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Maine Public Employees Retirement System

State Employee and Teacher Retirement Program

Actuarial Valuation Report as of June 30, 2021

Produced by Cheiron
October 2021

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TABLE OF CONTENTS

October 14, 2021

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, 2021 Actuarial Valuation Report for the State Employee and Teacher Retirement Program (Program) of the Maine Public Employees Retirement System (MainePERS or System).

The purpose of this report is to present the annual actuarial valuation of the State Employee and Teacher Retirement Program (Program) of the Maine Public Employees Retirement System. This report is for the sole use of the MainePERS Board and its auditors in preparing financial reports in accordance with 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.

In preparing our report, we relied on information (some oral and some written) supplied by the System's staff. This information includes, but is not limited to, the plan provisions, employee 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.

Future results may differ significantly from the current results presented in this report due to such factors as the following: plan experience differing from that anticipated by the assumptions; changes in assumptions; and changes in plan provisions or applicable law.

This report and its contents have been prepared in accordance with 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. Furthermore, as credentialed actuaries, we meet the Qualification Standards of the American Academy of Actuaries to render the opinion contained 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.

This actuarial report was prepared exclusively for MainePERS for the purposes described herein and for the use by the plan auditor in completing an audit related to the matters herein. Other users of this report are not intended users as defined in the Actuarial Standards of Practice, and Cheiron assumes no duty or liability to such other users.

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

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Consulting Actuary

FOREWORD

Cheiron has completed the Actuarial Valuation Report for the Maine Public Employees Retirement System (MainePERS or System) State Employee and Teacher Program (Program) of the as of June 30, 2021. 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) 2021 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).

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

Experience from July 1, 2020 through June 30, 2021 (FY 2021)

The informational total employer contribution rate produced by the June 30, 2020 valuation reflecting all Plans in the State Employee and Teacher Retirement Program was 20.15% of payroll. The equivalent rate produced in this June 30, 2021 valuation is 21.72% of payroll. The change in this contribution rate is attributable to several elements, including a gain from investment returns, a loss from assumption changes from the experience study and actuarial audit, including a drop in the discount rate from 6.75% to 6.5%, and a very slight liability experience loss of 0.2% of total liabilities, consisting primarily of a loss on salary increases greater than anticipated offset partially by the actual cost-of-living adjustment (COLA) paid of 0.6% instead of the assumed 2.2%.

As of the June 30, 2021 valuation, the Program has an unfunded actuarial liability (UAL) of $2.931 billion based on the actuarial value of assets (AVA). This represents an increase of $0.316 billion from the $2.615 billion AVA UAL measured as of June 30, 2020, thus decreasing the Program's UAL. 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 2021 as well as their combined effect on the UAL.

SECTION I – BOARD SUMMARY

Table I-1
(Amounts in Billions)

	Liabilities	Assets*	UAL
Value as of June 30, 2020	$ 14.865	$ 12.250	$ 2.615
Expected Change	0.325	0.491	(0.166)
Impact of Plan Changes	0.000	0.000	0.000
Impact of Assumption Changes	1.176	0.000	1.176
Recognized Investment Gain	0.000	0.720	(0.720)
Recognized Liability Loss	0.026	0.000	0.026
Value as of June 30, 2021	$ 16.392	$ 13.461	$ 2.931

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

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

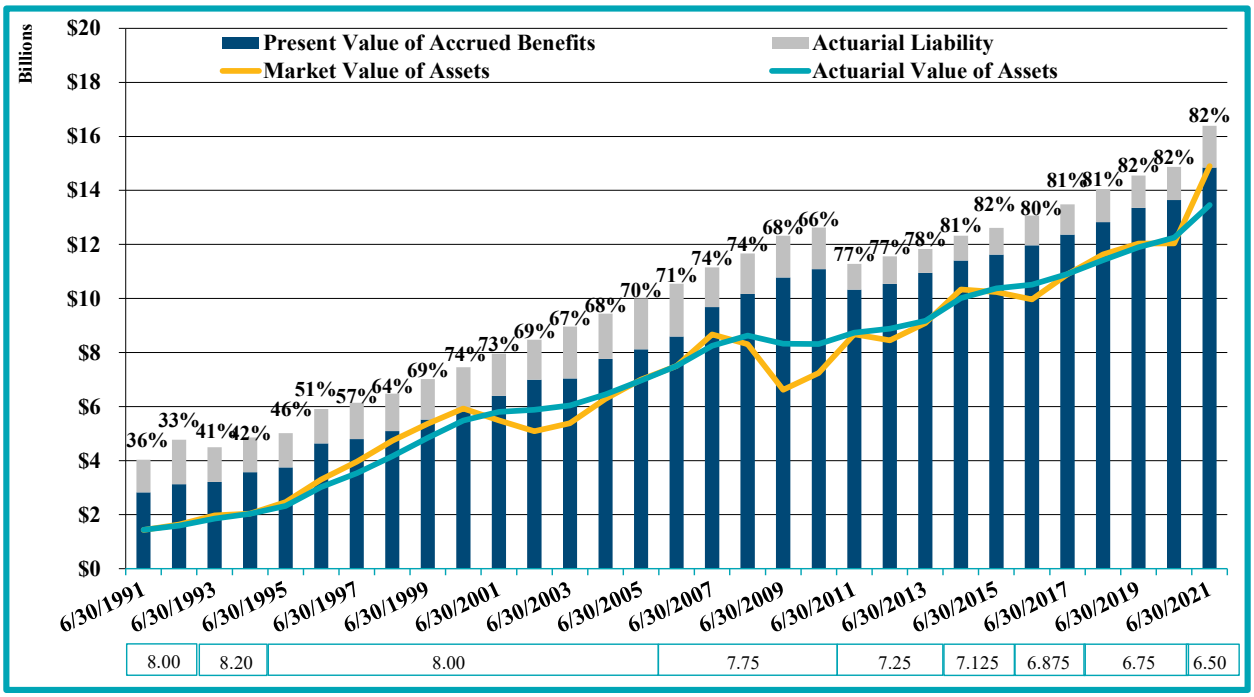
It is important to take a step back from the latest results and view them in the context of the Program's history. On the next few pages, we present a series of graphs that display key historical trends relating to the Program's condition. In addition to considering the past, examining future possible 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. The values shown below the dates are the discount rates in effect for each year and should be read as percentages, i.e., 8.00 represents an 8.00% discount rate.

SECTION I – BOARD SUMMARY

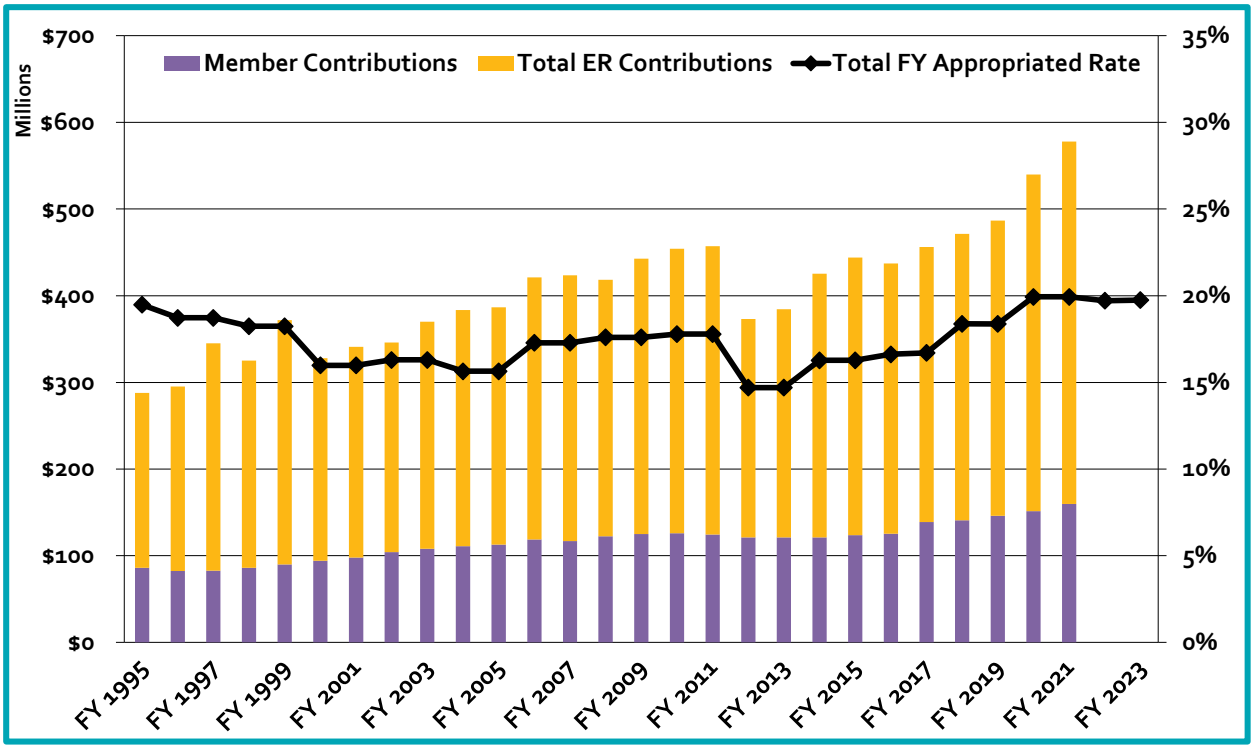


Plan changes were legislated during 2010 and first reflected in the 2011 valuation, resulting in the reduction in liability seen for that year. As of June 30, 2021, the Program is funded 82.1% based on the AVA funded ratio, which represents a slight decrease from the 82.4% ratio reported in the prior valuation. Note however that the prior year's liabilities were measured at a 6.75% discount rate where the current year's are measured at a more conservative 6.50%. Measured on an MVA n basis, the funded ratio is 90.9% as of June 30, 2021, a significant increase over last year's 81.0% MVA funded ratio.

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. These rates are those determined by the ratemaking process rather than the informational rates determined in the annual valuations. The FY 2022 through FY 2023 contribution rates have already been determined based on the ratemaking process, so two additional years of the contribution rate are shown versus dollars received.

SECTION I – BOARD SUMMARY



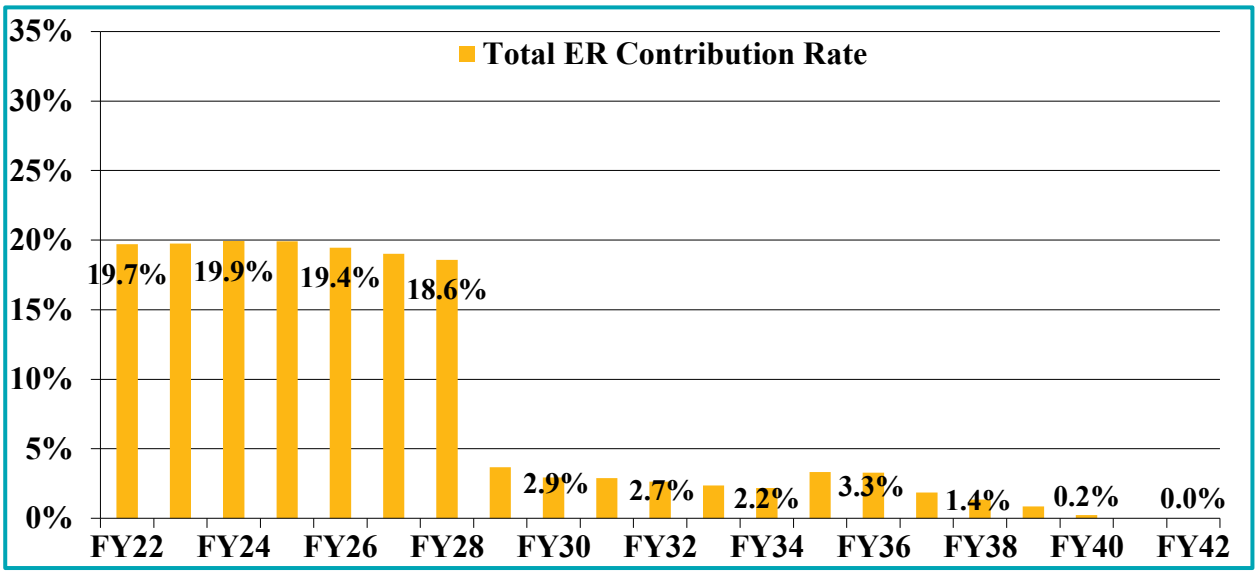
The member contribution rates are set by statute, based on the Plan within the Program in which each member participates. The total employer contribution rate is set by the ratemaking process on a biennial basis. The contribution rate for FY 2021 was based on a roll-forward of the June 30, 2017 valuation to June 30, 2018, as previously described in this Board Summary.

The most important information to be gleaned from this chart is that the Program, as evidenced in the prior chart, has successfully and significantly improved its funded status over the past 30 years, while maintaining a remarkably stable State contribution rate between approximately 15% and 20%.

Baseline Projections

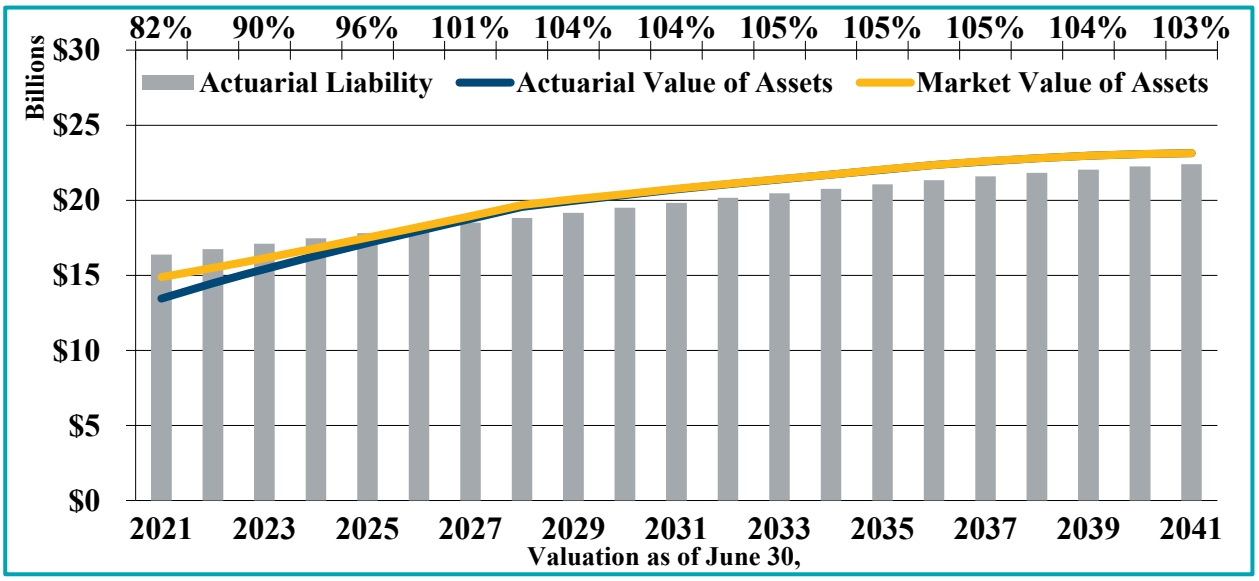
Our analysis of the projected financial trends for the Program is an important part of this valuation. In this section, we project future valuation results, focusing on the previously referenced AVA funded ratio (AVA over AL) and the expected employer contributions that will be developed through the ratemaking process. Here we present a baseline projection of these metrics based on all actuarial assumptions being exactly met during the projection period, including the assumed 6.50% 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 averaging similar to the assumed but deviating in each of the twenty years from the assumed rate.

SECTION I – BOARD SUMMARY



This baseline projection shows that the overall composite employer contribution rate for the Program is projected to remain within approximately one percentage of the current rate through FY 2028, then dramatically drop off in FY 2029 once the 1996 UAL balance is fully paid off. At that point, the employer contribution rates under this baseline scenario drop substantially, initially to 3.7%, with small further changes thereafter with a general downward trend, dropping to 0.0% due to the amortization of the UAL offsetting the employer normal cost in entirety, 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.

SECTION I – BOARD SUMMARY



The graph above shows the projected AVA funded ratio (AVA divided by AL) over the next 20 years based in this baseline scenario. It shows that the Program's AVA funded ratio is projected to improve from the current 82% as of FY 2021 to over 100% starting in FY 2027. Under this baseline scenario where all underlying assumptions are exactly met, the AVA funded ratio increases to 105% and then gradually declines to 103%. Note that the timing of contribution development and payment, as well as the combination of the amortization layers, is why the funded status is projected to exceed full funding during the projection. 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.

SECTION I – BOARD SUMMARY

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

	Valuation as of June 30, 2020	Valuation as of June 30, 2021	% Change
Member Counts			
Active Members	40,395	40,099	(0.7)%
Retired Members	28,731	29,301	2.0%
Beneficiaries of Retired Members	6,247	6,249	0.0%
Survivors of Deceased Members	584	580	(0.7)%
Disabled Members	1,589	1,560	(1.8)%
Terminated Vested Members	8,157	8,387	2.8%
Inactives Due Refunds	37,653	38,393	2.0%
Total Membership	123,356	124,569	1.0%
Annual Payroll of Active Members	$ 2,060,622,725	$ 2,199,458,213	6.7%
Annual Payments to Benefit Recipients	$ 859,787,631	$ 884,049,653	2.8%
Assets and Liabilities			
Actuarial Liability (AL)	$ 14,865,460,130	$ 16,392,351,328	10.3%
Actuarial Value of Assets (AVA)	12,249,961,306	13,460,870,272	9.9%
Unfunded AL (UAL)	$ 2,615,498,824	$ 2,931,481,056	12.1%
AVA Funded Ratio (AVA/AL)	82.4%	82.1%	
MVA Funded Ratio (MVA/AL)	81.0%	90.9%	
Accrued Benefit Liability (PVAB)	$ 13,638,199,968	$ 14,840,603,750	8.8%
Market Value of Assets (MVA)	12,044,916,279	14,900,644,020	23.7%
Unfunded PVAB	$ 1,593,283,689	$ (60,040,270)	(103.8)%
Accrued Benefit Funded Ratio	88.3%	100.4%	
Contributions as a Percentage of Payroll			
Employer Normal Cost Rate	3.88%	4.64%	
UAL Amortization Rate	16.27%	17.08%	
Total Employer Calculated Rate	20.15%	21.72%	

	2018 Ratemaking		2020 Ratemaking	
Total Employer Budgeted Rates	FY 2020	19.93%	FY 2022	19.71%
Total Employer Budgeted Rates	FY 2021	19.93%	FY 2023	19.75%

SECTION I – BOARD SUMMARY

Table I-3
Summary of Principal Results
Teacher Program

	Valuation as of June 30, 2020	Valuation as of June 30, 2021	% Change
Member Counts			
Active Members	27,565	27,444	(0.4)%
Retired Members	17,804	18,231	2.4%
Beneficiaries of Retired Members	2,967	2,970	0.1%
Survivors of Deceased Members	277	280	1.1%
Disabled Members	683	680	(0.4)%
Terminated Vested Members	5,162	5,368	4.0%
Inactives Due Refunds	29,609	29,934	1.1%
Total Membership	84,067	84,907	1.0%
Annual Payroll of Active Members	$ 1,318,948,228	$ 1,414,446,640	7.2%
Annual Payments to Benefit Recipients	$ 545,719,165	$ 563,008,592	3.2%
Assets and Liabilities			
Actuarial Liability (AL)	$ 9,636,587,340	$10,736,439,623	11.4%
Actuarial Value of Assets (AVA)	8,140,595,773	8,934,933,743	9.8%
Unfunded Actuarial Liability (UAL)	$ 1,495,991,567	$ 1,801,505,880	20.4%
AVA Funded Ratio (AVA/AL)	84.5%	83.2%	
MVA Funded Ratio (MVA/AL)	83.1%	92.1%	
Accrued Benefit Liability (PVAB)	$ 8,772,718,122	$ 9,646,954,676	10.0%
Market Value of Assets (MVA)	8,004,335,042	9,890,613,635	23.6%
Unfunded PVAB	$ 768,383,080	$ (243,658,959)	(131.7)%
Accrued Benefit Funded Ratio	91.2%	102.5%	
Contributions as a Percentage of Payroll			
Employer Normal Cost Rate	3.78%	4.44%	
UAL Rate	14.91%	16.21%	
Total Employer Rate	18.69%	20.65%	

	2018 Ratemaking		2020 Ratemaking	
Total Employer Budgeted Rates	FY 2020	18.49%	FY 2022	18.13%
Total Employer Budgeted Rates	FY 2021	18.49%	FY 2023	18.13%

SECTION I – BOARD SUMMARY

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

	Valuation as of June 30, 2020	Valuation as of June 30, 2021	% Change
Member Counts			
Active Members	12,830	12,655	(1.4)%
Retired Members	10,927	11,070	1.3%
Beneficiaries of Retired Members	3,280	3,279	(0.0)%
Survivors of Deceased Members	307	300	(2.3)%
Disabled Members	906	880	(2.9)%
Terminated Vested Members	2,995	3,019	0.8%
Inactives Due Refunds	8,044	8,459	5.2%
Total Membership	39,289	39,662	0.9%
Annual Payroll of Active Members	$ 741,674,497	$ 785,011,573	5.8%
Annual Payments to Benefit Recipients	$ 314,068,466	$ 321,041,061	2.2%
Assets and Liabilities			
Actuarial Liability (AL)	$ 5,228,872,790	$ 5,655,911,705	8.2%
Actuarial Value of Assets (AVA)	4,109,365,533	4,525,936,529	10.1%
Unfunded Actuarial Liability (UAL)	$ 1,119,507,257	$1,129,975,176	0.9%
AVA Funded Ratio (AVA/AL)	78.6%	80.0%	
MVA Funded Ratio (MVA/AL)	77.3%	88.6%	
Accrued Benefit Liability (PVAB)	$ 4,865,481,846	$ 5,193,649,074	6.7%
Market Value of Assets (MVA)	4,040,581,237	5,010,030,385	24.0%
Unfunded PVAB	$ 824,900,609	$ 183,618,689	(77.7)%
Accrued Benefit Funded Ratio	83.0%	96.5%	
Contributions as a Percentage of Payroll			
Employer Normal Cost Rate	4.05%	5.01%	
UAL Rate	18.70%	18.67%	
Total Employer Rate	22.75%	23.68%	

	2018 Ratemaking		2020 Ratemaking	
Total Employer Budgeted Rates	FY 2020	22.54%	FY 2022	22.74%
Total Employer Budgeted Rates	FY 2021	22.53%	FY 2023	22.88%

SECTION I – BOARD SUMMARY

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

	Valuation as of June 30, 2020	Valuation as of June 30, 2021	% Change
Member Counts			
Active Members	11,132	10,968	(1.5)%
Retired Members	9,924	10,012	0.9%
Beneficiaries of Retired Members	2,906	2,880	(0.9)%
Survivors of Deceased Members	291	284	(2.4)%
Disabled Members	827	802	(3.0)%
Terminated Vested Members	2,658	2,662	0.2%
Inactives Due Refunds	7,037	7,404	5.2%
Total Membership	34,775	35,012	0.7%
Annual Payroll of Active Members	$ 622,210,265	$ 659,392,341	6.0%
Annual Payments to Benefit Recipients	$ 274,645,703	$ 279,034,216	1.6%
Assets and Liabilities			
Actuarial Liability (AL)	$ 4,421,149,900	$ 4,760,482,177	7.7%
Actuarial Value of Assets (AVA)	3,506,883,155	3,837,853,657	9.4%
Unfunded Actuarial Liability (UAL)	$ 914,266,745	$ 922,628,520	0.9%
AVA Funded Ratio (AVA/AL)	79.3%	80.6%	
MVA Funded Ratio (MVA/AL)	78.0%	89.2%	
Accrued Benefit Liability (PVAB)	$ 4,121,895,591	$ 4,377,395,170	6.2%
Market Value of Assets (MVA)	3,448,183,463	4,248,350,217	23.2%
Unfunded PVAB	$ 673,712,128	$ 129,044,953	(80.8)%
Accrued Benefit Funded Ratio	83.7%	97.1%	
Contributions as a Percentage of Payroll			
Employer Normal Cost Rate	3.90%	4.81%	
UAL Rate	18.20%	18.13%	
Total Employer Rate	22.10%	22.94%	
	2018 Ratemaking	2020 Ratemaking	
Total Employer Budgeted Rates	FY 2020 21.98%	FY 2022 22.11%	
Total Employer Budgeted Rates	FY 2021 21.98%	FY 2023 22.24%	

SECTION I – BOARD SUMMARY

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

	Valuation as of June 30, 2020	Valuation as of June 30, 2021	% Change
Member Counts			
Active Members	1,698	1,687	(0.6)%
Retired Members	1,003	1,058	5.5%
Beneficiaries of Retired Members	374	399	6.7%
Survivors of Deceased Members	16	16	0.0%
Disabled Members	79	78	(1.3)%
Terminated Vested Members	337	357	5.9%
Inactives Due Refunds	1,007	1,055	4.8%
Total Membership	4,514	4,650	3.0%
Annual Payroll of Active Members	$ 119,464,232	$ 125,619,232	5.2%
Annual Payments to Benefit Recipients	$ 39,422,763	$ 42,006,845	6.6%
Assets and Liabilities			
Actuarial Liability (AL)	$ 807,722,890	$ 895,429,528	10.9%
Actuarial Value of Assets (AVA)	602,482,378	688,082,872	14.2%
Unfunded Actuarial Liability (UAL)	$ 205,240,512	$ 207,346,656	1.0%
AVA Funded Ratio (AVA/AL)	74.6%	76.8%	
MVA Funded Ratio (MVA/AL)	73.3%	85.1%	
Accrued Benefit Liability (PVAB)	$ 743,586,255	$ 816,253,904	9.8%
Market Value of Assets (MVA)	592,397,774	761,680,168	28.6%
Unfunded PVAB	$ 151,188,481	$ 54,573,736	(63.9)%
Accrued Benefit Funded Ratio	79.7%	93.3%	
Contributions as a Percentage of Payroll			
Employer Normal Cost Rate	4.85%	6.05%	
UAL Rate	21.27%	21.41%	
Total Employer Rate	26.12%	27.46%	
	2018 Ratemaking	2020 Ratemaking	
Total Employer Budgeted Rates	FY 2020 25.17%	FY 2022 25.82%	
Total Employer Budgeted Rates	FY 2021 25.17%	FY 2023 25.98%	

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.

SECTION II – RISK ASSESSMENT AND DISCLOSURE

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 most individual years, with the magnitude of the gains and losses from investment experience often significantly larger than the gains and losses from liability experience. In addition, 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 only been greater about a quarter of the investment gains and losses over this same period.

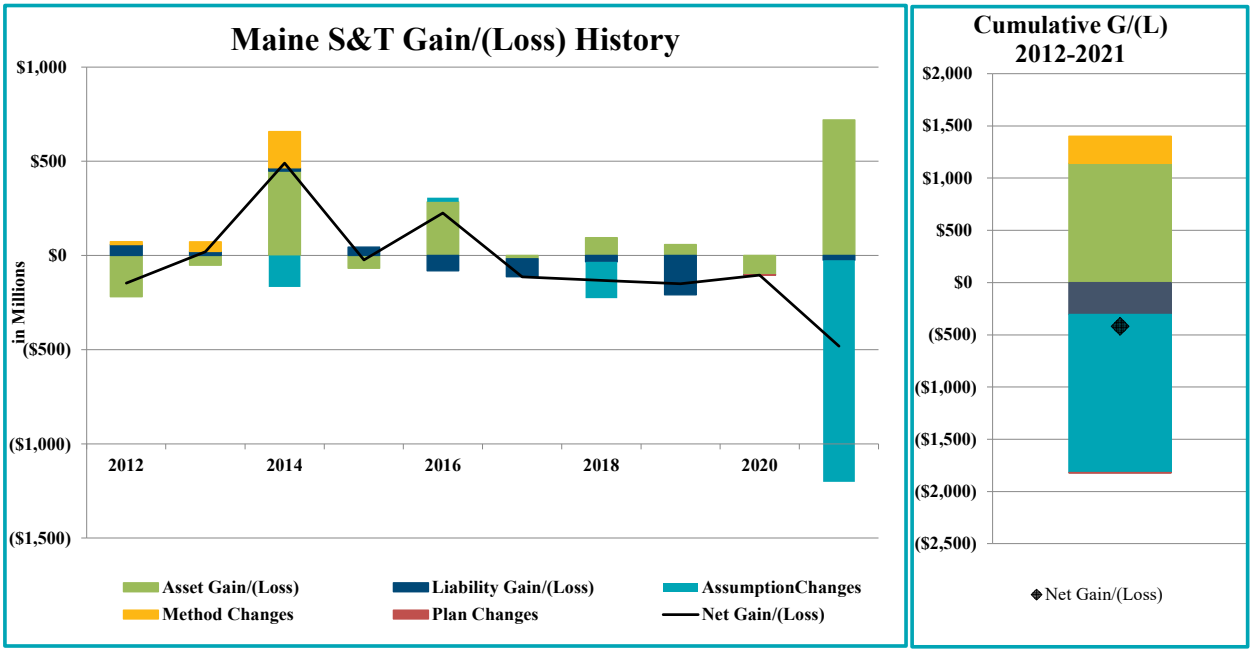
Plan Change Risk is the potential for the provisions of the Program to be changed such that the funding or benefits are changed materially. In addition to the actual payments to and from the Program being changed, future valuation measurements can also be impacted, with Program changes leading to deviations between actual future measurements and those expected by prior valuations. Over the period shown in the ten years of the historical section, this Program has had no significant plan changes. However, it is worth noting that there have been significant plan changes in other periods, in particular, a large gain in 2011.

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 valuation. 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 the most 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, where these changes have produced a gain for the Program over the period shown.

SECTION II – RISK ASSESSMENT AND DISCLOSURE

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, assumption changes and asset gains and losses have been the most significant risks for the Program over this ten-year period. The next two causes of experience deviations, the liability gains/(losses) and the method changes, were much less significant over this period. Over this period, plan changes were so insignificant that they are barely visible on the graphs.

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.

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.

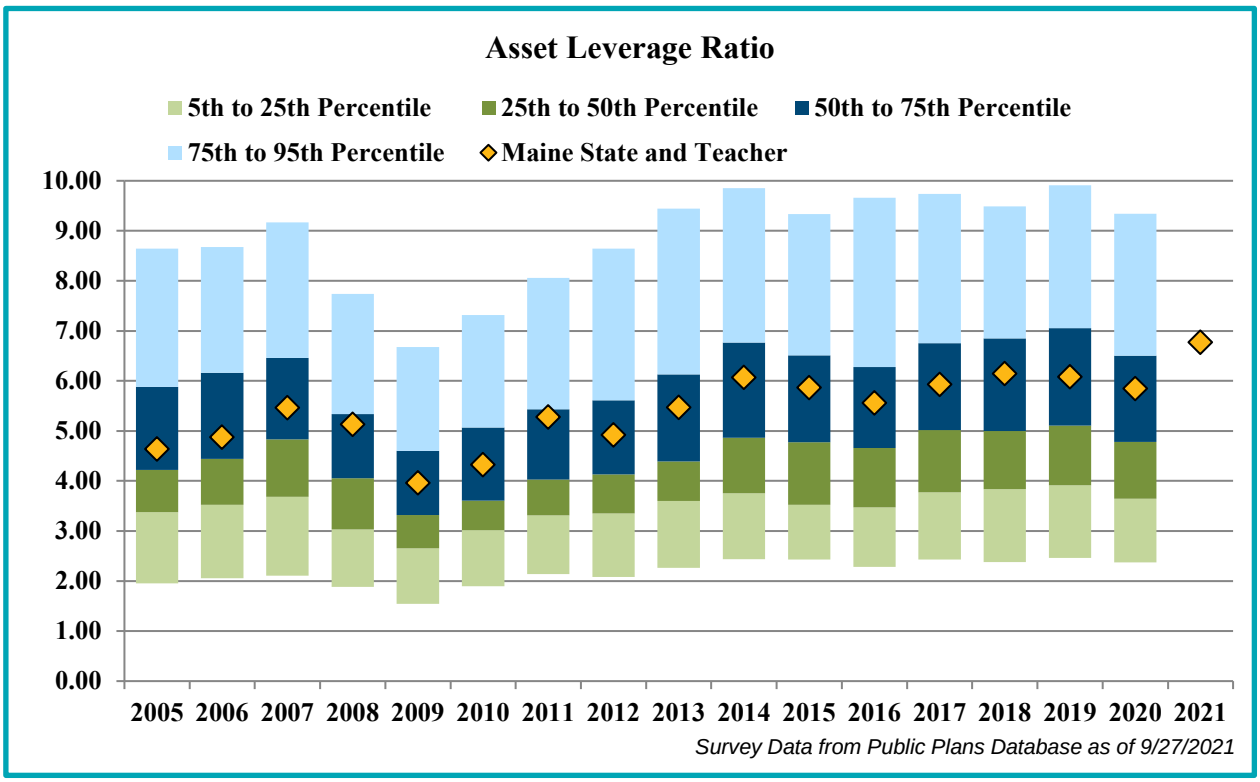
	($ in millions)	
	Plan A	**Plan B**
Plan Assets	**$ 5,000**	**$ 5,000**
Payroll	**$ 500**	**$ 1,000**
Asset Leverage Ratio	**10.0**	**5.0**
10% Loss	**$ 500**	**$ 500**
10% Loss as % of Payroll	**100%**	**50%**

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 2005. 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, within 50% of 600% of salary, for the past eight years prior to 2021, when it increased to 677%, or 6.77 times salary.

SECTION II – RISK ASSESSMENT AND DISCLOSURE

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 2021 numbers are not yet available for the database. When these numbers are available, we anticipate that the universe of public plans will also show a similar increase in this ratio given the significant increase in the market value of assets that most of these plans experience during 2021.

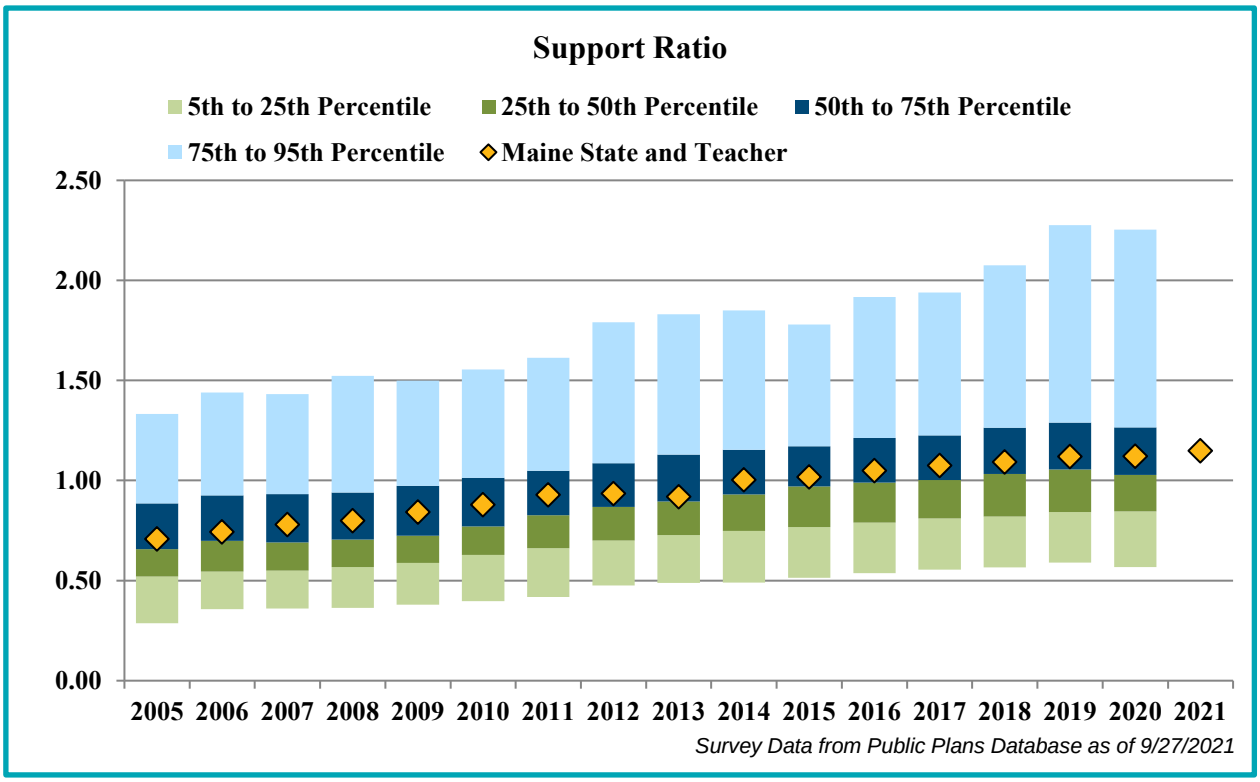


Support Ratios

Another 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, with the proportion of the plan's liability represented by actives generally declining.

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

SECTION II – RISK ASSESSMENT AND DISCLOSURE



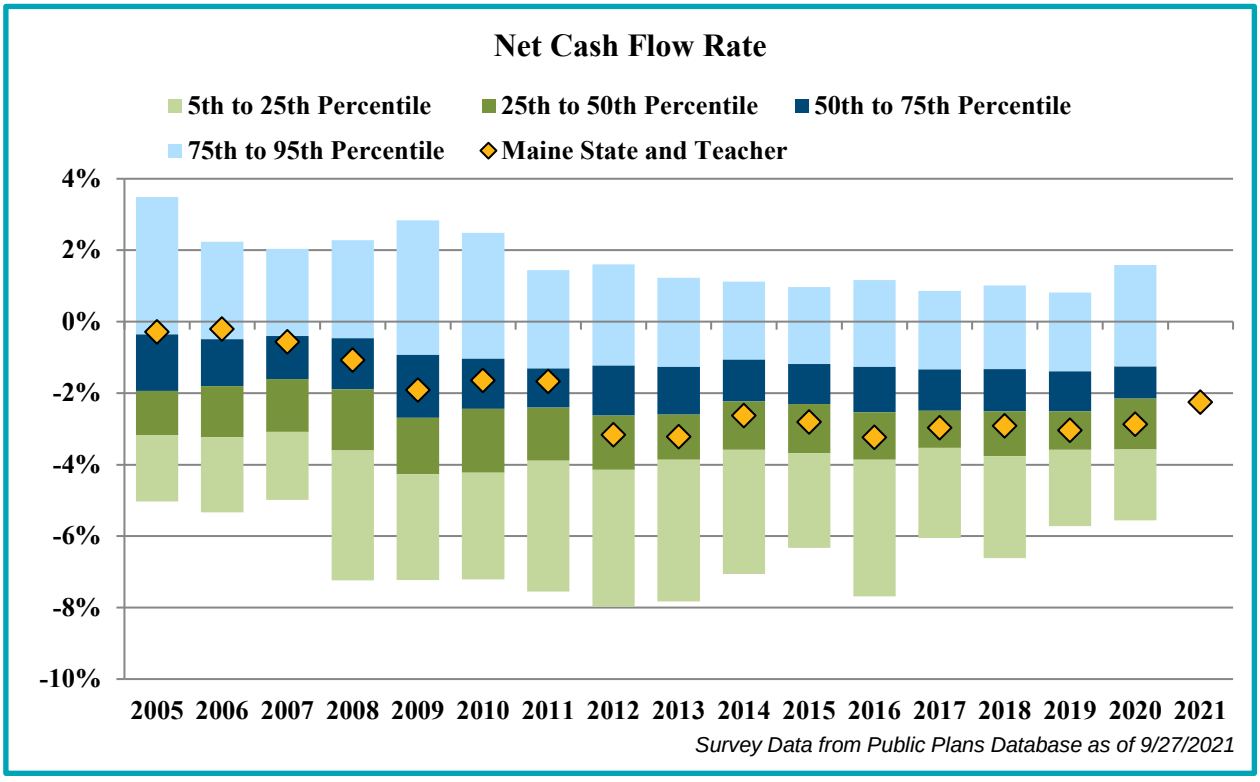
The gold diamonds in this graph show that the Program's support ratio for each year has generally increased over time in absolute terms while staying in relatively the same position relative to the universe of systems. This indicates that the Program is maturing, as have most plans in this database over 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 (excluding investment returns) for a 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% and has generally become more negative since then, with the value in 2020 just under negative three percent. In 2021, the Program's negative cash flow improved to -2.3%, largely due to the significant asset gains in FY 2021. 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 somewhat more negative than the median plan in the universe. Since the results for other systems as of 2021 are not yet available, we do not yet know how the improvement in the net cash flow ratio for this System in 2021 will compare relative to other systems. The overall pattern of this measure becoming more negative for the Program

relative to the universe of public pensions thus provides some indication that this Program is maturing at a pace somewhat faster than the typical public plan.



Assessing Future Risk

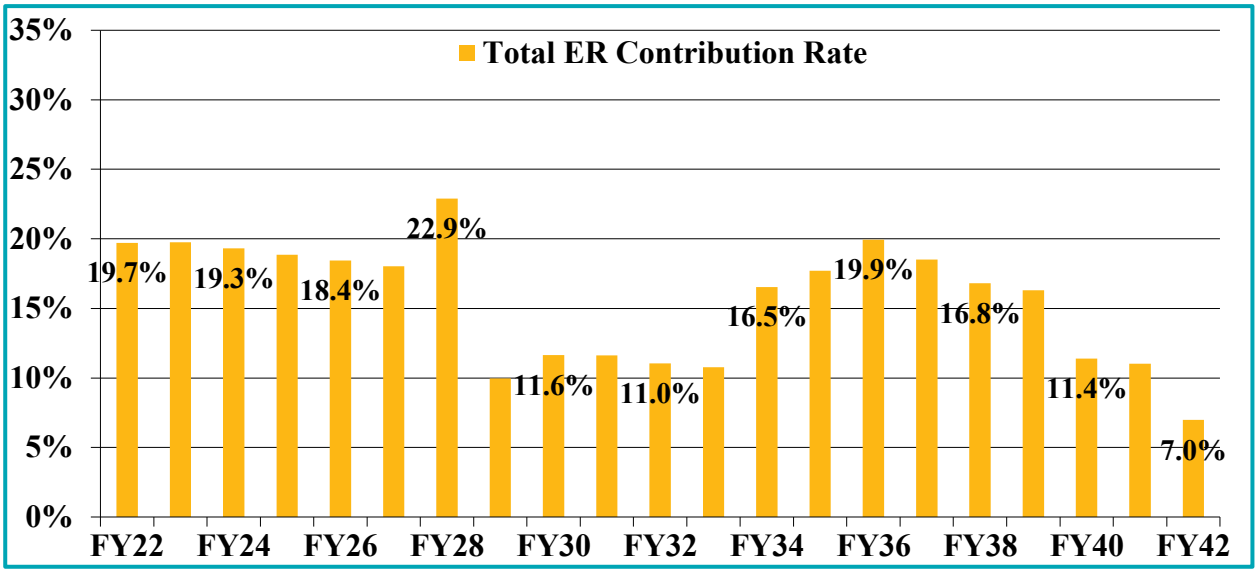
Assessing the future risk that the expected measurements produced by the actuarial valuations will deviate from the actual values over time is complex and can never be exactly known. However, to try to assist the Board in its utilization of this report, we have attempted to develop some basic assessments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

Pages 5-6 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, 1999 through June 30, 2019. This period produced an average return of 6.90% for this hypothetical portfolio. The rates assumed for this scenario are shown below.

SECTION II – RISK ASSESSMENT AND DISCLOSURE

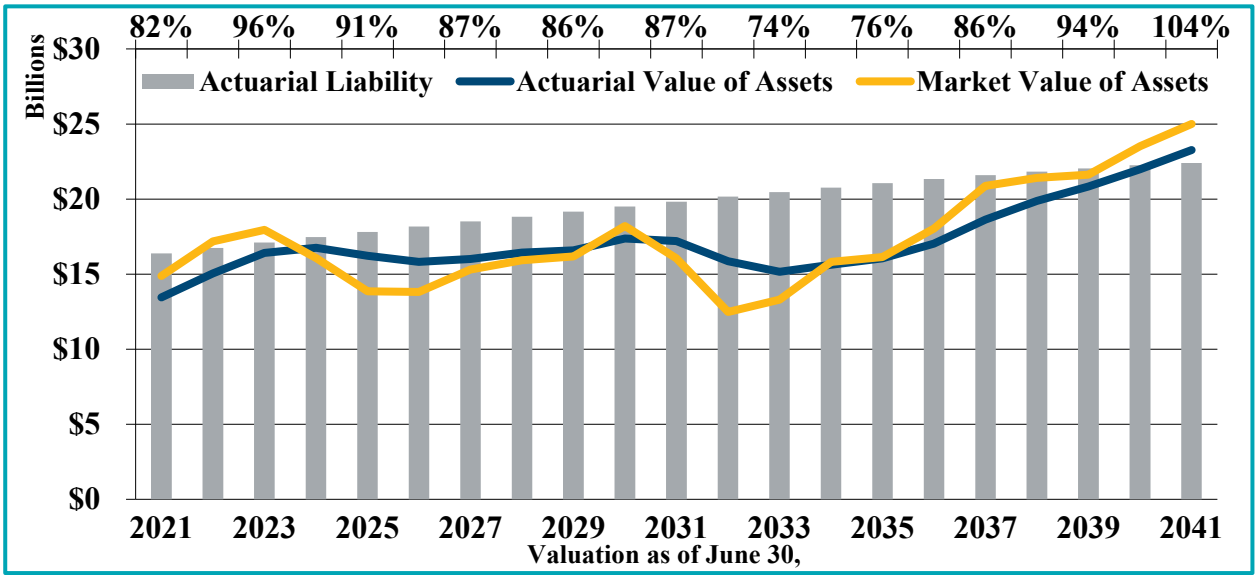
FY	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Return	17.9%	6.6%	-8.3%	-11.3%	2.8%	14.4%	6.4%	6.3%	17.0%	-8.1%
FY	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
Return	-18.1%	13.2%	24.0%	6.0%	15.3%	19.6%	6.0%	4.5%	13.3%	10.7%

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 approximately 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, increasing to a maximum of almost 23%. 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 of almost 20%, and remaining higher than the 0.0% 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. These two scenarios end at approximately the same funded ratio, 103% in the baseline and 104% in the illustrative varying returns scenario. However, where the baseline projection has the funded ratio steadily increasing from the current 82% to 105% and then gradually declining towards 100% over the forecasted period, in this varying returns scenario, the funded ratio is much more 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 in both scenarios.

SECTION II – RISK ASSESSMENT AND DISCLOSURE



SECTION III – ASSETS

Pension plan assets play a key role in the financial operation of plans and in the decisions that 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 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, 2020 and June 30, 2021,
- 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.

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 2021.

Table III-1
Changes in Market Value of Total MainePERS Defined Benefit (DB) Assets

Market Value of Total MainePERS DB Assets – June 30, 2020		**$ 15,152,648,971**
Additions		
Contributions:		
Employer Contributions	$ 487,886,863	
Member Contributions	213,983,849	
Transfers	(226,654)	
Total Contributions	$ 701,644,058	
Investment Income:		
Net Appreciation (Depreciation) in Fair Value of Investments	$4,142,724,692	
Interest on Bank Balances	185,277	
Total Investment Income	$4,142,909,969	
Investment Activity Expenses:		
Management Fees	$ (118,561,261)	
Investment Related Expense	(4,948,779)	
Banking Fees	(32,554)	
Total Investment Activity Expenses	$ (123,542,594)	
Net Income from Investing Activities	$4,019,367,375	
Total Additions		$ 4,721,011,433
Deductions		
Retirement Benefits	$(1,016,546,293)	
Disability Benefits	(28,922,911)	
Survivor Benefits	(24,933,925)	
Refunds	(21,209,236)	
Administrative Expenses	(13,950,085)	
Total Deductions		$ (1,105,562,450)
Total		
Net Increase (Decrease)		$ 3,615,448,983
Market Value of Total MainePERS DB Assets – June 30, 2021		**$ 18,768,097,954**

SECTION III – ASSETS

Table III-2 below develops the actuarial value of assets for the total MainePERS DB assets as of June 30, 2021 using the adopted actuarial valuation methodology.

Table III-2
Development of Actuarial Value of Total MainePERS Defined Benefit (DB) Assets as of June 30, 2021

1.	Actuarial Value of Total MainePERS DB Assets at June 30, 2020	$ 15,410,598,072
2.	Amount in (1) with Interest to June 30, 2021	16,450,813,442
3.	Employer and Member Contributions for FY 2021	701,644,058
4.	Interest on Contributions in (3), Assuming Received Uniformly throughout FY 2021	23,293,822
5.	Total Disbursements without Administrative Expenses, for FY 2021	(1,091,612,365)
6.	Interest on Disbursements in (5), Assuming Payments made Uniformly throughout FY 2021	(36,240,347)
7.	Expected Value of Total MainePERS DB Assets at June 30, 2021 = (2) + (3) + (4) + (5) + (6)	$ 16,047,898,610
8.	Actual Market Value of Total MainePERS DB Assets at June 30, 2021	18,768,097,954
9.	Excess of (8) Over (7)	2,720,199,344
10.	Actuarial Value of Total MainePERS DB Assets at June 30, 2021 = (7) + [33⅓% of (9)]	$ 16,954,631,725

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, 2021.

SECTION III – ASSETS

Allocation of Actuarial Value of Assets to the Program

The assets for 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, 2021 valuation, as shown in Table III-2 above, is 0.903375 ($16,954,631,725 ÷ $18,768,097,954). 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, 2021

Program	Market Value	Actuarial Value
Teacher	$ 9,890,613,635	$ 8,934,933,743
State (Regular & Special)	5,010,030,385	4,525,936,529
Judicial	89,893,506	81,207,552
Legislative	16,659,121	15,049,435
Participating Local Districts (Consolidated & Non-Consolidated)	3,760,901,307	3,397,504,466
Total	$ 18,768,097,954	$ 16,954,631,725

Investment Performance

The market value of assets for the total MainePERS DB assets returned a positive 26.76% during FY 2021. This is greater than the assumed return of 6.75% for FY 2021. The equivalent market value returns for the total MainePERS DB assets for FY 2020 and FY 2019 were positive 2.89% and positive 6.62%, respectively.

On an actuarial value of assets basis, the return for FY 2021 was a positive 12.71% for the total MainePERS DB assets. This return is less than the return on a market value basis but is greater than the 6.75% assumption in effect for FY 2021. Therefore, this return gave rise to an investment gain on the total MainePERS DB assets this year.

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
2022	$ 952,523,000	$ 439,434,000	$ 171,894,000	$ 611,328,000
2023	987,555,000	452,434,000	176,621,000	629,055,000
2024	1,021,800,000	469,536,000	181,478,000	651,014,000
2025	1,056,530,000	481,357,000	186,469,000	667,826,000
2026	1,090,270,000	483,312,000	191,597,000	674,909,000
2027	1,123,778,000	485,372,000	196,866,000	682,238,000
2028	1,156,142,000	487,544,000	202,280,000	689,824,000
2029	1,187,796,000	99,454,000	207,842,000	307,296,000
2030	1,219,464,000	81,258,000	213,558,000	294,816,000
2031	1,249,383,000	82,670,000	219,431,000	302,101,000

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 2022 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 6.50% 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 five.

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 2022.

SECTION IV – LIABILITIES

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

- Disclosure of the Program's liabilities as of June 30, 2020 and June 30, 2021,
- 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 6.50% 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 DB Programs, the method used is referred to as the entry age normal (EAN) funding method, which is the only permitted 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. Note that this year, the amount of assets now exceeds this liability basis, so there is now a surplus of the MVA compared to the PVAB.

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 Program. 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.

SECTION IV – LIABILITIES

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

The liability measures are compared to appropriate measures of assets, along with the expected future value of member and employer contributions where appropriate. The difference between the liability measure and the anticipated resources indicates either an expected shortfall or an expected surplus related to that liability measure. The surplus or shortfall on the present value of benefits (PVB) item indicates the size of the Program's stored gains or losses that remain outside of the valuation process.

Table IV-1
Disclosure of Liabilities

	June 30, 2020	June 30, 2021
Present Value of Benefits (PVB)		
Active Member Benefits	$ 6,930,514,827	$ 8,232,539,040
Retired, Disabled, Survivor, and Beneficiary Benefits	8,976,604,672	9,633,181,638
Terminated Vested Benefits	612,562,819	672,216,005
Terminated Nonvested Benefits	79,124,838	81,709,816
Total PVB	**$ 16,598,807,156**	**$ 18,619,646,499**
Market Value of Assets (MVA)	$ 12,044,916,279	$ 14,900,644,020
Future Member Contributions	1,218,779,360	1,465,479,203
Future Employer Contributions	3,229,544,488	3,814,725,520
Projected (Surplus)/Shortfall	105,567,029	(1,561,202,244)
Total Resources	**$ 16,598,807,156**	**$ 18,619,646,499**
Actuarial Liability (AL)		
Present Value of Benefits (PVB)	$ 16,598,807,156	$ 18,619,646,499
Present Value of Future Normal Costs (PVFNC)		
Employer Portion	514,567,666	761,815,968
Member Portion	1,218,779,360	1,465,479,203
Actuarial Liability (AL = PVB – PVFNC)	$ 14,865,460,130	$ 16,392,351,328
Actuarial Value of Assets (AVA)	12,249,961,306	13,460,870,272
Net (Surplus)/Unfunded (AL – AVA)	$ 2,615,498,824	$ 2,931,481,056
Present Value of Accrued Benefits		
Present Value of Future Benefits (PVB)	$ 16,598,807,156	$ 18,619,646,499
Present Value of Future Benefit Accruals (PVFBA)	2,960,607,188	3,779,042,749
Accrued Liability (PVAB = PVB – PVFBA)	$ 13,638,199,968	$ 14,840,603,750
Market Value of Assets (MVA)	12,044,916,279	14,900,644,020
Net (Surplus)/Unfunded (PVAB – MVA)	**$ 1,593,283,689**	**$ (60,040,270)**

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 that follows, 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, 2020	$ 16,598,807,156	$ 14,865,460,130	$ 13,638,199,968
Liability Measurement – June 30, 2021	18,619,646,499	16,392,351,328	14,840,603,750
Liability Measurement Increase/ (Decrease) Due to:	$ 2,020,839,343	$ 1,526,891,198	$ 1,202,403,782
Program Amendment	$ 0	$ 0	$ 0
Assumption Change	1,618,187,036	1,175,893,728	917,742,001
Actuarial (Gain)/Loss	N/C	25,575,263	N/C
Benefits Accumulated and Other Sources	$ 402,652,307	$ 325,422,207	$ 284,661,781

N/C = Not calculated

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, 2021

	Total Program	Teacher Program	State Regular Plans	State Special Plans
1. Actuarial Liabilities for:				
a. Active Members	$ 6,005,243,869	$4,036,529,860	$ 1,599,760,297	$ 368,953,712
b. Retired, Disabled, Survivor, and Beneficiary Members	9,633,181,638	6,182,645,776	2,942,550,632	507,985,230
c. Terminated (Vested & Nonvested) Members	753,925,821	517,263,987	218,171,248	18,490,586
2. Total Actuarial Liability [1(a) + 1(b) + 1(c)]	$ 16,392,351,328	$10,736,439,623	$ 4,760,482,177	$ 895,429,528
3. Actuarial Value of Assets	13,460,870,272	8,934,933,743	3,837,853,657	688,082,872
4. Unfunded Actuarial Liability (2 – 3)	$ 2,931,481,056	$1,801,505,880	$ 922,628,520	$ 207,346,656

SECTION V – CONTRIBUTIONS

In this section, we present detailed information on informational employer contribution rates as developed in this June 30, 2021 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 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.

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, 2020	June 30, 2021
Composite Employer NC Rate	3.88%	4.64%
Composite UAL Amortization Rate	16.27%	17.08%
Composite Total Employer Rate	20.15%	21.72%

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

Table V-2 below 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 June 30, 2021	Total NC Rate	Employee Contribution Rate	Employer NC Rate	UAL Contribution Rate	Total Employer Contribution Rate
Total Program	12.35%	7.71%	4.64%	17.08%	21.72%
Teacher Program	12.09%	7.65%	4.44%	16.21%	20.65%
State Program	12.82%	7.81%	5.01%	18.67%	23.68%
State Regular	12.46%	7.65%	4.81%	18.13%	22.94%
25 & Out Plan	14.17%	8.65%	5.52%	20.62%	26.14%
1998 Special Plan	14.87%	8.65%	6.22%	21.66%	27.88%
Fire Marshals	20.61%	8.65%	11.96%	30.03%	41.99%
State Police*	21.82%	8.65%	13.17%	31.76%	44.93%
Inland F&W*	23.13%	8.65%	14.48%	33.68%	48.16%
Forest Rangers*	11.88%	8.65%	3.23%	17.32%	20.55%

* Closed plan

SECTION V – CONTRIBUTIONS

Table V-3 below provides the development of the 17.08% UAL amortization rate for the Program as a whole and divided between the Teacher and State Programs.

Table V-3
Derivation of Unfunded Actuarial Liability Rates

Valuation Date June 30, 2021	Teacher Program	State Program (Regular and Special Plans)	Total Program
1. Actuarial Liability (AL)	$10,736,439,623	$5,655,911,705	$ 16,392,351,328
2. Actuarial Value of Assets (AVA)	8,934,933,743	4,525,936,529	13,460,870,272
3. Unfunded Actuarial Liability (UAL)	$1,801,505,880	$1,129,975,176	$ 2,931,481,056
4. Remaining Balances of Prior Amortization Bases			
a. Original UAL Amount	$1,113,744,036	$ 641,323,803	$ 1,755,067,839
b. 2012 (Gain)/Loss Base	26,443,325	23,558,453	50,001,778
c. 2013 (Gain)/Loss Base	(116,948,497)	131,449,568	14,501,071
d. 2014 (Gain)/Loss Base	(187,313,297)	(84,709,861)	(272,023,158)
e. 2015 (Gain)/Loss Base	3,566,015	(5,710,673)	(2,144,658)
f. 2016 (Gain)/Loss Base	168,556,752	188,862,291	357,419,043
g. 2017 (Gain)/Loss Base	102,681,385	18,670,669	121,352,054
h. 2018 (Gain)/Loss Base	110,506,224	28,931,669	139,437,893
i. 2019 (Gain)/Loss Base	145,468,117	24,285,205	169,753,322
j. 2020 (Gain)/Loss Base	26,902,561	85,216,365	112,118,926
k. 2021 (Gain)/Loss Base	407,899,259	78,097,687	485,996,946
l. Sum of the Bases	$1,801,505,880	$ 1,129,975,176	$ 2,931,481,056
5. UAL Amortizations			
a. Original UAL Amount 7 Years	$ 182,368,571	$ 105,012,733	$ 287,381,304
b. 2012 (Gain)/Loss Base 11 Years	2,948,835	2,627,128	5,575,963
c. 2013 (Gain)/Loss Base 12 Years	(12,156,012)	13,663,301	1,507,289
d. 2014 (Gain)/Loss Base 13 Years	(18,272,901)	(8,263,668)	(26,536,569)
e. 2015 (Gain)/Loss Base 14 Years	328,395	(525,896)	(197,501)
f. 2016 (Gain)/Loss Base 15 Years	14,726,796	16,500,890	31,227,686
g. 2017 (Gain)/Loss Base 16 Years	8,548,539	1,554,390	10,102,929
h. 2018 (Gain)/Loss Base 17 Years	8,799,925	2,303,911	11,103,836
i. 2019 (Gain)/Loss Base 18 Years	11,117,620	1,856,033	12,973,653
j. 2020 (Gain)/Loss Base 19 Years	1,979,185	6,269,252	8,248,437
k. 2021 (Gain)/Loss Base 20 Years	28,963,673	5,545,477	34,509,150
l. Sum of Amortization Payments	$ 229,352,626	$ 146,543,551	$ 375,896,177
6. Covered Payroll	$1,414,446,640	$ 785,011,573	$ 2,199,458,213

SECTION V – CONTRIBUTIONS

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

Valuation Date June 30, 2021	Teacher Program	State Program (Regular and Special Plans)	Total Program
7. UAL Amortization Rates			
a. Original UAL Amount 7 Years	12.89%	13.38%	13.06%
b. 2012 (Gain)/Loss Base 11 Years	0.21%	0.33%	0.25%
c. 2013 (Gain)/Loss Base 12 Years	(0.86)%	1.74%	0.07%
d. 2014 (Gain)/Loss Base 13 Years	(1.29)%	(1.05)%	(1.21)%
e. 2015 (Gain)/Loss Base 14 Years	0.02%	(0.07)%	(0.01)%
f. 2016 (Gain)/Loss Base 15 Years	1.04%	2.10%	1.42%
g. 2017 (Gain)/Loss Base 16 Years	0.60%	0.20%	0.46%
h. 2018 (Gain)/Loss Base 17 Years	0.62%	0.29%	0.50%
i. 2019 (Gain)/Loss Base 18 Years	0.79%	0.24%	0.59%
j. 2020 (Gain)/Loss Base 19 Years	0.14%	0.80%	0.38%
k. 2021 (Gain)/Loss Base 20 Years	2.05%	0.71%	1.57%
l. Sum of UAL Amortization Rates	**16.21%**	**18.67%**	**17.08%**

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, 2021	Total State Program	State Regular Plan	25 & Out Plan	1998 Special Plan	Fire Marshals	State Police (Closed)	Inland F&W (Closed)	Forest Rangers (Closed)
1. Employer NC Rate	5.01%	4.81%	5.52%	6.22%	11.96%	13.17%	14.48%	3.23%
2. Member Contribution Rate	7.81%	7.65%	8.65%	8.65%	8.65%	8.65%	8.65%	8.65%
3. Total NC Rate	12.82%	12.46%	14.17%	14.87%	20.61%	21.82%	23.13%	11.88%
4. UAL Amortization Rates*								
a. Original UAL Amount	13.38%	13.00%	14.79%	15.52%	21.51%	22.77%	24.14%	12.40%
b. 2012 Loss Base	0.33%	0.32%	0.36%	0.38%	0.53%	0.56%	0.60%	0.31%
c. 2013 Loss Base	1.74%	1.69%	1.92%	2.02%	2.80%	2.96%	3.14%	1.61%
d. 2014 Gain Base	(1.05)%	(1.02)%	(1.16)%	(1.22)%	(1.69)%	(1.79)%	(1.89)%	(0.97)%
e. 2015 Gain Base	(0.07)%	(0.07)%	(0.08)%	(0.08)%	(0.11)%	(0.12)%	(0.13)%	(0.06)%
f. 2016 Loss Base	2.10%	2.04%	2.32%	2.44%	3.38%	3.57%	3.79%	1.95%
g. 2017 Loss Base	0.20%	0.19%	0.22%	0.23%	0.32%	0.34%	0.36%	0.19%
h. 2018 Loss Base	0.29%	0.28%	0.32%	0.34%	0.47%	0.49%	0.52%	0.27%
i. 2019 Loss Base	0.24%	0.23%	0.27%	0.28%	0.39%	0.41%	0.43%	0.22%
j. 2020 Loss Base	0.80%	0.78%	0.88%	0.93%	1.29%	1.36%	1.44%	0.74%
k. 2021 Gain Base	0.71%	0.69%	0.78%	0.82%	1.14%	1.21%	1.28%	0.66%
l. Sum of Amortization Rates	**18.67%**	**18.13%**	**20.62%**	**21.66%**	**30.03%**	**31.76%**	**33.68%**	**17.32%**

* The 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 12.82% 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.

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 the Annual Financial Reports (AFR) 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, 2021 are discounted at the assumed valuation interest rate of 6.50% per annum in all of these disclosures.

SECTION VI – FINANCIAL DISCLOSURE INFORMATION

Table VI-1 below includes the relevant amounts as of June 30, 2020 and June 30, 2021 as well as a reconciliation between the two dates under FASB ASC Topic 960.

Table VI-1
Accrued Benefits Information

	June 30, 2020	June 30, 2021
FASB ASC Topic 960 Basis		
1. Present Value of Benefits Accrued to Date (PVAB)		
a. Members Currently Receiving Payments	$ 8,976,604,672	$ 9,633,181,638
b. Terminated Vested Members	612,562,819	672,216,005
c. Terminated Nonvested Members	79,124,838	81,709,816
d. Active Members	3,969,907,639	4,453,496,291
e. Total PVAB	$ 13,638,199,968	$ 14,840,603,750
2. Market Value of Assets (MVA)	12,044,916,279	14,900,644,020
3. Unfunded Present Value of Accrued Benefits, But Not Less Than Zero	$ 1,593,283,689	$ 0
4. Ratio of MVA to PVAB (2)/(1)(e)	88.3%	100.4%

Change in Present Value of Benefits Accrued to Date during FY 2021	
Increase/(Decrease) during Year Attributable to:	
Passage of Time	$ 890,602,761
Benefits Paid	(902,913,134)
Assumption Changes	917,742,001
Program Changes	0
Benefits Accrued, Other Gains/Losses	296,972,154
Net Increase (Decrease)	$ 1,202,403,782

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, 2021 as well as related ratios calculated under the provisions of GASB Statement No. 67 for the Program.

As of the June 30, 2021 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.

SECTION VI – FINANCIAL DISCLOSURE INFORMATION

Table VI-2
Schedule of Changes in Net Pension Liability and Related Ratios
FY 2021

	Teacher Program	State Program	Total State and Teacher Program
Total Pension Liability (TPL)			
Service Cost (SC)	$ 150,790,221	$ 87,984,972	$ 238,775,193
Interest (Includes Interest on SC)	641,516,623	348,043,526	989,560,149
Changes of Benefit Terms	0	0	0
Differences Between Actual and Expected Experience	18,805,380	6,769,883	25,575,263
Changes of Assumptions	865,004,772	310,888,956	1,175,893,728
Benefit Payments, Including Refunds of Member Contributions	(576,264,713)	(326,648,422)	(902,913,135)
Net Change in TPL	**1,099,852,283**	**427,038,915**	**1,526,891,198**
Beginning of Year (BOY) TPL	**9,636,587,340**	**5,228,872,790**	**14,865,460,130**
End of Year (EOY) TPL	**$10,736,439,623**	**$5,655,911,705**	**$16,392,351,328**
Plan Fiduciary Net Position (FNP)			
Employer Contributions	$ 246,375,527	$ 172,197,992	$ 418,573,519
Member Contributions	104,473,001	55,037,002	159,510,003
Transfers	0	(389,920)	(389,920)
Net Investment Income	2,119,063,837	1,072,972,393	3,192,036,230
Benefit Payments, Including Refunds of Member Contributions	(576,264,713)	(326,648,422)	(902,913,135)
Administrative Expense	(7,369,059)	(3,719,897)	(11,088,956)
Net Change in FNP	1,886,278,593	969,449,148	2,855,727,741
BOY FNP	**8,004,335,042**	**4,040,581,237**	**12,044,916,279**
EOY FNP	**$9,890,613,635**	**$5,010,030,385**	**$14,900,644,020**
EOY Net Pension Liability (NPL)	**$ 845,825,988**	**$ 645,881,320**	**$ 1,491,707,308**
FNP as a Percentage of TPL	92.1%	88.6%	90.9%
Covered Payroll*	1,332,399,085	763,966,247	2,096,365,332
NPL as a Percentage of Covered Payroll	63.5%	84.5%	71.2%

* For FY 2021

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

Demographic assumptions were changed based on recommendations from the July 1, 2015 to June 30, 2020 experience study as well as the actuarial audit completed of the June 30, 2020 actuarial valuation, first effective with the development of the NPL as of June 30, 2021. The annual rate of investment return was also reduced from 6.75% to 6.50% effective as of this same date. The impact of these changes is included in the TPL reconciliation as changes of assumptions.

SECTION VI – FINANCIAL DISCLOSURE INFORMATION

A ten-year schedule of changes in NPL and related ratios is to be included within the AFR 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 AFRs 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, 2021, we have included suggested information for 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 we 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 2021

	1% Decrease 5.50%	Discount Rate 6.50%	1% Increase 7.50%
Teacher Program			
Total Pension Liability (TPL)	$12,111,849,409	$10,736,439,623	$ 9,591,272,095
Plan Fiduciary Net Position (FNP)	9,890,613,635	9,890,613,635	9,890,613,635
Net Pension Liability (NPL)	$ 2,221,235,774	$ 845,825,988	$ (299,341,540)
FNP as a Percentage of TPL	81.7%	92.1%	103.1%
State Program			
Total Pension Liability (TPL)	$ 6,326,424,271	$ 5,655,911,705	$ 5,092,853,436
Plan Fiduciary Net Position (FNP)	5,010,030,385	5,010,030,385	5,010,030,385
Net Pension Liability (NPL)	$ 1,316,393,886	$ 645,881,320	$ 82,823,051
FNP as a Percentage of TPL	79.2%	88.6%	98.4%
Total State and Teacher Program			
Total Pension Liability (TPL)	$18,438,273,680	$16,392,351,328	$14,684,125,531
Plan Fiduciary Net Position (FNP)	14,900,644,020	14,900,644,020	14,900,644,020
Net Pension Liability (NPL)	$ 3,537,629,660	$ 1,491,707,308	$ (216,518,489)
FNP as a Percentage of TPL	80.8%	90.9%	101.5%

A one percent decrease in the discount rate increases the TPL for the total Program by approximately 12% and increases the NPL by approximately 137%. A one percent increase in the discount rate decreases the TPL by approximately 10% and decreases the NPL by approximately 115%.

SECTION VI – FINANCIAL DISCLOSURE INFORMATION

Table VI-4 below 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 Program. 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 AFR.

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 AFR 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 2021

	Teacher Program	State Program	Total State and Teacher Program
Actuarially Determined Contribution (ADC)	$ 246,360,591	$ 172,197,992	$ 418,558,583
Contributions in Relation to the ADC	246,360,591	172,197,992	418,558,583
Contribution Deficiency/(Excess)	$ 0	$ 0	$ 0
Covered Payroll (Payroll)	$1,332,399,085	$ 763,966,247	$ 2,096,365,332
Contributions as a Percentage of Payroll	18.49%	22.54%	19.97%

SECTION VI – FINANCIAL DISCLOSURE INFORMATION

Notes to Schedule of Employer Contributions

Valuation Date:	June 30, 2017
Timing:	June 30, 2021 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 periods. Original UAL amortized over a remaining eight years from July 1, 2020. Subsequent layers of UAL amortized over individual 20-year periods.
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.

A complete description of the methods and assumptions used to determine contribution rates for the year ending June 30, 2021 can be found in the June 30, 2018 actuarial valuation report.

SECTION VI – FINANCIAL DISCLOSURE INFORMATION

Other Information

None

Table VI-5 below 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, 2021, these values are thus developed as of June 30, 2020. 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. Also note that the decision was made to use these averages based on rounding to the nearest whole year, so the values are thus shown as such.

Table VI-5
Average Expected Remaining Service Lives
For Measurement Year Ending June 30, 2021

Teacher Program

Status	Total Expected Future Service	Count	Average Remaining Service Lives
Active Members	284,900	27,565	10
In-Pay Members	0	21,731	0
Terminated Vested Members	0	5,162	0
Inactives Due Refunds	0	29,609	0
Total Membership	284,900	84,067	3

State Program

Status	Total Expected Future Service	Count	Average Remaining Service Life
Actives	110,060	12,830	9
In-Pay Members	0	15,420	0
Terminated Vested Members	0	2,995	0
Inactives Due Refunds	0	8,044	0
Total Membership	110,060	39,289	3

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, 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	Gain (or Loss) For Fiscal Year Ended June 30, 2021
Investment Income	$(284,220,804)	$ (18,117,992)	$ 94,329,730	$ 57,985,155	$ (102,951,302)	$ 720,053,045
Combined Liability Experience	(81,506,701)	(95,207,531)	(34,151,279)	(208,719,412)	(162,293)	(25,575,263)
Gain (or Loss) during Year from Financial Experience	$(365,727,505)	$(113,325,523)	$ 60,178,451	$ (150,734,257)	$ (103,113,595)	$ 694,477,782
Non-Recurring Items	(30,436,605)	0	(191,998,939)	0	(1,223,156)	(1,175,893,728)
Composite Gain (or Loss) During Year	**$(396,164,110)**	**$(113,325,523)**	**$ (131,820,488)**	**$ (150,734,257)**	**$ (104,336,751)**	**$(481,415,946)**

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, 2021, 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:						
	(1)	(2)	(3)		Portion of Actuarial Liabilities Covered by Reported Assets		
Valuation Date June 30,	Active Member Contributions	Retirees, Vested Terms, Beneficiaries	Active Members (Employer Financed Portion)	Reported Assets*	(1)	(2)	(3)
2021	$2,588,064,433	$10,387,107,459	$3,417,179,436	$13,460,870,272	100%	100%	14%
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

* 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.

APPENDIX A – MEMBERSHIP INFORMATION

Active Member Data as of June 30, 2021	
Teacher Plan	
Count	27,444
Average Current Age	46.0
Average Benefit Service	12.3
Average Vesting Service	12.4
Average Valuation Pay	$ 51,539
State Employee Regular Plan	
Count	10,968
Average Current Age	48.2
Average Benefit Service	11.7
Average Vesting Service	12.1
Average Valuation Pay	$ 60,120
Forest Rangers Special Plan (Closed Plan)	
Count	1
Average Current Age	62.6
Average Benefit Service	42.1
Average Vesting Service	42.1
Average Valuation Pay	$116,137
Inland Fisheries & Wildlife Officers Special Plan (Closed Plan)	
Count	1
Average Current Age	65.9
Average Benefit Service	43.2
Average Vesting Service	43.2
Average Valuation Pay	$ 79,867
State Police Special Plan (Closed Plan)	
Count	1
Average Current Age	67.8
Average Benefit Service	43.9
Average Vesting Service	43.9
Average Valuation Pay	$ 86,253

APPENDIX A – MEMBERSHIP INFORMATION

Active Member Data as of June 30, 2021	
State Employee Special 25 & Out Plan	
Count	463
Average Current Age	40.9
Average Benefit Service	14.1
Average Vesting Service	14.6
Average Valuation Pay	$ 88,021
State Employee 1998 Special Plan	
Count	1,209
Average Current Age	43.5
Average Benefit Service	11.8
Average Vesting Service	12.2
Average Valuation Pay	$ 69,048
Fire Marshal Special Plan	
Count	12
Average Current Age	43.5
Average Benefit Service	8.7
Average Vesting Service	14.3
Average Valuation Pay	$ 92,044
State Employee Totals (Excludes Teachers)	
Count	12,655
Average Current Age	47.5
Average Benefit Service	11.8
Average Vesting Service	12.2
Average Valuation Pay	$ 62,032

Non-Active Member Data as of June 30, 2021
Teachers

	Count	Average Age	Total Annual Benefit	Average Annual Benefit
Retired	18,231	73.6	$ 503,994,258	$ 27,645
Retired – Concurrent Beneficiary	1,346	74.3	8,273,812	6,147
Disability – Section 1122	0		0	0
Disability – Section 3 and 3A	680	69.3	20,301,316	29,855
Beneficiary of Above	1,624	73.8	28,655,360	17,645
Pre-Retirement Death Beneficiary	280	63.1	1,783,847	6,371
Terminated Vested	5,368	52.7	46,453,156	8,654
Inactive Due Refund	29,934	NA	NA	NA

APPENDIX A – MEMBERSHIP INFORMATION

Non-Active Member Data as of June 30, 2021
State Regular

	Count	Average Age	Total Annual Benefit	Average Annual Benefit
Retired	10,012	73.5	$ 223,439,901	$ 22,317
Retired – Concurrent Beneficiary	931	73.0	5,033,735	5,407
Disability – Section 1122	0	-	0	NA
Disability – Section 3 and 3A	802	67.7	20,040,476	24,988
Beneficiary of Above	1,949	64.9	28,714,491	14,733
Pre-Retirement Death Beneficiary	284	68.2	1,805,613	6,358
Terminated Vested	2,662	52.9	21,508,350	8,080
Inactive Due Refund	7,404	NA	NA	NA

Non-Active Member Data as of June 30, 2021
State Special

	Count	Average Age	Total Annual Benefit	Average Annual Benefit
Retired	1,058	68.4	$ 34,360,399	$ 32,477
Retired – Concurrent Beneficiary	152	67.2	1,022,948	6,730
Disability – Section 1122	1	90.6	20,585	20,585
Disability – Section 3 and 3A	77	61.3	2,270,189	29,483
Beneficiary of Above	247	72.7	4,240,955	17,170
Pre-Retirement Death Beneficiary	16	46.2	91,769	5,736
Terminated Vested	357	45.9	2,628,185	7,362
Inactive Due Refund	1,055	NA	NA	NA

In preparing this report, we relied on data provided by MainePERS as modified following the procedures outlined in the State of Maine Data Processing Notebook. Adjustments to the data are made based on this processing notebook. Accuracy of the results is dependent on the completeness of the underlying information. The plan sponsor is responsible for the validity and completeness of the information provided. We believe the data provided as modified as documented in the Processing Notebook is sufficient for the actuarial analysis performed.

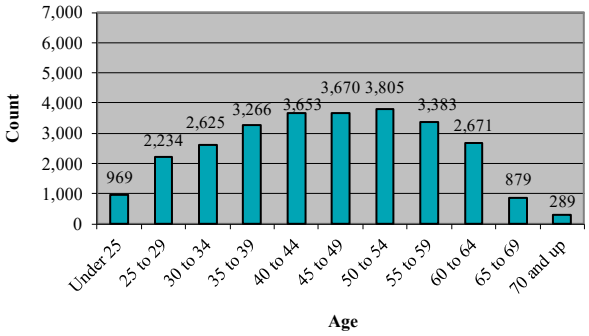
APPENDIX A – MEMBERSHIP INFORMATION

Distribution of Active Members
As of June 30, 2021

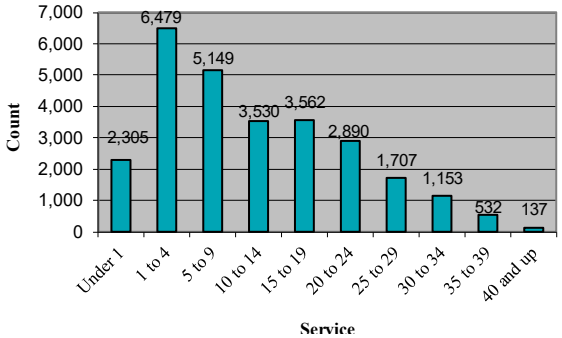
Teachers

	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	Totals
Under 25	534	435	0	0	0	0	0	0	0	0	969
25 to 29	341	1,408	485	0	0	0	0	0	0	0	2,234
30 to 34	247	930	1,133	315	0	0	0	0	0	0	2,625
35 to 39	275	903	816	888	384	0	0	0	0	0	3,266
40 to 44	250	782	734	597	957	333	0	0	0	0	3,653
45 to 49	204	656	668	511	588	806	237	0	0	0	3,670
50 to 54	152	529	554	497	618	565	683	205	2	0	3,805
55 to 59	113	406	363	354	497	529	366	575	179	1	3,383
60 to 64	98	282	267	262	373	493	297	276	283	40	2,671
65 to 69	53	101	84	86	117	131	104	75	59	69	879
70 and up	38	47	45	20	28	33	20	22	9	27	289
Total	2,305	6,479	5,149	3,530	3,562	2,890	1,707	1,153	532	137	27,444

Age Distribution



Service Distribution



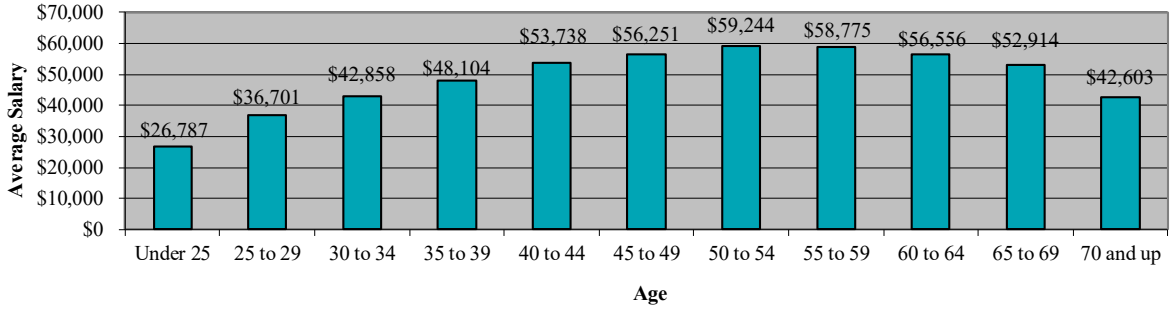
APPENDIX A – MEMBERSHIP INFORMATION

Distribution of Active Members
As of June 30, 2021

Teachers

	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	21,995	32,671	0	0	0	0	0	0	0	0	26,787
25 to 29	26,110	36,511	44,700	0	0	0	0	0	0	0	36,701
30 to 34	26,248	38,244	47,404	53,153	0	0	0	0	0	0	42,858
35 to 39	28,329	39,586	47,195	57,595	62,279	0	0	0	0	0	48,104
40 to 44	26,598	38,223	49,575	59,887	66,812	71,125	0	0	0	0	53,738
45 to 49	26,042	39,127	47,716	56,818	65,171	72,262	75,908	0	0	0	56,251
50 to 54	26,563	38,044	45,592	54,744	64,338	71,259	77,475	76,893	47,430	0	59,244
55 to 59	25,320	37,914	43,332	49,712	57,128	64,658	73,767	76,035	77,735	25,776	58,775
60 to 64	25,986	35,774	41,325	46,515	53,839	59,264	68,607	75,178	76,700	76,879	56,556
65 to 69	21,865	34,067	37,850	43,322	51,087	59,146	63,304	70,107	74,033	73,505	52,914
70 and up	21,457	25,133	32,338	39,637	45,843	54,764	53,581	62,619	62,929	72,639	42,603
Average	25,294	37,462	46,381	55,010	62,232	67,531	73,776	75,341	76,409	73,971	51,539

Average Salary Distribution



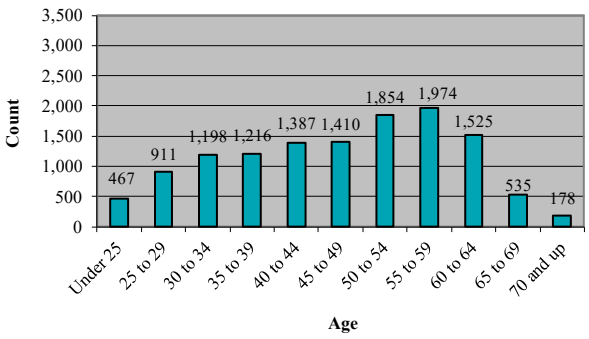
APPENDIX A – MEMBERSHIP INFORMATION

Distribution of Active Members
As of June 30, 2021

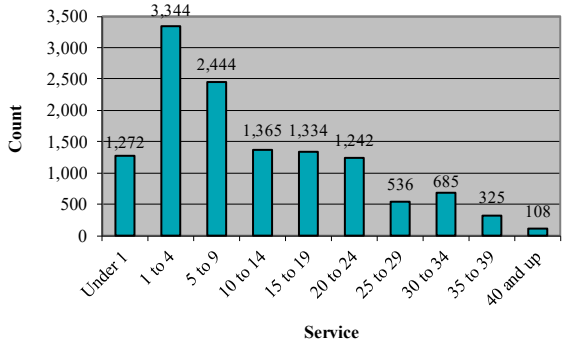
State

	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	Totals
Under 25	280	181	6	0	0	0	0	0	0	0	467
25 to 29	217	536	158	0	0	0	0	0	0	0	911
30 to 34	176	562	403	54	3	0	0	0	0	0	1,198
35 to 39	112	423	372	203	100	6	0	0	0	0	1,216
40 to 44	99	387	325	230	244	102	0	0	0	0	1,387
45 to 49	105	302	275	179	211	273	62	3	0	0	1,410
50 to 54	112	342	280	221	246	296	181	164	12	0	1,854
55 to 59	85	318	286	217	236	252	138	284	152	6	1,974
60 to 64	52	203	223	178	202	218	111	180	117	41	1,525
65 to 69	23	61	95	67	67	78	32	38	32	42	535
70 and up	11	29	21	16	25	17	12	16	12	19	178
Total	1,272	3,344	2,444	1,365	1,334	1,242	536	685	325	108	12,655

Age Distribution



Service Distribution



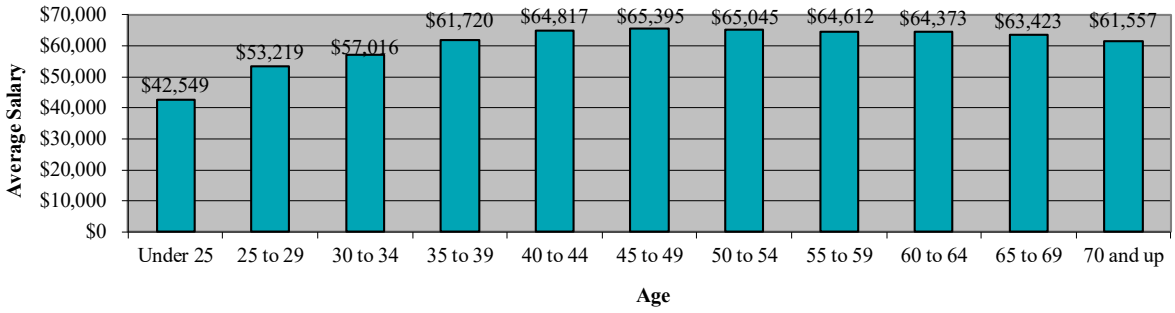
APPENDIX A – MEMBERSHIP INFORMATION

Distribution of Active Members
As of June 30, 2021

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	38,225	48,856	54,043	0	0	0	0	0	0	0	42,549
25 to 29	44,979	53,813	62,521	0	0	0	0	0	0	0	53,219
30 to 34	46,407	54,626	63,397	67,748	76,793	0	0	0	0	0	57,016
35 to 39	51,585	55,737	64,598	71,380	68,068	61,668	0	0	0	0	61,720
40 to 44	51,424	58,003	64,496	71,100	72,362	72,476	0	0	0	0	64,817
45 to 49	50,169	55,289	61,725	66,615	71,403	76,936	81,900	65,444	0	0	65,395
50 to 54	48,484	53,556	61,103	65,593	68,778	71,882	79,961	71,564	69,664	0	65,045
55 to 59	43,296	53,674	61,366	63,400	67,413	69,507	76,386	71,150	71,770	67,358	64,612
60 to 64	50,438	51,843	60,455	63,153	64,769	67,320	73,254	73,171	71,968	68,706	64,373
65 to 69	39,397	55,898	57,934	60,570	65,907	63,576	71,536	71,746	83,803	70,996	63,423
70 and up	38,245	45,558	68,513	60,608	56,141	60,258	67,428	87,952	80,815	62,773	61,557
Average	45,462	54,350	62,521	66,629	68,584	71,029	77,092	72,181	73,282	68,478	62,032

Average Salary Distribution

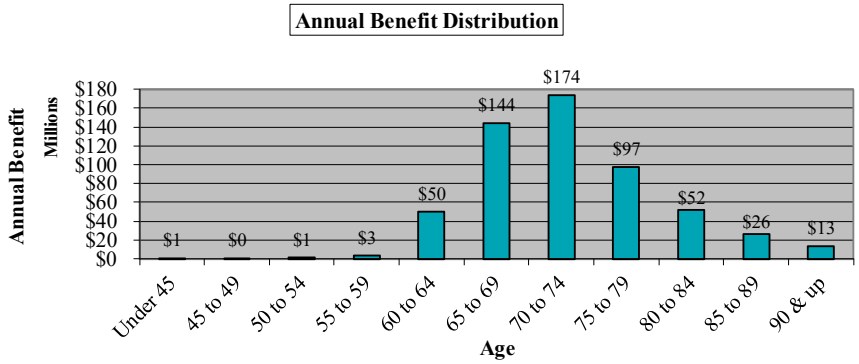


APPENDIX A – MEMBERSHIP INFORMATION

Distribution of Retirees, Disabled Members, Beneficiaries, and Survivors As of June 30, 2021

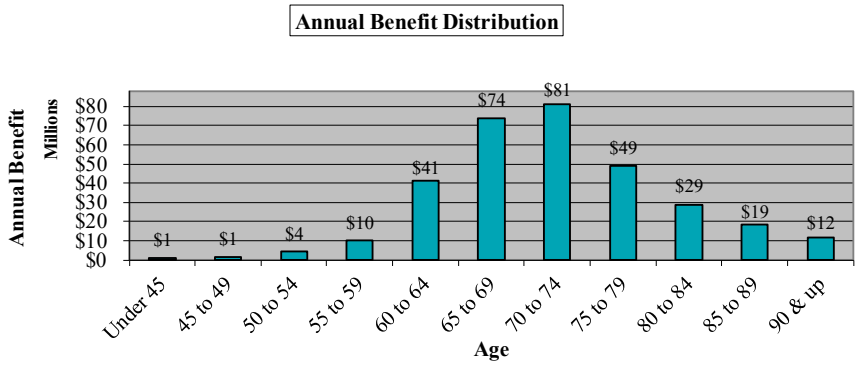
Teachers

Age	Count	Annual Benefit
Under 45	144	$ 966,619
45 to 49	50	430,521
50 to 54	93	1,254,390
55 to 59	173	3,285,098
60 to 64	1,726	50,031,669
65 to 69	5,259	144,145,532
70 to 74	6,677	173,985,660
75 to 79	3,952	97,406,941
80 to 84	2,211	51,742,900
85 to 89	1,186	26,349,709
90 & up	690	13,409,553
Total	22,161	$ 563,008,592



State

Age	Count	Annual Benefit
Under 45	124	$ 1,036,313
45 to 49	102	1,314,508
50 to 54	225	4,235,900
55 to 59	484	10,048,047
60 to 64	1,816	41,344,839
65 to 69	3,495	73,933,796
70 to 74	3,803	80,894,242
75 to 79	2,332	48,937,843
80 to 84	1,486	28,852,983
85 to 89	989	18,588,323
90 & up	673	11,854,267
Total	15,529	$ 321,041,061



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, 2020	**27,565**	**17,804**	**2,967**	**277**	**683**	**5,162**
New hires	1,853					
Rehires	490				(2)	(161)
Movement between plans	(7)					(8)
New retirees	(429)	865				(435)
New beneficiaries due to retirements			48			
New disabled retirees	(16)				24	(5)
New deferred vested members	(829)					907
Non-vested terminations	(994)					
Refunds	(168)					(84)
Deaths, no future benefits	(10)	(385)	(119)	(4)	(22)	(4)
Deaths with a survivor or beneficiary	(5)	(51)	74	6	(7)	(10)
Benefits expired				(5)		
Data correction	(6)	(2)	-	6	4	6
As of June 30, 2021	**27,444**	**18,231**	**2,970**	**280**	**680**	**5,368**

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, 2020	**12,830**	**10,927**	**3,280**	**307**	**906**	**2,995**
New hires	1,089					
Rehires	68					(33)
Movement between plans	(14)					(3)
New retirees	(376)	497				(119)
New beneficiaries due to retirements			43			
New disabled retirees	(15)				27	(12)
New deferred vested members	(212)					263
Non-vested terminations	(536)					
Refunds	(169)					(63)
Deaths, no future benefits	(4)	(292)	(148)	(11)	(28)	(7)
Deaths with a survivor or beneficiary	(6)	(62)	100	5	(19)	(8)
Benefits expired				(2)		
Data correction		-	4	1	(6)	6
As of June 30, 2021	**12,655**	**11,070**	**3,279**	**300**	**880**	**3,019**

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.

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 7.65% thereafter.

APPENDIX B – SUMMARY OF PROGRAM PROVISIONS

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.

APPENDIX B – SUMMARY OF PROGRAM PROVISIONS

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.

APPENDIX B – SUMMARY OF PROGRAM PROVISIONS

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

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: 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.

APPENDIX B – SUMMARY OF PROGRAM PROVISIONS

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.

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.

APPENDIX B – SUMMARY OF PROGRAM PROVISIONS

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.

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: 66⅔% 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.

APPENDIX B – SUMMARY OF PROGRAM PROVISIONS

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 66⅔% 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 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.

APPENDIX B – SUMMARY OF PROGRAM PROVISIONS

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.

- 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.

APPENDIX B – SUMMARY OF PROGRAM PROVISIONS

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.

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
2021 - $22,947.11

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.

APPENDIX B – SUMMARY OF PROGRAM PROVISIONS

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*.

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

None

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.

APPENDIX C – ACTUARIAL ASSUMPTIONS AND METHODS

A. Actuarial Assumptions

Where assumptions were changed in 2021, the revised assumption in effect for this June 30, 2021 valuation are shown with grey shading.

1. Annual Rate of Investment Return

State Employees	6.50%
Teachers	6.50%
(both previously 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)

	Prior Assumption		Revised Assumption	
Service	State Employees	Teachers	State Employees	Teachers
0	8.75%	14.50%	9.43%	13.03%
5	5.00	5.75	6.24	5.83
10	3.75	4.75	5.32	4.81
15	3.20	4.00	3.98	4.29
20	2.95	3.25	3.78	3.26
25 and over	2.75	2.75	3.26	2.80

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

APPENDIX C – ACTUARIAL ASSUMPTIONS AND METHODS

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

Service	Prior Assumption State Employees & Teachers	Revised Assumption State Employees	Revised Assumption Teachers
0	33.5%	32.5%	26.0%
5	10.50	10.0	9.0
10	5.95	6.0	5.5
15	4.25	4.0	3.5
20	4.00	3.0	3.0
25	4.00	2.5	3.0

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)

	Prior Assumption (showing values in 2021)				Revised Assumption (showing values in 2021)			
	State Employees		Teachers		State Employees		Teachers	
Age	Male	Female	Male	Female	Male	Female	Male	Female
50	40	31	38	25	31	25	10	6
55	56	42	53	34	47	35	21	17
60	76	61	72	50	72	48	36	27
65	108	93	103	77	104	70	59	37
70	167	149	159	123	160	113	98	60
75	273	245	259	202	271	202	180	115
80	459	413	437	341	489	373	345	323
85	801	734	763	606	899	706	719	632
90	1,434	1,333	1,365	1,100	1,560	1,317	1,338	1,193
95	2,297	2,226	2,187	1,837	2,432	2,148	2,251	2,122

Prior 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. Prior 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

APPENDIX C – ACTUARIAL ASSUMPTIONS AND METHODS

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.

Revised rates for State Employees are based on 112.1% and 118.5% of the 2010 Public Plan General Benefits-Weighted Healthy Retiree Mortality Table, respectively, for males and females.

Revised rates for Teachers are based on the 2010 Public Plan Teacher Benefits-Weighted Healthy Retiree Mortality Table adjusted as follows:

- 98.1% and 87.5% respectively of the rates for males before age 85 and females before age 80
- 106.4% and 122.3% respectively of the rates for males on and after age 85 and females on and after age 80

The revised rates are projected generationally using the RPEC_2020 model, with an ultimate rate of 1.00% for ages 80 and under, grading down to 0.05% at age 95, and further grading down to 0.00% at age 115, along with convergence to the ultimate rates in the year 2027. All other parameters used in the RPEC_2020 model are those included in the published MP-2020 scale.

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

	Prior Assumption (showing values in 2021)				Revised Assumption (showing values in 2021)			
	State Employees		Teachers		State Employees		Teachers	
Age	Male	Female	Male	Female	Male	Female	Male	Female
20	4	2	3	1	3	1	3	1
25	4	2	4	2	3	1	2	1
30	4	2	4	2	4	2	3	2
35	5	3	5	3	6	3	4	3
40	6	5	6	4	7	4	5	3
45	9	7	9	6	8	5	6	4
50	16	12	16	10	12	7	10	6
55	27	19	26	16	18	11	16	10
60	46	28	44	23	28	17	26	16
65	81	43	77	35	40	25	41	24

* 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.

APPENDIX C – ACTUARIAL ASSUMPTIONS AND METHODS

Prior 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. Prior 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.

Revised rates for State Employees are based on 83.5% and 88.6% of the 2010 Public Plan General Benefits-Weighted Employee Mortality Table, respectively, for males and females. Revised rates for Teachers are based on 93.1% and 91.9% of the 2010 Public Plan Teacher Benefits-Weighted Employee Mortality Table, respectively, for males and females. These rates are generationally projected using the same version of the RPEC_2020 model as described in the healthy annuitant mortality.

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

	Prior Assumption (showing values in 2021)				Revised Assumption (showing values in 2021)			
	State Employees		Teachers		State Employees		Teachers	
Age	Male	Female	Male	Female	Male	Female	Male	Female
25	80	23	80	23	36	21	31	25
30	77	29	77	29	53	37	47	44
35	90	41	90	41	72	57	63	68
40	108	56	108	56	89	76	78	91
45	168	88	168	88	112	99	98	119
50	206	116	206	116	161	144	142	173
55	238	146	238	146	220	185	194	222
60	270	173	270	173	280	213	246	256
65	323	211	323	211	331	223	290	268
70	418	286	418	286	390	264	343	316

Prior 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.

APPENDIX C – ACTUARIAL ASSUMPTIONS AND METHODS

Revised rates for State Employees are based on 107.3% and 103.2% of the 2010 Public Plan Non-Safety Benefits-Weighted Disabled Retiree Mortality Table, respectively, for males and females. Revised rates for Teachers are based on 94.2% and 123.8% of the 2010 Public Plan Non-Safety Benefits-Weighted Disabled Retiree Mortality Table, respectively, for males and females. These rates are generationally projected using the same version of the RPEC_2020 model described in the healthy annuitant mortality.

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

Teachers and State Regular Plans

	Prior Assumptions		
	State Regular Employees and Teachers		
Age	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

APPENDIX C – ACTUARIAL ASSUMPTIONS AND METHODS

	Revised Assumptions State Regular Employees			Revised Assumptions Teachers		
Age	NRA 60	NRA 62	NRA 65	NRA 60	NRA 62	NRA 65
57	40	35	N/A	40	35	N/A
59	260	40	N/A	200	45	N/A
60	210	50	20	275	80	20
61	210	350	20	210	240	20
62	210	270	50	230	220	50
63	250	180	80	220	180	80
64	190	200	300	280	220	200
65	210	220	250	340	300	300
70	200	200	200	300	200	300
75	350	350	250	400	200	300
80	1,000	1,000	1,000	1,000	1,000	1,000

In the case of State Regular and Teacher employees, NRA 60 refers to those who had accrued at least 10 years of service by July 1, 1993. NRA 62 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. NRA 65 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			
	Prior Assumption		Revised Assumption	
Age	Service < 25	Service >= 25	Service < 25	Service >= 25
55	20.0%	25.0%	20.0%	25.0%
57	10.0	25.0	10.0	25.0
60	20.0	30.0	20.0	30.0
62	15.0	30.0	30.0	30.0
65	23.4	30.0	23.4	30.0
67	36.8	50.0	36.8	50.0
70	100.0	100.0	100.0	100.0

APPENDIX C – ACTUARIAL ASSUMPTIONS AND METHODS

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

Service	25 & Out Plan Prior Assumption	Revised Assumption
<24	0.0%	0.0%
25-29	25.0%	25.0
30-31	50.0%	25.0
32-34	50.0%	40.0
35-37	100.0%	40.0
38+	100.0%	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.

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

	Prior Assumptions			Revised Assumptions		
	State Employees			State Employees		
	Regular	Special	Teachers	Regular	Special	Teachers
25	5.0	5.4	2.1	2.5	5.4	1.1
30	6.1	6.5	2.3	3.1	6.5	1.2
35	9.3	9.9	2.3	9.3	9.9	1.2
40	14.8	15.8	3.1	14.0	15.8	1.6
45	22.8	24.4	7.0	16.0	24.4	3.1
50	34.0	36.4	10.9	18.0	36.4	6.6
55	39.9	42.6	14.9	25.0	42.6	22.1
60	43.4	46.4	18.8	43.4	46.4	22.2

* 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.

APPENDIX C – ACTUARIAL ASSUMPTIONS AND METHODS

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. Revised assumption: Reflect actual historical member contribution interest rates from 1970 through the valuation; future contribution interest assumed to equal the inflation assumption of 2.75%.

COLA Timing: June 30. Revised assumption: 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 prior 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.

The revised demographic assumptions were adopted by the Board of Trustees at their March 11, 2021 meeting. The revised discount rate was adopted by the Board of Trustees at their August 12, 2021 meeting. The demographic assumptions adopted are based on an experience study covering the period from July 1, 2015 through June 30, 2020, and the economic assumptions are based on this experience study along with advice of the MainePERS investment consultants.

APPENDIX C – ACTUARIAL ASSUMPTIONS AND METHODS

14. Changes since Last Valuation

Assumptions for salary increase, termination, mortality, disability, retirement, COLA timing and member contribution interest were changed based on results of the most recent experience study. The discount rate was also lowered to 6.50%.

15. Rationale for Change in Actuarial Assumptions

The revised demographic assumptions were adopted by the Board of Trustees at their March 11, 2021 meeting. The revised discount rate was adopted by the Board of Trustees at their August 12, 2021 meeting. The demographic assumptions adopted are based on an experience study covering the period from July 1, 2015 through June 30, 2020, and the economic assumptions are based on this experience study along with advice of the MainePERS investment consultants.

16. Disclosure of Models used

ProVal: Cheiron utilizes ProVal, an actuarial valuation software leased from Winklevoss Technologies (WinTech) to calculate the liabilities, normal costs and projected benefit payments. We have relied on WinTech as the developer of ProVal. We have reviewed ProVal and have a basic understanding of it and have used ProVal in accordance with its original intended purpose. We have not identified any material inconsistencies in assumptions or output of ProVal that would affect this actuarial valuation.

Projection Model: This report includes projections of future contributions, assets, liabilities and funded status for the purpose of assisting the Board of Trustees with the management of the Fund. We have used Cheiron's P-Scan and R-Scan model to develop these projections. The model is also used to stress test the impact of volatile asset returns over the projection period.

The P-Scan projection uses projected benefit payments for current members, but does not include projected benefit payments for new members. This limitation is not material for the next 20 years, but longer projection periods should be viewed with caution. The P-Scan projection uses standard roll-forward techniques that implicitly assume a stable active population. Changes in the demographic characteristics of the active population will lead to different results.

The stochastic projections of investment returns are based on an assumption that each future year's investment return is independent from all other years and is identically distributed according to a lognormal distribution. This assumption may result in an unrealistically wide range of compound investment returns over longer periods of time. The standard deviation used in the stochastic projection of investment returns was provided by the investment consultant.

APPENDIX C – ACTUARIAL ASSUMPTIONS AND METHODS

Mortality Improvement Model: Cheiron utilized the RPEC_2014_v2020 Model Implementation Tool for the purposes of developing the customized version of MP-2020 used in this report. This tool is updated and published annually by the Society of Actuaries and their Retirement Plans Experience Committee and allows actuaries to develop customized versions of mortality improvement scales based on the parameters and data underlying the published MP-2020 scale but allowing practitioners to vary parameters from those used in the published MP-2020 scale.

We have reviewed this model and believe it is appropriate to our intended use in developing a customized mortality improvement scale for the Programs. Further, we are aware of no material inconsistencies that would limit our ability to use this model for its intended purpose.

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.

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 7 years of its prescribed amortization period remaining and all other gains and losses, including assumption changes, are amortized over twenty-year periods beginning on the date as of which they occur. The UAL amortization uses a level percentage of pay method with payroll assumed to increase at 2.75% annually. Amortization payments are assumed to

APPENDIX C – ACTUARIAL ASSUMPTIONS AND METHODS

occur at each pay period. Benefit changes are funded immediately and are therefore not included in the amortization of the UAL.

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

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.

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.