Falmouth Retirement System
Actuarial Valuation

January 1, 2020

PUBLIC EMPLOYEE RETIREMENT ADMINISTRATION COMMISSION
COMMONWEALTH OF MASSACHUSETTS

TABLE OF CONTENTS

1. INTRODUCTION & CERTIFICATION

This report presents the results of the actuarial valuation of the Falmouth Contributory Retirement System. The valuation was performed as of January 1, 2020 pursuant to Chapter 32 of the General Laws of the Commonwealth of Massachusetts. The actuarial assumptions used in this valuation are the same as those used in the January 1, 2018 valuation except the mortality assumption was revised based upon the results of the local system retiree mortality study which was completed in 2019.

This valuation was based on member data as of December 31, 2019, which was supplied by the Retirement Board. Such tests as we deemed necessary were performed on the data to ensure accuracy. Asset information as of December 31, 2019 was provided in the Annual Statement for the Financial Condition as submitted to this office in accordance with G.L. c. 32, ss. 20(5)(h), 23(1) and 23(2)(e). Both the membership data and financial information were reviewed for reasonableness, but were not audited by us.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions, changes in economic and demographic assumptions, increases or decreases expected as part of natural operation of the methodology used for these measurements such as additional contribution requirements based on the plan's funded status and changes in plan provisions or applicable law. As part of this valuation, we have not performed an analysis of the potential range of future measurements.

We, the undersigned actuaries, are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained in this report. In our opinion, the actuarial assumptions used in this report are reasonable, are related to plan experience and expectations, and represent our best estimate of anticipated experience under the system. We believe this report represents an accurate appraisal of the actuarial status of the system performed in accordance with generally accepted actuarial principles and practices relating to pension plans.

Respectfully submitted,
Public Employee Retirement Administration Commission

John F. Boorack, Actuary
Member of the American Academy of Actuaries
Associate of the Conference of Consulting Actuaries
Enrolled Actuary Number 20-8562

James R. Lamenzo, Actuarial Consultant
Member of the American Academy of Actuaries
Associate of the Society of Actuaries
Enrolled Actuary Number 20-4709

John W. Parsons, Esquire
Executive Director

January 5, 2021

2. EXECUTIVE SUMMARY

PART A | COSTS UNDER CURRENT VALUATION

The principal results of the January 1, 2020 actuarial valuation are shown below.

Present Value of Future Benefits

Actives	$144,042,327
Retirees, Survivors, and Inactives	126,636,952
Total	$270,679,279

Normal Cost

Total Normal Cost	$5,033,727
Expected Employee Contributions	2,865,826
Net Normal Cost	$2,167,901

Actuarial Liability and Development of Unfunded Actuarial Liability

Actives	$99,675,731
Retirees, Survivors, and Inactives	126,636,952
Total	$226,312,683
Assets	151,747,766
Unfunded Actuarial Liability	$74,564,917

The Board recently adopted a funding schedule effective in FY21. The appropriation for FY21 under this funding schedule is shown on page 16 and the complete funding schedule is shown on page 17.

2. EXECUTIVE SUMMARY *(continued)*

PART B | COMPARISON WITH PRIOR VALUATION

The last full valuation was performed by PERAC as of January 1, 2018. The mortality assumption has been revised based on the results of the local system retiree mortality study which was completed in 2019 (see Part C). Other assumptions are based on our Local Experience Study Analysis issued in 2002 with a subsequent adjustment to the salary increase assumption. Below we have shown a comparison of the results between the two valuations.

	PERAC 1/1/20	PERAC 1/1/18	Increase (Decrease)	% Increase (Decrease)
Total Normal Cost	$5,033,727	$4,827,230	$206,497	4.3%
Expected Employee Contributions	2,865,826	2,677,726	188,100	7.0%
Net Normal Cost	$2,167,901	$2,149,504	$18,397	0.9%
Actuarial Liability				
Actives	$99,675,731	$90,391,441	$9,284,290	10.3%
Retirees and Inactives	126,636,952	123,093,269	3,543,683	2.9%
Total	$226,312,683	$213,484,710	$12,827,973	6.0%
Assets	151,747,766	138,384,451	13,363,315	9.7%
Unfunded Actuarial Liability	$74,564,917	$75,100,259	($535,342)	(0.7%)
Funded Ratio	67.1%	64.8%	2.3%	

2. EXECUTIVE SUMMARY *(continued)*

PART B | COMPARISON WITH PRIOR VALUATION *(continued)*

Actives	PERAC 1/1/20	PERAC 1/1/18	% Difference
Number	581	571	1.8%
Total Payroll	$32,168,104	$29,951,403	7.4%
Average Salary	$55,367	$52,454	5.6%
Average Age	49.1	48.6	1.0%
Average Service	12.6	12.2	3.3%

Retirees and Survivors	PERAC 1/1/20	PERAC 1/1/18	% Difference
Number	409	397	3.0%
Total Benefits*	$12,066,210	$11,480,700	5.1%
Average Benefits*	$29,502	$28,919	2.0%
Average Age	72.5	71.6	1.3%

**excluding State reimbursed COLA*

2. EXECUTIVE SUMMARY *(continued)*

PART C | FUNDED STATUS AND PLAN EXPERIENCE SINCE PRIOR VALUATION

Funded Status

The unfunded actuarial liability (UAL) and funded ratio are measures of the plan's funded status. These measures reflect the plan's position as of January 1, 2020. We believe these measures, by themselves, are not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations or assessing the need for or the amount of future contributions. However, we believe these measures, in conjunction with the plan's funding schedule shown on page 17, are appropriate for assessing the amount of future contributions.

The UAL in this valuation reflects the actuarial value of assets, a method that recognizes investment gains and losses over five years. As of January 1, 2020, the actuarial value of assets is 96.9% of the market value. On a market value basis, the UAL is $69.7 million and the funded ratio is 67.1%.

Plan Experience

Plan Liabilities
Since the last valuation, there was a gain on plan liabilities of approximately $6.1 million (the actuarial liability was less than expected). This gain is primarily due to salary increases for continuing active members increasing less than assumed. This gain is determined before reflecting the assumption change discussed on the next few pages.

Plan Assets
The Board previously adopted an asset smoothing methodology to determine the actuarial value of assets (AVA). As of January 1, 2020, the actuarial value of assets is $151.7 million compared with the market value of $156.7 million. There was an asset loss on a market value basis of approximately $4.2 million over the 2-year period. The rates of return on a market value basis in 2018 and 2019 were -5.8% and 18.4% respectively. On an AVA basis, the rates of return for 2018 and 2019 were approximately 5.3% and 6.8% respectively.

The AVA as of January 1, 2018 was 95.9% of the market value. As of January 1, 2020, the AVA is 96.9% of the market value. The recognition of a portion of prior deferred investment gains and losses during 2018 and 2019 partially contributed to an asset loss of approximately $3.6 million over the 2-year period on an AVA basis.

Total
There was a total net gain of approximately $2.5 million since the last valuation ($6.1 million gain on actuarial liability less $3.6 million loss on the AVA).

2. EXECUTIVE SUMMARY *(continued)*

PART C | FUNDED STATUS AND PLAN EXPERIENCE SINCE PRIOR VALUATION *(continued)*

Actuarial Assumptions

Investment Return
For local retirement systems, PERAC's "standard" investment return assumption was 8.0% in our 2012 actuarial valuations. This had been our standard assumption (assuming a reasonable asset allocation) for over 15 years. Beginning with our January 1, 2013 actuarial valuations of local systems, we generally recommended an investment return assumption of 7.75%. For our January 1, 2015 actuarial valuations, we recommended reducing this assumption further. For our 2016 actuarial valuations, we generally recommended a 7.50% assumption. For our 2017 and 2018 actuarial valuations, we generally recommended a range of 7.25% - 7.40%, and a range of 7.15% - 7.40% respectively. For our 2019 actuarial valuations, we generally recommended a range of 7.0% - 7.25%, partially depending on the assumption used in the prior actuarial valuation. The trend both in Massachusetts and across the country for nearly 20 years has been to steadily reduce this assumption.

Early in 2020, NEPC, PRIT's investment consultant, provided figures for 30-year expected return projections using a building block approach and the target allocation and expected long term returns by asset class. The expected annual return is 7.3% (6.8% assuming expenses of 50 basis points and the expected return reflects a gross return) in this study. This figure is 60 basis points lower than the figure from the 2019 study. Note that the 7.3% average expected return does not mean that the expected return each year will be 7.3%. In fact, over the shorter term (10 years) the average expected return is 6.2% (also 60 basis points lower than last year). Greater expected returns in later years determined NEPC's long-term projection. The NEPC projected returns are one measure we use to determine the long-term investment return assumption.

A comparison of recent expected return projections as well as historical PRIT returns is shown below.

	Expected Annual Return						
	2014	2015	2016	2017	2018	2019	2020
10-year expected return *	7.1%	6.8%	6.8%	6.8%	6.6%	6.8%	6.2%
30-year expected return	8.2%	7.9%	7.8%	7.8%	7.7%	7.9%	7.3%

* In years prior to 2020, NEPC's short-term horizon was 5-7 years

Actual Returns as of December 31, 2019	
2019	16.7%
5 years (2015-2019)	8.1%
10 years (2010-2019)	9.1%
20 years (2000-2019)	6.6%
35 years (1985-2019)	9.5%

The increase in both the short-term and long-term projections in 2019 was unexpected especially since the 2019 study used a more conservative asset allocation than used in the 2018 study. The reason for the increase was primarily due to an increase in the projected returns by asset class and an increase in interest rates. The decrease in the 2020 projections (60 basis points) seems more noticeable because of the unexpected increase in the 2019 projections. If the expected returns for 2019 had decreased 10-20 basis points as we had expected, the decrease in 2020 would have been only 20-30 basis points instead of the 60 basis points reduction actually shown and would not appear so prominent.

2. EXECUTIVE SUMMARY *(continued)*

PART C | FUNDED STATUS AND PLAN EXPERIENCE SINCE PRIOR VALUATION *(continued)*

For our analysis, we primarily use the NEPC study to help us determine a reasonable range for the investment return assumption. In addition, we review other capital market studies for comparison.

One study that we use for comparison is the Horizon study. This study compares 34 different investment consultants (included NEPC). The Horizon study used in our analysis was published in August 2019. Overall, this study continued to show the trend of decreasing expected investment returns. As a result, we are generally recommending a slight decrease in this assumption for 2020 valuations of PRIT systems. Our recommendation for each system is based partially on the assumption used in the 2018 actuarial valuation.

Our analysis primarily concerns systems with most or all of their assets with the Pension Reserves Investment Trust (PRIT). For non-PRIT systems, we often recommend a slightly lower assumption to reflect generally more conservative investment allocations. Since your system is in the non-PRIT group, we performed additional analysis using information available with respect to the Board's target allocation and expected returns by asset class in determining a recommended assumption. Based on your asset allocation, we estimated the system's expected return to be 40-60 basis points lower than PRIT's.

As we indicated earlier, we generally recommended a 7.0% - 7.25% assumption in our 2019 local system valuations. As part of our analysis, we considered whether to recommend maintaining this range in our 2020 actuarial valuations or reducing the assumption further. Although, a case can be made to maintain our 2019 range, we believe a stronger case can be made to slightly reduce this range. Since we did not perform an actuarial valuation of your plan as of January 1, 2019 (and thus did not consider reducing this assumption at that time), we strongly recommend reducing this assumption as part of the January 1, 2020 actuarial valuation to reflect the two-year period since the prior assumption was selected.

There are several reasons to reduce this assumption. First, as discussed earlier, there was a decrease in both the short-term and long-term expected returns in the NEPC study from the prior year's study. Additionally, there was a decrease in the Horizon study survey average, long-term expected geometric return from the prior study's results. Lastly, the average investment return assumption in the NASRA study published in February 2020, shows a decrease from the prior study as well. Therefore, we believe a corresponding reduction in the assumption is appropriate this year.

In 2019, we did not recommend increasing the assumption when the NEPC study indicated an increase in the assumption. Likewise, this year we do not recommend decreasing this assumption by 60 basis points when the NEPC study indicates such a decrease. Instead, we look to the other sources to help up determine an appropriate reduction. The reduction in the Horizon study's survey average, long-term expected geometric return was approximately 10 basis points. The reduction in the average investment return assumption in the NASRA study was 6 basis points. Therefore, we recommend a reduction of 10-15 basis points in the assumption this year. This, along with the 10-15 basis points reduction recommended last year, leads to a recommended reduction of 20-30 basis points from the assumption used in the prior actuarial valuation. Generally, we have limited the reduction in any valuation to 25 basis points.

We initially recommended reducing this assumption to 7.0% as part of this valuation. However, the Board requested we provide results with the 7.25% assumption and ultimately decided to maintain that assumption. We will continue to monitor this assumption and we may recommend decreasing this assumption as part of the January 1, 2022 actuarial valuation.

2. EXECUTIVE SUMMARY *(continued)*

PART C | FUNDED STATUS AND PLAN EXPERIENCE SINCE PRIOR VALUATION *(continued)*

Mortality

A revision to the actuarial standards of practice in 2010 required that future mortality improvements (longer life expectancy) be considered in valuations performed after July, 2011. To begin recognizing this change, as part of our January 1, 2011 local actuarial valuations, we used the RP-2000 mortality table projected 10 years with Scale AA (a mortality improvement scale). In our 2012, 2013 and 2014 valuations, we gradually extended the mortality improvement scale beyond the valuation date. In our 2014 valuations, we projected mortality improvement to 2022 for active members and 2017 for retirees.

Beginning with our January 1, 2015 actuarial valuations, we began using a “fully generational” mortality assumption. A fully generational projection is two-dimensional. The mortality improvement projection is developed based on both the age of a member and the calendar year. We used retiree mortality experience from the State Retirement System from 2012 to 2014 as a proxy in determining the mortality assumption for local systems. We found that the RP-2000 mortality table with projected mortality improvement using the more recently developed projection Scale BB and a base year of 2009 was appropriate for our 2015 valuations. We maintained this assumption in our 2016 and 2017 actuarial valuations.

A revised mortality table (the RP-2014 mortality table) was published in 2014. The revised table has no experience related to public plans. We found in our 2015 State analysis that our experience was not consistent with the base table. In 2017, we did further analysis of retiree mortality for the State Retirement System based on deaths in 2015 and 2016. Again, we found that our experience was not consistent with the base table. However, we preferred to update our assumption to a version of the 2014 table. Based on our findings, we modified the State’s assumption in the 2017 valuation to reflect a blue collar version of the RP-2014 table. We maintained this assumption in our 2018 and 2019 State valuations.

Our 2018 local system valuations generally reflected the assumption used in 2017 with the actuarial liability increased by 0.75% to recognize the anticipated impact of the assumption we would ultimately adopt. We began work analyzing retiree mortality for local systems in 2017. We completed this analysis in early 2019 and adopted an assumption for use in our 2019 actuarial valuations for local systems. As part of our analysis, we compared our experience to the new public retirement plan mortality tables released in early 2019 (the Pub-2010 Mortality Tables). Public plans from Massachusetts were not included in this study. We found that our experience was not consistent with these tables. Based on our findings, we adopted the RP-2014 Blue Collar table projected generationally with Scale MP-2018. We will continue to use this assumption for our 2020 actuarial valuations for local systems.

This change decreased the normal cost by approximately $51,000 but increased the actuarial accrued liability by approximately $1.0 million.

2. EXECUTIVE SUMMARY *(continued)*

PART C | FUNDED STATUS AND PLAN EXPERIENCE SINCE PRIOR VALUATION *(continued)*

Chapter 176 Provisions

Chapter 176 of the Acts of 2011, *An Act Providing for Pension Reform and Benefit Modernization*, made a number of changes to the Chapter 32 pension law. There are several changes that will have the most impact on decreasing plan liabilities over the longer term. These include an increase in the normal retirement age by two years (for example, from age 65 to age 67 for Group 1 members), an increase in the age (early retirement) reduction factor for ages below the maximum age (from a 4.0% to a 6.0% annual reduction), and an increase in the period for determining a member's average annual compensation (from 3 years to 5 years). Since these changes are effective only for members hired after April 1, 2012, this is the fourth actuarial valuation to reflect these changes.

As of January 1, 2020, there were 263 members hired after April 1, 2012. These members have short service and are generally younger than the average member of the system. The impact on plan costs for these members (on a percentage basis) is greater for the normal cost than the actuarial liability. The normal cost decreased approximately $200,000 and the actuarial liability decreased approximately $1.6 million for these members compared to the figures under the prior provisions.

COLA Base

This valuation reflects a $14,000 COLA base. The 2018 valuation reflected the same base.

2. EXECUTIVE SUMMARY *(continued)*

PART C | FUNDED STATUS AND PLAN EXPERIENCE SINCE PRIOR VALUATION *(continued)*

Expenses

We have generally included administrative expenses paid by the plan in the development of normal cost in our actuarial valuations. However, that is not the case with investment related expenses. Historically, most local systems have used an investment return assumption that is net of investment related expenses. In our 2010 actuarial valuations, we began reflecting a portion of investment related expenses in the normal cost. We used an expense assumption of $720,000 in this valuation, which reflects approximately $360,000 of investment related expenses. Over time, we expect the total administrative and investment expenses to be included in the normal cost. Alternatively, a lower investment return assumption can achieve a similar result.

Net 3(8)(c) Reimbursements

A common assumption is that §3(8)(c) payments paid from a system are approximately equal to §3(8)(c) payments paid to a system. However, we found for most local systems, this isn't true. For your system, there is net §3(8)(c) cash outflow during the year. In order to better reflect the actual cost to the System, we have once again included expected net §3(8)(c) payments in the alternative funding schedule.

Funding Schedule

The funding schedule presented in this report was recently adopted by the Board. The FY21 payment was maintained from the prior schedule. The total appropriation increases 6.31% each year through FY32 with a final amortization payment in FY33.

GASB 67/68

We used the results of the January 1, 2018 valuation rolled forward to December 31, 2019 to prepare the Governmental Accounting Standards Board (GASB) disclosures for the fiscal year ending June 30, 2020 and the plan year ending December 31, 2019. The statements are commonly referred to as GASB 67 and GASB 68. GASB 67 relates to financial reporting for state and local government pension plans (plan financials). GASB 68 relates to financial reporting by state and local governments for pension plans (employer financials). We have used a measurement date of December 31 in each year we have provided these disclosures. We have not provided any GASB 67/68 exhibits in this report. These disclosure exhibits have been provided under separate cover.

2. EXECUTIVE SUMMARY *(continued)*

PART D | RISK

Risk is defined as the potential for differences in future plan measurements resulting from actual future experience deviating from actual assumed experience. The plan is subject to a number of risks that could affect the plan's future financial condition. Examples of risk include the following:

Investment risk – the potential that investment returns will be different than expected;

Asset/liability mismatch risk – the potential that changes in asset values are not matched by changes in the liabilities;

Interest rate risk – the potential that interest rates will be different than expected;

Longevity and demographic risk – the potential that mortality or other demographic experience will be different than expected;

Contribution risk – the potential that employer contributions to the plan will not be made, or will not be made at the assumed level.

In this section, we provide a brief analysis of several risk measures that we believe are most significant for the plan. A more detailed risk assessment that includes further scenario testing (assessing the impact of one or several events on the plan's financial condition, for example projecting plan investment returns), stress testing (assessing the impact of an adverse change in one or several factors), sensitivity testing (assessing the impact of a change in an actuarial assumption), or stochastic modeling (generating numerous possible outcomes by allowing for random variations in input items to assess the distribution of the outcomes) may provide a better understanding than the analysis in this section.

Unfunded Actuarial Liability and Funded Ratio

The plan's unfunded actuarial liability (UAL) and the funded ratio for the past 10 years are shown below. The UAL is the Actuarial Liability less the Actuarial Value of Assets. The funded ratio is the Actuarial Value of Assets divided by the Actuarial Liability. The retirement system is said to be fully funded when the UAL is zero, or said another way, when the funded ratio is 100%. Actuarial valuations have been performed every two years over this period and the valuation results are determined as of January 1.

	Valuation Date					
	2010	2012	2014	2016	2018	2020
UAL (in millions)	$53.7	$62.9	$68.0	$71.5	$75.1	$74.6
Funded Ratio	61.3%	58.9%	59.8%	62.5%	64.8%	67.1%

The UAL has generally increased over this period. The 2010 valuation was the first actuarial valuation after the significant market value loss in 2008. The 2008 investment loss was not fully recognized until the 2014 valuation. Reductions in the investment return assumption and changes to the mortality assumption in the past 10 years have increased the plan's actuarial liability and therefore the UAL. The plan has reduced its investment return assumption several times from 8.0% in the 2010 and 2012 valuations to 7.25% in the 2018 and this valuation. The mortality assumption has also been updated several times including the adoption of a fully generational table in 2016 and the update described in this report in 2020. For comparison, under the assumptions used in the 2010 valuation, the UAL would be approximately $45 million as of January 1, 2020.

2. EXECUTIVE SUMMARY *(continued)*

PART D | RISK *(continued)*

The funded ratio has increased in each valuation after an initial decrease in 2012. The assumption changes described above have also significantly impacted the funded ratio. For comparison, using the 2010 plan assumptions, the 2020 funded ratio would be approximately 77%.

Investment Return Assumption and Funding Schedule

Investment return assumption:	7.25%
Amortization of UAL basis:	6.31% total appropriation increase to FY32 with a final payment in FY33

The System maintained the investment return assumption of 7.25% in this valuation. For comparison, there are currently 67 Massachusetts systems using an assumption of 7.25% or below. Of those, 33 use a 7.25% assumption, 26 use an assumption of 7.0% and 7.20%, and 8 use an assumption less than 7.0%. We expect over 70 systems will use an investment return assumption of 7.25% or below once all the 2020 valuations are completed.

It is important to note that our emphasis for over the past several years has been to establish funding schedules that complete the amortization of the UAL no later than FY35. This allows systems some flexibility in the event of another market downturn. We believe establishing a schedule that completes the amortization of the UAL by FY35 should be a top priority. The system completes the amortization of the UAL by FY35.

A related priority to fully funding the System by FY35 is limiting the amount and period of "negative amortization". Negative amortization occurs while the UAL increases in the funding schedule. The reason it occurs is that the amortization payment for a given year is not large enough to pay the interest on the UAL. Negative amortization often occurs in amortization schedules with annual increasing payments. Negative amortization is acceptable as long as it is only for a limited period of time. We believe the goal for all systems should be to eliminate negative amortization as soon as possible. The plan has no negative amortization.

A number of boards have adopted schedules that increase the total appropriation by a set percentage for a period of time (or the entire length of the schedule). The Board's current schedule reflects this methodology. However, the level of annual increase exceeds 6.0% so there is some risk in whether such a level of increase is sustainable.

Maturity and Volatility Measures

There are a number of plan maturity and volatility ratios that can provide significant insight into the level of a plan's risk. To illustrate, we are providing two such measures. In both cases, we show the 10-year history of the ratio. In addition, we comment on how the results compare with other local systems. We believe that these measures are more useful when compared to historical averages and the results of other plans. See our notes earlier in this section regarding the 2008 investment loss and assumption changes over this period which significantly affect these results.

2. EXECUTIVE SUMMARY *(continued)*

PART D | RISK *(continued)*

Retiree Actuarial Liability / Total Actuarial Liability

This ratio measures the percentage of actuarial liability due to the plan's retirees. Higher ratios and/or an increase in this ratio indicate a system that is more mature or becoming more mature. As this ratio increases, it generally indicates the retired population is increasing faster than the active member population and there is a greater likelihood of negative cash flow (benefit payments exceeding employer and employee contributions). Retirees in pay status are more expensive than younger members. As a plan matures, it becomes more sensitive to investment volatility and the plan will have more difficulty recovering from losses even with increases in employer contributions.

	Valuation Date					
	2010	2012	2014	2016	2018	2020
Retiree/Total Liability	.46	.48	.52	.53	.56	.54

The ratios for this system show a generally steady increase indicating the plan has become more mature. Public sector plans often have aging populations generating an increase in this ratio. We have found this to be generally true for the systems for which PERAC is the actuary. In 2010, this ratio ranged from .31 to .67. In recent valuations this range has increased to .45 to .65. Most local systems have seen an increase in this ratio over the past 10-15 years as the number of retirees, and specifically the retiree liability has increased as a percentage of the total. A number of systems have had fairly consistent ratios and a few have had decreasing ratios. Such systems have already reached and or maintained a more mature level.

Actuarial Liability / Pay

This measure reflects how a change in actuarial liability (and therefore UAL) may impact the adequacy of contributions. As this ratio increases, plan contributions (using a traditional amortization schedule) increase as a percentage of pay. Furthermore, like the Retiree Liability ratio noted above, higher ratios exacerbate the impact of investment losses on plan contributions.

	Valuation Date					
	2010	2012	2014	2016	2018	2020
Actuarial Liability/Pay	5.1	5.7	6.2	6.7	7.1	7.0

This system shows generally increasing rates. For comparison with other PERAC systems, in 2010, this ratio ranged from 4.3 to 6.5. For recent valuations this range has increased. The ratios currently range from 5.3 to 8.9. This ratio has increased for most local systems indicating increasing levels of risk.

Impact of Investment Returns on Unfunded Liability and Funded Ratio (Market Value Basis)

We have prepared a simple 5-year projection illustrating the potential impact of actual investment returns on funding levels. For this estimate, we used the market value of assets and did not attempt to develop an actuarial value of assets. In projecting the actuarial liability, we assumed the January 1, 2020 actuarial assumptions are exactly realized over the next 5 years and that there are no changes in assumptions over this period.

2. EXECUTIVE SUMMARY *(continued)*

PART D | RISK *(continued)*

We first projected the market value of assets assuming the actual return for each of the next 5 years is 7.25% (the assumption used in the valuation). For comparison, we have also shown the results if the return were 3.0% each year. The 3.0% assumption is not intended to be a worst case basis, but only to reflect the impact of a lower short term return than the current plan assumption. As discussed earlier in the Executive Summary, projected returns are lower over the next 10 years than over the next 30 years.

	Valuation Date					
	2020	2021	2022	2023	2024	2025
UAL (in millions)						
7.25%	$69.7	$68.9	$67.6	$65.8	$63.3	$60.2
3.00%	$69.7	$75.5	$81.5	$87.7	$94.0	$100.5
Funded Ratio						
7.25%	69.2%	70.8%	72.5%	74.4%	76.4%	78.6%
3.00%	69.2%	68.0%	66.9%	65.9%	65.0%	64.2%

For this comparison, we assumed that for the 3.0% projections, the appropriation for the next 5 years would remain as in the current funding schedule (and the same as that if the actual returns were 7.25% per year). If returns were actually 3.0% per year, the funding schedule might have to be increased before FY25.

PART E | COVID-19 IMPACT

This actuarial valuation was performed as of January 1, 2020 and is based on membership information and plan assets as of December 31, 2019. Since this time, the COVID-19 pandemic has had a significant impact on financial markets. The plan’s funded status does not reflect any changes that have occurred since December 31, 2019. As of March 31, PRIT’s year to date rate of return was approximately -10%. Much of that loss has been recouped (the year to date return as of November 30 is expected to be approximately 3.50%). This figure is roughly comparable to the 3.0% return shown in the above exhibit and can be used to estimate the valuation results as of January 1, 2021.

3. SUMMARY OF VALUATION RESULTS

A. Number of Members on Current Valuation Date	
Active Members	581
Vested Terminated Members	26
Non-Vested Terminated Members	131
Retired Members and Survivors	409
Total	1,147
B. Total Regular Compensation of Active Members	$32,168,104
C. Normal Cost	
Total Normal Cost	$5,033,727
Expected Employee Contributions	2,865,826
Net Employer Normal Cost	$2,167,901
D. Actuarial Liability	
Active Members	$99,675,731
Vested Terminated Members	3,591,777
Non-Vested Terminated Members	912,358
Retirees and Survivors	122,132,817
Total Actuarial Liability	$226,312,683
E. Actuarial Value of Assets	$151,747,766
F. Unfunded Actuarial Liability: D – E	$74,564,917
G. Funded Ratio: E/D	67.1%

4. APPROPRIATION DEVELOPMENT FOR FISCAL YEAR 2021

PART A | DERIVATION OF APPROPRIATION

Cost Under Current Funding Schedule

1. a. Employer Normal Cost as of January 1, 2020	$2,167,901
b. Estimated Expenses	$720,000
c. Total Employer Normal Cost (a+b, adjusted for timing)	$2,992,587
2. Net 3(8)(c) payments	$120,000
3. a. Unfunded Actuarial Liability as of January 1, 2020	$74,567,917
b. FY21 amortization payment (13-year, 6.31% total increasing) *	$6,053,124
4. Total FY21 Payment [Sum of 1(c), 2, and 3(b)]	$9,165,711

* FY21 appropriation was maintained at the same level as the prior schedule.

All amounts assume payments will be made July 1 of each fiscal year.

4. APPROPRIATION DEVELOPMENT FOR FISCAL YEAR 2021
(continued)

PART B | CURRENT FUNDING SCHEDULE

Fiscal Year	Normal Cost	Net 3(8)(c)	Amort. of UAL	Total Cost	Unfunded Act. Liab.	Change in Cost
2021	2,992,587	120,000	6,053,124	9,165,711	77,267,895	
2022	3,127,254	120,000	6,496,814	9,744,067	76,377,843	6.31%
2023	3,267,980	120,000	6,970,938	10,358,918	74,947,404	6.31%
2024	3,415,039	120,000	7,477,526	11,012,566	72,904,760	6.31%
2025	3,568,716	120,000	8,018,742	11,707,459	70,170,708	6.31%
2026	3,729,308	120,000	8,596,891	12,446,199	66,657,983	6.31%
2027	3,897,127	120,000	9,214,427	13,231,554	62,270,521	6.31%
2028	4,072,498	120,000	9,873,968	14,066,466	56,902,661	6.31%
2029	4,255,760	120,000	10,578,299	14,954,060	50,438,273	6.31%
2030	4,447,270	120,000	11,330,391	15,897,661	42,749,822	6.31%
2031	4,647,397	120,000	12,133,406	16,900,803	33,697,340	6.31%
2032	4,856,530	120,000	12,990,714	17,967,244	23,127,319	6.31%
2033	5,075,073	120,000	10,871,509	16,066,582	10,871,509	-10.58%
2034	5,303,452	120,000		5,423,452	0	-66.24%

All amounts assume payments will be made July 1 of each fiscal year.
Total appropriation assumed to increase 6.31% each year until FY32, with a final amortization payment in FY33.
FY21 normal cost includes assumed expenses of $720,000 and is assumed to increase 4.5% per year.
FY21 appropriation was maintained at the same level as the prior schedule.

5. GASB INFORMATION

The actuarial information required by Governmental Accounting Standards Board (GASB) Statement Nos. 67 and 68 replaced the information required by Statement Nos. 25 and 27.

The information required by GASB 67 (plan) is to be reported and measured as of December 31 each year.

The information required by GASB 68 (employer) is to be reported as of the end of the fiscal year (June 30 for cities and towns). We are allowed to select a measurement date at any date during the fiscal year. We have selected a measurement date of December 31 which is consistent with GASB 67.

We have not provided any GASB 67 or 68 exhibits in this valuation report. We have provided the disclosure exhibits under separate cover.

Although GASB 25 no longer applies, we are including the schedule of funding progress previously required by the Statement to provide historical context.

Schedule of Funding Progress

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL)* (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a % of Cov. Payroll ((b-a)/c)
1/1/2020	$151,747,766	$226,312,683	$74,564,917	67.1%	$32,168,104	231.8%
1/1/2018	$138,384,451	$213,484,710	$75,100,259	64.8%	$29,951,403	250.7%
1/1/2016	$118,988,731	$190,442,350	$71,453,619	62.5%	$28,416,969	251.4%
1/1/2014	$101,194,876	$169,215,558	$68,020,682	59.8%	$27,477,612	247.5%
1/1/2012	$90,205,985	$153,103,169	$62,897,184	58.9%	$26,681,972	235.7%

**excludes State reimbursed COLA*

6. PLAN ASSETS

A | BREAKDOWN OF ASSETS BY INVESTMENT TYPE

Cash and Cash Equivalents	$1,503,605
Pooled Domestic Equity Funds	61,392,131
Pooled International Equity Funds	24,903,740
Pooled Domestic Fixed Income Funds	30,211,977
Pooled Alternative Investments	6,930,262
Pooled Real Estate Funds	16,438,991
Hedge Funds	15,317,585
Accounts Receivable	1,661
Accounts Payable	(40,721)
Total	$156,659,231

B | BREAKDOWN OF ASSETS BY FUND

Annuity Savings Fund	$34,264,375
Annuity Reserve Fund	10,583,761
Military Fund	10,304
Pension Fund	9,504,173
Pension Reserve Fund	102,296,618
Total	$156,659,231

C | MARKET VALUE OF ASSETS $156,659,231

D | ACTUARIAL VALUE OF ASSETS $151,747,766

6. PLAN ASSETS *(continued)*

E | DEVELOPMENT OF ACTUARIAL VALUE OF ASSETS

	2019	2020
A. Development of total investment income including appreciation		
1. Beginning of year market value	133,657,201	156,659,231
2a. Employee contributions	3,112,471	
b. Employer contributions	8,621,683	
c. Other receipts	1,171,734	
d. Total receipts: (a) + (b) + (c)	12,905,888	
e. Benefit payments	12,043,670	
f. Expenses	1,363,467	
g. Other disbursements	824,659	
h. Total disbursements: (e) + (f) + (g)	14,231,796	
i. Cash flow: (d) – (h)	(1,325,908)	
3. End of year market value	156,659,231	
4. Investment income including appreciation: (3) – (1) – (2(i))	24,327,938	
B. Expected market value development		
1. Beginning of year market value	133,657,201	
2. Cash flow (A2(i))	(1,325,908)	
3. Expected Return on (1)	9,690,147	
4. Expected return on cash flow A2(i) x 0.0725 / 2	(48,064)	
5. Expected market value end of year (1)+(2)+(3)+(4)	141,973,376	
C. Gain/(loss) for year: A3-B5	14,685,855	
D. Development of Actuarial Value of Assets		
1. Beginning of year market value	133,657,201	156,659,231
2a. Asset gain/(loss) in prior year	(18,868,348)	14,685,855
b. Asset gain/(loss) in 2nd prior year	9,984,789	(18,868,348)
c. Asset gain/(loss) in 3rd prior year	2,449,370	9,984,789
d. Asset gain/(loss) in 4th prior year	(8,279,899)	2,449,370
3. Unrecognized gain/(loss) .8 x [2a] + .6 x [2b] + .4 x [2c] +.2 x [2d]	(9,780,037)	4,911,465
4. Beginning of year actuarial value of assets: [1] - [3]	143,437,238	151,747,766
5. Actuarial value / Market value	107.3%	96.9%
6. Adjusted actuarial value: (4) but not less than 90% nor greater than 110% of market value	143,437,238	151,747,766

7. INFORMATION ON SYSTEM MEMBERSHIP

A critical element of an actuarial valuation is accurate and up-to-date membership information. PERAC conducted an extensive review of member data submitted for this valuation.

PART A | ACTIVE MEMBERS

	Actives	Vested Terminations
Number of Members	581	26
Average Age	49.1	53.3
Average Service	12.6	13.5
Average Salary	$55,367	$46,202
Average Annuity Savings Fund Balance	$55,058	$52,168

Age by Service Distribution of Active Members

Years of Service

Present Age	0 - 4	5 –9	10 - 14	15 - 19	20 - 24	25 - 29	30+	Total
0 - 24	16							16
25 - 29	34	4						38
30 - 34	29	17	3	1				50
35 - 39	20	13	12	6				51
40 - 44	12	10	9	12	5			48
45 - 49	18	8	12	13	11	7		69
50 - 54	18	8	14	14	10	12	7	83
55 - 59	23	9	13	17	13	7	16	98
60 - 64	11	12	12	30	14	6	10	95
65+	3	2	6	6	6	7	3	33
Total	184	83	81	99	59	39	36	581

7. INFORMATION ON SYSTEM MEMBERSHIP *(continued)*

PART A | ACTIVE MEMBERS *(continued)*

Salary by Age Distribution of Active Members

Present Age	Number of Members	Total Salary	Average Salary
0 - 24	16	$571,289	$35,706
25 - 29	38	$1,885,978	$49,631
30 - 34	50	$2,685,923	$53,718
35 - 39	51	$2,870,028	$56,275
40 - 44	48	$2,912,714	$60,682
45 - 49	69	$4,104,613	$59,487
50 - 54	83	$5,057,330	$60,932
55 - 59	98	$5,268,528	$53,760
60 - 64	95	$4,849,297	$51,045
65+	33	$1,962,404	$59,467
Total	581	$32,168,104	$55,367

7. INFORMATION ON SYSTEM MEMBERSHIP *(continued)*

PART B | RETIREES AND SURVIVORS

	Superannuation	Ordinary Disability	Accidental Disability	Survivors	Total
Number of Members	329	2	36	42	409
Average Age	73.4	64.0	65.4	72.2	72.5
Average Annual Benefit	$29,777	$35,043	$39,053	$20,315	$29,648

Benefit by Payment and Retirement Type

	Superannuation	Ordinary Disability	Accidental Disability	Survivors	Total
Total Annuity	$1,869,929	$8,880	$116,500	$124,479	$2,119,788
Pension (excluding State reimbursed COLA)	$7,908,688	$61,205	$1,272,851	$703,679	$9,946,423
State reimbursed COLA	$18,122	$0	$16,555	$25,059	$59,736
Total	$9,796,739	$70,085	$1,405,906	$853,217	$12,125,947

7. INFORMATION ON SYSTEM MEMBERSHIP *(continued)*

PART B | RETIREES & SURVIVORS *(continued)*

Benefit by Age Distribution

Present Age	Number of Members	Total Benefits	Average Benefits
Less than 40	0	$0	$0
40 - 44	4	$138,661	$34,665
45 - 49	1	$14,178	$14,178
50 - 54	6	$235,589	$39,265
55 - 59	30	$963,296	$32,110
60 - 64	52	$1,832,570	$35,242
65 - 69	78	$2,737,696	$35,099
70 - 74	78	$2,403,554	$30,815
75 - 79	64	$1,800,526	$28,133
80 - 84	49	$1,154,782	$23,567
85 - 89	33	$643,496	$19,500
90+	14	$201,599	$14,400
Totals	409	$12,125,947	$29,648

8. VALUATION COST METHODS

PART A | ACTUARIAL COST METHOD

The Actuarial Cost Method which was used to determine pension liabilities in this valuation is known as the *Entry Age Normal Cost Method***.** Under this method the *Normal Cost* for each active member on the valuation date is determined as the level percent of salary, which, if paid annually from the date the employee first became a member of the retirement system, would fully fund by retirement, death, disability or termination, the projected benefits which the member is expected to receive. The *Actuarial Liability* for each member is determined as the present value as of the valuation date of all projected benefits which the member is expected to receive, minus the present value of future annual Normal Cost payments expected to be made to the fund. Since only active members have a Normal Cost, the Actuarial Liability for inactives, retirees and survivors is simply equal to the present value of all projected benefits. The sum of Normal Cost and Actuarial Liability for each member is equal to the Normal Cost and Actuarial Liability for the Plan. The *Unfunded Actuarial Liability* is the Actuarial Liability less current assets.

The Normal Cost for a member will remain a level percent of salary for each year of membership except for changes in provisions of the Plan or the actuarial assumptions employed in projection of benefits and present value determinations. The Normal Cost for the entire system will also change due to the addition of new members or the retirement, death or termination of members. The Actuarial Liability for a member will increase each year to reflect the additional accrual of Normal Cost. It will also change if the Plan provisions or actuarial assumptions are changed.

Differences each year between the actual experience of the Plan and the experience projected by the actuarial assumptions are reflected by adjustments to the Unfunded Actuarial Liability. An experience difference which increases the Unfunded Actuarial Liability is called an *Actuarial Loss* and one which decreases the Unfunded Actuarial Liability is called an *Actuarial Gain.*

PART B | ASSET VALUATION METHOD

The actuarial value of assets is determined in accordance with the deferred recognition method under which 20% of the gains or losses occurring in the prior year are recognized, 40% of those occurring 2 years ago are recognized, etc., so that 100% of gains or losses occurring 5 years ago are recognized. The actuarial value of assets will be adjusted, if necessary, in order to remain between 90% and 110% of market value.

9. ACTUARIAL ASSUMPTIONS

Investment Return

7.25% per year net of investment expenses

The investment return assumption is a long term assumption and is based on capital market expectations by asset class, historical returns, and professional judgment. We considered analysis prepared by PRIM's investment advisor using a building block approach which included expected returns by asset class, risk analysis, and the determination of a 30-year expected target rate of return. We used this analysis in conjunction with the System's target allocation.

Interest Rate Credited to the Annuity Savings Fund

3.5% per year

Assumed Rate of Cost of Living Increases (COLA)

3.0% per year (on the first $14,000 of an allowance)

Mortality

Pre-retirement mortality reflects the RP-2014 Blue Collar Employees table projected generationally with Scale MP-2018 (gender distinct). *(Prior assumption was RP-2000 Employees table projected generationally with Scale BB and a base year of 2009 (gender distinct) with the total normal cost increased by 1.5% and plan liabilities increased .75% to reflect the anticipated impact of the assumption change upon completion of our local system retiree mortality study.)*

Post-retirement mortality reflects the RP-2014 Blue Collar Healthy Annuitant table projected generationally with Scale MP-2018 (gender distinct). *(Prior assumption was RP-2000 Healthy Annuitant table projected generationally with Scale BB and a base year of 2009 (gender distinct) with plan liabilities increased .75% to reflect the anticipated impact of the assumption change upon completion of our local system retiree mortality study.)*

For disabled members, the mortality rate is assumed to be in accordance with the RP-2014 Blue Collar Healthy Annuitant Table (set forward one year for both males and females) projected generationally with Scale MP-2018 (gender distinct). *(Prior assumption was RP-2000 Healthy Annuitant Table projected generationally with Scale BB and a base year of 2012 (gender distinct) with plan liabilities increased .75% to reflect the anticipated impact of the assumption change upon completion of our local system retiree mortality study.)*

It is assumed that 55% of pre-retirement deaths are job-related for Group 1 and 2 members and 90% are job-related for Group 4 members. For members retired under an Accidental Disability, 40% of deaths are assumed to be from the same cause as the disability.

We completed a local system retiree mortality study in 2019. As part of our analysis, we compared our experience to the new public retirement plan mortality tables released in early 2019 (the Pub-2010 Mortality Tables). Public plans from Massachusetts were not included in this study. We found that our experience was not consistent with these tables. The mortality assumptions selected reflect observed current mortality and expected mortality improvement as well as professional judgement.

9. ACTUARIAL ASSUMPTIONS *(continued)*

Salary Increase

Service	Group 1	Group 2	Group 4
0	6.00%	6.00%	7.00%
1	5.50%	5.50%	6.50%
2	5.50%	5.50%	6.00%
3	5.25%	5.25%	5.75%
4	5.25%	5.25%	5.25%
5	4.75%	4.75%	5.25%
6	4.75%	4.75%	4.75%
7	4.50%	4.50%	4.75%
8	4.50%	4.50%	4.75%
9	4.25%	4.50%	4.75%
10+	4.25%	4.50%	4.75%

The salary increase assumption reflects both prior experience and professional judgment.

Withdrawal

Based on analysis of past experience. Annual rates are based on years of service. Sample annual rates for Groups 1 and 2 are shown below. For Group 4 members the rate is 0.015 each year for service up to and including 10 years. No withdrawal is assumed thereafter.

Service	Groups 1 & 2
0	0.150
5	0.076
10	0.054
15	0.033
20	0.020

Withdrawal rates are based on our most recent experience analysis which reviewed age, gender and job group. The assumption reflects this analysis as well as professional judgment.

9. ACTUARIAL ASSUMPTIONS *(continued)*

Disability

Based on an analysis of past experience. It is also assumed that the percentage of job-related disabilities is 55% for Groups 1 & 2 and 90% for Group 4.

Age	Groups 1 & 2	Group 4
20	0.00010	0.0010
30	0.00030	0.0030
40	0.00101	0.0030
50	0.00192	0.0125
60	0.00280	0.0085

Disability rates are based on our most recent experience analysis which reviewed age, gender and job group. The assumption reflects this analysis as well as professional judgment.

Expenses

An amount of $720,000 has been included in the Normal Cost for FY21. This amount includes estimated administrative expenses and a portion of the investment related expenses. This amount is assumed to increase by 4.5% each year.

Members Hired on or After April 2, 2012

Chapter 176 of the Acts of 2011 changed the retirement eligibility for the different job groups. For example, Group 1 eligibility changed from 55 years old with 10 years of service to 60 years old with 10 years of service (Chapter 176 removed the provision that allowed retirement at any age with 20 years of service). Our software system is programmed such that at any given age, a member is assumed to either retire or terminate, but not both. Therefore, we adjusted the retirement and termination rates for members impacted by Chapter 176. For example, for Group 1 members, we removed retirement rates for ages 50-59. Termination rates remain in effect for those years. We will monitor these assumptions going forward.

9. ACTUARIAL ASSUMPTIONS *(continued)*

Retirement

Age	Groups 1 & 2		Group 4
	Male	Female	
45-49	0.000	0.000	0.010
50	0.010	0.015	0.020
51	0.010	0.015	0.020
52	0.010	0.020	0.020
53	0.010	0.025	0.050
54	0.020	0.025	0.075
55	0.020	0.055	0.150
56	0.025	0.065	0.100
57	0.025	0.065	0.100
58	0.050	0.065	0.100
59	0.065	0.065	0.150
60	0.120	0.050	0.200
61	0.200	0.130	0.200
62	0.300	0.150	0.250
63	0.250	0.125	0.250
64	0.220	0.180	0.300
65	0.400	0.150	1.000
66	0.250	0.200	1.000
67	0.250	0.200	1.000
68	0.300	0.250	1.000
69	0.300	0.200	1.000
70 and after	1.000	1.000	1.000

Retirement rates are based on our most recent experience analysis which reviewed age, service, gender and job group. The assumption reflects this analysis as well as professional judgment.

10. SUMMARY OF PLAN PROVISIONS

ADMINISTRATION

There are 104 contributory retirement systems for public employees in Massachusetts. Each system is governed by a retirement board and all boards, although operating independently, are governed by Chapter 32 of the Massachusetts General Laws. This law in general provides uniform benefits, uniform contribution requirements and a uniform accounting and funds structure for all systems.

PARTICIPATION

Participation is mandatory for all full-time employees. Eligibility with respect to part-time, provisional, temporary, seasonal or intermittent employment is governed by regulations promulgated by the retirement board, and approved by PERAC. Membership is optional for certain elected officials.

There are 4 classes of membership under Chapter 32, but one of these classes, Group 3, is made up exclusively of the State Police who are in the State Retirement System. The other 3 classes are as follows:

Group 1:

General employees, including clerical, administrative, technical and all other employees not otherwise classified.

Group 2:

Certain specified hazardous duty positions.

Group 4:

Police officers, firefighters, and other specified hazardous positions.

MEMBER CONTRIBUTIONS

Member contributions vary depending on the most recent date of membership:

Prior to 1975:	5% of regular compensation
1975 - 1983:	7% of regular compensation
1984 to 6/30/96:	8% of regular compensation
7/1/96 to present:	9% of regular compensation
1979 to present:	an additional 2% of regular compensation in excess of $30,000.

In addition, members of Group 1 who join the system on or after April 2, 2012 will have their withholding rate reduced to 6 % after achieving 30 years of creditable service.

10. SUMMARY OF PLAN PROVISIONS *(continued)*

RATE OF INTEREST

Interest on regular deductions made after January 1, 1984 is a rate established by PERAC in consultation with the Commissioner of Banks. The rate is obtained from the average rates paid on individual savings accounts by a representative sample of at least 10 financial institutions.

RETIREMENT AGE

The mandatory retirement age for some Group 2 and Group 4 employees is age 65. Most Group 2 and Group 4 members may remain in service after reaching age 65. Group 2 and Group 4 members who are employed in certain public safety positions are required to retire at age 65. There is no mandatory retirement age for employees in Group 1.

SUPERANNUATION RETIREMENT

A person who became a member before April 2, 2012 is eligible for a superannuation retirement allowance (service retirement) upon meeting the following conditions:

- completion of 20 years of service, or
- attainment of age 55 if hired prior to 1978, or if classified in Group 4, or
- attainment of age 55 with 10 years of service, if hired after 1978, and if classified in Group 1 or 2

A person who became a member on or after April 2, 2012 is eligible for a superannuation retirement allowance (service retirement) upon meeting the following conditions:

- attainment of age 60 with 10 years of service if classified in Group 1, or
- attainment of age 55 with 10 years of service if classified in Group 2, or
- attainment of age 55 if classified in Group 4.

10. SUMMARY OF PLAN PROVISIONS *(continued)*

AMOUNT OF BENEFIT

A member's annual allowance is determined by multiplying average salary by a benefit rate related to the member's age and job classification at retirement, and the resulting product by his creditable service. The amount determined by the benefit formula cannot exceed 80% of the member's highest three year (or five year salary as discussed below) average salary. For veterans as defined in G.L. c. 32, s. 1, there is an additional benefit of $15 per year for each year of creditable service, up to a maximum of $300.

• Salary is defined as gross regular compensation. For persons who become members after January 1, 2011, regular compensation is limited to 64% of the federal limit found in 26 U.S.C. 401(a)(17). In addition, regular compensation for members who retire after April 2, 2012 will be limited to prohibit "spiking" of a member's salary to increase the retirement benefit.

• For persons who became members prior to April 2, 2012, Average Salary is the average annual rate of regular compensation received during the 3 consecutive years that produce the highest average, or, if greater, during the last 3 years (whether or not consecutive) preceding retirement.

• For persons who became members on or after April 2, 2012, Average Salary is the average annual rate of regular compensation received during the 5 consecutive years that produce the highest average, or, if greater, during the last 5 years (whether or not consecutive) preceding retirement.

• The Benefit Rate varies with the member's retirement age. For persons who became members prior to April 2, 2012 the highest rate of 2.5% applies to Group 1 employees who retire at or after age 65, Group 2 employees who retire at or after age 60, and to Group 4 employees who retire at or after age 55. A .1% reduction is applied for each year of age under the maximum age for the member's group. For Group 2 employees who terminate from service under age 55, the benefit rate for a Group 1 employee shall be used.

• For persons who became members on or after April 2, 2012 and retire with less than 30 years of creditable service, the highest rate of 2.5% applies to Group 1 employees who retire at or after age 67, Group 2 employees who retire at or after age 62, and to Group 4 employees who retire at or after age 57. A .15% reduction is applied for each year of age under the maximum age for the member's group.

• For persons who became members on or after April 2, 2012 and retire with more than 30 years of creditable service, the highest rate of 2.5% applies to Group 1 employees who retire at or after age 67, Group 2 employees who retire at or after age 62, and to Group 4 employees who retire at or after age 57. A .125% reduction is applied for each year of age under the maximum age for the member's group.

10. SUMMARY OF PLAN PROVISIONS *(continued)*

DEFERRED VESTED BENEFIT

A participant who has attained the requisite years of creditable service can elect to defer his or her retirement until a later date. Certain public safety employees cannot defer beyond age 65. All participants must begin to receive a retirement allowance or withdraw their accumulated deductions no later than April 15 of the calendar year following the year they reach age 72.

WITHDRAWAL OF CONTRIBUTIONS

Member contributions may be withdrawn upon termination of employment. The interest rate for employees who first become members on or after January 1, 1984 who voluntarily withdraw their contributions with less than 10 years of service will be 3%. Interest payable on all other withdrawals will be set at regular interest.

DISABILITY RETIREMENT

The Massachusetts Retirement Plan provides 2 types of disability retirement benefits:

ORDINARY DISABILITY

Eligibility: Non-veterans who become totally and permanently disabled by reason of a non-job related condition with at least 10 years of creditable service (or 15 years creditable service in systems in which the local option contained in G.L. c. 32, s.6(1) has not been adopted).

Veterans with ten years of creditable service who become totally and permanently disabled by reason of a non-job related condition prior to reaching “maximum age”. “Maximum age” applies only to employees classified in Group 4 who are subject to mandatory retirement.

Retirement Allowance: For persons who became members prior to April 2, 2012, the benefit is equal to the accrued superannuation retirement benefit as if the member was age 55. If the member is a veteran, the benefit is 50% of the member’s final rate of salary during the preceding 12 months, plus an annuity based upon accumulated member contributions plus credited interest. If the member is over age 55, he or she will receive not less than the superannuation allowance to which he or she is entitled.

For persons in Group 1 who became members on or after April 2, 2012, the benefit is equal to the accrued superannuation retirement benefit as if the member was age 60. If the member is a veteran, the benefit is 50% of the member’s final rate of salary during the preceding 12 months, plus an annuity based upon accumulated member contributions plus credited interest. If the member is over age 60, he or she will receive not less than the superannuation allowance to which he or she would have been entitled had they retired for superannuation.

10. SUMMARY OF PLAN PROVISIONS *(continued)*

ORDINARY DISABILITY *(continued)*

For persons in Group 2 and Group 4 who became members on or after April 2, 2012, the benefit is equal to the accrued superannuation retirement benefit as if the member was age 55. If the member is a veteran, the benefit is 50% of the member's final rate of salary during the preceding 12 months, plus an annuity based upon accumulated member contributions plus credited interest. If the member is over age 55, he or she will receive not less than the superannuation allowance to which he or she is entitled.

ACCIDENTAL DISABILITY

Eligibility: Applies to members who become permanently and totally unable to perform the essential duties of the position as a result of a personal injury sustained or hazard undergone while in the performance of duties. There are no minimum age or service requirements.

Retirement Allowance: 72% of salary plus an annuity based on accumulated member contributions, with interest. This amount is not to exceed 100% of pay. For those who became members in service after January 1, 1988 or who have not been members in service continually since that date, the amount is limited to 75% of pay. There is an additional pension of $952.32 per year (or $312.00 per year in systems in which the local option contained in G.L. c. 32, s. 7(2)(a)(iii) has not been adopted), per child who is under 18 at the time of the member's retirement, with no age limitation if the child is mentally or physically incapacitated from earning. The additional pension may continue up to age 22 for any child who is a full time student at an accredited educational institution. For systems that have adopted Chapter 157 of the Acts of 2005, veterans as defined in G.L. c. 32, s. 1 receive an additional benefit of $15 per year for each year of creditable service, up to a maximum of $300.

ACCIDENTAL DEATH

Eligibility: Applies to members who die as a result of a work-related injury or if the member was retired for accidental disability and the death was the natural and proximate result of the injury or hazard undergone on account of which such member was retired.

Allowance: An immediate payment to a named beneficiary equal to the accumulated deductions at the time of death, plus a pension equal to 72% of current salary and payable to the surviving spouse, dependent children or the dependent parent, plus a supplement of $952.32 per year, per child (or $312.00 per year in systems in which the local option contained in G.L. c. 32, s. 9(2)(d)(ii) has not been adopted), payable to the spouse or legal guardian until all dependent children reach age 18 or 22 if a full time student, unless mentally or physically incapacitated.

The surviving spouse of a member of a police or fire department or any corrections officer who, under specific and limited circumstances detailed in the statute, suffers an accident and is killed or sustains injuries while in the performance of his duties that results in his death, may receive a pension equal to the maximum salary for the position held by the member upon his death.

In addition, an eligible family member may receive a one-time payment of $300,000.00 from the State Retirement Board.

DEATH AFTER ACCIDENTAL DISABILITY RETIREMENT

Effective November 7, 1996, Accidental Disability retirees were allowed to select Option C at retirement and provide a benefit for an eligible survivor. For Accidental Disability retirees prior to November 7, 1996, who could not select Option C, if the member's death is from a cause unrelated to the condition for which the member received accidental disability benefits, a surviving spouse will receive an annual allowance of $6,000. For Systems that accept the provisions of Section 28 of Chapter 131 of the Acts of 2010 the amount of this benefit is $9,000 and for Systems that accept the provisions of Section 65 of Chapter 139 of the Acts of 2012 the amount of this benefit is $12,000.

DEATH IN ACTIVE SERVICE *(OPTION D)*

Allowance: An immediate allowance equal to that which would have been payable had the member retired and selected Option C on the day before his or her death. For a member who became a member prior to April 2, 2012 whose death occurred prior to the member's minimum superannuation retirement age, the age 55 benefit rate is used. For a member classified in Group 1 who became a member on or after April 2, 2012 whose death occurred prior to the member's minimum superannuation retirement age, the age 60 benefit rate is used. If the member died after age 60, the actual age is used. For a member classified in Group 2 or Group 4 who became a member on or after April 2, 2012 and whose death occurred prior to the member's minimum superannuation retirement age, the benefit shall be calculated using an age 55 factor. The minimum annual allowance payable to the surviving spouse of a member in service who dies with at least two years of creditable service is $3,000 unless the retirement system has accepted the local option increasing this minimum annual allowance to $6,000, provided that the member and the spouse were married for at least one year and living together on the member's date of death

The surviving spouse of such a member in service receives an additional allowance equal to the sum of $1,440 per year for the first child and $1,080 per year for each additional child until all dependent children reach age 18 or 22 if a full time student, unless mentally or physically incapacitated.

COST OF LIVING

If a system has accepted Chapter 17 of the Acts of 1997, and the Retirement Board votes to pay a cost of living increase (COLA) for that year, the percentage is determined based on the increase in the Consumer Price Index used for indexing Social Security benefits, but cannot exceed 3.0%. Section 51 of Chapter 127 of the Acts of 1999, if accepted, allows boards to grant COLA increases greater than that determined by CPI but not to exceed 3.0%. The first $12,000 (or the increased COLA base if adopted by the Board) of a retiree's total allowance is subject to a COLA. The total COLA for periods from 1981 through 1996 is paid for by the Commonwealth of Massachusetts.

Under the provisions of Chapter 32, Section 103(j) inserted by Section 19 of Chapter 188 of the Acts of 2010, systems may increase the maximum base on which the COLA is calculated in multiples of $1,000. For many years, the COLA was calculated upon the first $12,000 of a retiree's allowance. Now the maximum base upon which the COLA is calculated varies from System to System. Each increase must be accepted by a majority vote of the Retirement Board and approved by the legislative body.

10. SUMMARY OF PLAN PROVISIONS *(continued)*

METHODS OF PAYMENT

A member may elect to receive his or her retirement allowance in one of 3 forms of payment.

Option A: Total annual allowance, payable in monthly installments, commencing at retirement and terminating at the member's death.

Option B: A reduced annual allowance, payable in monthly installments, commencing at retirement and terminating at the death of the member, provided, however, that if the total amount of the annuity portion received by the member is less than the amount of his or her accumulated deductions, including interest, the difference or balance of his accumulated deductions will be paid in a lump sum to the retiree's beneficiary or beneficiaries of choice.

Option C: A reduced annual allowance, payable in monthly installments, commencing at retirement. At the death of the retired employee, 2/3 of the allowance is payable to the member's designated beneficiary (who may be the spouse, or former spouse who is unmarried at the time of retirement for a member whose retirement becomes effective on or after February 2, 1992, child, parent, sister, or brother of the employee) for the life of the beneficiary. For members who retired on or after January 12, 1988, if the beneficiary pre-deceases the retiree, the benefit payable increases (or "pops up" to Option A) based on the factor used to determine the Option C benefit at retirement. For members who retired prior to January 12, 1988, if the System has accepted Section 288 of Chapter 194 of the Acts of 1998 and the beneficiary pre-deceases the retiree, the benefit payable "pops up" to Option A in the same fashion. The Option C became available to accidental disability retirees on November 7, 1996.

ALLOCATION OF PENSION COSTS

If a member's total creditable service was partly earned by employment in more than one retirement system, the cost of the "pension portion" is allocated between the different systems pro rata based on the member's service within each retirement system. If a member received regular compensation concurrently from two or more systems on or after January 1, 2010, and was not vested in both systems as of January 1, 2010, such a pro-ration will not be undertaken. This is because such a person will receive a separate retirement allowance from each system.

11. GLOSSARY OF TERMS

ACTUARIAL ACCRUED LIABILITY

That portion of the Actuarial Present Value of pension plan benefits which is not provided by future Normal Costs or employee contributions. It is the portion of the Actuarial Present Value attributable to service rendered as of the Valuation Date.

ACTUARIAL ASSUMPTIONS

Assumptions, based upon past experience or standard tables, used to predict the occurrence of future events affecting the amount and duration of pension benefits, such as: mortality, withdrawal, disablement and retirement; changes in compensation; rates of investment earnings and asset appreciation or depreciation; and any other relevant items.

ACTUARIAL COST METHOD (OR FUNDING METHOD)

A procedure for allocating the Actuarial Present Value of all past and future pension plan benefits to the Normal Cost and the Actuarial Accrued Liability.

ACTUARIAL GAIN OR LOSS (OR EXPERIENCE GAIN OR LOSS)

A measure of the difference between actual experience and that expected based upon the set of Actuarial Assumptions, during the period between two Actuarial Valuation dates.

Note: The effect on the Accrued Liability and/or the Normal Cost resulting from changes in the Actuarial Assumptions, the Actuarial Cost Method, or pension plan provisions would be described as such, not as an Actuarial Gain (Loss).

ACTUARIAL PRESENT VALUE

The dollar value on the valuation date of all benefits expected to be paid to current members based upon the Actuarial Assumptions and the terms of the Plan.

AMORTIZATION PAYMENT

That portion of the pension plan appropriation which represents payments made to pay interest on and the reduction of the Unfunded Accrued Liability.

11. GLOSSARY OF TERMS *(continued)*

ANNUAL STATEMENT

The statement submitted to PERAC each year that describes the asset holdings and Fund balances as of December 3l and the transactions during the calendar year that affected the financial condition of the retirement system.

ANNUITY RESERVE FUND

The fund into which total accumulated deductions, including interest, is transferred at the time a member retires, and from which annuity payments are made.

ANNUITY SAVINGS FUND

The fund in which employee contributions plus interest credited are held for active members and for former members who have not withdrawn their contributions and are not yet receiving a benefit (inactive members).

ASSETS

The value of securities as described in Section 8.

COST OF BENEFITS

The estimated payment from the pension system for benefits for the fiscal year. This was the minimum amount payable during the first six years of some funding schedules.

FUNDING SCHEDULE

The schedule based upon the most recently approved actuarial valuation which sets forth the amount which would be appropriated to the pension system in accordance with Section 22(6A), Section 22D or Section 22F of M.G.L. Chapter 32.

GASB

Governmental Accounting Standards Board

11. GLOSSARY OF TERMS *(continued)*

NORMAL COST

Total Normal Cost is that portion of the Actuarial Present Value of pension plan benefits, which is to be paid in a single fiscal year. The Employee Normal Cost is the amount of the expected employee contributions for the fiscal year. The Employer Normal Cost is the difference between the Total Normal Cost and the Employee Normal Cost.

PENSION FUND

The fund into which appropriation amounts as determined by PERAC are paid and from which pension benefits are paid.

PENSION RESERVE FUND

The fund which shall be credited with all amounts set aside by a system for the purpose of establishing a reserve to meet future pension liabilities. These amounts would include excess interest earnings.

SPECIAL FUND FOR MILITARY SERVICE CREDIT

The fund which is credited with amounts paid by the retirement board equal to the amount which would have been contributed by a member during a military leave of absence as if the member had remained in active service of the retirement board. In the event of retirement or a non-job related death, such amount is transferred to the Annuity Reserve Fund. In the event of termination prior to retirement or death, such amount shall be transferred to the Pension Fund.

UNFUNDED ACCRUED LIABILITY

The excess of the Actuarial Accrued Liability over the Assets.

COMMONWEALTH OF MASSACHUSETTS
Public Employee Retirement Administration Commission
Five Middlesex Avenue, Suite 304 | Somerville, MA 02145
Phone: 617-666-4446 | Fax: 617-628-4002
TTY: 617-591-8917 | Web: www.mass.gov/perac