Actuarially Determined Contribution (ADC)	\$ 236,112,735	\$ 163,663,053	\$ 399,775,788
Contributions in Relation to the ADC	236,112,735	163,663,053	399,775,788
Contribution Deficiency/(Excess)	<u>\$ 0</u>	<u>\$ 0</u>	<u>\$ 0</u>
Covered Payroll (Payroll)	\$1,276,975,312	\$ 726,100,501	\$ 2,003,075,813
Contributions as a Percentage of Payroll	18.49%	22.54%	19.96%

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Notes to Schedule of Employer Contributions

Valuation Date: June 30, 2017

Timing: June 30, 2020 ADC rates are calculated based on 2018 liabilities developed as a roll-forward of the 2017 valuation liability, adjusted for expected experience and any assumption or methodology changes during FY 2018 using preliminary actual assets as of June 30, 2018.

Key Methods and Assumptions Used to Determine Contribution Rates

Actuarial Cost Method: Entry age normal

Asset Valuation Method: Three-year smoothed market

Amortization Method: Level percentage of payroll, closed 10-year amortization of UAL prior to 2012 and individual, closed, level percent of payroll, 20-year amortization of UAL arising each year beginning in 2012.

Discount Rate: 6.75%

Amortization
Growth Rate: 2.75%

Price Inflation: 2.75%

Salary Increases: 2.75% plus merit component based on employee's years of service

Mortality: State Employee Program: 104% and 120% of the RP-2014 Total Dataset Healthy Annuitant Mortality Table, respectively, for males and females, using the RP-2014 Total Dataset Employee Mortality Table for ages prior to the start of the Healthy Annuitant Mortality Table, both projected from the 2006 base rates using MP_2015 model with an ultimate rate of 0.85% for ages 20-85 grading down to an ultimate rate of 0.00% for ages 111-120, and convergence to the ultimate rate in the year 2020.

Teacher Program: 99% of the RP-2014 Total Dataset Healthy Annuitant Mortality Table for both males and females, using the RP-2014 Total Dataset Employee Mortality Table for ages prior to the start of the Healthy Annuitant Mortality Table, respectively, both projected using the RPEC_2015 model, with an ultimate rate of 0.85% for ages 20-85, grading down to an ultimate rate of 0.00% for ages 111-120, and convergence to the ultimate rate in the year 2020.

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SECTION VI – FINANCIAL DISCLOSURE INFORMATION

A complete description of the methods and assumptions used to determine contribution rates for the year ending June 30, 2020 can be found in the June 30, 2018 actuarial valuation report.

Other Information

None

Table VI-5 that follows is provided in this report at the request of MainePERS staff, showing the development of the average remaining service life for the Program. GASB No. 68 requires some items be recognized by employers into pension expense over a period “equal to the average of the expected remaining service lives of all employees that are provided with pensions through the pension plan (active employees and inactive employees) determined as of the beginning of the measurement period.” For the current measurement year ending on June 30, 2020, these values are thus developed as of June 30, 2019. The development of this value is shown below, including reflection of the decision by MainePERS to round the resulting value to the nearest whole year. Note that the decision was made to apply GASB No. 68 separately to the Teacher Program and the State Program based upon paragraph 19 of that statement, so this value has been provided separately for these Programs.

Table VI-5 Average Expected Remaining Service Lives For Measurement Year Ending June 30, 2020			
<u>Teacher Program</u>			
Status	Total Expected Future Service	Count	Average Remaining Service Lives
Active Members	282,318	27,441	10
In-Pay Members	0	21,189	0
Terminated Vested Members	0	5,161	0
Inactives Due Refunds	<u>0</u>	<u>30,670</u>	<u>0</u>
Total Membership	282,318	84,461	3
<u>State Program</u>			
Status	Total Expected Future Service	Count	Average Remaining Service Life
Actives	110,060	12,435	9
In-Pay Members	0	15,282	0
Terminated Vested Members	0	3,027	0
Inactives Due Refunds	<u>0</u>	<u>7,970</u>	<u>0</u>
Total Membership	110,060	38,714	3

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SECTION VI – FINANCIAL DISCLOSURE INFORMATION

Table VI-6 below is a gain/loss analysis of the changes in the actuarial liability over the past six years, reflecting variances between actual experience and assumed experience for different kinds of risk as specified in the GFOA GAAFR.

Table VI-6 Analysis of Financial Experience Gain and Loss in Actuarial Liability During Fiscal Years Ended June 30 Resulting from Differences Between Assumed Experience and Actual Experience						
Type of Activity	Gain (or Loss) For Fiscal Year Ended June 30, 2015	Gain (or Loss) For Fiscal Year Ended June 30, 2016	Gain (or Loss) For Fiscal Year Ended June 30, 2017	Gain (or Loss) For Fiscal Year Ended June 30, 2018	Gain (or Loss) For Fiscal Year Ended June 30, 2019	Gain (or Loss) For Fiscal Year Ended June 30, 2020
Investment Income	\$ (67,533,511)	\$(284,220,804)	\$ (18,117,992)	\$ 94,329,730	\$ 57,985,155	\$(102,951,302)
Combined Liability Experience	<u>44,287,643</u>	<u>(81,506,701)</u>	<u>(95,207,531)</u>	<u>(34,151,279)</u>	<u>(208,719,412)</u>	<u>(162,293)</u>
Gain (or Loss) during Year from Financial Experience	\$ (23,245,868)	\$(365,727,505)	\$ (113,325,523)	\$ 60,178,451	\$ (150,734,257)	\$(103,113,595)
Non-Recurring Items	<u>0</u>	<u>(30,436,605)</u>	<u>0</u>	<u>(191,998,939)</u>	<u>0</u>	<u>(1,223,156)</u>
Composite Gain (or Loss) During Year	\$ (23,245,868)	\$(396,164,110)	\$ (113,325,523)	\$ (131,820,488)	\$ (150,734,257)	\$ (104,336,751)

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SECTION VI – FINANCIAL DISCLOSURE INFORMATION

Table VI-7 below compares the Program's assets as of each valuation date shown to the Program's actuarial liability divided into three separate groups: liabilities for contributions on deposit for current active members, liabilities for future benefits for inactive members, and employer-financed liabilities for current active members. This Schedule of Funded Liabilities by Type is used to assess funding progress based on what percentage of the liabilities for each of these groups the Program's assets are sufficient to cover. Per GFOA guidance, this schedule is to include this assessment for the ten most recent years and notes to this schedule should be provided to explain any factors that affect the comparability of the data. We do not believe such a note is needed for the measurement year ending June 30, 2020, but it is our expectation that the System's staff will make the final determination regarding any notes needed for this schedule.

Table VI-7 Schedule of Funded Liabilities by Type							
Aggregate Actuarial Liabilities for:							
Valuation Date	(1) Active Member Contributions	(2) Retirees, Vested Terms, Beneficiaries	(3) Active Members (Employer Financed Portion)	Reported Assets *	Portion of Actuarial Liabilities Covered by Reported Assets		
June 30,					(1)	(2)	(3)
2020	\$2,600,834,192	\$9,668,292,329	\$2,596,333,609	\$12,249,961,306	100%	100%	0%
2019	2,499,498,544	9,460,680,994	2,587,043,375	11,894,672,150	100	99	0
2018	2,453,797,249	9,030,789,541	2,546,601,055	11,419,986,652	100	99	0
2017	2,402,112,525	8,727,549,999	2,355,223,988	10,904,082,221	100	97	0
2016	2,359,818,665	8,399,121,582	2,311,014,701	10,512,524,178	100	97	0
2015	2,339,138,044	7,831,348,903	2,445,800,107	10,375,552,497	100	100	8
2014	2,315,075,905	7,572,038,284	2,433,044,594	10,017,512,006	100	100	5
2013	2,290,505,939	7,181,259,077	2,358,884,866	9,177,749,627	100	96	0
2012	2,271,164,594	6,656,860,191	2,625,281,496	8,880,730,120	100	99	0
2011	2,229,984,967	6,453,384,730	2,598,295,489	8,736,885,121	100	100	2

* Reported assets are measured at actuarial value. Results would be different if the market value of assets were used. Despite the name of this exhibit, the liabilities presented in this schedule are not an appropriate measurement of the settlement liability of the Program.

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Active Member Data as of June 30, 2020	
<u>Teacher Plan</u>	
Count	27,565
Average Current Age	46.0
Average Benefit Service	12.2
Average Vesting Service	12.3
Average Valuation Pay	\$ 47,849
<u>State Employee Regular Plan</u>	
Count	11,132
Average Current Age	48.1
Average Benefit Service	11.6
Average Vesting Service	12.0
Average Valuation Pay	\$ 55,894
<u>Forest Rangers Special Plan (Closed Plan)</u>	
Count	1
Average Current Age	61.6
Average Benefit Service	41.1
Average Vesting Service	41.1
Average Valuation Pay	\$118,132
<u>Inland Fisheries & Wildlife Officers Special Plan (Closed Plan)</u>	
Count	1
Average Current Age	64.9
Average Benefit Service	42.2
Average Vesting Service	42.2
Average Valuation Pay	\$ 75,307
<u>State Police Special Plan (Closed Plan)</u>	
Count	1
Average Current Age	66.8
Average Benefit Service	42.9
Average Vesting Service	42.9
Average Valuation Pay	\$ 83,612

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Active Member Data as of June 30, 2020

State Employee Special 25 & Out Plan

Count	469
Average Current Age	41.6
Average Benefit Service	14.9
Average Vesting Service	15.3
Average Valuation Pay	\$ 85,593

State Employee 1998 Special Plan

Count	1,213
Average Current Age	43.3
Average Benefit Service	11.7
Average Vesting Service	12.0
Average Valuation Pay	\$ 64,175

Fire Marshal Special Plan

Count	13
Average Current Age	45.9
Average Benefit Service	11.0
Average Vesting Service	16.8
Average Valuation Pay	\$ 92,321

State Employee Totals (Excludes Teachers)

Count	12,830
Average Current Age	47.4
Average Benefit Service	11.7
Average Vesting Service	12.2
Average Valuation Pay	\$ 57,808

**Non-Active Member Data as of June 30, 2020
Teachers**

	Count	Average Age	Total Annual Benefit	Average Annual Benefit
Retired	17,804	73.3	\$ 487,081,132	\$ 27,358
Retired – Concurrent Beneficiary	1,377	73.8	8,401,881	6,102
Disability – Section 1122	0		0	0
Disability – Section 3 and 3A	683	68.9	20,463,614	29,961
Beneficiary of Above	1,590	73.6	28,019,800	17,623
Pre-Retirement Death Beneficiary	277	63.1	1,752,738	6,328
Terminated Vested	5,162	52.7	45,381,152	8,791
Inactive Due Refund	29,609	NA	NA	NA

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Non-Active Member Data as of June 30, 2020 State Regular				
	Count	Average Age	Total Annual Benefit	Average Annual Benefit
Retired	9,924	73.2	\$ 218,595,424	\$ 22,027
Retired – Concurrent Beneficiary	971	72.8	5,196,178	5,351
Disability – Section 1122	1	92.5	19,825	19,825
Disability – Section 3 and 3A	826	67.1	20,513,660	24,835
Beneficiary of Above	1,935	65.3	28,494,985	14,726
Pre-Retirement Death Beneficiary	291	67.7	1,825,630	6,274
Terminated Vested	2,658	52.8	21,199,681	7,976
Inactive Due Refund	7,037	NA	NA	NA

Non-Active Member Data as of June 30, 2020 State Special				
	Count	Average Age	Total Annual Benefit	Average Annual Benefit
Retired	1,003	68.6	\$ 32,136,803	\$ 32,041
Retired – Concurrent Beneficiary	143	66.8	944,049	6,602
Disability – Section 1122	1	89.6	20,478	20,478
Disability – Section 3 and 3A	78	61.0	2,269,941	29,102
Beneficiary of Above	231	72.1	3,962,129	17,152
Pre-Retirement Death Beneficiary	16	45.2	89,363	5,585
Terminated Vested	337	45.8	2,499,739	7,418
Inactive Due Refund	1,007	NA	NA	NA

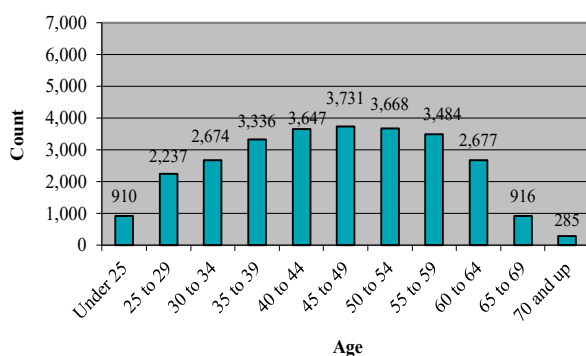
**MAINE PUBLIC EMPLOYEES RETIREMENT SYSTEM
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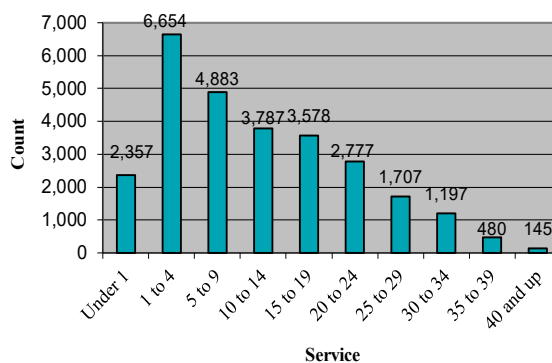
**Distribution of Active Members
As of June 30, 2020**

	Teachers											Totals
	Years of Service											
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 and up		
Under 25	473	437	0	0	0	0	0	0	0	0	910	
25 to 29	341	1,414	482	0	0	0	0	0	0	0	2,237	
30 to 34	283	977	1,105	309	0	0	0	0	0	0	2,674	
35 to 39	292	958	751	984	351	0	0	0	0	0	3,336	
40 to 44	265	825	682	624	934	317	0	0	0	0	3,647	
45 to 49	210	680	644	559	604	807	226	1	0	0	3,731	
50 to 54	164	524	501	513	582	530	653	201	0	0	3,668	
55 to 59	131	400	340	391	536	494	393	620	179	0	3,484	
60 to 64	95	279	240	291	430	469	302	280	233	58	2,677	
65 to 69	69	108	102	87	116	130	111	71	51	71	916	
70 and up	34	52	36	29	25	30	22	24	17	16	285	
Total	2,357	6,654	4,883	3,787	3,578	2,777	1,707	1,197	480	145	27,565	

Age Distribution



Service Distribution



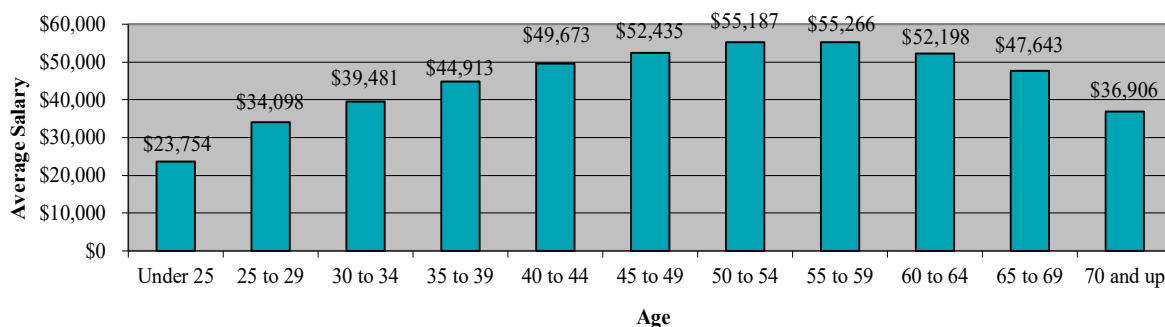
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**Distribution of Active Members
As of June 30, 2020**

Teachers											
	Average Salary Years of Service										Average
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 and up	
Under 25	16,719	31,369	0	0	0	0	0	0	0	0	23,754
25 to 29	19,522	34,752	42,491	0	0	0	0	0	0	0	34,098
30 to 34	20,883	35,211	44,836	50,862	0	0	0	0	0	0	39,481
35 to 39	22,629	35,738	45,093	54,797	60,398	0	0	0	0	0	44,913
40 to 44	20,257	34,417	45,583	57,016	63,020	68,985	0	0	0	0	49,673
45 to 49	19,112	34,158	44,033	52,688	64,118	68,695	72,162	111,554	0	0	52,435
50 to 54	22,964	33,249	42,768	51,032	60,122	69,029	72,553	73,016	0	0	55,187
55 to 59	18,701	33,101	42,242	44,982	54,254	61,720	68,874	72,761	73,499	0	55,266
60 to 64	16,104	29,080	34,922	43,037	51,424	56,224	64,499	70,868	74,153	70,781	52,198
65 to 69	14,019	26,400	32,934	38,825	49,386	55,424	60,577	66,891	71,315	70,998	47,643
70 and up	12,552	16,280	24,893	32,882	40,484	52,752	56,498	55,843	63,241	71,394	36,906
Average	19,348	33,901	43,367	51,568	59,170	64,651	69,244	71,706	73,221	70,955	47,849

Average Salary Distribution



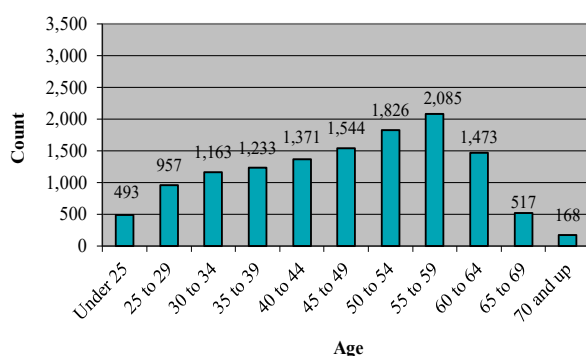
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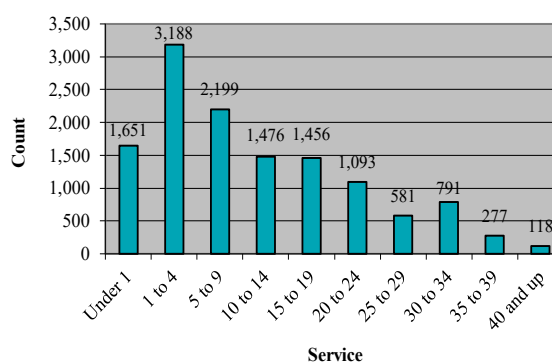
**Distribution of Active Members
As of June 30, 2020**

	State											Totals
	Years of Service											
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 and up		
Under 25	293	196	4	0	0	0	0	0	0	0	493	
25 to 29	264	548	144	1	0	0	0	0	0	0	957	
30 to 34	212	506	372	71	2	0	0	0	0	0	1,163	
35 to 39	195	382	317	232	101	6	0	0	0	0	1,233	
40 to 44	154	342	272	243	254	104	2	0	0	0	1,371	
45 to 49	143	338	252	212	254	263	68	14	0	0	1,544	
50 to 54	160	307	256	223	240	253	185	194	8	0	1,826	
55 to 59	143	288	268	219	280	226	164	349	137	11	2,085	
60 to 64	59	190	206	190	231	169	116	172	95	45	1,473	
65 to 69	18	58	93	71	66	60	32	50	26	43	517	
70 and up	10	33	15	14	28	12	14	12	11	19	168	
Total	1,651	3,188	2,199	1,476	1,456	1,093	581	791	277	118	12,830	

Age Distribution



Service Distribution



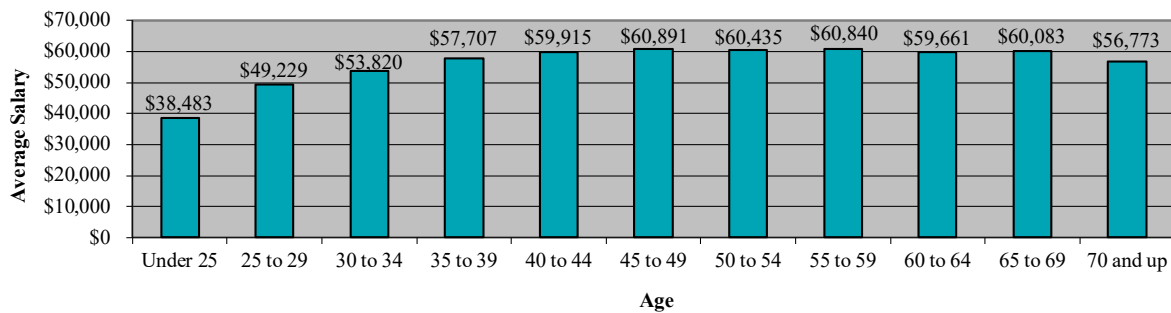
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APPENDIX A – MEMBERSHIP INFORMATION

**Distribution of Active Members
As of June 30, 2020**

	State											
	Average Salary											
	Years of Service											
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 and up	Average	
Under 25	33,351	46,092	41,512	0	0	0	0	0	0	0	38,483	
25 to 29	41,778	50,649	57,533	42,626	0	0	0	0	0	0	49,229	
30 to 34	43,739	51,798	60,397	63,596	63,846	0	0	0	0	0	53,820	
35 to 39	43,551	55,018	60,689	65,003	68,283	71,256	0	0	0	0	57,707	
40 to 44	42,831	53,264	60,183	66,203	67,930	71,543	89,304	0	0	0	59,915	
45 to 49	40,733	52,777	59,021	62,202	65,813	73,840	76,197	69,578	0	0	60,891	
50 to 54	39,398	49,353	57,309	59,528	65,018	69,295	74,172	69,794	69,407	0	60,435	
55 to 59	39,896	52,104	57,656	59,154	64,282	65,464	70,605	67,033	68,063	58,329	60,840	
60 to 64	36,656	48,766	54,349	58,130	60,887	64,782	66,807	68,118	69,841	68,857	59,661	
65 to 69	25,342	49,832	52,800	60,149	61,796	64,278	72,535	71,061	71,637	66,590	60,083	
70 and up	29,313	37,282	69,550	63,609	51,085	54,891	71,007	82,230	69,380	65,655	56,773	
Average	39,920	51,322	58,514	61,889	64,679	68,690	71,818	68,476	69,100	66,534	57,808	

Average Salary Distribution



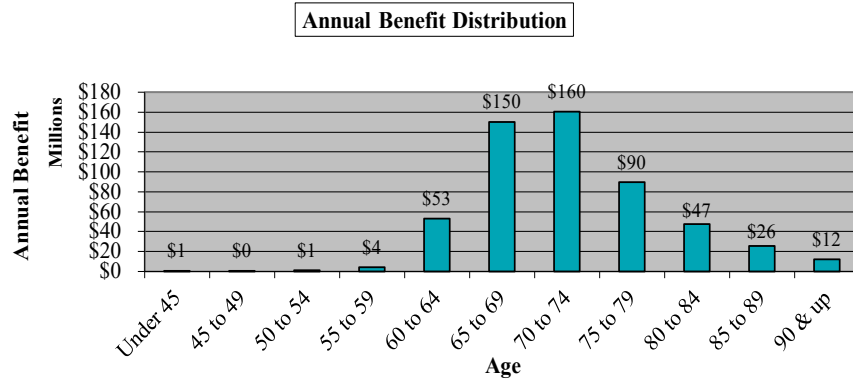
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**Distribution of Retirees, Disabled
Members, Beneficiaries, and Survivors
As of June 30, 2020**

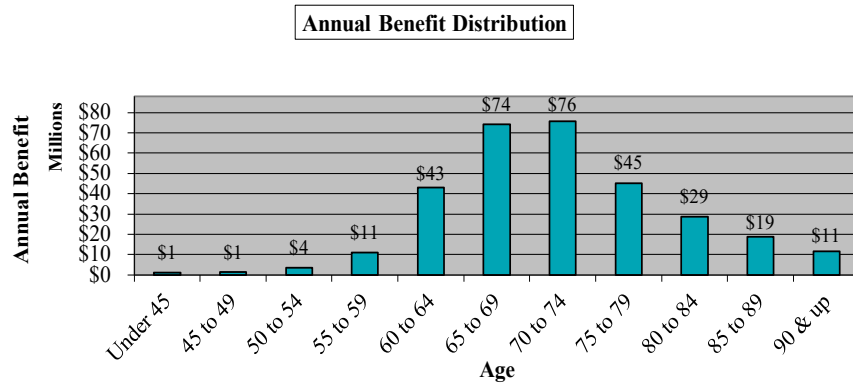
Teachers

Age	Count	Annual Benefit
Under 45	136	\$ 875,976
45 to 49	53	442,868
50 to 54	91	1,198,543
55 to 59	217	4,346,581
60 to 64	1,860	53,221,002
65 to 69	5,553	150,220,936
70 to 74	6,247	160,483,414
75 to 79	3,689	89,560,142
80 to 84	2,046	47,492,013
85 to 89	1,189	25,889,263
90 & up	<u>650</u>	<u>11,988,427</u>
Total	21,731	\$ 545,719,165



State

Age	Count	Annual Benefit
Under 45	131	\$ 1,066,610
45 to 49	108	1,260,931
50 to 54	213	3,633,387
55 to 59	537	11,038,483
60 to 64	1,965	43,109,979
65 to 69	3,526	74,269,432
70 to 74	3,589	75,799,338
75 to 79	2,192	45,228,771
80 to 84	1,465	28,580,394
85 to 89	1,022	18,637,249
90 & up	<u>672</u>	<u>11,443,892</u>
Total	15,420	\$ 314,068,466



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APPENDIX A – MEMBERSHIP INFORMATION

Status Reconciliation - Teachers						
	Active Members	Retired Members	Beneficiaries of Retired Members	Survivors of Deceased Members	Disabled Members ¹	Terminated Vested Members ²
As of June 30, 2019	27,441	17,313	2,929	280	667	5,161
New hires	1,877					
Rehires	552					(205)
Movement between plans	(3)					(4)
New retirees	(390)	894				(500)
New beneficiaries due to retirements			52			
New disabled retirees	(17)				24	(6)
New deferred vested members	(784)					844
Non-vested terminations	(930)					
Refunds	(160)					(104)
Deaths, no future benefits	(10)	(309)	(87)	(8)	(15)	(11)
Deaths with a survivor or beneficiary	(11)	(78)	74	10	(8)	(10)
Benefits expired				(5)		
Data correction		(16)	(1)		15	(3)
As of June 30, 2020	27,565	17,804	2,967	277	683	5,162

1. Former disabled retirees who have changed to service retirement as mandated by the Plan are still included as disabled members.

2. Terminated vested members includes those indicated to us in the data who have terminated and are eligible for a future annuity.

Status Reconciliation - State Regular and Special Groups						
	Active Members	Retired Members	Beneficiaries of Retired Members	Survivors of Deceased Members	Disabled Members ¹	Terminated Vested Members ²
As of June 30, 2019	12,435	10,758	3,297	320	907	3,027
New hires	1,444					
Rehires	145					(50)
Movement between plans	(6)					(9)
New retirees	(353)	524				(172)
New beneficiaries due to retirements			51			
New disabled retirees	(13)				20	(6)
New deferred vested members	(212)					293
Non-vested terminations	(484)					
Refunds	(114)					(68)
Deaths, no future benefits	(3)	(256)	(167)	(15)	(17)	(14)
Deaths with a survivor or beneficiary	(9)	(90)	101	5	(12)	(3)
Benefits expired				(3)		
Data correction		(9)	(2)	-	8	(3)
As of June 30, 2020	12,830	10,927	3,280	307	906	2,995

1. Former disabled retirees who have changed to service retirement as mandated by the Plan are still included as disabled members.

2. Terminated vested members includes those indicated to us in the data who have terminated and are eligible for a future annuity.

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APPENDIX B – SUMMARY OF PROGRAM PROVISIONS

1. Membership

Membership is a condition of employment for state employees and teachers, and optional for elected and appointed officials.

Membership ceases on the earlier of withdrawal of contributions, retirement, or death.

2. Member Contributions

Except as otherwise described below, members are required to contribute 7.65% of earnable compensation. Member contributions earn annual interest at the rate adopted by the Board of Trustees each February.

Contribution Requirements for Special State Employee Groups

State police and inland fisheries and wildlife officers employed before September 1, 1984: required to contribute 8.65% of earnable compensation for 20 years of service and 7.65% thereafter.

Forest rangers employed before September 1, 1984: required to contribute 8.65% of earnable compensation until eligible for retirement and 7.65% thereafter.

1998 Special Plan employees, which includes state prison employees, airplane pilots, forest rangers, defense, veterans and emergency management firefighters employed at Bangor International Airport, corrections employees, Baxter State Park Authority rangers, State Fire Marshal and state fire marshal inspectors, oil and hazardous materials emergency response workers, and capitol security officers: required to contribute 8.65% of earnable compensation for 25 years and 7.65% thereafter.

State police employed on or after September 16, 1984 and special agent investigators hired before June 21, 1982: required to contribute 8.65% of earnable compensation for 25 years and 7.65% thereafter.

Inland fisheries and wildlife officers and marine resources officers employed on or after September 1, 1984: required to contribute 8.65% of earnable compensation for 25 years and 7.65% thereafter.

Fire marshal investigators and fire marshal sergeants: required to contribute 8.65% of earnable compensation until eligible for retirement and 7.5% thereafter.

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3. Average Final Compensation

For purposes of determining benefits payable, average final compensation is the average annual rate of earnable compensation for the three years of creditable service (not necessarily consecutive) that produce the highest such average.

For compensation paid on or after July 1, 1993, increases in earnable compensation of greater than 5% per year or greater than 10% over the highest three years are not included in calculating average final compensation unless the employer pays the cost of including such compensation. Earnable compensation does not include sick and vacation pay for those members who had less than ten years of service at July 1, 1993. For members for whom sick and vacation pay is includable in earnable compensation, these payments are included in applying the caps described above.

4. Creditable Service

Creditable service includes service while a member, certain service prior to the establishment of the Program, purchased service credit of which there are several types, and service while receiving disability benefits under the Program.

5. Service Retirement Benefits

A. Regular Plan (State Employees and Teachers)

- i. Provisions for Members with at Least Ten Years of Creditable Service on July 1, 1993

Normal Retirement Age: 60

Eligibility for Members in Active Service and Inactive Members: 25 years of creditable service.

Eligibility Alternative for Members in Active Service: At least one year of creditable service immediately before retirement and at least normal retirement age.

Eligibility for Members not in Active Service at Retirement and not in Active Service on or after October 1, 1999: At least ten years of creditable service and at least normal retirement age.

Eligibility for Members not in Active Service at Retirement, but in Active Service on or after October 1, 1999: At least five years of creditable service and at least normal retirement age.

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Benefit: 1/50 of average final compensation multiplied by years of creditable service and up to 25 years of prior service, reduced by the following approximate percentages for each year retirement age is less than age 60.

Age	Reduction	Age	Reduction
45	29.3%	53	16.6%
46	28.0	54	14.6
47	26.6	55	12.5
48	25.2	56	10.3
49	23.6	57	7.9
50	22.0	58	5.4
51	20.3	59	2.8
52	18.5	60	0.0

Form of Payment: Life annuity

- ii. Provisions for Members with Less Than Ten Years of Creditable Service on July 1, 1993

Normal Retirement Age: 62

Eligibility for Members in Active Service and Inactive Members: 25 years of creditable service.

Eligibility Alternative for Members in Active Service: At least one year of creditable service immediately before retirement age and at least normal retirement age.

Eligibility for Members not in Active Service at Retirement and not in Active Service on or after October 1, 1999: At least ten years of creditable service and at least normal retirement age.

Eligibility for Members not in Active Service at Retirement, but in Active Service on or after October 1, 1999: At least five years of creditable service and at least normal retirement age.

Benefit: 1/50 of average final compensation multiplied by years of membership service and up to 25 years of prior service, reduced by 6% for each year retirement age is less than age 62.

Form of Payment: Life annuity

- iii. Provisions for Members with Less Than Five Years of Creditable Service on July 1, 2011

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Normal Retirement Age: 65

Eligibility for Members in Active Service and Inactive Members: 25 years of creditable service.

Eligibility Alternative for Members in Active Service: At least one year of creditable service immediately before retirement age and at least normal retirement age.

Eligibility for Members not in Active Service at Retirement and not in Active Service on or after October 1, 1999: At least ten years of creditable service and at least normal retirement age.

Eligibility for Members not in Active Service at Retirement, but in Active Service on or after October 1, 1999: At least five years of creditable service and at least normal retirement age.

Benefit: $\frac{1}{50}$ of average final compensation multiplied by years of membership service and up to 25 years of prior service, reduced by 6% for each year retirement age is less than age 65.

Form of Payment: Life annuity.

B. Special Plans (State Employees)

- i. State Police Employed Before September 16, 1984 and Inland Fisheries and Wildlife Officers Employed Before September 1, 1984

Eligibility: 20 years of creditable service in named positions.

Benefit: One-half of average final compensation plus 2% for each year of service in excess of 20. If greater, the pro-rated portion of the benefit for service before July 1, 1976, is based on annual pay instead of average final pay.

Form of Payment: 50% joint and survivor annuity or life annuity.

- ii. Forest Rangers Employed Before September 1, 1984

Eligibility: Age 50 with 25 years of creditable service as a forest ranger.

Benefit: One-half of average final compensation plus 2% for each year of service earned after qualification for retirement. If greater, the pro-rated portion of the benefit for service before July 1, 1976, is based on annual pay instead of average final pay.

Form of Payment: Life annuity

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iii. 1998 Special Plan

1998 Entrants: State prison employees, airline pilots, forest rangers, and liquor inspectors, employed after August 31, 1984; defense, veterans, and emergency management firefighters employed on and after July 1, 1998.

2000 Entrants: Baxter State Park Authority rangers, correctional employees, and State Fire Marshal and state fire marshal inspectors employed on or after January 1, 2000.

2002 Entrants: Capitol Police and oil and hazardous materials emergency response workers.

Eligibility: Ten years of creditable service under the 1998 Special Plan in one or a combination of the covered capacities and the attainment of age 55 – OR – 25 years of creditable service in one or a combination of the covered capacities.

Benefit: For service prior to coverage in the 1998 Special Plan, 1/50 of average final compensation multiplied by years of service reduced for retirement before age 60, 62, or 65 (as determined by the applicable Regular Plan provisions described in 5.A.), except oil and hazardous materials emergency response workers, certain prison employee, and Capitol Police benefits are reduced for retirement before age 55.

-PLUS-

For service under the 1998 Special Plan, 1/50 of average final compensation multiplied by years of service reduced for retirement before age 55.

Form of Payment: Life annuity.

iv. 25 & Out Plan

1998 Entrants: State police employed on or after September 16, 1984 and special agent investigators hired before June 21, 1982.

2002 Entrants: Inland fisheries and wildlife officers and marine resources officers employed on and after August 31, 1984.

Eligibility: 25 years of creditable service in named positions.

Benefit: 1/50 of average final compensation multiplied by years of service.

Form of Payment: Life annuity

Members in Special Plans who fail to qualify for Special Plan benefits can receive Regular Plan benefits when and as eligible and qualified.

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v. Fire Marshals

Eligibility: 20 years of creditable service in named positions.

Benefit: One-half of average final compensation plus 2% for each year of service in excess of 20.

Form of Payment: Life annuity

Members in Special Plans who fail to qualify for Special Plan benefits can receive Regular Plan benefits when and as eligible and qualified.

vi. Minimum Service Retirement Benefit

\$100 per month

6. Disability Retirement Benefits Other Than No Age Benefits (See Item 7)

Eligibility: Disabled as defined in the MainePERS statutes prior to applicable normal retirement age, employed prior to October 16, 1992, and did not elect No Age Disability Benefits, and either disabled in the line-of-duty or disabled with at least five years of creditable service.

Benefit: $66\frac{2}{3}\%$ of average final compensation, reduced by employment earnings over the specified statutory limit, and to the extent that the benefit, in combination with Workers' Compensation and Social Security, exceeds 80% of average final compensation.

Form of Payment: Payment begins on termination of service and ceases on cessation of disability or after two years, unless the member is unable to engage in any substantially gainful activity, in which case payments cease on the earlier of ten years following normal retirement age or on the date that the service retirement benefit equals or exceeds the disability benefit.

Conversion to Service Retirement: During the period of disability, service is credited and average final compensation is increased at the same rate as any cost-of-living adjustments for which the member is eligible (not subject to a cap) (see item 12). On the date when service benefits reach a level of $66\frac{2}{3}\%$ of average final compensation or ten years after the normal retirement date if earlier, the disability converts to a service retirement benefit based on service and average final compensation at that time.

7. No Age Disability Retirement Benefits

Eligibility: Disabled as defined in the MainePERS statutes, employed on or after October 16, 1992 or employed prior to October 16, 1992 and elected the provisions of No

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Age Disability, and either disabled in the line-of-duty or disabled with at least five years of creditable service.

Benefit: 59% of average final compensation, reduced by employment earnings over the specified statutory limit, and to the extent that the benefit, in combination with Workers' Compensation and Social Security, exceeds 80% of average final compensation.

Form of Payment: Payment begins on termination of service and ceases on cessation of disability or after two years, unless the member is unable to engage in any substantially gainful activity, in which case payments cease on the date the service retirement benefit equals or exceeds the disability benefit.

Conversion to Service Retirement: During the period of disability, service is credited and average final compensation is increased at the same rate as any cost-of-living adjustments for which the member is eligible (not subject to a cap) (see item 12). On the date when service benefits reach a level of 59% of average final compensation, the disability benefit converts to a service retirement benefit based on service and average final compensation at that time.

8. Pre-Retirement Ordinary Death Benefits

Eligibility: Death while active, inactive eligible to retire, or disabled not resulting from an injury received in the line-of-duty.

Benefit: Designated beneficiary, spouse, children, or parents entitled to benefit calculated as if the deceased member had retired under Option 2 (see item 13); however, the beneficiary may elect survivor benefits payable to a surviving spouse, dependent children, parent, or other designated beneficiaries in monthly amounts varying by the status of beneficiary and number of eligible survivors. Otherwise accumulated contributions with interest are payable to the designated beneficiary, spouse, children, older parents, or estate.

9. Pre-Retirement Accidental Death Benefits

Eligibility: Death while active or disabled resulting from an injury received in the line-of-duty.

Benefit:

- If the member leaves no dependent children, two-thirds of the member's average final compensation to the surviving spouse until death.
- If the member is survived by a spouse who has the care of dependent children of the member, the surviving spouse shall receive an annual sum equal to the member's average final compensation while having the care of dependent children. When there are no longer any dependent children, the surviving spouse shall receive two-thirds of the member's average final compensation until death.

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- If the member is survived by a spouse who does not have the care of the member's dependent children, the surviving spouse and dependent children shall share equally an annual sum equal to the member's average final compensation. When there are no longer any dependent children, the surviving spouse shall receive two-thirds of the member's average final compensation until death.
- If the member leaves no spouse, the dependent children shall share an annual amount equal to the member's average final compensation. Benefits will cease when the last dependent child no longer meets the definition of "dependent child."

10. Termination Benefit

Eligibility: Termination of service other than by retirement or death with at least five years of creditable service.

Benefit: The member's choice of a refund of the accumulated contributions with interest or a retirement benefit using creditable service and average final compensation as of the date of termination, deferred to normal retirement age.

11. Refund of Contributions

Eligibility: Termination of service other than by retirement or death with less than five years of creditable service.

Benefit: Refund of member's accumulated contributions with interest.

12. Cost-of-Living Adjustments

All service and disability retirement and survivor benefits are adjusted each year that there is a percentage change in the Consumer Price Index, based on the Index. If the percentage change is negative, then no adjustment is made in that year. In subsequent years, the adjustment that would have been made will be adjusted downward to the extent necessary to recoup the full actuarial value of not having made the previous year's negative adjustment. This process of adjustment may occur over a multi-year period if needed to recoup the full value of negative changes in the Index.

Cost-of-living adjustments (COLA) are effective September 1 of each year and are applied to that portion of the benefit that is not in excess of a COLA cap whose value grows annually with the same adjustment as the COLA (see values below) for all benefits that have been in payment for at least twelve months as of that date. The maximum annual increase is 3%. Average final compensation used in determining disability benefits for disabled members is similarly adjusted for purposes of determining the recipient's service retirement benefit if and when the recipient moves to service retirement.

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COLA Cap History: (value as of September 1 of listed year when COLA effective):

2014 -	\$20,000.00
2015 -	\$20,420.00
2016 -	\$20,940.71
2017 -	\$21,474.70
2018 -	\$21,818.30
2019 -	\$22,451.03
2020 -	\$22,810.25

Members who did not have ten years of service on July 1, 1993, will begin receiving cost-of-living adjustments at the later of 12 months after their normal retirement age and the first September 1 following a minimum of twelve months of being in receipt of their benefit.

13. Methods of Payment of Service Retirement Benefits

At retirement, a member who retires with a benefit must choose from the following methods of payment:

Full Benefit: Unadjusted benefit paid for the life of the member only.

Option 1: Cash refund equal to the remaining member contribution balance, if any, at the date of death (where the member contribution balance has been reduced each month by the portion of the monthly benefit deemed to be provided by member contributions).

Option 2: 100% joint and survivor annuity.

Option 3: 50% joint and survivor annuity.

Option 4: Joint and survivor annuity at any percentage other than those available under Option 2 and Option 3.

Option 5: Designated percentage of the benefit (not less than 51%) payable to the member, with the remaining percentage (the two to equal 100%) payable to a beneficiary (may only be a sole beneficiary) while both are alive. At the death of either, the higher of the two percentages is paid to the survivor for the survivor's life, and the lower-percentage benefit ceases to be paid.

Option 6: 100% joint and survivor annuity (Option 2) with pop-up*.

Option 7: 50% joint and survivor annuity (Option 3) with pop-up*.

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Option 8: Option 4 with pop-up*.

* The “pop-up” feature attached to a given Option means that in the case of a beneficiary predeceasing the member, the member’s benefit will be revised prospectively to the amount that the benefit would have been had the member selected Full Benefit payment upon retirement.

14. Plan Changes since Prior Valuation

Fire marshal investigators and fire marshal sergeants were removed from the 1998 Special Plan to their own special plan with 20 years of service requirement for retirement.

This Appendix B is intended to be a brief summary of provisions. In the event of a dispute, applicable statutes and administrative policy supersede this report description.

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APPENDIX C – ACTUARIAL ASSUMPTIONS AND METHODS

A. Actuarial Assumptions

1. Annual Rate of Investment Return

State Employees	6.75%
Teachers	6.75%

Rate is net of both administrative and investment expense.

2. Cost-of-Living Adjustment (COLA) Assumed Rate

State Employees	2.20%
Teachers	2.20%

3. Annual Rate of Individual Salary Increase (% at Selected Years of Service)

Service	State Employees	Teachers
0	8.75%	14.50%
5	5.00%	5.75
10	3.75%	4.75
15	3.20%	4.00
20	2.95%	2.75
25 and over	2.75%	2.75

The above rates include a 2.75% across-the-board increase at each year of service.

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4. Sample Rates of Termination (% at Selected Years of Service)

State Employees and Teachers	
Service	
0	33.50%
5	10.50
10	5.95
15	4.25
20	4.00
25	4.00

Non-vested members are assumed to take a refund of contributions with interest. Once vested, the member is assumed to elect the greater of the deferred vested benefit or a refund of member contributions with interest-based on present value at the time of termination.

5. Sample Rates of Mortality for Healthy Annuitant Lives at Selected Ages (number of deaths per 10,000 members)

(Showing values in 2020)				
Age	State Employees		Teachers	
	Male	Female	Male	Female
50	40	31	38	26
55	57	42	54	35
60	77	61	73	50
65	109	94	104	77
70	169	150	161	124
75	275	247	262	204
80	463	417	441	344
85	808	741	769	611
90	1,440	1,339	1,371	1,105
95	2,298	2,227	2,188	1,838

Rates for State Employees are based on 104% and 120% of the RP-2014 Total Dataset Healthy Annuitant Mortality Table, respectively, for males and females, using the RP-2014 Total Dataset Employee Mortality Table for ages prior to the start of the Healthy Annuitant Mortality Table, both projected from the 2006 base rates using the RPEC_2015 model, with an ultimate rate of 0.85% for ages 20-85, grading down to an ultimate rate of 0.00% for ages 111-120, and convergence to the ultimate rate in the year 2020. Proposed rates for Teachers are based on 99% of the RP-2014 Total Dataset Healthy Annuitant Mortality Table for both males and females, using the RP-2014 Total

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Dataset Employee Mortality Table for ages prior to the start of the Healthy Annuitant Mortality Table, respectively, both projected using the RPEC_2015 model, with an ultimate rate of 0.85% for ages 20-85, grading down to an ultimate rate of 0.00% for ages 111-120, and convergence to the ultimate rate in the year 2020.

6. Sample Rates of Mortality for Active Healthy Lives at Selected Ages (number of deaths per 10,000 members)*

(Showing values in 2020)				
Age	<u>State Employees</u>		<u>Teachers</u>	
	Male	Female	Male	Female
20	4	2	3	1
25	4	2	4	2
30	4	2	4	2
35	5	3	5	3
40	6	5	6	4
45	9	7	9	6
50	17	12	16	10
55	28	19	26	16
60	46	29	44	24
65	82	43	78	35

* For State Regular and Teachers 5% of deaths assumed to arise out of and in the course of employment; for State Special 20% of deaths are assumed to arise out of and in the course of employment.

Rates for State Employees are based on 104% and 120% of the RP-2014 Total Dataset Employee Mortality Table, respectively, for males and females, using the RP-2014 Total Dataset Healthy Annuitant Mortality Table rates after the end of the Total Employee Mortality Table, both projected from the 2006 base rates using the RPEC_2015 model, with an ultimate rate of 0.85% for ages 20-85, grading down to an ultimate rate of 0.00% for ages 111-120, and convergence to the ultimate rate in the year 2020. Proposed rates for Teachers are based on 99% of the RP-2014 Total Dataset Healthy Annuitant Mortality Table for both males and females, using the RP-2014 Total Dataset Healthy Annuitant Mortality Table rates after the end of the Total Employee Mortality Table, respectively, both projected using the RPEC_2015 model, with an ultimate rate of 0.85% for ages 20-85, grading down to an ultimate rate of 0.00% for ages 111-120, and convergence to the ultimate rate in the year 2020.

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7. Sample Rates of Mortality for Disabled Annuitant Lives at Selected Ages (number of deaths per 10,000 members)

(Showing values in 2020)				
Age	State Employees		Teachers	
	Male	Female	Male	Female
25	80	23	80	23
30	77	30	77	30
35	91	41	91	41
40	109	57	109	57
45	170	89	170	89
50	208	117	208	117
55	240	147	240	147
60	273	175	273	175
65	326	212	326	212
70	422	289	422	289

Rates are based on 108% and 105% of the RP-2014 Total Dataset Disabled Annuitant Mortality Table, respectively, for males and females, projected from the 2006 base rates using the RPEC_2015 model, with an ultimate rate of 0.85% for ages 20-85, grading down to an ultimate rate of 0.00% for ages 111-120, and convergence to the ultimate rate in the year 2020.

8. Sample Rates of Retirement at Selected Ages (number retiring per 1,000 members)

Teachers and State Regular Plans

Age	State Employees and Teachers		
	Tier 1	Tier 2	Tier 3
45	13	NA	NA
50	29	NA	NA
55	40	40	40
59	150	40	40
60	250	75	40
61	200	175	40
62	200	250	40
63	200	150	75
64	250	200	225
65	350	250	300
70	200	200	300
75	1,000	1,000	1,000

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APPENDIX C – ACTUARIAL ASSUMPTIONS AND METHODS

In the case of State Regular and Teacher employees, Tier 1 refers to those who had accrued at least 10 years of service by July 1, 1993. Tier 2 refers to those who had not accrued at least 10 years of service by July 1, 1993, or were hired after that date but had five years of service by July 1, 2011. Tier 3 refers to those who did not have five years of service by July 1, 2011. Rates are only applied for early retirement when the member is at least age 57. Earlier rates are applicable for normal retirement.

State Special Plans

Members of the 1998 Special Plan are assumed to retire at rates that vary by age and whether service is less than 25 years or not. Sample rates are as follows:

1998 Special Plan Retirement		
Age	Service < 25	Service >= 25
55	20.0%	25.0%
57	10.0	25.0
60	20.0	30.0
62	15.0	30.0
65	23.4	30.0
67	36.8	50.0
70	100.0	100.0

Members of the 25 & Out Plan are assumed to retire at rates that vary by service. Sample rates are as follows:

25 & Out Plan	
Service	Rate
< 24	0.0%
25 - 29	25.0%
30 - 34	50.0%
35+	100.0%

Members of State Special Plans other than the 25 & Out Plan and the 1998 Special Plan are all currently assumed to retire at a rate of 50% per year, beginning when they reach eligibility for unreduced benefits, with a 100% assumed rate at age 70. Rates are only applied when the member is at least age 50.

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APPENDIX C – ACTUARIAL ASSUMPTIONS AND METHODS

9. Sample Rates of Disability at Selected Ages (number becoming disabled per 10,000 members)*

Age	State Employees		Teachers
	Regular	Special	
25	5.0	5.4	2.1
30	6.1	6.5	2.3
35	9.3	9.9	2.3
40	14.8	15.8	3.1
45	22.8	24.4	7.0
50	34.0	36.4	10.9
55	39.9	42.6	14.9
60	43.4	46.4	18.8

* 10% assumed to receive Workers Compensation benefits offsetting disability benefit; also, current rates for State Special groups are higher by 7 per 10,000 at all ages.

10. Family Composition Assumptions

80% of active members are assumed to be married and have two children born when the member is 24 and 28; children are assumed dependent until age 18; a female spouse is assumed to be three years younger than a male spouse; member is assumed to have no dependent parents; unmarried members are assumed to have beneficiaries entitled to benefits worth 80% as much as those of married members' beneficiaries.

11. Vacation/Sick Leave Credits

For members who had ten years of service on July 1, 1993, credits for unused vacation and sick leave may be used to increase final average compensation and/or creditable service. In order to reflect this, projected retirement benefits are increased by 0.48% for state (regular) employees and 0.75% for teachers for impacted members.

12. Technical and Miscellaneous Assumptions

Decrement Timing: Middle of the valuation year

Pay Increase Timing: Salary provided is treated as the rate of pay as of the valuation date. Annual increases are applied as of the beginning of each subsequent valuation.

Member Contribution Interest Rate: 5% assumed for all future years

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COLA Timing: September 1

Special Plan Member Contribution Rates: For members of Special Plans where the contribution rate drops from 8.65% to 7.65% after a given number of years, 8.65% is used for all years for valuation purposes as a simplifying assumption reflecting data limitations.

13. Rationale for Assumptions

The assumptions were adopted by the Board of Trustees at their July 14, 2016 meeting. The demographic assumptions adopted are based on an experience study covering the period from June 30, 2012 through June 30, 2015 and the economic assumptions are based on this experience study along with the advice of the MainePERS investment consultants.

14. Changes since Last Valuation

None

15. Rationale for Change in Actuarial Assumptions

N/A

B. Actuarial Methods

1. Funding Method

For the plans in this Program, the funding methodology employed is the entry age normal funding method. Under this method, there are two components to the total contribution: the normal cost rate (NC rate), and the unfunded actuarial liability rate (UAL rate). Both of these rates are developed for each Plan within the Program, consisting of the Teacher Program, the State Regular Plan, and several State Special Plans.

For each Plan in the Program, an individual entry age normal cost rate is determined for each active member. The normal cost is determined by the following steps. First, an individual normal cost rate is determined by taking the value, as of entry age into a Plan, of each active member's projected future benefit. Second, this value is then divided by the value, also at entry age, of the member's expected future salary. Finally, the rate is reduced by the member contribution rate to produce the employer normal contribution rate. These rates are then multiplied by each member's salary as of the valuation date to get the total normal cost dollars as of the valuation date for that Plan and then divided by the total payroll at the valuation for the Plan to get the normal cost rate for that Plan. This process results in specific normal cost rates for each of the Plans in the Program.

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The unfunded actuarial liability under the entry age normal funding method equals the present value, at the time of valuation, of the future benefit payments less the present value of future employer normal cost contributions, future member contributions, future UAL payments, and current assets. The UAL rate determined is the percentage that applied to member payroll is expected to amortize the UAL according to the Program's amortization policy. Specifically, the remaining original UAL has 8 years of its prescribed amortization period remaining and all other gains and losses are amortized over twenty-year periods beginning on the date as of which they occur.

2. Asset Valuation Method

For purposes of determining the employer contributions to the Program and the Program's funded ratio, we use an actuarial value of assets. The asset adjustment method dampens the volatility in asset values that could occur because of fluctuations in market conditions. Use of an asset smoothing method is consistent with the long-term nature of the actuarial valuation process.

In determining the actuarial value of assets, we calculate an expected actuarial value based on cash flow for the year and imputed returns at the actuarial assumption. This expected value is compared to the market value and one-third of the difference is added to the preliminary actuarial value to arrive at the final actuarial value.

3. Changes since Last Valuation

None

4. Rationale for Change

N/A

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APPENDIX D – GLOSSARY OF GASB TERMS

1. Actuarially Determined Contribution

A target or recommended contribution for the reporting period, determined in conformity with Actuarial Standards of Practice based on the most recent measurement available when the contribution for the reporting period was adopted.

2. Actuarial Valuation Date

The date as of which an actuarial valuation is performed. This date may be up to 24 months prior to the measurement date and up to 30 months prior to the employer's reporting date.

3. Deferred Inflow of Resources

An acquisition of net assets by a government employer that is applicable to a future reporting period. In the context of GASB 68, these are experience gains on the Total Pension Liability, assumption changes reducing the Total Pension Liability, or investment gains that are recognized in future reporting periods.

4. Deferred Outflow of Resources

A consumption of net assets by a government employer that is applicable to a future reporting period. In the context of GASB 68, these are experience losses on the Total Pension Liability, assumption changes increasing the Total Pension Liability or investment losses that are recognized in future reporting periods.

5. Entry Age Actuarial Cost Method

The actuarial cost method required for GASB 67 and 68 calculations. Under this method, 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 Service Cost. The portion of this actuarial present value not provided for at a valuation date by the actuarial present value of future service costs is called the Total Pension Liability.

6. Measurement Date

The date as of which the Total Pension Liability and Plan Fiduciary Net Position are measured. The Total Pension Liability may be projected from the Actuarial Valuation Date to the Measurement Date. The Measurement Date must be the same as the Reporting Date for the plan.

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APPENDIX D – GLOSSARY OF GASB TERMS

7. Net Pension Liability

The liability of employers and non-employer contributing entities for employees for benefits provided through a defined benefit pension plan. It is calculated as the Total Pension Liability less the Plan Fiduciary Net Position.

8. Plan Fiduciary Net Position

The fair or market value of assets.

9. Reporting Date

The last day of the Plan or employer's fiscal year.

10. Service Cost

The portion of the actuarial present value of projected benefit payments that is attributed to the current period of employee service in conformity with the requirements of GASB 67 and 68. The Service Cost is the normal cost calculated under the entry age actuarial cost method.

11. Total Pension Liability

The portion of the actuarial present value of projected benefit payments that is attributed to past periods of employee service in conformity with the requirements of GASB 67 and 68. The Total Pension Liability is the actuarial liability calculated under the entry age actuarial cost method.



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