Employees' Retirement System of Rhode Island

Actuarial Valuation Report

As of June 30, 2022

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December 19, 2022

Retirement Board
50 Service Avenue, 2nd Floor
Warwick, RI 02886-1021

Dear Members of the Board:

Subject: Actuarial Valuation as of June 30, 2022

This is the June 30, 2022 actuarial valuation of the Employees' Retirement System of Rhode Island (ERSRI), which is a defined benefit plan that covers State Employees and Teachers. This report describes the current actuarial condition of ERSRI, determines recommended employer contribution rates, and analyzes changes in these contribution rates. Valuations are prepared annually, as of June 30th, the last day of the ERSRI plan year. Not covered in this report are the Municipal Employees' Retirement System, the State Police Retirement Benefits Trust, State Police Retirement Fund Trust, the Judicial Retirement Benefits Trust, and the Teachers' Survivor Benefits Plan, even though assets for ERSRI and these other programs are commingled for investment purposes. Additionally, this report does not consider the contribution requirements associated with any defined contribution benefits provided to State Employees and Teachers outside of the defined benefit plan.

Under Rhode Island General Laws, the employer contribution rates for State Employees and for Teachers are certified annually by the State of Rhode Island Retirement Board. These rates are determined actuarially, based on the plan provisions in effect as of the valuation date, the actuarial assumptions adopted by the Board, and the methodology set forth in the statutes. The Board's current policy is that the contribution rates determined by a given actuarial valuation become effective two years after the valuation date. For example, the rates determined by this June 30, 2022 actuarial valuation will be applicable for the year beginning July 1, 2024 and ending June 30, 2025.

FINANCING OBJECTIVES

The actuarial cost method and the amortization periods are set by statute. Normal cost rate (as a percent of pay) and actuarial accrued liabilities are computed using the Entry Age Normal actuarial cost method. The employer contribution rate is the sum of two pieces: the employer normal cost rate and the amortization rate. The employer normal cost rate is the difference between the normal cost rate and the member contribution rate. The amortization rate, also determined as a level percent of pay, is the amount required to amortize the unfunded actuarial accrued liability over a closed period. The amortization rate is adjusted for the two-year deferral in contribution rates. Separate employer contribution rates are determined for State Employees and for Teachers.

PROGRESS TOWARD REALIZATION OF FINANCING OBJECTIVES

The employer contribution rate for State Employees is 28.54% while the employer contribution rate for Teachers is 25.12%. These employer contribution rates determined by this June 30, 2022 actuarial valuation will be applicable for the year beginning July 1, 2024 and ending June 30, 2025. The rates for both groups declined from last year because of a combination of additional voluntary contributions from the State that fully paid off the amortization basses created as a result of the 1990/91 and 1991/92 deferrals as well as a gain on the actuarial value of assets.

The funded ratio (the ratio of the actuarial value of assets to the actuarial accrued liability) is a standard measure of a plan's funded status. The funded status alone is not appropriate for assessing the need for future contributions. The funded status is not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations. The funded ratio for State Employees is 58.8% while the funded ratio for Teachers is 61.5%. The funded ratio increased from the prior valuation for both State Employees and Teachers primarily due to actuarial gains from strong investment performance during the fiscal year. The funded ratio also increased because the contributions determined by the funding policy are intended to move the System towards 100% funded.

Given the plan's contribution allocation procedure, if all actuarial assumptions are met (including the assumption of the plan earning 7.00% on the actuarial valuation of assets), it is expected that:

1. The employer normal cost as a percentage of pay will decrease to the level of the newest tier as members with service under the old tiers declines and is replaced by new tier members (approximately, 7.0% for the State and 6.0% for Teachers),
2. The amortization payment as a percentage of pay remain level from fiscal year 2024 through 2036,
3. The unfunded actuarial accrued liability will be fully amortized within 20 years from fiscal year 2024 with single equivalent periods for all current amortization layers of 13.5 and 15.2 years for state and teachers respectively, and
4. In the absence of benefit improvements, the funded ratio should increase over time, until it reaches 100%.

An analysis of the changes in the employer contribution rates appears in Table 11A of this report. An analysis of the changes in the unfunded actuarial accrued liability appears in Table 11C.

BENEFIT PROVISIONS

The benefit provisions reflected in this valuation are those which were in effect on June 30, 2022, and there have been no changes to the benefit provisions since the preceding valuation. All benefit provisions are summarized in Appendix B.

ASSUMPTIONS AND METHODS

The assumptions are unchanged from the last actuarial valuation and were approved by the Board on May 22, 2020 based on the Actuarial Experience Investigation dated May 6, 2020. We believe the assumptions are internally consistent and are reasonable, based on the actual experience of ERSRI.

The results of the actuarial valuation are dependent upon the actuarial assumptions used. Actual results can and almost certainly will differ, as actual experience deviates from the assumptions. Even seemingly minor changes in the assumptions can materially change the liabilities and the calculated contribution rates.

All assumptions and methods are described in Appendix A. The actuarial assumptions and methods used in this report comply with the parameters for disclosure that appear in Governmental Accounting Standards Board (GASB) Statement Number 67.

This report was prepared using our proprietary valuation model and related software which in our professional judgment has the capability to provide results that are consistent with the purposes of the valuation. We performed tests to ensure that the model reasonably represents that which is intended to be modeled.

DATA

The ERSRI staff supplied data for retired, active and inactive members as of June 30, 2022. We did not audit this data, but we did apply a number of tests to the data, and we concluded that it was reasonable and consistent with the prior year's data. The ERSRI staff also supplied asset data as of June 30, 2022.

CERTIFICATION

All of our work conforms with generally accepted actuarial principles and practices, and with the Actuarial Standards of Practice issued by the Actuarial Standards Board. In our opinion, our calculations also comply with the requirements of Rhode Island state law and, where applicable, the Internal Revenue Code, ERISA, and the Statements of the Governmental Accounting Standards Board.

The undersigned are independent actuaries. All are Members of the American Academy of Actuaries. They all meet the Qualification Standards of the American Academy of Actuaries and they are experienced in performing valuations for large public retirement systems.

Respectfully submitted,
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Actuarial Standards of Practice Disclosure Statements

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 or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law.

This report should not be relied on for any purpose other than the purpose described above. Determinations of the financial results associated with the benefits described in this report in a manner other than the intended purpose may produce significantly different results.

The valuation was based upon information furnished by the System's staff, concerning Retirement System benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries. We checked for internal and year-to-year consistency, but did not otherwise audit the data. We are not responsible for the accuracy or completeness of the information provided by the System's staff.

The developed findings included in this report consider data or other information through June 30, 2022.

This is one of multiple documents comprising the actuarial report. The other document comprising the actuarial report is a PowerPoint presentation presented to the Board of Trustees following the publication of this report.

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SECTION A

EXECUTIVE SUMMARY

Executive Summary (State Employees)

Item	Valuation Date: June 30, 2022	Valuation Date: June 30, 2021
Membership		
Number of:		
- Active members	10,820	10,803
- Retirees and beneficiaries	11,365	11,373
- Inactive members	4,651	4,154
- Total	26,836	26,330
Previous year payroll supplied by ERSRI	$ 763,233,105	$ 739,998,727
Contribution rates (Defined Benefit Only)		
Member	4.21%	4.25%
Employer	28.54%	28.97%
Assets		
Market value	$ 2,911,444,772	$ 3,057,226,491
Actuarial value	2,896,669,194	2,747,732,215
Return on market value	-2.7%	27.0%
Return on actuarial value	8.2%	10.1%
Employer contribution for FYE	$ 245,148,773	$ 204,267,002
Ratio of actuarial value to market value	99.5%	89.9%
Actuarial Information		
Employer normal cost %	3.66%	3.76%
Unamortized actuarial accrued liability (UAAL)	$ 2,031,907,747	$ 2,100,454,287
Amortization rate	24.88%	25.21%
Single Equivalent Funding period	13.5 years	15.5 years
Funded ratio	58.8%	56.7%
Projected employer contribution		
Fiscal year ending June 30,	2025	2024
Projected payroll (millions)	$ 834.0	$ 808.6
Projected employer contribution (millions)	238.0	234.3

Executive Summary (Teachers)

Item	Valuation Date: June 30, 2022	Valuation Date: June 30, 2021
Membership		
Number of:		
- Active members	13,537	13,372
- Retirees and beneficiaries	11,521	11,398
- Inactive members	4,539	4,227
- Total	29,597	28,997
Previous year payroll supplied by ERSRI	$ 1,118,606,392	$ 1,091,442,659
Contribution rates (Defined Benefit Only)		
Member	3.75%	3.75%
Employer	25.12%	26.16%
State share	10.68%	11.13%
Local employer share	14.44%	15.03%
Assets		
Market value	$ 4,418,568,124	$ 4,671,641,312
Actuarial value	4,362,074,064	4,142,172,560
Return on market value	-2.7%	27.0%
Return on actuarial value	8.2%	10.1%
Employer contribution (state & local)	$ 322,772,188	$ 275,778,411
Ratio of actuarial value to market value	98.7%	88.7%
Actuarial Information		
Employer normal cost %	3.56%	3.68%
Unamortized actuarial accrued liability (UAAL)	$ 2,735,182,328	$ 2,909,260,411
Amortization percentage	21.56%	22.48%
Single Equivalent Funding period	15.2 years	17.0 years
Funded ratio	61.5%	58.7%
Projected employer contribution		
Fiscal year ending June 30,	2025	2024
Projected payroll (millions)	$ 1,204.6	$ 1,175.4
Projected employer contribution (millions)	302.6	307.5
State share (millions)	128.7	130.8
Local employer share (millions)	173.9	176.7

SECTION B

DISCUSSION

Discussion (Contribution Rates)

The employer contribution rates for ERSRI are determined actuarially. Separate rates are determined for State Employees and for Teachers. The rates determined in this valuation become effective two years after the valuation date, i.e., as of July 1, 2024.

The rate consists of two pieces: the normal cost rate and the amortization rate. The normal cost rate is the employer's Entry Age normal cost, expressed as a percentage of active member payroll. The amortization rate is the contribution required to amortize each of the laddered bases that comprise the unfunded actuarial accrued liability over closed period as a level percentage of payroll. Payment for each base is generally calculated based on a 20-year amortization period beginning 2 years after they are established. The investment return assumption was lowered from 7.5% to 7.0% in the 2017 experience study and the impact was divided into separate "staggers" with the first payment beginning in FY2020 over a 20-year period. Other staggers will begin payment in FY2021 through FY2024 with amortization periods decreasing by one year for each year past FY2020 in which payment begins (e.g. the FY2024 stagger will have a 16-year amortization period). Thus, all of the individual staggers will be fully amortized over the 20-year period beginning with FY2020, but will have different starting years. The impact of the most recent experience study was a small gain and it is divided into two staggers to align with the final two staggers from the 2017 experience study. The final stagger for each study was recognized with the FY2024 contribution, which was set in last year's valuation. Please see pages 11 and 12 for details on each outstanding base.

For the Teachers, the State of Rhode Island pays 40% of the rate. In previous years, this was further adjusted so that the State paid the entire amortization charge for the 1990/91 and 1991/92 deferrals, and the town or city employing the Teacher paid the balance. This past fiscal year, the State made voluntary contributions to fully pay off the amortization charge for the 1990/91 and 1991/92 deferrals, and thus the contributions are now split based on the 40%.

	Local	State	Total
Amortization for FY 91 and 92 deferrals	0.00%	0.00%	0.00%
Normal cost and all other amortizations	14.44%	10.68%	25.12%
Total	14.44%	10.68%	25.12%

Discussion (Impact of Decrease in Contribution Rate)

Under Rhode Island General Laws (RIGL) §36-10-2(e), if the State's actuarially determined contribution rate for State Employees or for Teachers for a fiscal year will be less than in the preceding fiscal year, the Governor is required to include an appropriation to ERSRI in the fiscal year budget equal to 20% of the reduction. For purposes of this calculation, the impact of voluntary contributions will be excluded. Because the FYE 2025 contribution rates after adjustments for voluntary contributions are lower than the rates for FYE 2024, the following additional appropriation will be required.

Employees' Retirement System of Rhode Island

Calculation of Budget Appropriation Under RIGL Section 36-10-2(g)

	Item	State Employees	Teachers
A.	Prior valuation date	June 30, 2021	June 30, 2021
B.	Total employer contribution rate (prior valuation)	28.97%	26.16%
B.2.	State share for Teachers		11.13%
C.	Current valuation date	June 30, 2022	June 30, 2022
D.	Total employer contribution rate (current valuation)	28.54%	25.12%
D.2.	State share for Teachers		10.68%
E.	Contribution for fiscal year ending	June 30, 2025	June 30, 2025
F.	Pay projected for this fiscal year	$834,005,421	$1,204,616,737
G.	Adjustment to Exclude Voluntary State Contributions	-0.33%	-0.31%
H.	Net Decrease in State's contribution rate	0.10%	0.14%
I.	Decrease in State's contribution	$835,359	$1,716,667
J.	20% of decrease to be appropriated	$167,072	$343,333

Discussion (Financial Data and Experience)

Assets for ERSRI are held in trust and are commingled with those of several other plans and programs for investment purposes. The State Investment Commission is responsible for setting the asset allocation policy and for investing the funds. The ERSRI assets are then allocated by the ERSRI staff among State Employees, Teachers, and the Teachers' Survivor Benefits Plan.

Table 6 of this report shows the net plan assets for ERSRI in total, and it shows the breakdown between State Employees, Teachers and the Teachers' Survivor Benefits Plan. Table 7 of this report shows a reconciliation of the assets for State Employees and Teachers between the previous valuation and this valuation. Table 9 shows the target distribution of investments by category—60% of assets are held in equities, including real estate and private equity—and Table 10 shows a historical summary of the return rates. As can be seen, the net market value rate of return was -2.7% for the year ended June 30, 2022, and the return on an actuarial asset value basis was 8.2%.

The average annual return based on the market value of assets over the last ten years (July 1, 2012 – June 30, 2022) was 7.9%. This is more than the current 7.0% annual investment return assumption.

All returns above are net of both investment and administrative expenses and may differ from other information provided by the General Treasurer's office or the investment managers and advisors due to timing of reflected cash flows, frequency of compounding, and treatment of administrative expenses.

The ERSRI staff provided all of the financial information used in this report.

Discussion (Benefit Provisions)

Appendix B includes a summary of the benefit provisions for ERSRI. There were no material changes in the benefit provisions since the preceding valuation.

The COLA to be provided to retired members is contingent on the investment performance, the annual change in the CPI-U, and funded status of the System. The amount of the COLA is determined based on 50% of the plan's five-year average investment rate of return minus 5.0% and will range from zero to 4.0%, and 50% of the lesser of 3% or last year's CPI-U increase for a total maximum increase of 3.50%. This calculation produces a 3.50% COLA for Calendar Year 2022 and 3.11% for Calendar Year 2023. The COLA will be limited and this limit will be indexed annually to increase in the same manner as COLAs, with the known values as follows:

Year	COLA Limit
2014	$ 25,000
2015	$ 25,168
2016	$ 25,855
2017	$ 26,098
2018	$ 26,291
2019	$ 26,687
2020	$ 27,184
2021	$ 27,608
2022	$ 27,901
2023	$ 28,878
2024	$ 29,776

Furthermore, the COLA will be suspended for all state employees, teachers, BHDDH nurses, correctional officers, judges and state police until the aggregate funding level of their plans exceeds 80%; however, an interim COLA will be granted in four-year intervals while the COLA is suspended. The first interim COLA was during the Calendar Year beginning January 1, 2017. Also, for current retirees and beneficiaries retired on or before July 1, 2015 the $25,000 cap will be increased to $30,000 (indexed) for any COLA payable based on the every fourth year provision.

Discussion (Actuarial Methods and Assumptions)

Appendix A of this report includes a summary of the actuarial assumptions and methods used in this valuation. Costs are determined using the Entry Age Normal actuarial cost method.

The method used to determine the actuarial value of assets is the five-year smoothed market method. This technique is further described in Section III of Appendix A. The development of the actuarial value of assets utilizing this method is shown in Tables 8A and 8B of this report.

The assumptions were adopted by the Board on May 22, 2020. We believe the assumptions are internally consistent and are reasonable, based on the actual experience of ERSRI.

SECTION C

TABLES

Tables

Table 1A

Development of Contribution Rate (State Employees)

		June 30, 2022 (1)	June 30, 2021 (2)
1.	Aggregate payroll		
	(a) Supplied by ERSRI for previous fiscal year	$ 763,233,105	$ 739,998,727
	(b) Adjusted for one-year's payroll growth	786,130,098	762,198,689
2.	Actuarial accrued liability	4,928,576,941	4,848,186,502
3.	Actuarial value of assets	2,896,669,194	2,747,732,215
4.	Unfunded actuarial accrued liability (UAAL) (2 - 3)	2,031,907,747	2,100,454,287
5.	Single Equivalent Funding Period	13.5	15.5
6.	Contribution effective for fiscal year ending:	June 30, 2025	June 30, 2024
7.	Payroll projected for two-year delay	834,005,421	808,616,589
8.	Amortization of UAAL	207,537,386	203,839,705
9.	Normal cost		
	(a) Total normal cost rate	7.87%	8.01%
	(b) Employee contribution rate	4.21%	4.25%
	(c) Employer normal cost rate (a - b)	3.66%	3.76%
10.	Employer contribution rate as percent of payroll		
	(a) Employer normal cost rate	3.66%	3.76%
	(b) Amortization payments (8 / 7)	24.88%	25.21%
	(c) Total (a + b)	28.54%	28.97%
11.	Estimated employer contribution amount (7 * 10(c))	$ 238,025,147	$ 234,256,226

Table 1B

Development of Contribution Rate (Teachers)

		June 30, 2022 (1)	June 30, 2021 (2)
1.	Aggregate payroll		
	(a) Supplied by ERSRI for previous fiscal year	$ 1,118,606,392	$ 1,091,442,659
	(b) Adjusted for one-year's payroll growth	1,146,571,552	1,118,728,726
2.	Actuarial accrued liability	7,097,256,392	7,051,432,971
3.	Actuarial value of assets	4,362,074,064	4,142,172,560
4.	Unfunded actuarial accrued liability (UAAL) (2 - 3)	2,735,182,328	2,909,260,411
5.	Single Equivalent Funding Period	15.2	17.0
6.	Contribution effective for fiscal year ending:	June 30, 2025	June 30, 2024
7.	Payroll projected for two-year delay	1,204,616,737	1,175,364,368
8.	Amortization of UAAL	259,659,547	264,207,906
9.	Normal cost		
	(a) Total normal cost rate	7.31%	7.43%
	(b) Employee contribution rate	3.75%	3.75%
	(c) Employer normal cost rate (a - b)	3.56%	3.68%
10.	Employer contribution rate as percent of payroll		
	(a) Employer normal cost rate	3.56%	3.68%
	(b) Amortization payments (8 / 7)	21.56%	22.48%
	(c) Total (a + b)	25.12%	26.16%
11.	Estimated employer contribution amount (7 * 10(c))	$ 302,599,724	$ 307,475,319

Table 2A

Summary of Unfunded Liability (State Employees)

Purpose	Remaining Balance as of June 30, 2022	Fiscal Year 2023 Amortization Payment *	Fiscal Year 2024 Amortization Payment *	Fiscal Year 2025 Amortization Payment *	Years Remaing Beginning with Fiscal Year 2025
Original 2011 RIRSA Base	$ 1,656,026,078	$ 163,942,336	$ 168,860,606	$ 173,926,424	11
2014 Experience Base	(45,867,666)	(4,290,551)	(4,419,268)	(4,551,846)	12
2014 Mediation Settlement	109,885,987	10,278,950	10,587,319	10,904,939	12
2015 Experience Base	(32,962,488)	(2,928,050)	(3,015,893)	(3,106,370)	13
2016 Experience Base	45,510,459	3,855,713	3,971,384	4,090,526	14
2016 Assumption Change - FY20 Stagger **	32,199,898	2,611,748	2,690,100	2,770,803	15
2016 Assumption Change - FY21 Stagger **	74,165,993	6,015,637	6,196,106	6,381,988	15
2016 Assumption Change - FY22 Stagger **	79,969,270	6,486,342	6,680,931	6,881,360	15
2016 Assumption Change - FY23 Stagger **	86,483,371	7,014,703	7,225,144	7,441,898	15
2016 Assumption Change - FY24 Stagger **	86,483,371	-	7,839,889	8,075,086	15
2017 Experience Base	17,183,516	1,393,762	1,435,575	1,478,642	15
2018 Experience Base	26,067,887	2,031,046	2,091,977	2,154,735	16
2019 Experience Base	7,825,627	587,437	605,060	623,212	17
2020 New Assumptions - FY23 Stagger **	(31,128,993)	(2,524,886)	(2,600,633)	(2,678,652)	15
2020 New Assumptions - FY24 Stagger **	(31,128,994)	-	(2,821,905)	(2,906,562)	15
2020 Experience Base	20,355,207	1,476,044	1,520,325	1,565,935	18
2021 Experience Base	(73,176,034)	-	(5,677,752)	(5,848,085)	19
New Experience Base This Fiscal Year	4,015,258	-	-	333,353	20
Unfunded Actuarial Accrued Liability	$ 2,031,907,747	$ 195,950,231	$ 201,168,965	$ 207,537,386	

*Assuming payment made at the middle of the year.

**Assumption change staggers will begin in the fiscal year indicated.

Table 2B

Summary of Unfunded Liability (Teachers)

Purpose	Remaining Balance as of June 30, 2022	Fiscal Year 2023 Amortization Payment *	Fiscal Year 2024 Amortization Payment *	Fiscal Year 2025 Amortization Payment *	Years Remaing Beginning with Fiscal Year 2025
Original 2011 RIRSA Base (State)	$ 897,229,027	$ 91,203,967	$ 93,484,066	$ 95,821,168	11
Original 2011 RIRSA Base (Local)	1,471,352,068	123,498,170	126,585,623	129,750,265	15
2014 Experience Base (State)	(15,189,777)	(1,461,876)	(1,498,424)	(1,535,883)	12
2014 Experience Base (Local)	(23,993,876)	(2,013,930)	(2,064,278)	(2,115,885)	15
2014 Mediation Settlement (State)	62,205,090	5,986,662	6,136,329	6,289,736	12
2014 Mediation Settlement (Local)	98,259,607	8,247,434	8,453,621	8,664,962	15
2015 Experience Base	(47,776,500)	(4,374,992)	(4,484,366)	(4,596,476)	13
2016 Experience Base	31,955,725	2,796,308	2,866,214	2,937,870	14
2016 Assumption Change - FY20 Stagger **	62,824,090	5,273,150	5,404,979	5,540,103	15
2016 Assumption Change - FY21 Stagger **	95,900,544	8,049,427	8,250,663	8,456,930	15
2016 Assumption Change - FY22 Stagger **	103,718,281	8,705,610	8,923,250	9,146,331	15
2016 Assumption Change - FY23 Stagger **	112,503,796	9,443,024	9,679,100	9,921,078	15
2016 Assumption Change - FY24 Stagger **	112,503,796	-	10,533,850	10,797,196	15
2017 Experience Base	66,341,597	5,568,393	5,707,603	5,850,293	15
2018 Experience Base	7,894,613	637,709	653,652	669,993	16
2019 Experience Base	(16,413,270)	(1,279,714)	(1,311,707)	(1,344,500)	17
2020 New Assumptions - FY23 Stagger **	(40,944,248)	(3,436,662)	(3,522,579)	(3,610,643)	15
2020 New Assumptions - FY24 Stagger **	(40,944,255)	-	(3,833,654)	(3,929,495)	15
2020 Experience Base	(50,123)	(3,782)	(3,877)	(3,974)	18
2021 Experience Base	(114,915,141)	-	(9,277,787)	(9,509,732)	19
New Experience Base This Fiscal Year	(87,278,716)	-	-	(7,539,790)	20
Unfunded Actuarial Accrued Liability	$ 2,735,182,328	$ 256,838,898	$ 260,682,278	$ 259,659,547	
State Portion of UAAL Payment				$ 111,527,685	
Local Portion of UAAL Payment				$ 148,131,862	

*Assuming payment made at the middle of the year.

**Assumption change staggers will begin in the fiscal year indicated.

Table 3A

Actuarial Present Value of Future Benefits (State Employees)

	June 30, 2022 (1)	June 30, 2021 (2)
1. Active members		
a. Service retirement benefits	$ 1,722,403,330	$ 1,675,537,765
b. Deferred termination benefits	65,608,516	64,246,078
c. Refunds	4,413,190	4,322,226
d. Pre-retirement death benefits	28,235,852	27,726,065
e. Disability retirement benefits	186,243,585	179,086,799
f. Total	$ 2,006,904,473	$ 1,950,918,933
2. Retired members		
a. Service retirements	$ 2,893,669,771	$ 2,890,245,657
b. Disability retirements	202,513,506	187,593,263
c. Beneficiaries	208,925,885	201,497,256
d. Post-retirement death benefit	17,690,000	17,665,000
e. Stipends payable	0	0
f. Total	$ 3,322,799,162	$ 3,297,001,176
3. Inactive members	$ 148,002,573	$ 137,274,178
4. Total actuarial present value of future benefits	$ 5,477,706,208	$ 5,385,194,287
5. Determination of actuarial accrued liability		
a. Total actuarial present value of future benefits	$ 5,477,706,208	$ 5,385,194,287
b. Less present value of future normal costs	(524,906,186)	(509,536,556)
c. Less present value of supplemental member contributions	(24,223,081)	(27,471,229)
d. Actuarial accrued liability (a + b + c)	$ 4,928,576,941	$ 4,848,186,502

Table 3B

Actuarial Present Value of Future Benefits (Teachers)

	June 30, 2022 (1)	June 30, 2021 (2)
1. Active members		
a. Service retirement benefits	$ 2,654,869,241	$ 2,614,619,879
b. Deferred termination benefits	60,946,984	61,771,280
c. Refunds	4,787,515	4,364,392
d. Pre-retirement death benefits	33,658,920	33,394,740
e. Disability retirement benefits	306,259,165	299,126,472
f. Total	$ 3,060,521,825	$ 3,013,276,763
2. Retired members		
a. Service retirements	$ 4,389,535,433	$ 4,417,985,669
b. Disability retirements	114,094,447	108,163,593
c. Beneficiaries	138,712,291	134,955,431
d. Post-retirement death benefit	17,757,000	17,255,000
e. Stipends payable	0	0
f. Total	$ 4,660,099,171	$ 4,678,359,693
3. Inactive members	$ 214,180,584	$ 190,407,605
4. Total actuarial present value of future benefits	$ 7,934,801,580	$ 7,882,044,061
5. Determination of actuarial accrued liability		
a. Total actuarial present value of future benefits	$ 7,934,801,580	$ 7,882,044,061
b. Less present value of future normal costs	(809,901,862)	(797,000,410)
c. Less present value of supplemental member contributions	(27,643,326)	(33,610,680)
d. Actuarial accrued liability (a + b + c)	$ 7,097,256,392	$ 7,051,432,971

Table 3C

Ten-Year Projections (State Employees)

Valuation as of June 30,	Unfunded Actuarial Accrued Liability (in Millions)	Funded Ratio	Actuarial Value of Fund Assets (in Millions)	For Fiscal Year Ending June 30,	Covered Compensation (in Millions)	Employer Contribution Rate	Employer Contribution	Employee Contribution	Benefit Payments, Refunds, and Administrativ	Net External Cash Flow
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
2022	$ 2,031.9	58.8%	$ 2,896.7	2023	$ 786.1	28.01%	$ 220.2	$ 39.0	$ 358.4	$ (99.1)
2023	1,975.1	60.3%	2,996.9	2024	809.7	28.97%	234.6	39.2	363.4	(89.6)
2024	1,901.3	62.1%	3,114.0	2025	834.0	28.54%	238.0	39.5	367.8	(90.3)
2025	1,819.7	64.0%	3,238.6	2026	859.0	28.46%	244.5	39.8	375.9	(91.6)
2026	1,725.6	66.1%	3,370.5	2027	884.8	28.33%	250.7	40.3	380.9	(89.9)
2027	1,556.7	69.3%	3,513.4	2028	911.3	28.25%	257.4	40.8	381.3	(83.0)
2028	1,369.3	72.8%	3,673.6	2029	938.7	28.18%	264.5	41.5	381.8	(75.8)
2029	1,223.6	75.9%	3,852.2	2030	966.8	27.58%	266.6	42.3	388.9	(80.0)
2030	1,003.5	80.1%	4,039.2	2031	995.8	27.00%	268.9	43.2	388.5	(76.5)
2031	828.2	83.7%	4,242.8	2032	1,025.7	26.94%	276.4	44.1	394.8	(74.3)
2032	633.3	87.6%	4,463.0	2033	1,056.5	26.40%	278.9	45.2	399.8	(75.7)

Table 3D

Ten-Year Projections (Teachers)

Valuation as of June 30,	Unfunded Actuarial Accrued Liability (in Millions)	Funded Ratio	Actuarial Value of Fund Assets (in Millions)	For Fiscal Year Ending June 30,	Covered Compensation (in Millions)	Employer Contribution Rate	Employer Contribution	Employee Contribution	Benefit Payments, Refunds, and Administrativ	Net External Cash Flow
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
2022	$ 2,735.2	61.5%	$ 4,362.1	2023	$ 1,146.6	26.16%	$ 299.9	$ 49.5	$ 500.0	$ (150.5)
2023	2,658.6	62.9%	4,511.7	2024	1,175.2	26.16%	307.4	49.8	502.6	(145.4)
2024	2,569.9	64.5%	4,677.2	2025	1,204.6	25.12%	302.6	50.1	505.5	(152.7)
2025	2,481.2	66.1%	4,846.5	2026	1,234.7	24.99%	308.5	50.5	514.8	(155.9)
2026	2,379.8	67.9%	5,024.5	2027	1,265.6	24.85%	314.5	50.9	517.9	(152.6)
2027	2,202.2	70.3%	5,218.4	2028	1,297.2	24.75%	321.1	51.3	519.4	(146.9)
2028	2,005.5	73.0%	5,431.7	2029	1,329.7	24.66%	328.0	52.0	520.7	(140.8)
2029	1,850.1	75.4%	5,666.3	2030	1,362.9	24.18%	329.6	52.7	529.1	(146.8)
2030	1,619.2	78.5%	5,911.1	2031	1,397.0	23.72%	331.4	53.6	529.9	(144.9)
2031	1,370.5	81.8%	6,175.0	2032	1,431.9	23.65%	338.6	54.6	531.0	(137.8)
2032	1,159.5	84.8%	6,464.7	2033	1,467.7	23.21%	340.7	55.7	540.0	(143.7)

Table 4

Schedule of Funding Progress

Valuation Date	Actuarial Value of Assets (AVA)	Actuarial Accrued Liability	Unfunded Actuarial Accrued Liability (UAAL)	Funded Ratio	Annual Covered Payroll	UAAL as % of Payroll
(1)	(2)	(3)	(3)-(2) (4)	(2)/(3) (5)	(6)	(4)/(6) (7)
State Employees						
June 30, 2013[1]	2,411,057,214	4,266,053,163	1,854,995,949	56.5%	664,118,904	279.3%
June 30, 2014[2]	2,449,125,421	4,369,081,872	1,919,956,451	56.1%	675,204,750	284.4%
June 30, 2015	2,476,485,327	4,371,789,900	1,895,304,573	56.6%	691,555,582	274.1%
June 30, 2016	2,468,446,998	4,404,298,648	1,935,851,650	56.0%	693,242,177	279.2%
June 30, 2017	2,485,576,642	4,698,278,808	2,212,702,166	52.9%	704,036,300	314.3%
June 30, 2018	2,516,618,305	4,755,940,934	2,239,322,629	52.9%	711,736,212	314.6%
June 30, 2019	2,557,560,104	4,801,093,045	2,243,532,941	53.3%	740,294,095	303.1%
June 30, 2019[3]	2,557,560,104	4,750,271,989	2,192,711,885	53.8%	739,575,363	296.5%
June 30, 2020	2,597,672,247	4,793,667,018	2,195,994,771	54.2%	777,970,071	282.3%
June 30, 2021	2,747,732,215	4,848,186,502	2,100,454,287	56.7%	762,198,689	275.6%
June 30, 2022	2,896,669,194	4,928,576,941	2,031,907,747	58.8%	786,130,098	258.5%
Teachers						
June 30, 2013[1]	3,697,787,537	6,265,311,945	2,567,524,408	59.0%	963,525,547	266.5%
June 30, 2014[2]	3,742,152,714	6,424,596,267	2,682,443,553	58.2%	982,565,406	273.0%
June 30, 2015	3,783,601,053	6,438,732,100	2,655,131,047	58.8%	995,994,669	266.6%
June 30, 2016	3,772,348,051	6,466,478,470	2,694,130,419	58.3%	1,009,979,725	266.8%
June 30, 2017	3,778,302,063	6,894,243,228	3,115,941,165	54.8%	1,035,710,229	300.9%
June 30, 2018	3,815,698,266	6,951,505,936	3,135,807,670	54.9%	1,057,179,746	296.6%
June 30, 2019	3,866,452,572	6,994,286,436	3,127,833,864	55.3%	1,086,984,336	287.8%
June 30, 2019[3]	3,866,452,572	6,927,441,023	3,060,988,451	55.8%	1,085,923,864	281.9%
June 30, 2020	3,911,140,020	6,957,586,318	3,046,446,298	56.2%	1,107,935,749	275.0%
June 30, 2021	4,142,172,560	7,051,432,971	2,909,260,411	58.7%	1,118,728,726	260.1%
June 30, 2022	4,362,074,064	7,097,256,392	2,735,182,328	61.5%	1,146,571,552	238.6%

[1] June 30, 2013 actuarial value after changes of actuarial assumptions
[2] June 30, 2014 actuarial value after reflecting the amendment of Article 21
[3] June 30, 2019 actuarial value after changes of actuarial assumptions

Table 5

Notes to Required Supplementary Information

Item	State Employees	Teachers
(1)	(2)	(3)
Valuation date	June 30, 2022	June 30, 2022
Actuarial cost method	Entry Age Normal	Entry Age Normal
Amortization method	Level percentage, closed	Level percentage, closed
Remaining amortization period	13.5 years	15.2 years
Asset valuation method	5-Yr Smoothed Market	5-Yr Smoothed Market
Actuarial assumptions:		
Investment rate of return *	7.00%	7.00%
Projected salary increase *	3.25% to 6.25%	3.00% to 13.00%
* Includes inflation at:	2.50%	2.50%
Cost of living adjustments	2.10%	2.10%

COLAs are currently suspended for all state employees, teachers, BHDDH nurses, correctional officers, judges and state police until the aggregate funding level of their plans exceeds 80%. In the original RIRSA legislation, the COLAs suspended through 2027 were advance recognized due to the funding level of the plans; and all subsequent valuations have continued to reference this same timeframe. However, an interim COLA may be granted in four-year intervals while the COLA is suspended.

Table 6

Plan Net Assets
(Assets at Market or Fair Value)

Item	June 30, 2022	June 30, 2021
(1)	(2)	(3)
A. Total ERSRI assets		
1. Cash and cash equivalents	$ 5,233,405	$ 6,182,790
2. Receivables:		
a. Transfers receivable	$ 0	$ 0
b. Member and employer contributions	79,130,351	15,856,759
c. Due from state for teachers	24,497,989	24,092,359
d. Net investment income and other	2,809,764	1,658,506
e. Total receivables	$ 106,438,104	$ 41,607,624
3. Investments		
a. Short-term investment fund	$ 0	$ 0
b. Pooled trust	7,623,350,634	8,107,517,206
c. Plan specific investments	0	0
d. Invested securities lending collateral	0	0
e. Total	$ 7,623,350,634	$ 8,107,517,206
4. Prepaid expenses	$ 1,817,161	$ 2,271,451
5. Total assets	$ 7,736,839,304	$ 8,157,579,071
6. Liabilities		
a. Due to other plans	$ 463,444	$ 580,266
b. Accounts and vouchers payable	4,566,410	4,157,257
c. Securities lending liability	0	0
d. Total liabilities	$ 5,029,854	$ 4,737,523
7. Total market value of assets available for benefits (Item 5 - Item 6)	$ 7,731,809,450	$ 8,152,841,548
B. Breakdown		
1. State employees	$ 2,911,444,772	$ 3,057,226,491
2. Teachers	4,418,568,124	4,671,641,312
3. Teachers' survivors benefits	401,796,554	423,973,744
4. Total	$ 7,731,809,450	$8,152,841,548

Table 7

Reconciliation of Plan Net Assets

Item	Year Ending June 30, 2022 State Employees	Year Ending June 30, 2022 Teachers
(1)	(2)	(3)
1. Market value of assets at beginning of year	$ 3,057,226,491	$ 4,671,641,312
Current year prior period adjustments	0	0
Adjusted market value of assets at BOY	$ 3,057,226,491	$ 4,671,641,312
2. Contributions		
a. Members	$ 39,831,549	$ 49,363,747
b. Employers	245,148,773	322,772,188
c. Reimbursement of Supplemental Pensions	11,477	771,467
d. Service purchases	155,528	23,835
e. Total	$ 285,147,327	$ 372,931,237
3. Investment earnings, net of investment and administrative expenses	$ (78,154,600)	$ (131,387,447)
4. Expenditures for the year		
a. Benefit payments	$ (297,000,048)	$ (395,317,218)
b. Cost-of-living adjustments	(50,928,674)	(94,473,703)
c. Death benefits	(1,798,640)	(1,219,613)
d. Social security supplements	(1,677,682)	(367,747)
e. Supplemental pensions	(11,477)	(771,535)
f. Refunds	(2,761,282)	(2,311,637)
g. Total expenditures	$ (354,177,803)	$ (494,461,453)
5. Transfers and other adjustments	$ 1,403,357	$ (155,525)
6. Market value of assets at end of year	$ 2,911,444,772	$ 4,418,568,124

Table 8A

Development of Actuarial Value of Assets (State Employees)

	Year Ending June 30, 2022
1. Market value of assets at beginning of year (prior to adjustment)	$ 3,057,226,491
2. Net new investments	
a. Contributions	$ 285,147,327
b. Benefits paid	(351,416,521)
c. Refunds	(2,761,282)
d. Transfers	1,403,357
e. Subtotal	(67,627,119)
3. Market value of assets at end of year	$ 2,911,444,772
4. Net earnings (3-1-2) (includes misc revenues)	$ (78,154,600)
5. Assumed investment return rate for fiscal year	7.00%
6. Expected return	$ 211,638,905
7. Excess return (4-6)	$ (289,793,505)

8. Development of amounts to be recognized as of June 30, 2022:

Fiscal Year End	Remaining Deferrals of Excess (Shortfall) of Investment Income*	Offsetting of Gains/(Losses)	Net Deferrals Remaining	Years Remaining	Recognized for this valuation	Remaining after this valuation
	(1)	(2)	(3) = (1) + (2)	(4)	(5) = (3) / (4)	(6) = (3) - (5)
2018	$ 0	$ 0	$ 0	1	$ 0	$ 0
2019	0	0	0	2	0	0
2020	0	0	0	3	0	0
2021	309,494,276	(289,793,505)	19,700,771	4	4,925,193	14,775,578
2022	(289,793,505)	289,793,505	0	5	0	0
Total	$ 19,700,771	$ 0	$ 19,700,771		$ 4,925,193	$ 14,775,578

9. Actuarial value of assets as of June 30, 2022 (Item 3 - Item 8)	$ 2,896,669,194
10. Ratio of actuarial value to market value	99.5%

*Values of $0 result from the beginning balance being offset by future gains or losses in the opposite direction.

Table 8B

Development of Actuarial Value of Assets (Teachers)

	Year Ending June 30, 2022
1. Market value of assets at beginning of year	$ 4,671,641,312
2. Net new investments	
a. Contributions	$ 372,931,237
b. Benefits paid	(492,149,816)
c. Refunds	(2,311,637)
d. Transfers	(155,525)
e. Subtotal	(121,685,741)
3. Market value of assets at end of year	$ 4,418,568,124
4. Net earnings (3-1-2) (includes misc revenues)	$ (131,387,447)
5. Assumed investment return rate for fiscal year	7.00%
6. Expected return	$ 322,755,891
7. Excess return (4-6)	$ (454,143,338)

8. Development of amounts to be recognized as of June 30, 2022:

Fiscal Year End	Remaining Deferrals of Excess (Shortfall) of Investment Income*	Offsetting of Gains/(Losses)	Net Deferrals Remaining	Years Remaining	Recognized for this valuation	Remaining after this valuation
	(1)	(2)	(3) = (1) + (2)	(4)	(5) = (3) / (4)	(6) = (3) - (5)
2018	$ 0	$ 0	$ 0	1	$ 0	$ 0
2019	0	0	0	2	0	0
2020	0	0	0	3	0	0
2021	529,468,752	(454,143,338)	75,325,414	4	18,831,354	56,494,060
2022	(454,143,338)	454,143,338	0	5	0	0
Total	$ 75,325,414	$ 0	$ 75,325,414		$ 18,831,354	$ 56,494,060

9. Actuarial value of assets as of June 30, 2022 (Item 3 - Item 8)	$ 4,362,074,064
10. Ratio of actuarial value to market value	98.7%

*Values of $0 result from the beginning balance being offset by future gains or losses in the opposite direction.

Table 9

Target Distribution of Assets at Market Value
(Percentage of Total Investments)

Item	June 30, 2022
(1)	(2)
US Equity	24.8%
International Developed Equity	10.9%
Emerging Markets Equity	4.3%
Private Equity and Opportunistic Private Credit	12.5%
Non-Core Real Estate	2.5%
Equity Options	2.0%
EMD (50/50 Blend)	2.0%
Liquid Credit	3.0%
Private Credit	3.0%
CLOs	2.0%
Treasury Duration	5.0%
Systematic Trend	5.0%
Core Real Estate	4.0%
Private Infrastructure	4.0%
IG Corp Credit	3.3%
Securitized Credit	3.3%
Absolute Return	6.5%
Cash	2.0%
Total investments	100.0%

Table 10

History of Investment Return Rates

(Net of Investment and Administrative Expenses)

Year Ending June 30 of	Market	Actuarial
(1)	(2)	(3)
1995	17.0%	10.2%
1996	13.7%	13.7%
1997	19.1%	19.1%
1998	16.1%	16.5%
1999	10.1%	14.7%
2000	9.1%	8.8%
2001	-11.0%	4.9%
2002	-8.4%	0.9%
2003	2.6%	-0.8%
2004	18.7%	0.4%
2005	11.4%	1.8%
2006	11.6%	7.4%
2007	18.2%	13.0%
2008	-5.8%	10.7%
2009	-20.1%	2.4%
2010	14.0%	0.8%
2011	19.5%	2.1%
2012	1.4%	3.9%
2013	11.0%	6.1%
2014	14.9%	8.2%
2015	2.2%	7.3%
2016	-0.2%	5.5%
2017	11.5%	5.7%
2018	7.9%	6.3%
2019	6.3%	6.3%
2020	3.7%	5.7%
2021	27.0%	10.1%
2022	-2.7%	8.2%
Average Returns:		
Last 5 Years	8.0%	7.3%
Last 10 Years	7.9%	6.9%
Since 1995	7.3%	7.0%

Table 11A

Analysis of Change in Employer Cost

Basis	State Employees	Teachers
(1)	(2)	(3)
1. Employer contribution rates from prior valuation	28.97%	26.16%
2. Impact of changes, gains and losses		
a. Non-economic liability experience (gain)/loss	0.08%	(0.08%)
b. Salary (gain)/loss	0.26%	(0.11%)
c. Total payroll growth (gain)/loss	(0.03%)	0.00%
d. Investment experience (gain)/loss	(0.27%)	(0.40%)
e. Actual COLA (3.11%)	0.03%	0.04%
f. Supplemental Employer Contribution	(0.33%)	(0.31%)
g. Decrease in Normal Cost from New Hires	(0.10%)	(0.13%)
h. Change in Assumptions/Methods	0.00%	0.00%
i. Total	(0.36%)	(0.99%)
3. Employer contribution rates from current valuation	28.54%	25.12%

Table 11B

History of Employer Contribution Rates

Valuation Date as of June 30, (1)	Fiscal Year Ending June 30, (2)	Employer Contribution Rate (3)
State Employees		
2005	2008	20.77%
2006	2009	21.64% [1]
2007	2010	20.78% [2]
2008	2011	20.78%
2009	2012	22.98%
2010	2013	21.18% [3]
2011	2014	23.05%
2012	2015	23.33%
2013	2016	23.64%
2014	2017	25.34% [4]
2015	2018	24.87%
2016	2019	25.75%
2017	2020	26.39%
2018	2021	27.54%
2019	2022	28.01%
2020	2023	28.00%
2021	2024	28.97%
2022	2025	28.54%
Teachers		
2005	2008	22.01%
2006	2009	20.07% [1]
2007	2010	19.01% [2]
2008	2011	19.01%
2009	2012	22.32%
2010	2013	19.29% [3]
2011	2014	20.68%
2012	2015	22.60%
2013	2016	23.14%
2014	2017	23.13% [4]
2015	2018	23.13%
2016	2019	23.51%
2017	2020	24.61%
2018	2021	25.25%
2019	2022	25.72%
2020	2023	26.16%
2021	2024	26.16%
2022	2025	25.12%

[1] Restated after adopting the amendment of Article 7.

[2] Restated after adopting the amendment of Article 16.

[3] Restated after reflecting the Rhode Island Retirement Security Act of 2011.

[4] Restated after adopting the amendment of Article 21.

Table 11C

Analysis of Change in UAAL

Basis	State Employees	Teachers
(1)	(2)	(3)
1. UAAL as of June 30, 2021	$ 2,100	$ 2,909
2. Impact of changes, gains and losses		
a. Interest at 7.00% for one year	147	204
b. Expected amortization payments	(193)	(257)
c. Supplemental Employer Contribution	(27)	(34)
d. Investment experience (gain)/loss	(26)	(55)
e. Actual COLA (3.11%)	2	4
f. Salary (gain)/loss	26	(15)
g. Non-economic liability experience (gain)/loss	3	(21)
h. Changes in assumptions/methods	-	-
i. Changes in plan provisions	-	-
j. Total	$ (68)	$ (174)
3. UAAL as of June 30, 2022	$ 2,032	$ 2,735

Note: All dollar amounts are shown in millions.

Table 12A

Membership Data (State Employees)

	June 30, 2022 (1)	June 30, 2021 (2)	June 30, 2020 (3)
1. Active members			
a. Eligible for 2.00% Multiplier	977	1,102	1,406
b. Hired before 2012 without 2.00% Multiplier	4,766	5,187	5,498
c. Zero Service as of 06/30/2012	5,077	4,514	4,294
d. Total Count	10,820	10,803	11,198
e. Number vested	7,674	7,726	8,011
f. Annualized salaries	$ 771,627,862	$ 733,336,552	$750,004,772
g. Average salary	71,315	67,883	66,977
h. Average age	49.2	49.2	49.3
i. Average service	13.6	13.7	13.8
2. Inactive members			
a. Number	4,651	4,154	3,875
3. Service retirees			
a. Number	9,203	9,270	9,114
b. Total annual benefits	$ 301,139,445	$ 300,008,653	$289,179,615
c. Average annual benefit	32,722	32,363	31,729
d. Average age	74.6	74.3	74.3
4. Disabled retirees			
a. Number	837	797	775
b. Total annual benefits	$ 19,370,883	$ 18,095,550	$17,499,796
c. Average annual benefit	23,143	22,705	22,580
d. Average age	66.7	66.6	66.5
5. Beneficiaries and spouses			
a. Number	1,325	1,306	1,326
b. Total annual benefits	$ 25,855,189	$ 25,052,311	$24,946,505
c. Average annual benefit	19,513	19,182	18,813
d. Average age	76.6	76.6	76.8

Table 12B

Membership Data (Teachers)

	June 30, 2022 (1)	June 30, 2021 (2)	June 30, 2020 (3)
1. Active members			
a. Eligible for 2.00% Multiplier	1,053	1,214	1,402
b. Hired before 2012 without 2.00% Multiplier	7,589	8,290	8,555
c. Zero Service as of 06/30/2012	4,895	3,868	3,517
d. Number	13,537	13,372	13,474
e. Number vested	11,028	11,028	11,140
f. Annualized salaries	$ 1,129,815,389	$1,098,198,511	$1,090,815,161
g. Average salary	83,461	82,127	80,957
h. Average age	46.7	46.8	46.8
i. Average service	15.8	15.9	15.7
2. Inactive members			
a. Number	4,539	4,227	4,001
3. Service retirees			
a. Number	10,533	10,441	10,338
b. Total annual benefits	$ 458,707,016	$456,696,521	$451,779,276
c. Average annual benefit	43,550	43,741	43,701
d. Average age	74.7	74.2	73.7
4. Disabled retirees			
a. Number	373	356	342
b. Total annual benefits	$ 11,091,131	$10,629,328	$10,128,301
c. Average annual benefit	29,735	29,858	29,615
d. Average age	66.5	66.2	66.2
5. Beneficiaries and spouses			
a. Number	615	601	594
b. Total annual benefits	$ 16,019,175	$15,630,218	$15,340,474
c. Average annual benefit	26,047	26,007	25,826
d. Average age	75.5	75.2	74.8

Table 13

Historical Summary of Active Member Data

Valuation as of June 30,	Active Members: Number	Active Members: Percent Increase	Total Salaries: Amount in $ Millions	Total Salaries: Percent Increase	Average Salary: $ Amount	Average Salary: Percent Increase	Average Age	Average Service
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
State Employees								
2011	11,233	1.0%	617	2.9%	54,949	1.9%	48.8	14.0
2012	11,166	-0.6%	644	4.3%	57,667	4.9%	49.1	14.2
2013	11,280	0.4%	650	5.3%	57,624	4.9%	49.2	14.1
2014	11,301	0.2%	653	0.5%	57,813	0.3%	49.4	14.2
2015	11,194	-0.9%	667	2.1%	59,615	3.1%	49.7	14.4
2016	11,083	-1.0%	670	0.4%	60,482	1.5%	49.9	14.6
2017	11,152	0.6%	686	2.4%	61,538	1.7%	49.8	14.3
2018	10,978	-1.6%	686	0.0%	62,519	1.6%	49.4	13.9
2019	11,318	3.1%	729	6.3%	64,447	3.1%	49.2	13.6
2020	11,198	-1.1%	750	2.8%	66,977	3.9%	49.3	13.8
2021	10,803	-3.5%	733	-2.2%	67,883	1.4%	49.2	13.7
2022	10,820	0.2%	772	5.2%	71,315	5.1%	49.2	13.6
Teachers								
2011	13,381	-1.1%	966	3.1%	72,174	4.2%	45.2	13.3
2012	13,212	-1.3%	962	-0.4%	72,809	0.9%	45.3	13.4
2013	13,193	-1.4%	936	-3.1%	70,965	-1.7%	45.4	13.6
2014	13,266	0.6%	952	1.7%	71,754	1.1%	45.6	14.0
2015	13,272	0.0%	968	1.7%	72,942	1.7%	45.8	14.3
2016	13,206	-0.5%	968	-0.1%	73,265	0.4%	46.0	14.6
2017	13,310	0.8%	1,001	3.4%	75,191	2.6%	46.1	14.8
2018	13,297	-0.1%	1,032	3.1%	77,581	3.2%	46.2	15.0
2019	13,511	1.6%	1,070	3.8%	79,232	2.1%	46.7	15.5
2020	13,474	-0.3%	1,091	1.9%	80,957	2.2%	46.8	15.7
2021	13,372	-0.8%	1,098	0.7%	82,127	1.4%	46.8	15.9
2022	13,537	1.2%	1,130	2.9%	83,461	1.6%	46.7	15.8

Table 14A

Distribution of Active Members by Age and by Years of Service (State Employees)
As of June 30, 2022

	Years of Credited Service												
Attained Age	0 Count & Avg. Comp.	1 Count & Avg. Comp.	2 Count & Avg. Comp.	3 Count & Avg. Comp.	4 Count & Avg. Comp.	5-9 Count & Avg. Comp.	10-14 Count & Avg. Comp.	15-19 Count & Avg. Comp.	20-24 Count & Avg. Comp.	25-29 Count & Avg. Comp.	30-34 Count & Avg. Comp.	35 & Over Count & Avg. Comp.	Total Count & Avg. Comp.
Under 25	84	24	9	9	1	0	0	0	0	0	0	0	127
	$47,633	$46,902	$41,743	$45,604	$39,045	$0	$0	$0	$0	$0	$0	$0	$46,866
25-29	214	113	94	94	79	46	0	0	0	0	0	0	640
	$57,109	$55,049	$56,732	$59,276	$60,147	$61,390	$0	$0	$0	$0	$0	$0	$57,691
30-34	150	102	97	141	103	307	36	0	0	0	0	0	936
	$56,225	$62,691	$59,224	$61,244	$65,293	$63,361	$64,795	$0	$0	$0	$0	$0	$61,665
35-39	113	76	69	103	90	344	228	66	0	0	0	0	1,089
	$54,341	$59,583	$56,720	$68,662	$66,363	$71,682	$74,246	$67,111	$0	$0	$0	$0	$67,625
40-44	73	47	52	63	75	255	222	215	41	1	0	0	1,044
	$60,566	$64,970	$61,539	$67,696	$67,829	$72,456	$71,405	$77,753	$78,547	$72,588	$0	$0	$71,231
45-49	70	40	47	68	47	183	157	218	217	19	0	0	1,066
	$59,451	$54,492	$64,181	$64,668	$63,541	$66,948	$74,500	$74,483	$83,718	$81,759	$0	$0	$71,901
50-54	71	43	56	66	55	212	190	230	299	157	124	2	1,505
	$56,157	$63,242	$67,529	$64,910	$68,534	$68,718	$68,545	$75,144	$83,219	$93,336	$83,257	$66,891	$75,356
55-59	70	38	35	72	54	244	235	219	227	189	401	112	1,896
	$62,034	$61,878	$62,083	$60,187	$60,057	$63,628	$69,757	$72,677	$81,107	$87,611	$87,817	$87,411	$76,082
60-64	33	23	35	53	32	211	209	201	252	153	234	166	1,602
	$64,116	$59,774	$60,488	$70,495	$64,571	$65,001	$66,257	$67,832	$76,447	$87,115	$86,463	$92,886	$75,438
65 & Over	7	14	8	19	15	109	146	177	166	76	83	95	915
	$83,650	$92,885	$73,349	$71,211	$64,442	$66,648	$65,876	$68,918	$75,759	$83,826	$78,190	$90,066	$74,171
Total	885	520	502	688	551	1,911	1,423	1,326	1,202	595	842	375	10,820
	$56,961	$60,093	$60,243	$64,039	$64,623	$67,366	$70,057	$72,711	$80,301	$88,298	$85,820	$90,398	$71,315

Table 14B

Distribution of Active Members by Age and by Years of Service (Teachers)
As of June 30, 2022

Attained Age	Years of Credited Service												
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35 & Over	Total
	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.
Under 25	35	98	26	1	0	0	0	0	0	0	0	0	160
	$54,881	$47,540	$47,396	$44,570	$0	$0	$0	$0	$0	$0	$0	$0	$49,104
25-29	71	229	167	176	97	99	0	0	0	0	0	0	839
	$56,388	$49,786	$51,959	$53,874	$57,540	$61,781	$0	$0	$0	$0	$0	$0	$53,947
30-34	47	154	88	118	105	629	74	0	0	0	0	0	1,215
	$63,682	$54,360	$58,388	$60,659	$62,182	$70,643	$86,567	$0	$0	$0	$0	$0	$66,691
35-39	49	90	73	78	72	443	557	97	0	0	0	0	1,459
	$74,250	$65,327	$65,927	$66,372	$69,516	$76,584	$86,624	$90,164	$0	$0	$0	$0	$79,119
40-44	32	78	56	59	42	272	362	732	198	1	0	0	1,832
	$73,580	$65,685	$65,657	$70,401	$76,549	$77,884	$87,781	$90,220	$93,341	$55,704	$0	$0	$85,188
45-49	35	54	28	58	39	208	194	461	951	101	0	0	2,129
	$76,319	$66,998	$69,641	$63,636	$68,846	$81,017	$87,694	$90,257	$91,819	$94,004	$0	$0	$87,789
50-54	28	30	32	34	28	190	180	326	760	646	107	1	2,362
	$71,100	$73,060	$81,023	$69,853	$76,641	$81,833	$88,028	$90,750	$92,188	$94,435	$95,464	$83,125	$90,449
55-59	13	18	14	13	29	104	137	207	398	356	474	58	1,821
	$79,062	$78,676	$56,077	$67,167	$74,429	$81,254	$88,351	$90,118	$91,966	$94,344	$95,032	$96,950	$91,338
60-64	9	11	8	9	5	63	77	153	325	236	179	93	1,168
	$69,011	$79,785	$74,118	$79,781	$103,301	$79,198	$85,540	$89,377	$92,462	$94,307	$96,835	$96,291	$91,757
65 & Over	5	6	5	5	4	33	31	89	156	111	55	52	552
	$74,171	$61,765	$74,080	$91,620	$69,731	$80,844	$85,015	$91,211	$91,724	$93,849	$92,983	$96,513	$90,813
Total	324	768	497	551	421	2,041	1,612	2,065	2,788	1,451	815	204	13,537
	$66,642	$57,172	$60,016	$61,942	$66,783	$75,536	$87,231	$90,279	$92,118	$94,290	$95,346	$96,470	$83,461

APPENDIX 1

SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS

APPENDIX 1

Summary of Actuarial Methods and Assumptions

I. Valuation Date

The valuation date is June 30th of each plan year. This is the date as of which the actuarial present value of future benefits and the actuarial value of assets are determined.

II. Actuarial Cost Method

The actuarial valuation uses the Entry Age actuarial cost method. Under this method, the employer contribution rate is the sum of (i) the employer normal cost rate, and (ii) a rate that will amortize the unfunded actuarial accrued liability (UAAL).

1. First, the actuarial present value of future benefits is determined by discounting the projected benefits for each member back to the valuation date using the assumed investment return rate as the discount rate. For active members, the projected benefits are based on the member's age, service, gender and compensation, and based on the actuarial assumptions. The calculations take into account the probability of the member's death, disability, or termination of employment prior to becoming eligible for a retirement benefit, as well as the possibility of the member will remain in service and receive a service retirement benefit. Future salary increases are anticipated. The present value of the expected benefits payable to all active members is added to the present value of the expected future payments to retired participants and beneficiaries to obtain the present value of all expected benefits. Liabilities for future members are not included.

2. The employer contributions required to support the benefits are determined as a level percentage of salary, and consist of a normal contribution and an amortization contribution

3. The normal contribution is determined using the Entry Age Normal method. Under this method, a calculation is made to determine the rate of contribution which, if applied to the compensation of each individual member during the entire period of anticipated covered service, would be required to meet the cost of all benefits payable on his behalf. The salary-weighted average of these rates is the normal cost rate. This calculation reflects the plan provisions that apply to each individual member.

4. The employer normal cost rate is equal to (i) the normal cost rate, minus (ii) the member contribution rate.

5. The actuarial accrued liability is equal to the present value of all benefits less the present value of future normal costs. The present value of the supplemental member contributions for members with 20 years of service as of June 30, 2012 is also subtracted. The unfunded actuarial accrued liability (UAAL) is then determined as (i) the actuarial accrued liability, minus (ii) the actuarial value of assets.

6. The amortization contribution rate is the level percentage of payroll required to reduce the UAAL to zero over the remaining amortization period. The employer contribution rate determined by this valuation will not be effective until two years after the valuation date. The determination of the contribution rate reflects this deferral. The amortization payment for the applicable fiscal year is first determined based on the individual amortization bases. The covered payroll is projected forward for two years, and we then determine the amortization rate by dividing the amortization payment by the projected payroll. Contributions are assumed to be made monthly throughout the year.

   The UAAL was initially being amortized over the remainder of a closed 30-year period from June 30, 1999. In conjunction with The Rhode Island Retirement Security Act of 2011, the amortization period was reset to 25 years as of June 30, 2010 for the UAAL that existed at that time. In addition, in conjunction with the Article 21 legislation, the amortization period for the local portion of the UAAL of the Teacher's Plan existing as of June 30, 2014 was reset to 25 years from June 30, 2014. New gains and losses each year will be amortized over individual 20 year periods. At any time that the System is in an overfunded status, the amortization schedule will be a rolling 20 year amortization of any surplus.

III. Actuarial Value of Assets

The actuarial value of assets is based on the market value of assets with a five-year phase-in of actual investment return in excess of (less than) expected investment income. Offsetting unrecognized gains and losses are immediately recognized, with the shortest remaining bases recognized first and the net remaining bases continue to be recognized on their original timeframe. Expected investment income is determined using the assumed investment return rate and the market value of assets (adjusted for receipts and disbursements during the year). The returns are computed net of administrative and investment expenses.

IV. Actuarial Assumptions

A. Economic Assumptions

1. Investment return: 7.00% per year, compounded annually, composed of an assumed 2.50% inflation rate and a 4.50% net real rate of return. This rate represents the assumed return, net of all investment and administrative expenses.

2. Salary increase rate:

   For State Employees: The sum of (i) a 3.25% wage inflation assumption (composed of a 2.50% price inflation assumption and a 0.75% additional general increase), and (ii) a service-related component as shown on next page.

   For Teachers: The sum of (i) a 3.00% wage inflation assumption (composed of a 2.50% price inflation assumption and a 0.50% additional general increase), and (ii) a service-related component as shown on next page.

APPENDIX 1 (Continued)

Salary Increase Rates						
	State Employees		Correctional Officers		Teachers	
Service	Service-Related Component	Total Increase	Service-Related Component	Total Increase	Service-Related Component	Total Increase
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	1.00%	4.25%	2.00%	5.25%	10.00%	13.00%
2	2.00%	5.25%	3.00%	6.25%	9.00%	12.00%
3	3.00%	6.25%	4.00%	7.25%	6.25%	9.25%
4	2.75%	6.00%	3.75%	7.00%	5.50%	8.50%
5	2.75%	6.00%	3.75%	7.00%	5.00%	8.00%
6	2.50%	5.75%	3.50%	6.75%	5.00%	8.00%
7	1.25%	4.50%	2.25%	5.50%	4.50%	7.50%
8	1.00%	4.25%	2.00%	5.25%	4.25%	7.25%
9	1.00%	4.25%	2.00%	5.25%	4.00%	7.00%
10	1.00%	4.25%	2.00%	5.25%	4.00%	7.00%
11	1.00%	4.25%	1.50%	4.75%	0.00%	3.00%
12	2.00%	5.25%	2.50%	5.75%	0.00%	3.00%
13	1.25%	4.50%	1.75%	5.00%	0.00%	3.00%
14	1.00%	4.25%	1.50%	4.75%	0.00%	3.00%
15	1.00%	4.25%	1.50%	4.75%	0.00%	3.00%
16	1.00%	4.25%	1.00%	4.25%	0.00%	3.00%
17	0.50%	3.75%	1.00%	4.25%	0.00%	3.00%
18	0.50%	3.75%	1.00%	4.25%	0.00%	3.00%
19	0.50%	3.75%	1.00%	4.25%	0.00%	3.00%
20	0.50%	3.75%	1.00%	4.25%	0.00%	3.00%
21	0.50%	3.75%	1.00%	4.25%	0.00%	3.00%
22	0.25%	3.50%	1.00%	4.25%	0.00%	3.00%
23	0.25%	3.50%	1.00%	4.25%	0.00%	3.00%
24	0.25%	3.50%	1.00%	4.25%	0.00%	3.00%
25 or more	0.00%	3.25%	0.00%	3.25%	0.00%	3.00%

Salary increases are assumed to occur once a year, on July 1. Therefore the pay used for the period year following the valuation date is equal to the reported pay for the prior year, increased by the salary increase assumption. For employees with less than one year of service, the reported rate of pay is used rather than the fiscal year salary paid.

4. Payroll growth rate: In the amortization of the unfunded actuarial accrued liability, payroll is assumed to increase 3.00% for State Employees and 2.50% for Teachers per year. This increase rate is solely due to the effect of wage inflation on, with no allowance for future membership growth.

5. Post-retirement Benefit Increase: Post-retirement benefit increases are assumed to be 2.10%, per annum, while the plan has a funding level that exceeds 80%; however, an interim COLA will be granted in four-year intervals while the COLA is suspended. The second such COLA was applicable in Calendar Year 2021. In the original RIRSA legislation, the COLAs suspended through 2027 were advance recognized due to the funding level of the plans; and all subsequent valuations have continued to reference this same timeframe. The actual amount of the COLA is determined based on 50% of the plan's five-year average investment rate of return minus 5.00% which will range from zero to 4.0%, and 50% of the lesser of 3% or last year's CPI-U increase for a total maximum increase of 3.50%.

B. Demographic Assumptions

1. Post-termination mortality rates (non-disabled)

   a. Male state employees: PUB-10 Median Table for Healthy General Employee Males, loaded by 115%, projected with Scale Ultimate MP16.

   b. Female state employees: PUB-10 Median Table for Healthy General Employee Females, loaded by 111%, projected with Scale Ultimate MP16.

   c. Male teachers: PUB-10 Median Table for Healthy Teacher Males, loaded by 108%, projected with Scale Ultimate MP16.

   d. Female teachers: PUB-10 Median Table for Healthy Teacher Females, loaded by 115%, projected with Scale Ultimate MP16.

   The following table provides the life expectancy for individuals retiring in future years based on the assumption with full generational projection

Life Expectancy for an Age 65 Retiree in Years					
Group	Year of Retirement				
	2020	2025	2030	2035	2040
State Employee - Male	20.7	21.1	21.5	21.9	22.3
State Employee - Female	23.5	23.9	24.3	24.7	25.0
Teacher – Male	22.8	23.2	23.6	24.0	24.4
Teacher – Female	24.6	25.0	25.3	25.7	26.0

APPENDIX 1 (Continued)

2. Post-retirement mortality (disabled lives): Separate set of rates are used for state employees and teachers

   a. State Employees: Sex distinct PUB-10 Tables for General Disabled Retirees by Occupation, projected with Scale Ultimate MP16.

   b. Teachers: Sex distinct PUB-10 Tables for Teacher Disabled Retirees by Occupation females, projected with Scale Ultimate MP16.

3. Pre-retirement mortality: Separate set of rates are used for state employees and teachers

   a. State Employees: Sex distinct PUB-10 Tables for General Employees by Occupation, projected with Scale Ultimate MP16.

   b. Teachers: Sex distinct PUB-10 Tables for Teachers Employees by Occupation for females, projected with Scale Ultimate MP16.

4. Disability rates: Sample rates are shown below. Ordinary disability rates are not applied to members eligible for retirement. One half the accidental disabilities are assumed to be totally and permanently disabled from any occupation.

Age	Number of Disabilities per 1,000							
	State Ordinary Males	State Accidental Males	State Ordinary Females	State Accidental Females	Teachers Ordinary Males	Teachers Accidental Males	Teachers Ordinary Females	Teachers Accidental Females
25	0.45	0.09	0.36	0.07	0.27	0.02	0.23	0.02
30	0.55	0.11	0.44	0.09	0.33	0.02	0.28	0.02
35	0.75	0.15	0.6	0.12	0.45	0.03	0.38	0.03
40	1.1	0.22	0.88	0.18	0.66	0.04	0.55	0.04
45	1.8	0.36	1.44	0.29	1.08	0.07	0.90	0.07
50	3.05	0.61	2.44	0.49	1.83	0.12	1.53	0.12
55	5.05	1.01	4.04	0.81	3.03	0.20	2.53	0.20
60	7.05	1.41	5.64	1.13	4.23	0.28	3.53	0.28
65	11.55	2.31	9.24	1.85	6.93	0.46	5.78	0.46

In addition, for members that are above age 60 and not eligible to retire, 2% is added to the rates above. For members that are age 55 with 20 Years of service and not eligible to retire, another 1% is added to the rates above.

5. Termination rates (for causes other than death, disability, or retirement) are a function of the member's gender and service. Termination rates are not applied to members eligible for retirement. Rates are shown below:

Service	State Employees	Correctional Officers	Teachers
1	0.168000	0.100000	0.157500
2	0.106218	0.070000	0.105000
3	0.084806	0.057393	0.078750
4	0.072281	0.049595	0.068052
5	0.063394	0.045034	0.050571
6	0.056501	0.041797	0.040169
7	0.050868	0.039287	0.033280
8	0.046107	0.037236	0.028385
9	0.041982	0.035502	0.024731
10	0.038344	0.033999	0.021900
11	0.035089	0.032674	0.019643
12	0.032145	0.031489	0.017804
13	0.029457	0.030417	0.016275
14	0.026984	0.029438	0.014985
15	0.024695	0.028537	0.013881
16	0.022563	0.027704	0.012928
17	0.020570	0.026927	0.012094
18	0.018697	0.026201	0.011361
19	0.016931	0.025519	0.010710
20	0.015262	0.024876	0.010128
21	0.013677	0.024268	0.009606
22	0.012170	0.023691	0.009135
23	0.010733	0.023142	0.008707
24	0.009360	0.022619	0.008316
25	0.008045	0.022119	0.007959

6. Retirement rates (unreduced):

   For State Employees (except Correctional Officers): a flat 20% per year retirement probability for members eligible for unreduced retirement. A 25% retirement probability at first eligibility will be only applied if they have reached age 65 or with at least 25 years of service. 100% of members aged 75 and above are assumed to retire immediately.

   For Teachers: a flat 20% per year retirement probability for members under the age of 65 eligible for unreduced retirement, a flat 35% per year retirement probability for members at age 65 or older eligible for unreduced retirement. A 30% retirement probability at first eligibility will be applied for employees under age 65. 100% of members aged 75 and above are assumed to retire immediately.

   For Correctional Officers: A set of unisex rates, indexed by service, as shown below. 100% of officers who have attained Social Security normal retirement age and have at least 5 years of service are assumed to retire.

Corrections	
Service	Ret. Rate
25	10.00%
26	5.00%
27	5.00%
28	5.00%
29	5.00%
30	6.00%
31	7.00%
32	8.00%
33	9.00%
34	10.00%
35	25.00%
36	20.00%
37	20.00%
38	20.00%
39	20.00%
40	100.00%

7. Reduced retirement: Rates based on the years from Normal Retirement Age, as shown below:

Years from Normal Retirement Age	Ret. Rate
5	1%
4	1%
3	1%
2	2%
1	3%

C. Other Assumptions:

1. Valuation payroll (used for determining the amortization contribution rate): Prior aggregate fiscal year payroll projected forward one year using the overall payroll growth rate.

2. Percent married: 85% of employees are assumed to be married.

3. Age difference: Male members are assumed to be three years older than their spouses, and female members are assumed to be three years younger than their spouses.

4. Percent electing annuity on death (when eligible): All of the spouses of vested, married participants are assumed to elect an annuity. The spousal annuity death benefit for vested married participants is valued using a static optional form conversion factor of 0.84 and 0.78 for males and females respectively.

5. For active death benefits, the liability is initially calculated based on the ordinary death benefit provisions, and then a 7.5% load is applied to account for duty related benefits.

6. Percent electing deferred termination benefit: Vested terminating members are assumed to elect a refund or a deferred benefit, whichever is more valuable at the time of termination.

7. Recovery from disability: None assumed.

8. Remarriage: It is assumed that no surviving spouse will remarry and there will be no children's benefit.

9. Assumed age for commencement of deferred benefits: Members electing to receive a deferred benefit are assumed to commence receipt at the first age at which unreduced benefits are available.

10. Investment and administrative expenses: The assumed investment return rate represents the anticipated net return after payment of all investment and administrative expenses.

11. Inactive members: For members who terminated service prior to June 30, 2017 liabilities for inactive members are approximated as a multiple of their member contribution account balances. For non-vested inactive members, the multiple is 1.0. For vested inactive members, the multiple is 8.0 for members with 25 or more years of service, 3.0 for vested inactive members age 45 or older with less than 25 years of service, and 1.0 for other vested inactive members younger than age 45. For members who terminated service after June 30, 2017, the expected liability at termination has been carried forward with interest from the last valuation the member was active.

12. Decrement timing: For all non-teachers employees, decrements are assumed to occur at the middle of the year. For Teachers the retirement and termination decrements are assumed to occur at the beginning of the year, while death and disability are assumed to occur at the middle of the year.

13. Eligibility testing: Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.

14. Decrement relativity: Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.

15. Incidence of Contributions: Contributions are assumed to be received continuously throughout the year based upon the computed percent of payroll shown in this report, and the actual payroll payable at the time contributions are made.

16. Benefit Service: All members are assumed to accrue one year of eligibility service each year.

17. All calculations were performed without regard to the compensation limit in IRC Section 401(a)(17) and the benefit limit under IRC Section 415.

D. Participant Data

Participant data was supplied on electronic files. There are separate files for (i) active and inactive members, and (ii) members and beneficiaries receiving benefits.

The data for active members included name, an identification number, gender, a code indicating whether the member was active or inactive, a code indicating employee type (State Employee or Teacher), date of birth, service, salary, date of last contribution, accumulated member contributions without interest, accrued benefit multiplier as of June 30, 2014, Final Average Compensation as of June 30, 2012, Article 7 Retirement Date, and the Rhode Island Retirement Security Act Retirement Date. For retired members and beneficiaries, the data included name, an identification number, gender, date of birth, date of retirement, amount of benefit, the amount of adjustment after age 62 for anyone electing the Social Security option, a code indicating the option elected and the type of retiree (service retiree, disabled retiree, beneficiary), and if applicable, the joint pensioner's date of birth and gender.

APPENDIX 1 (Continued)

Salary supplied for the current year was based on the earnings for the fiscal year preceding the valuation date. However, for members with less than one year of service, the current rate of salary was used. This salary was adjusted by the salary increase rate for one year. An additional adjustment was made so that a member's compensation would not be less than it was in the previous year.

In defining who was an active member, members with a date of last contribution in the final quarter of the fiscal year were considered active. Otherwise, the member was defined as inactive.

To correct for incomplete and inconsistent data, we first attempted to pulled data from prior valuation files and then made general assumptions to fill in the rest. These modifications had no material impact on the results presented.

APPENDIX 2

SUMMARY OF BENEFIT PROVISIONS

APPENDIX 2

Summary of Benefit Provisions

1. Effective Date and Authority: The Employees' Retirement System of Rhode Island (ERSRI) became effective on July 1, 1936 for State Employees and on July 1, 1949 for Teachers. Benefits for State Employees are described in Rhode Island General Laws, Title 36, Chapter 36-10, and benefits for Teachers are described in Rhode Island General Laws, Title 16, Chapter 16-16.

2. Plan Year: A twelve-month period ending June 30th.

3. Administration: ERSRI is administered by the State of Rhode Island Retirement Board. However, the State Investment Commission is responsible for the investment of the trust assets, including the establishment of the asset allocation policy.

4. Type of Plan: ERSRI is a qualified governmental defined benefit retirement plan. Separate contribution rates are determined for state employees and for teachers. For Governmental Accounting Standards Board purposes, it is a cost-sharing multiple employer plan.

5. Eligibility: Most Rhode Island state employees and certified public school teachers participate in ERSRI. Certain employees of the Airport Corporation, the Economic Development Corporation, and the Narragansett Bay Commission participate in the plan as though they were state employees. State police officers, state judges, and teachers and administrators in the public colleges and universities are covered by their own separate systems, and are therefore excluded. Certain elected state officials are excluded unless they make an election to join ERSRI. Superintendents, principals, business agents and other administrators participate as teachers. Non-certified public school employees, such as teacher's aides, janitors, secretaries, and bus drivers, cannot participate in ERSRI, although they may be covered by the Municipal Employees Retirement System (MERS) or a separate plan maintained by the town or city. Eligible employees become members as of their date of employment.

6. Employee Contributions: Effective July 1, 2012, State Employees (excluding Correctional Officers) and Teachers contribute 3.75% of their salary per year. For State Employees and Teachers with 20 or more years of service as of June 30, 2012 the contribution rate beginning July 1, 2015 will be 11.0%. Correctional Officers contribute 8.75% of their salary per year. The state "picks up" the members' contributions for its employees under the provisions of Internal Revenue Code (IRC) Section 414(h). At their option, the city or town employing a Teacher may also pick up their members' contributions.

7. Salary: Salary includes the member's base earnings plus any payments under a regular longevity or incentive plan. Salary excludes overtime, unused sick and vacation leave, severance pay, and other extraordinary compensation. Certain amounts that are excluded from taxable wages, such as amounts sheltered under a Section 125 plan or amounts picked up by the employer under IRC Section 414(h), are not excluded from salary.

APPENDIX 2 (Continued)

8. Employer Contributions: For Teachers, the state contributes 40% of the employer contribution rate and the city, town or other local employer contributes the remaining 60%. (This basic 40-60 split is further adjusted, since the State bears the cost of repaying certain amounts taken from the trust in the early 1990's.) Contributions determined in a given actuarial valuation go into effect two years after the actuarial valuation.

   In fiscal years beginning after June 30, 2005, if the State's contribution on behalf of State Employees decreases, the State shall appropriate an additional amount to the retirement trust. Such amount shall be equal to 20% of any decrease in expected contributions.

9. Service: Employees receive credit for service while a member. In addition, a member may purchase credit for certain periods, such as time spent teaching at a public school in another state, by making an additional contribution to purchase the additional service and those costs will be determined at full actuarial value, except for purchases of military service and redeposits of previously refunded contributions. Special rules and limits govern the purchase of additional service and the contribution required.

10. Final Average Compensation (FAC): For members eligible to retire as of September 30, 2009, their Final Average Compensation (FAC) will be based on the highest three consecutive annual salaries. For members not eligible to retire as of September 30, 2009, their FAC will be based on the highest five consecutive years of salary. Monthly benefits are based on one-twelfth of this amount.

11. Retirement

    a. Eligibility: As of July 1, 2012, retirement eligibility dates will be as follows.

       (i) Members with less than five years of contributory service as of June 30, 2012 and members hired on or after that date are eligible for retirement on or after their Social Security normal retirement age.

       (ii) Members who had at least five years of contributory service as of June 30, 2012 will be eligible for retirement at an individually determined age. This age is the result of interpolating between the member's Article 7 Retirement Date, described in Section 11(b) below, and the retirement age applicable to members hired after June 30, 2012 in (i) above. The interpolation is based on service as of June 30, 2012 divided by projected service at the member's Article 7 Retirement Date. The minimum retirement age is 59.

       (iii) Members with 10 or more years of contributory service on June 30, 2012 may choose to retire at their Article 7 Retirement Date if they continue to work and contribute until that date. If option is elected, the retirement benefit will be calculated using the benefits you have accrued as of June 30, 2012, i.e., the member will accumulate no additional defined benefits after this date, but the benefit will be paid without any actuarial reduction.

       (iv) Effective July 1, 2015, members will be eligible to retire with full benefits at the earlier of their current RIRSA date described in sections (i) – (iii) above or upon the attainment of age 65 with 30 years of service, age 64 with 31 years of service, age 63 with 32 years of service, or age 62 with 33 years of service.

(v) A member who is within five years of reaching their retirement eligibility date, described in this section, and has 20 or more years of service, may elect to retire at any time with a reduced benefit. The reduction is 9% for year 1, 8% for year 2, and 7% for each year thereafter.

(vi) Nurses (RNs) employed by MHRH are eligible to retire when they are at least 55 years old and have a minimum of 25 years of contributing service.

(vii) Correctional officers are eligible to retire when they are at least 55 years old and have a minimum of 25 years of contributing service. If a member has 25 years of service as of June 30, 2012, they may retain their Article 7 Retirement Date. Correctional officers who do not work for 25 years will not receive their pension benefit until they reach their Social Security normal retirement age.

b. Article 7 Retirement Date (member's retirement date as of September 30, 2009):

(i) Grandfathered Schedule A members—members with at least 10 years of contributory service at June 30, 2005 and eligible for retirement at September 30, 2009—are eligible to retire on or after age 60 if they have credit for 10 years of service, or at any age if they have credit for 28 years of service.

(ii) Correctional officers who have reached age 50 and have credit for 20 years of service as of September 30, 2009 are eligible to retire and are grandfathered.

(iii) Nurses (RNs) employed by MHRH who have reached age 50 with 25 years of service by September 30, 2009 are eligible to retire and are grandfathered.

(iv) Schedule B members—members with less than 10 years of contributory service as of June 30, 2005 and members hired on or after that date—are eligible for retirement on or after age 65 if they have credit for 10 years of service, or on or after age 62 if they have credit for 29 years of service. In addition, a member who attains age 62 with at least 20 years of service credit may retire with an actuarially reduced retirement benefit. The reduction is based on the difference between 65 and the member's age at retirement.

(v) Correctional officers who are hired after September 30, 2009 become eligible to retire when they have reach age 55 and have credit for 25 years of service.

(vi) Nurses (RNs) employed by MHRH who are hired after September 30, 2009 become eligible when they have reach age 55 and have credit for 25 years of service.

(vii) Schedule A members who are not grandfathered, i.e., members who had at least 10 years of creditable service at June 30, 2005 but who were not eligible to retire on September 30, 2009, will be eligible for retirement at an individually determined age. This age is the result of interpolating between the retirement age under the rules applicable to grandfathered employees in (i) above and the retirement age applicable to members hired after September 30, 2009 in (iv) above. The interpolation is based on service as of September 30, 2009 divided by projected service at the retirement age under (i) above.

(viii) Correctional officers hired on or before September 30, 2009 who are not eligible for retirement at that date will have an individually determined retirement age. This age is the result of interpolating between the retirement age for grandfathered employees in (ii) above and the retirement age applicable to members hired after September 30, 2009 in (v) above.

(ix) Similarly, MHRH nurses (RNs) hired on or before September 30, 2009 who are not eligible to retire at that date will have an individually determined retirement age. This age is the result of interpolating between the retirement age for grandfathered employees in (iii) above and the retirement age applicable to members hired after September 30, 2009 in (vi) above.

c. Monthly Benefit: Upon retirement, members are eligible to commence a benefit determined as the sum of:

(i) Benefit accrual of 1.0% per year for all service after June 30, 2015 unless the member had 20 or more years of service as of June 30, 2012 in which case the benefit accrual is 2.0% per year for service after June 30, 2015, and

(ii) Benefit accrual of 1.0% per year for all service from July 1, 2012 through June 30, 2015, and

(iii) Benefit accruals earned as of June 30, 2012, described in Section (d), below.

For purposes of calculating benefit accruals for service after June 30, 2012, the FAC is determined through retirement. Additionally, Correctional Officers who have completed 25 years of service on or before June 30, 2012 will continue to receive the benefit accrual rate under previous law for years 31 through 35 of service.

d. Benefit accruals earned as of June 30, 2012: The retirement benefit is a percentage of the member's monthly FAC. This percentage is a function of the member's service as described below. For purposes of determining the benefit accruals earned as of June 30, 2012, the service and FAC are frozen as of June 30, 2012.

(i) For grandfathered Schedule A members (members with at least 10 years of contributory service at June 30, 2005 and eligible for retirement at September 30, 2009), benefits are based under this schedule (Schedule A):

For Service In:	Years	Benefit Percentage Earned
The first 10 years of service	1 – 10	1.7% per year
The next 10 years of service	11 – 20	1.9% per year
The next 14 years of service	21 – 34	3.0% per year
The next 1 year of service	35	2.0% per year

The maximum benefit is 80% of FAC.

(ii) For Schedule B members (members with less than 10 years of contributory service as of June 30, 2005) and for all future hires, benefits are based on the following schedule (Schedule B):

For Service In:	**Years**	**Benefit Percentage Earned**
The first 10 years of service	1 – 10	1.6% per year
The next 10 years of service	11 – 20	1.8% per year
The next 5 years of service	21 – 25	2.0% per year
The next 5 years of service	26 – 30	2.25% per year
The next 7 years of service	31 – 37	2.50% per year
The next 1 year of service	38	2.25% per year

The maximum benefit is 80% of FAC.

(iii) For Schedule A members who are not grandfathered, i.e., members who had at least 10 years of creditable service at June 30, 2005 but who were not eligible to retire on September 30, 2009, benefits are based on Schedule A (under (i) above) for service through September 30, 2009 and on Schedule B (under (ii) above) for service after September 30, 2009. The maximum benefit is 80% of FAC.

(iv) MHRH nurses receive a benefit determined under the appropriate formula above.

(v) Correctional Officers receive a benefit computed under a different formula:

For Service In:	**Years**	**Benefit Percentage Earned**
The first 30 years of service	1 – 30	2.0% per year
The next 1 year of service	31	6.0% per year
The next 1 year of service	32	5.0% per year
The next 1 year of service	33	4.0% per year
The next 1 year of service	34	3.0% per year
The next 14 years of service	35	2.0% per year

Members with less than 25 years of service as of June 30, 2012 receive a flat 2.0% per year of service for years 1-30, 3.0 per year of service for years 31-35, and 2.0% per year of service in excess of 35. The maximum benefit for correctional officers is the greater of the benefit accrual as of June 30, 2012 or 75% of FAC.

e. Payment Form: Benefits are paid as a monthly life annuity. Optional forms of payment are available; see Item 16 below.

f. Death benefit: After retirement, death benefits are based on the form of annuity elected. If no option is elected, i.e., if payments are made as a life annuity, there is a minimum death benefit equal to the sum of the member's contributions without interest, less the sum of the monthly benefit payments made before the member's death. In addition, a lump-sum death benefit is payable upon the death of any retired member, regardless of option elected. This lump sum is equal to a percentage of the lump-sum death benefit that was available to the member at the time of retirement. The percentage is 100% in the first year of retirement, 75% in the second year, 50% in the third year, and 25% in the fourth and subsequent years of retirement. However, in no event will the lump sum death benefit be less than $4,000.

12. Disability Retirement

a. Eligibility: A member is eligible provided he/she has credit for at least five years of service or if the disability is work-related. Members are not eligible for an ordinary disability benefit if they are eligible for unreduced retirement.

b. Ordinary Disability Benefit: The benefit payable under the retirement formula, using FAC and service at the time of disability, but not less than 10 years of service.

c. Accidental Disability Benefit:

(i) For applications filed before or on September 30, 2009: An annual annuity equal to two-thirds (66 2/3%) of salary at the time of disability.

(ii) For applications filed after September 30, 2009: An accidental disability will be available at two-thirds (66 2/3%) of salary for members who are permanently and totally disabled from engaging in any occupation as determined by the retirement board. If the member is eligible for an accidental disability benefit but deemed able to work in other jobs, the benefit is limited to fifty percent (50%) of salary.

(iii) Benefits will be subject to an annual review by ERSRI.

d. Payment Form: The disability benefit commences immediately upon the member's retirement. Benefits cease upon recovery or reemployment. Disability benefits are payable as a monthly life annuity with a guarantee that, at the member's death, the sum of the member's contributions plus interest as of the date of retirement will be paid in a lump-sum to the member's beneficiary. All alternative forms of payment except for the Social Security Option are permitted in the case of disability retirement.

13. Deferred Termination Benefit

a. Eligibility: A member with at least five years of service is vested. A vested member who does not withdraw his/her contributions from the fund is eligible for a deferred termination benefit.

b. Monthly Benefit: The monthly benefit is based on the retirement formula described above. Both FAC and service are determined at the time the member leaves active employment. Benefits may commence when the member has met the requirements for a retirement benefit.

c. Payment Form: The same as for Retirement above.

d. Death Benefit before retirement: A member who dies after leaving active service but before retiring is entitled to receive a benefit as described below in item 15.

e. Death Benefit after Retirement: The same as for Retirement above.

14. Withdrawal (Refund) Benefit

a. Eligibility: All members leaving covered employment with less than five years of service are eligible. Optionally, vested members (those with five or more years of service) may withdraw their accumulated contributions in lieu of the deferred benefits otherwise due.

b. Benefit: The member who withdraws receives a lump-sum payment equal to the sum of his/her employee contributions. No interest is credited on these contributions.

15. Death Benefit of Active or Inactive Members

a. Eligibility: Death must have occurred while an active or an inactive, non-retired member.

b. Basic Benefit: Upon the death of a nonvested member, or upon the death of an inactive, vested member, or upon the death of an active, unmarried member, a refund of the member's contributions (without interest) is paid. Upon the death of a vested, married, active member, the spouse may elect (i) the refund benefit described above, or (ii) a life annuity paid to the spouse or beneficiary. The amount of the annuity is equal to the amount which would have been paid had the member retired at the time of his death and elected the Joint and 100% Survivor option. If the member was not eligible for retirement, the annuity benefit is reduced 9% per year from the date at which the member would have been eligible had he or she remained in service.

c. Lump-sum Benefit: $800 per year of service, with a maximum benefit of $16,000 and a minimum of $4,000. This benefit is only available to active members.

d. Accidental Duty-related Death Benefit: If a member dies as the result of an accident while in the course of his or her duties, in lieu of the above benefits the member's spouse may elect to receive (i) a refund of all contributions made (including interest), and (ii) an annual life annuity equal to 50% of the member's salary at the time of death. The annuity benefit stops when the spouse remarries or dies, although it may be continued to any children under age 18 or to any dependent parents.

16. Optional Forms of Payment: In addition to a life annuity, ERSRI offers members these optional forms of payment on an actuarially equivalent basis:

a. Option 1 (Joint and 100% Survivor) - A life annuity payable while either the participant or his beneficiary is alive.

b. Option 2 (Joint and 50% Survivor) - A life annuity payable to the member while both the member and beneficiary are alive, reducing to 50% of this amount if the member predeceases the beneficiary.

c. Social Security Option – An annuity paid at one amount prior to age 62, and at a reduced amount after age 62, designed to provide a level total income when combined with the member's age 62 Social Security benefit. Benefits cease upon the member's death. This option is only available for members with at least 10 years of contributory service as of June 30, 2005.

Actuarial equivalence is based on tables adopted by the Employees' Retirement Board.

17. Post-retirement Benefit Increase:

a. For members with at least 10 years of contributory service as of June 30, 2005 who are retired or eligible to retire as of September 30, 2009, and for all members receiving a disability retirement benefit on that date: a 3.00% compound increase in their retirement benefit each year, beginning in January of the year in which the member reaches the third anniversary of retirement. This increase is not a function of actual increases in the cost of living.

b. For other members who were retired or were eligible to retire as of June 30, 2010: a compound increase in their retirement benefit each year equal to the increase in the CPI, effective on each anniversary date beginning on the third anniversary of retirement. This increase is limited to 3.00%.

c. For other members who were not retired or eligible to retire as of June 30, 2010: a compound increase in their first $35,000 of annual retirement benefit each year equal to the increase in the CPI, effective on each anniversary date beginning on the later of the member's third anniversary of retirement and the month following their 65th birthday. This increase is limited to 3.00%. Additionally, the $35,000 annual COLA limit is applicable for benefits paid in 2010 and would be indexed annually to increase in the same manner as COLAs for Schedule B members (CPI increase for the year, not greater than 3.00%).

d. For members who retire after June 30, 2012: members will be eligible to receive cost of living increases at the later of the member's third anniversary of retirement and the month following their SSNRA.

e. Effective July 1, 2012, the following provisions will apply to all members:

(i) The COLA will be suspended for all state employees, teachers, BHDDH nurses, correctional officers, judges and state police until the aggregate funding level of their plans exceeds 80%; however, an interim COLA will be granted in four-year intervals while the COLA is suspended. The first interim COLA may begin January 1, 2017.

(ii) Effective July 1, 2015, the COLA is determined based on 50% of the plan's five-year average investment rate of return less 5.0% limited to a range of 0.0% to 4.0%, plus 50% of the lesser of 3.0% or last year's CPI-U increase for a total maximum increase of 3.50%. Previously, it was the plan's five-year average investment rate of return less 5.5% limited to a range of 0.0% to 4.0%

(iii) The COLA will be limited to the first $25,000 of the member's annual pension benefit. For retirees and beneficiaries who retired on or before July 1, 2015, years in which a COLA is payable based on the every fourth year provision described in (i) above will be limited to the first $30,000. These limits will be indexed annually to increase in the same manner as COLAs, with the known values of $25,000 for 2013, $25,000 for 2014, $25,168 for 2015, $25,855 for 2016, $26,098 for 2017, $26,290 for 2018, $26,687 for 2019, $27,184 for 2020, $27,608 for 2021, $27,901 for 2022, $28,878 for 2023, and $29,776 for 2024.

f. In addition to the scheduled increases described in section (e) above, there will be a one-time 2% COLA paid in FY2016 on the first $25,000 of pension benefit for all retirees and beneficiaries who retired on or before June 30, 2012. There will also be two one-time stipends of $500 payable in FY2016 and FY2017 to retirees and beneficiaries who retired on or before June 30, 2015.

APPENDIX 3

RISKS ASSOCIATED WITH MEASURING THE ACCRUED LIABILITY AND ACTUARIALLY DETERMINED CONTRIBUTION

APPENDIX 3

Risks Associated with Measuring the Accrued Liability and Actuarially Determined Contribution

The determination of the accrued liability and the actuarially determined contribution requires the use of assumptions regarding future economic and demographic experience. Risk measures, as illustrated in this report, are intended to aid in the understanding of the effects of future experience differing from the assumptions used in the course of the actuarial valuation. Risk measures may also help with illustrating the potential volatility in the accrued liability and the actuarially determined contribution that result from the differences between actual experience and the actuarial assumptions.

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 or demographic assumptions due to changing conditions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period, or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. The scope of an actuarial valuation does not include an analysis of the potential range of such future measurements.

Examples of risk that may reasonably be anticipated to significantly affect the plan's future financial condition include:

1. Investment risk – actual investment returns may differ from the expected returns;
2. Asset/Liability mismatch – changes in asset values may not match changes in liabilities, thereby altering the gap between the accrued liability and assets and consequently altering the funded status and contribution requirements;
3. Contribution risk – actual contributions may differ from expected future contributions. For example, actual contributions may not be made in accordance with the plan's funding policy or material changes may occur in the anticipated number of covered employees, covered payroll, or other relevant contribution base;
4. Salary and Payroll risk – actual salaries and total payroll may differ from expected, resulting in actual future accrued liability and contributions differing from expected;
5. Longevity risk – members may live longer or shorter than expected and receive pensions for a period of time other than assumed;
6. Other demographic risks – members may terminate, retire or become disabled at times or with benefits other than assumed resulting in actual future accrued liability and contributions differing from expected.

The effects of certain trends in experience can generally be anticipated. For example if the investment return since the most recent actuarial valuation is less (or more) than the assumed rate, the cost of the plan can be expected to increase (or decrease). Likewise if longevity is improving (or worsening), increases (or decreases) in cost can be anticipated.

The computed contribution rate shown on page 9 may be considered as a minimum contribution rate that complies with the Board's funding policy. The timely receipt of the actuarially determined contributions is critical to support the financial health of the plan. Users of this report should be aware that contributions made at the actuarially determined rate do not necessarily guarantee benefit security.

ERSRI SPECIFIC RELATIONSHIP TO CERTAIN RISKS

While ERSRI has various levels of exposure to all of the risks listed above, in our opinion the two that warrant the most observation for the ERSRI Board specifically are assumption change risk and affordability risk.

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 or increases in earnings multiples 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. And the difference in changing an assumption versus the other experience related risks listed above is instead of the loss slowly building over time, there is the immediate recognition of the change. Over the past decade, the changing of assumptions has increased the liabilities of ERSRI more than any other source. While those changes were warranted and put ERSRI on a stronger path going forward, it did cause a set back in many of the actuarial measurements and at least gives the appearance of a weaker System. We do not currently anticipate any significant changes to assumptions in the future and will continue to communicate with the Board if any issues beginning to show.

Affordability Risk is the simple fact that the contributions into ERSRI are quite large and in order to achieve the benefit security desired by the Board and the beneficiaries of ERSRI, they must remain high for quite a number of years. State Law requires the actuarial contribution occur and there has been no requests or attempts to lower the amounts, but it will always be a risk a future decision maker does attempt to do so.

Investment Risk is the largest of the experience related risks, but in ERSRI's case is actually dampened in comparison to its peers. For one, the funded ratio is lower, thus the amount of assets per unit of liability is lower. While that increases other risks, it actually lowers the amount of investment related risk over the shorter term. Also, the size of the benefit going forward is smaller and the COLAs are contingent on the investments performing, thus there are offsetting mechanisms that dampen Investment Risk in comparison to ERSRI's past and its peers.

APPENDIX 3 (Continued)

PLAN MATURITY MEASURES

Risks facing a pension plan evolve over time. A young plan with virtually no investments and paying few benefits may experience little investment risk. An older plan with a large number of members in pay status and a significant trust may be much more exposed to investment risk. Generally accepted plan maturity measures include the following:

	State Employees				
	June 30, 2022	June 30, 2021	June 30, 2020	June 30, 2019	June 30, 2018
Ratio of the market value of assets to total payroll	3.7	4.0	3.2	3.4	3.5
Ratio of actuarial accrued liability to payroll	6.3	6.4	6.2	6.5	6.7
Ratio of actives to retirees and beneficiaries	1.0	0.9	1.0	1.0	1.0
Ratio of net cash flows to market value of assets	-2.3%	-3.3%	-4.0%	-4.5%	-4.9%
Duration of the present value of benefits	10.8	10.7	10.4	10.7	11.8

	Teachers				
	June 30, 2022	June 30, 2021	June 30, 2020	June 30, 2019	June 30, 2018
Ratio of the market value of assets to total payroll	3.9	4.2	3.4	3.5	3.6
Ratio of actuarial accrued liability to payroll	6.2	6.3	6.3	6.4	6.6
Ratio of actives to retirees and beneficiaries	1.2	1.2	1.2	1.2	1.2
Ratio of net cash flows to market value of assets	-2.8%	-3.5%	-4.5%	-4.8%	-5.2%
Duration of the present value of benefits	11.5	11.1	11.5	10.7	11.8

RATIO OF MARKET VALUE OF ASSETS TO PAYROLL

The relationship between assets and payroll is a useful indicator of the potential volatility of contributions. For example, if the market value of assets is 4.0 times the payroll, a return on assets 5% different than assumed would equal 20% of payroll. A higher (lower) or increasing (decreasing) level of this maturity measure generally indicates a higher (lower) or increasing (decreasing) volatility in plan sponsor contributions as a percentage of payroll.

RATIO OF ACTUARIAL ACCRUED LIABILITY TO PAYROLL

The relationship between actuarial accrued liability and payroll is a useful indicator of the potential volatility of contributions for a fully funded plan. A funding policy that targets a funded ratio of

100% is expected to result in the ratio of assets to payroll and the ratio of liability to payroll converging over time.

The ratio of liability to payroll may also be used as a measure of sensitivity of the liability itself. For example, if the actuarial accrued liability is 5.5 times the payroll, a change in liability 2% other than assumed would equal 11% of payroll. A higher (lower) or increasing (decreasing) level of this maturity measure generally indicates a higher (lower) or increasing (decreasing) volatility in liability (and also plan sponsor contributions) as a percentage of payroll.

RATIO OF ACTIVES TO RETIREES AND BENEFICIARIES

A young plan with many active members and few retirees will have a high ratio of active to retirees. A mature open plan may have close to the same number of actives to retirees resulting in a ratio near 1.0. A super-mature or closed plan may have significantly more retirees than actives resulting in a ratio below 1.0.

RATIO OF NET CASH FLOW TO MARKET VALUE OF ASSETS

A positive net cash flow means contributions exceed benefits and expenses. A negative cash flow means existing funds are being used to make payments. A certain amount of negative net cash flow is generally expected to occur when benefits are prefunded through a qualified trust. Large negative net cash flows as a percent of assets may indicate a super-mature plan or a need for additional contributions.

DURATION OF PRESENT VALUE OF BENEFITS

The duration of the present value of benefits (PVB) may be used to approximate the sensitivity to a 1% change in the assumed rate of return. For example, duration of 10 indicates that the PVB would increase approximately 10% if the assumed rate of return were lowered 1%.

ADDITIONAL RISK ASSESSMENT

Additional risk assessment is outside the scope of the annual actuarial valuation. Additional assessment may include scenario tests, sensitivity tests, stochastic modeling, stress tests, and a comparison of the present value of accrued benefits at low-risk discount rates with the actuarial accrued liability. These types of other assessments are provided to the Board in the annual presentation.

GLOSSARY

DEFINITION OF ACTUARIAL TERMS

GLOSSARY

1. Actuarial Accrued Liability (AAL) - That portion, as determined by a particular Actuarial Cost Method, of the Actuarial Present Value of Future Plan Benefits which is not provided for by future Normal Costs. It is equal to the Actuarial Present Value of Future Plan Benefits minus the actuarial present value of future Normal Costs.

2. Actuarial Assumptions - Assumptions as to future experience under the Plan. These include assumptions about the occurrence of future events affecting costs or liabilities, such as:

   - mortality, withdrawal, disablement, and retirement;
   - future increases in salary;
   - future rates of investment earnings and future investment and administrative expenses;
   - characteristics of members not specified in the data, such as marital status;
   - characteristics of future members;
   - future elections made by members; and
   - other relevant items.

3. Actuarial Cost Method or Funding Method - A procedure for allocating the Actuarial Present Value of Future Benefits to various time periods; a method used to determine the Normal Cost and the Actuarial Accrued Liability. These items are used to determine the ARC.

4. Actuarial Gain or Actuarial Loss - A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions, during the period between two Actuarial Valuation dates. Through the actuarial assumptions, rates of decrements, rates of salary increases, and rates of fund earnings have been forecasted. To the extent that actual experience differs from that assumed, Actuarial Accrued Liabilities emerge which may be the same as forecasted, or may be larger or smaller than projected. Actuarial gains are due to favorable experience, e.g., the Plan's assets earn more than projected, salaries do not increase as fast as assumed, members retire later than assumed, etc. Favorable experience means actual results produce actuarial liabilities not as large as projected by the actuarial assumptions. On the other hand, actuarial losses are the result of unfavorable experience, i.e., actual results that produce actuarial liabilities which are larger than projected. Actuarial gains will shorten the time required for funding of the actuarial balance sheet deficiency while actuarial losses will lengthen the funding period.

5. Actuarially Equivalent - Of equal actuarial present value, determined as of a given date and based on a given set of Actuarial Assumptions.

GLOSSARY (Continued)

6. Actuarial Present Value (APV) - The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions. For purposes of this standard, each such amount or series of amounts is:

   a. adjusted for the probable financial effect of certain intervening events (such as changes in compensation levels, marital status, etc.),

   b. multiplied by the probability of the occurrence of an event (such as survival, death, disability, termination of employment, etc.) on which the payment is conditioned, and

   c. discounted according to an assumed rate (or rates) of return to reflect the time value of money.

7. Actuarial Present Value of Future Plan Benefits - The Actuarial Present Value of those benefit amounts which are expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age and past and anticipated future compensation and service credits. The Actuarial Present Value of Future Plan Benefits includes the liabilities for active members, retired members, beneficiaries receiving benefits, and inactive, nonretired members either entitled to a refund or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would be provide sufficient assets to pay all projected benefits and expenses when due.

8. Actuarial Valuation - The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a plan. An Actuarial valuation for a governmental retirement system typically also includes calculations of items needed for compliance with GASB 25, such as the funded ratio and the ARC.

9. Actuarial Value of Assets or Valuation Assets - The value of the Plan's assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets, but commonly actuaries use a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the ARC.

10. Actuarially Determined - Values which have been determined utilizing the principles of actuarial science. An actuarially determined value is derived by application of the appropriate actuarial assumptions to specified values determined by provisions of the law.

GLOSSARY (Continued)

11. Amortization Method - A method for determining the Amortization Payment. The most common methods used are level dollar and level percentage of payroll. Under the Level Dollar method, the Amortization Payment is one of a stream of payments, all equal, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the Amortization payment is one of a stream of increasing payments, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the stream of payments increases at the assumed rate at which total covered payroll of all active members will increase.

12. Amortization Payment - That portion of the pension plan contribution or ARC which is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability.

13. Annual Required Contribution (ARC) - The employer's periodic required contributions, expressed as a dollar amount or a percentage of covered plan compensation, determined under GASB 25. The ARC consists of the Employer Normal Cost and the Amortization Payment.

14. Closed Amortization Period - A specific number of years that is counted down by one each year, and therefore declines to zero with the passage of time. For example if the amortization period is initially set at 30 years, it is 29 years at the end of one year, 28 years at the end of two years, etc. See Funding Period and Open Amortization Period.

15. Decrements: Those causes/events due to which a member's status (active-inactive-retiree-beneficiary) changes, that is: death, retirement, disability, or termination.

16. Defined Benefit Plan: An employer-sponsored retirement benefit that provides workers, upon attainment of designated age and service thresholds, with a monthly benefit based on the employee's salary and length of service. The value of a benefit from a defined benefit plan is generally not affected by the return on the assets that are invested to fund the benefit.

17. Defined Contribution Plan: An employer-sponsored retirement plan, such as a 401(k) plan, a 403(b) plan, or a 457 plan, in which the contributions to the plan are assigned to an account for each member, and the plan's earnings are allocated to each account, and each member's benefits are a direct function of the account balance.

18. Employer Normal Cost: The portion of the Normal Cost to be paid by the employers. This is equal to the Normal Cost less expected member contributions.

19. Experience Study: A periodic review and analysis of the actual experience of the Plan which may lead to a revision of one or more actuarial assumptions. Actual rates of decrement and salary increases are compared to the actuarially assumed values and modified as deemed appropriate by the Actuary.

GLOSSARY (Continued)

20. Funded Ratio: The ratio of the actuarial value of assets (AVA) to the actuarial accrued liability (AAL). Plans sometimes calculate a market funded ratio, using the market value of assets (MVA), rather than the AVA, although GASB 25 reporting requires the use of the AVA.

21. Funding Period or Amortization Period: The term "Funding Period" is used in two ways. In the first sense, it is the period used in calculating the Amortization Payment as a component of the ARC. This funding period is chosen by the Board of Trustees. In the second sense, it is a calculated item: the number of years in the future that will theoretically be required to amortize (i.e., pay off or eliminate) the Unfunded Actuarial Accrued Liability, based on the statutory employer contribution rate, and assuming no future actuarial gains or losses.

22. GASB: Governmental Accounting Standards Board.

23. GASB 67 and GASB 68: Governmental Accounting Standards Board Statements No. 67 and No. 68. These are the governmental accounting standards that set the accounting rules for public retirement systems and the employers that sponsor or contribute to them. Statement No. 67 sets the accounting rules for the employers that sponsor or contribute to public retirement systems, while Statement No. 68 sets the rules for the systems themselves.

24. Normal Cost: That portion of the Actuarial Present Value of pension plan benefits and expenses which is allocated to a valuation year by the Actuarial Cost Method. Any payment in respect of an Unfunded Actuarial Accrued Liability is not part of Normal Cost (see Amortization Payment). For pension plan benefits which are provided in part by employee contributions, Normal Cost refers to the total of employee contributions and employer Normal Cost unless otherwise specifically stated. Under the entry age normal cost method, the Normal Cost is intended to be the level cost (when expressed as a percentage of pay) needed to fund the benefits of a member from hire until ultimate termination, death, disability or retirement.

25. Open Amortization Period: An open amortization period is one which is used to determine the Amortization Payment but which does not change over time. In other words, if the initial period is set as 30 years, the same 30-year period is used in determining the Amortization Period each year. In theory, if an Open Amortization Period is used to amortize the Unfunded Actuarial Accrued Liability, the UAAL will never completely disappear, but will become smaller each year, either as a dollar amount or in relation to covered payroll.

26. Unfunded Actuarial Accrued Liability: The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. This value may be negative in which case it may be expressed as a negative Unfunded Actuarial Accrued Liability, also called the Funding Surplus.

27. Valuation Date or Actuarial Valuation Date: The date as of which the value of assets is determined and as of which the Actuarial Present Value of Future Plan Benefits is determined. The expected benefits to be paid in the future are discounted to this date.