Connecticut State Teachers' Retirement System

Actuarial Valuation Report

Prepared as of June 30, 2024

CavMac
Actuarial Consulting Services

November 21, 2024

Board of Directors
Connecticut State Teachers' Retirement System
165 Capitol Ave
Hartford, CT 06106

Members of the Board:

The laws governing the operation of the Connecticut State Teachers' Retirement System provide that actuarial valuations of the assets and liabilities of the System shall be made each year. We have conducted the actuarial valuation of the System as of June 30, 2024 and the results of the valuation are contained in the following report.

In performing the valuation, we relied on data supplied by the System and performed limited tests on the data for consistency and reasonableness. The valuation was prepared in accordance with the funding objectives of the System as set forth in Chapter 167a, Section 10-183z of the Connecticut General Statutes as amended by Section 88 of Public Act No. 19-117. The normal cost and accrued liability of the System are developed using the entry age normal cost method. Under this method, the normal cost is the level percent of payroll necessary to fully fund the expected benefits to be earned over the career of each individual active member. The normal cost is partially funded with active member contributions with the remainder funded by employer contributions.

In determining the System's liabilities, future events, such as investment returns, salary increases, deaths, retirements, etc., are anticipated based upon the set of actuarial assumptions as approved by the Board. The assets of the system for valuation purposes are developed using an asset smoothing technique which spreads the recognition of the unexpected portion of market related gains and losses over a period of four years with the goal of dampening the impact of market volatility upon valuation results.

An unfunded accrued liability exists in the amount equal to the excess of accrued liability over valuation assets. The accrued liability contribution was determined in accordance with subsections (b) and (c) of Section 10-183z of the Statutes as amended by Section 88 of Public Act No. 19-117. Based on the current valuation, the expected future contributions together with current assets will be sufficient to provide the planned benefits. Therefore, in our opinion, the System continues to operate on an actuarially sound basis.

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The State of Connecticut uses a biennial budget process. Beginning with the June 30, 2022 valuation, the System began performing annual valuations instead of biennial valuations which had an impact on the State's budgeting process. The June 30, 2022 valuation was used to set the budget appropriation for the first year of the State's budget biennium (FYE 2024) and was also used to produce a forecast for the second year of the biennium (FYE 2025). The June 30, 2023 valuation was then used to set the actual budget appropriation for FYE 2025. This pattern will continue to be repeated in future years with the June 30, 2024 valuation setting the budget appropriation for FYE 2026 and then will be used to provide a forecast for the appropriation for FYE 2027. The actual appropriation for FYE 2027 would then be determined with the June 30, 2025 valuation.

When the actual budget appropriation determined from an odd-year valuation differs from the forecasted amount from the prior even-year valuation, there is a mechanism per Section 4(b) of Public Act 24-81 that permits the Governor, with the approval of the Finance Advisory Committee, to adjust the budget and transfer the necessary funds to ensure that the full actuarially determined contribution is made. This pattern is expected to be a normal part of the valuation process going forward.

In order to prepare the results in this report, we have utilized actuarial models that were developed to measure liabilities and develop actuarial costs. These models include tools that we have produced and tested, along with commercially available valuation software that we have reviewed to confirm the appropriateness and accuracy of the output. In utilizing these models, we develop and use input parameters and assumptions about future contingent events along with recognized actuarial approaches to develop the needed results. Future actuarial results may differ significantly from the current results presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; and changes in plan provisions or applicable law. Since the potential impact of such factors is outside the scope of a normal annual actuarial valuation, an analysis of the range of results is not presented herein.

This actuarial valuation was performed to determine the recommended funding amount for the System. The asset values used to determine unfunded liabilities and funded ratios are not market values but less volatile market related values. A smoothing technique is applied to market values to determine the market related values. The unfunded liability amounts and funded ratios using the market value of assets would be different. The interest rate used for determining liabilities is based on the expected return of assets.

This is to certify that the independent consulting actuary is a member of the American Academy of Actuaries and has experience in performing valuations for public retirement systems, that the valuation was prepared in accordance with principles of practice prescribed by the Actuarial Standards Board, and that the actuarial calculations were performed by qualified actuaries in accordance with accepted actuarial procedures, based on the current provisions of the retirement system and on actuarial assumptions and methods that are internally consistent and reasonable, based on the actual experience of the System.

Respectfully submitted,

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Principal and Consulting Actuary

Ben D. Mobley, ASA, FCA, MAAA
Consulting Actuary

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SECTION 1 – BOARD SUMMARY

The table below summarizes the results of the June 30, 2024 actuarial valuation as compared with the prior valuation.

Table I-1: Comparative Summary of Principal Results	June 30, 2023	June 30, 2024
Membership		
Active Members		
Number	53,436	53,373
Annual Payroll	$4,904,426	$5,054,181
Retirees and Beneficiaries		
Number	39,843	40,034
Annual Benefits	$2,312,204	$2,385,276
Inactive Members		
Vested	2,275	2,457
Non-Vested	8,433	8,901
Assets		
Market Value	$23,763,127	$26,392,634
Actuarial Value	$24,454,966	$26,333,611
Return on Market Value	8.57%	11.49%
Return on Actuarial Value	6.07%	8.06%
Ratio of Actuarial to Market Value	102.91%	99.78%
Actuarial Information		
Unfunded Actuarial Accrued Liability (UAAL)	$16,422,061	$15,926,345
Funded Ratio	59.83%	62.31%
Computed Contribution Rates		
Normal Cost	12.65%	12.64%
UAAL	26.05%	26.15%
Total	38.70%	38.79%
Member	7.00%	7.00%
State	31.70%	31.79%
Actuarially Determined Employer Contribution (ADEC) for Fiscal Year Ending		
June 30, 2025	$1,601,407	
June 30, 2026		$1,655,121

All dollar amounts are in thousands.

Summary of Key Findings

The employer contribution rate for the System is used to pay the employer's portion of the normal cost and to amortize the unfunded actuarial accrued liability (UAAL).

The actuarially determined normal cost contribution rate was 12.65% as of June 30, 2023, decreasing slightly to 12.64% as of June 30, 2024. The unfunded actuarial accrued liability decreased from $16.422 billion to $15.926 billion since the last valuation. The unfunded actuarial accrued liability rate increased from 26.05% to 26.15%. We note the following key findings:

- The UAAL increased by $1.133 billion due to interest and decreased by $1.281 billion due to the expected amortization payment since the last valuation.
- Additionally, the assets as of June 30, 2024 recognizes $411.1 million as a receivable contribution which reflects the discounted value of the $273.2 million deposited approximately 3 months after the 2024 fiscal year end and an expected $147.2 million deposited approximately 6 months after the 2024 fiscal year end. This further decreased the UAAL by $411.1 million. The $147.2 million additional contribution expected in December of this year is pending the completion of the State's audited financial statements. Any material difference in this amount may require a revision to this actuarial valuation.
- The System experienced an actuarial gain on plan assets of $281.2 million for fiscal year 2024 because the investment return on the actuarial value of assets was different than the assumed rate. Table III-3 provides the calculation of the investment gains and losses for the year.
- The System experienced a net actuarial loss of $344.2 million as of June 30, 2024 on plan liabilities due to non-investment related experience. Table IV-2 provides the reconciliation of the UAAL which is summarized as follows:
  1. The System provides post-retirement Cost-of-Living Adjustments based upon certain criteria set forth in the statutes. For purposes of the valuation, the benefits paid to eligible retirees and beneficiaries are expected to increase at a rate of 3.00% annually for members retired before September 1992 and 2.00% for members retired on and after September 1, 1992 (1.75% for members hired on or after July 1, 2007). The actual COLAs granted for members retired before September 1, 1992, were 3.0% for members with a January COLA date and 3.3% for members with a July COLA date. The actual COLAs granted for members retired on and after September 1, 1992, were 3.2% (3.0% for members hired on or after July 1, 2007). This resulted in a $267.4 million loss to the System for the year.
  2. In years where the salaries of active members increase less than expected, an actuarial gain occurs. The System experienced a $4.7 million gain due to salary experience for the year.
  3. In addition, there were other gains and losses primarily attributable to the System demographic experience. The loss for the year was $81.5 million.

SECTION 1 – BOARD SUMMARY

Section 2 of the report provides summarized information on the membership data used in the valuation. Section 3 of the report covers the System's assets and Section 4 of the report covers the System's liabilities. The results of the valuation are provided in Section 5 of the report and the accounting information is in Section 6. The appendices provide additional information on: A) the System members; B) the actuarial assumptions and methods; and C) the summary of plan provisions. In addition, Appendix D provides a glossary of actuarial terminology.

SECTION 2 – MEMBERSHIP DATA

Data regarding the membership of the System for use in the valuation were furnished by the Retirement System. The following table summarizes the membership data as of June 30, 2024 and is compared with that reported for the prior valuation.

Table II-1: Summary of Membership Data

	June 30, 2023	June 30, 2024
Active Members		
Total Number of Active Members	53,436	53,373
Total Annual Compensation	$4,904,426	$5,054,181
Retirees and Beneficiaries		
Number of Service Retirements	37,413	37,572
Total Annual Benefit Payments	$2,223,959	$2,293,365
Number of Disability Retirements	263	262
Total Annual Benefit Payments	$8,086	$8,063
Number of Beneficiaries	2,167	2,200
Total Annual Benefit Payments	$80,159	$83,848
Inactive Members		
Number of Non-vested Inactive Members	8,433	8,901
Number of Vested Inactive Members	2,275	2,457

All dollar amounts are in thousands.

SECTION 3 – SYSTEM ASSETS

The following tables provide information on the System's assets.

Table III-1: Market Value Reconciliation		
	2022 - 2023	**2023 - 2024**
Net Market Value as of July 1	$21,574,433	$23,763,127
Additions		
State Contributions	$1,578,038	$1,554,542
Non-State Contributions	$339,321	$366,988
Total Contributions	$1,917,359	$1,921,530
Net Investment Income	$1,830,103	$2,702,753
Receivable Contributions	$801,208*	$411,051**
Total Additions	$4,548,670	$5,035,334
Deductions		
Benefit Payments and Refunds	($2,359,976)	($2,405,827)
Other	$ 0	$ 0
Total Deductions	($2,359,976)	($2,405,827)
Net Increase	$2,188,694	$2,629,507
Net Market Value as of June 30	$23,763,127	$26,392,634
Rate of Return on Market Value	8.57%	11.49%

All dollar amounts are in thousands.

* Reflects the additional contributions of $272.8 million and an expected $551.0 million received subsequent to FYE 2023 discounted at 6.9% to the valuation date.

** Reflects the additional contributions of $273.2 million and an expected $147.2 million received subsequent to FYE 2024 discounted at 6.9% to the valuation date.

Development of Actuarial Value of Assets

The Actuarial Value of Assets represents a "smoothed" value developed with the purpose of dampening the impact of market volatility on the assets used in determining valuation results. The Actuarial Value of Assets has been calculated by spreading the recognition of excess investment income over four years. The amount of excess investment income in each year is the difference between expected investment income on actuarial value and the actual market value investment income. Table III-2 provides the development of the actuarial value of assets since the previous valuation.

Table III-2: Development of Actuarial Value of Assets

		June 30, 2023	June 30, 2024
1.	Actuarial Value Beginning of Year	$22,729,202	$24,454,966
2.	Market Value End of Year	$23,763,127	$26,392,634
3.	Market Value Beginning of Year	$21,574,433	$23,763,127
4.	Cash Flow		
	a. Contributions	$1,917,359	$1,921,530
	b. Disbursements	($2,359,976)	($2,405,827)
	c. Net: 4a + 4b	($442,617)	($484,297)
5.	Receivable Contributions	$801,208	$411,051
6.	Investment Income		
	a. Market Total: 2 – 3 – 4c – 5	$1,830,103	$2,702,753
	b. Assumed Rate of Return	6.90%	6.90%
	c. Amount for Immediate Recognition: (1 x 6b) + (4c x 6b x 0.5)	$1,553,045	$1,670,684
	d. Amount for Phased-In Recognition: 6a – 6c	$277,058	$1,032,069
7.	Phased-In Recognition of Investment Income		
	a. Current Year: 6d * .25	$69,265	$258,017
	b. First Prior Year	($853,563)	$69,265
	c. Second Prior Year	$807,488	($853,563)
	d. Third Prior Year	($209,062)	$807,488
	e. Total Recognized Investment Gain	($185,872)	$281,207
8.	Total Recognized Investment Return: 6c + 7e	$1,367,173	$1,951,891
9.	Adjustment	0	0
10.	Actuarial Value End of Year: 1 + 4c + 5 + 8 + 9	$24,454,966	$26,333,611
11.	Difference Between Market & Actuarial Values: 2 – 10	($691,839)	$59,023
12.	Rate of Return on Actuarial Value	6.07%	8.06%

All dollar amounts are in thousands.

The actuarial valuation assumes the investment income on the assets of the System is 6.90% annually. This assumption is based upon the reasonable long-term expected return on the assets. In each year, the System will experience actuarial gains and losses due to the actual investment return of the assets.

Table III-3: Calculation of Actuarial Investment Gain/(Loss)

	June 30, 2023	June 30, 2024
1. Actuarial Value of Assets at Beginning of Year	$22,729,202	$24,454,966
2. Total Net Cash Flow	(442,617)	(484,297)
3. Receivable Contribution	801,208	411,051
4. Expected Return on Actuarial Value of Assets: (1 x 6.90% + 2 x 6.90% x .5)	$1,553,045	$1,670,684
5. Expected Actuarial Value of Assets at End of Year: (1 + 2 + 3 + 4)	$24,640,838	$26,052,404
6. Actual Actuarial Value of Assets at End of Year	$24,454,966	$26,333,611
7. Actuarial Gain/(Loss) Due to Investment Experience: (6 - 5)	($185,872)	$281,207

All dollar amounts are in thousands.

SECTION 4 – SYSTEM LIABILITIES

The present value of benefits is the value as of the valuation date of all future benefits expected to be paid to current members of the System. An actuarial cost method allocates each individual's present value of benefits to past and future years of service. The actuarial accrued liability includes the portion of the active member present value of benefits allocated to past service as well as the entire present value of benefits for retirees, beneficiaries and inactive members. The unfunded actuarial accrued liability (UAAL) is the difference between the actuarial accrued liability and the actuarial value of assets. Table IV-1 shows the allocation of the present value of future benefits into components for future normal cost contributions and actuarial accrued liabilities and the determination of the UAAL as of the valuation date.

Table IV-1: Calculation and Allocation of Present Value of Future Benefits

		Entry Age Actuarial Cost Method	
	(1) Present Value of Future Benefits	(2) Portion Covered By Future Normal Cost Contributions	(3) Actuarial Accrued Liabilities (1) - (2)
Active Members			
Service Retirement	$21,990,280	$5,154,611	$16,835,669
Disability Retirement	119,904	85,307	34,597
Survivors' Benefits	200,131	60,092	140,039
Termination	1,243,928	1,087,234	156,694
Total for Active Members	23,554,243	6,387,244	17,166,999
Inactive Members			
Non-Vested (Refund only)	154,289	0	154,289
Vested	585,273	0	585,273
Total for Inactive Members	739,562	0	739,562
Retirees and Beneficiaries			
Service Retirements	23,592,158	0	23,592,158
Disability Retirements	105,336	0	105,336
Beneficiaries	655,901	0	655,901
Total for Retirees and Beneficiaries	24,353,395	0	24,353,395
Total	$48,647,200	$6,387,244	$42,259,956
Actuarial Value of Assets			$26,333,611
Unfunded Actuarial Accrued Liability			$15,926,345
Funded Ratio			62.31%

All dollar amounts are in thousands.

SECTION 4 – SYSTEM LIABILITIES

The funded ratio of the System is the ratio of the actuarial value of assets divided by the actuarial accrued liability as of the valuation date. As of June 30, 2024, the funded ratio of the System is 62.31% as compared to the ratio in the prior valuation of 59.83%. The ratio is a commonly used measure of the funding progress of a System and can be useful in reviewing the historical trend of a System's funding progress. Such a review should also consider the impact to this measure over the historical period due to changes to plan benefits, changes to the actuarial assumptions and methods, and the significant impact that investment experience can have on the ratio over short-term periods. We caution that no single "point in time" measure can provide a universal basis for comparing one System to another.

Although the terminology used to describe the excess of the System's actuarial accrued liability over the System's actuarial value of assets is called the "unfunded" actuarial accrued liability, there is a dedicated source of funding for this liability. The scheduled employer and employee contributions are expected to completely fund the System's liabilities (pay off the UAAL) within a reasonable period based on statutory funding requirements.

The calculation of the System's actuarial liabilities requires the use of several assumptions concerning the future experience of the System and its members. In each valuation, the latest year of actual experience is compared to that expected by the prior valuation. The differences are actuarial gains and losses which decrease or increase the UAAL. Table IV-2 provides for the reconciliation of the UAAL and shows the primary sources of this year's gains and losses due to actuarial experience.

Table IV-2: Reconciliation of the UAAL

1.	UAAL as of June 30, 2023	$16,422,061
2.	Expected Interest (1 x 6.90%)	1,133,122
3.	Expected Amortization Payment	(1,280,791)
4.	Expected End of Year UAAL (1 + 2 + 3)	$16,274,392
5.	Actuarial Experience (Gain)/Loss	
	Receivable Contribution	(411,051)
	Asset Experience	(281,207)
	COLA	267,432
	Salary Experience	(4,738)
	Post-retirement Mortality	(14,867)
	Retirements	1,913
	Turnover and Other	94,471
	Total Actuarial (Gain)/Loss	($348,047)
6.	UAAL as of June 30, 2024 (4 + 5)	$15,926,345

All dollar amounts are in thousands.

SECTION 5 – ACTUARIAL VALUATION RESULTS

Section 4 of this report presented the System's total present value of future benefits allocated between the present value of future normal cost contributions and actuarial accrued liability. The portion of the active members' present value of benefits allocated to future years of service is funded through annual normal cost contributions comprised of both active member and employer contributions. The System's annual normal cost rate is calculated as a percent of covered payroll, which is expected to remain level over all future years of service. The portion of the total normal cost rate in excess of the active member contribution rate is the state normal cost rate. The normal cost rate developed as of the valuation date is presented in Table V-1. Table V-1 also shows the state contribution rates necessary to amortize the UAAL in accordance with the funding requirements in the statutes.

The Actuarial Standards Board recently updated Actuarial Standard of Practice (ASOP) No. 4 to require actuaries to disclose a "reasonable" actuarially determined contribution (ADC), which reflects actuarial methods and assumptions that follow actuarial standards of practice. We believe that the System's current assumptions and actuarial cost method meet the "reasonable" standard for purposes of calculating the ADC under ASOP No. 4.

Table V-1: Actuarially Determined Employer Contribution (ADEC) Rate	
Normal Cost Rate of Active Members by Expected Benefit Type	
Service Retirement	10.19%
Termination	2.16%
Disability Retirement	0.17%
Survivors' Benefits	0.12%
Total Normal Cost Rate for Active Members	12.64%
Less: Active Member Contribution Rate	7.00%
State Normal Cost Rate	5.64%
Unfunded Actuarial Accrued Liability (UAAL)	
June 30, 2018 Transitional (24 years)	28.29%
June 30, 2020 Incremental (21 years)	1.87%
June 30, 2022 Incremental (23 years)	(2.34)%
June 30, 2023 Incremental (24 years)	(1.06)%
June 30, 2024 Incremental (25 years)	(0.61)%
Total UAAL Rate	26.15%
Actuarially Determined Employer Contribution (ADEC) Rate	31.79%

SECTION 6 – ACCOUNTING INFORMATION

The Governmental Accounting Standards Board has issued Statement No. 67 which replaces Statement No. 25 for plan years beginning after June 15, 2013. The information required under GASB 67 will be issued in a separate report.

We are providing the schedule of funding progress as shown below for informational purposes. This schedule is no longer required under GASB 67.

Table VI-1: Schedule of Funding Progress

Actuarial Valuation as of June 30	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (UAAL) (b) - (a)	Funded Ratio (a) / (b)	Covered Payroll (c)	UAAL as a % of Active Member Payroll [(b) - (a)] / (c)
2012	$13,734.8	$24,862.2	$11,127.4	55.2%	$3,652.5	304.7%
2014	15,546.5	26,349.2	10,802.7	59.0	3,831.6	281.9
2016	16,712.3	29,860.3	13,148.0	56.0	3,949.9	332.9
2018	17,951.8	34,712.0	16,760.2	51.7	4,075.9	411.2
2020	19,055.1	37,128.0	18,072.9	51.3	4,438.4	407.2
2022	22,729.2	39,860.3	17,131.1	57.0	4,695.7	364.8
2023	24,455.0	40,877.0	16,422.0	59.8	4,904.4	334.8
2024	26,333.6	42,260.0	15,926.4	62.3	5,054.2	315.1

All dollar amounts are in millions

SECTION 6 – ACCOUNTING INFORMATION

The information presented above was determined as part of the actuarial valuation as of June 30, 2024. Additional information as of the latest actuarial valuation follows.

Table VI-2: Additional Information	
Valuation date	June 30, 2024
Actuarial cost method	Entry Age
Amortization method	Level dollar amortization method effective with the June 30, 2024 valuation.
Remaining amortization periods	
June 30, 2018 Transitional	24 years
June 30, 2020 Incremental	21 years
June 30, 2022 Incremental	23 years
June 30, 2023 Incremental	24 years
June 30, 2024 Incremental	25 years
Equivalent single amortization period	24.7 years
Asset valuation method	Four-year smoothed market value
Actuarial assumptions:	
Investment rate of return (includes inflation)	6.90%
Projected salary increases (includes inflation)	3.00% - 6.50%
Inflation	2.50%
Cost-of-living adjustments	
Retirements prior to September 1, 1992	3.00%
Retirements on or after September 1, 1992	
Hired prior to July 1, 2007	2.00%
Hired on or after July 1, 2007	1.75%

SECTION 7 – RISK ASSESSMENT

Overview

Actuarial Standards of Practice (ASOP) No. 51, issued by the Actuarial Standards Board, provides guidance on assessing and disclosing risks related to pension plan funding. This guidance is binding on all credentialed actuaries practicing in the United States. This standard was issued as final in September 2017 with application to measurement dates on or after November 1, 2018.

The term “risk” frequently has a negative connotation, but from an actuarial perspective, it may be thought of as simply the fact that what actually happens in the real world will not always match what was expected, based on actuarial assumptions. Of course, when actual experience is better than expected, the favorable risk is easily absorbed. The risk of unfavorable experience will likely be unpleasant, and so there is an understandable focus on aspects of risk that are negative.

Risk usually can be reduced or eliminated at some cost. Consumers, for example, buy auto and home insurance to reduce the risk of accidents or catastrophes. Another way to express this concept, however, is that there is generally some reward for assuming risk. Thus, retirement plans invest not just in US Treasury bonds which have almost no risk, but also in equities which are considerably riskier – because they have an expected reward of a higher return that justifies the risk.

Under ASOP 51, the actuary is called on to identify the significant risks to the pension plan and provide information to help those sponsoring and administering the plan understand the implications of these risks. In this section, we identify some of the key risks for the System and provide information to help interested parties better understand these risks.

Investment Risk

The investment return on assets is the most obvious risk – and usually the largest risk – to funding a pension plan. To illustrate the magnitude of this risk, the following chart shows the Asset Volatility Ratio (AVR), defined as the fair value of assets divided by covered payroll.

($ in thousands)

Valuation	Market Value of Assets	Covered Payroll	Asset Volatility Ratio
2016	$15,584,564	$3,949,926	3.95
2018	$17,946,839	$4,075,939	4.40
2020	$18,286,419	$4,438,394	4.12
2022	$21,574,433	$4,695,730	4.59
2023	$23,763,127	$4,904,426	4.85
2024	$26,392,634	$5,054,181	5.22

The asset volatility ratio is especially useful to compare across plans or through time. It is also frequently useful to consider how the AVR translates into changes in the Required Contribution Rate (actuarially determined employer contribution rate). For example, in the table below with an AVR of 5.00, if the market value return is 10% below assumed, or negative 3.10% (6.90% minus 10.00%) for the System, there will be an increase in the Required Contribution Rate of 1.06% of payroll in the first year. Without asset smoothing or without returns above the expected return in the next three years, the impact on the Required Contribution Rate would be 4.25%. A higher AVR would produce more volatility in the Required Contribution Rate.

AVR	Unsmoothed Amortization	Smoothed Amortization
4.0	3.40%	0.85%
5.0	4.25%	1.06%
6.0	5.10%	1.28%

Mortality Risk

The mortality assumption is a significant assumption for valuation results, second only to the investment assumption in most situations. The System's mortality assumption utilizes a mortality table (with separate rates for males and females, as well as different rates by status) and a projection scale for how the mortality experience is expected to improve through time.

The future, however, is not known, and actual mortality improvements may occur at a faster rate than expected, or at a slower rate than expected (or even decline). Although changes in mortality will affect the benefits paid, this assumption is carefully studied during the regular experience studies that the System conducts so that incremental changes can be made to smoothly reflect emerging experience.

Contribution Risk

The System is primarily funded by member and employer contributions to the trust fund, together with the earnings on those accumulated contributions. Each year in the valuation, the Actuarial Determined Employer Contribution (ADEC) is determined, based on the System's funding policy. This rate is the sum of the rates for the normal cost for the plan, the amortization of the UAAL, and the administrative expenses. There are statutory provisions which mandate the full ADEC is contributed to the Fund each year and, in our opinion, there is no Contribution Risk at this time.

Liquidation Risk

Under the revised Actuarial Standards of Practice (ASOP) No. 4 effective for valuations after February 15, 2023, we must now include a low-default-risk obligation measure of the Fund's liability in our funding valuation report. This is an informational disclosure as described below and would not be appropriate for assessing the funding progress or health of this plan.

This measure uses the unit credit cost method and reflects all the assumptions and provisions of the funding valuation except that the discount rate is derived from considering low-default-risk fixed income securities. We considered the FTSE Pension Discount Curve based on market bond rates published by the Society of Actuaries as of June 30, 2024 and with the 30-year spot rate used for all durations beyond 30. Using these assumptions, we calculate a low-default-risk obligation measure liability of approximately $44.3 billion.

This amount approximates the termination liability if the plan (or all covered employment) ended on the valuation date and all of the accrued benefits had to be paid with cash-flow matched bonds. This assurance of funded status and benefit security is typically more relevant for corporate plans than for governmental plans since governments rarely have the need or option to completely terminate a plan.

Table A-1: Schedule of Active Participant Data as of June 30, 2024										
	Years of Service									
AGE	Under 5	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 & up	No.	Avg. Pay
Under 25	588								588	53,441
25 to 29	3,478	689	1						4,168	58,736
30 to 34	2,202	3,003	564						5,769	68,642
35 to 39	1,334	1,994	3,264	493					7,085	80,899
40 to 44	1,069	1,157	1,912	3,614	659				8,411	93,702
45 to 49	861	759	941	1,922	3,158	473			8,114	100,195
50 to 54	638	610	715	1,090	2,080	2,471	234		7,838	103,966
55 to 59	384	376	540	828	1,209	1,568	1,052	152	6,109	103,791
60 to 64	183	201	310	570	781	607	414	432	3,498	102,302
65 to 69	66	82	84	238	292	256	115	199	1,332	103,145
70 & up	22	24	26	52	95	79	59	104	461	107,085
Total	10,825	8,895	8,357	8,807	8,274	5,454	1,874	887	53,373	90,684

Table A-2: Comparative Summary of Active Data		
	June 30, 2023	**June 30, 2024**
Average Age	44.8 years	45.0 years
Average Service	14.2 years	14.5 years
Average Pay	$87,866	$90,684

Table A-3: Number of Monthly Retirement Allowances Of Benefit Recipients as of June 30, 2024

Payee Type	Number	Monthly Retirement Allowances
Service Retirement		
A (Life Annuity)	2	$4,313
B (100% Cash Refund)	0	0
C (Period Certain and Life)	483	2,105,643
D (Joint and Survivor)	8,856	48,523,985
N (25% Cash Refund)	28,231	140,479,776
Total	**37,572**	**$191,113,717**
Disability Retirement		
A (Life Annuity)	0	$0
B (100% Cash Refund)	0	0
C (Period Certain and Life)	0	0
D (Joint and Survivor)	0	0
N (25% Cash Refund)	0	0
W (Disability)	262	671,893
Total	**262**	**$671,893**
Beneficiaries	**2,200**	**$6,987,365**
GRAND TOTAL	**40,034**	**$198,772,975**

Investment Rate of Return

Assumed annual rate of 6.90% net of investment expenses.

Rates of Annual Salary Increase

Rates of Annual Salary Increase Assumption	
Years of Service	
0	6.50%
1	6.25
2	6.00
3	6.00
4	6.00
5	6.00
6	6.00
7	6.00
8	6.00
9	6.00
10	5.50
11	5.50
12	5.25
13	5.00
14	4.75
15	4.50
16	4.00
17	3.75
18	3.50
19	3.25
20	3.00
21+	3.00

Active Member Decrement Rates

a. Tables below provide a summary of the assumed rates of service retirement.

Annual Rates of Retirement				
	Unreduced			
Age	Less than 35 years of Service		35 or more years of Service	
	Male	Female	Male	Female
50			35.0%	30.0%
55			35.0%	30.0%
60	20.0%	20.0%	30.0%	30.0%
65	27.5%	32.5%	35.0%	37.5%
70	27.5%	30.0%	30.0%	32.5%
75	100.0%	100.0%	100.0%	100.0%

Annual Rates of Retirement				
Age	Proratable		Reduced	
	Male	Female	Male	Female
50			1.50%	1.25%
52			1.50%	1.25%
54			2.00%	2.25%
56			4.00%	3.75%
58			6.50%	5.50%
60	6.0%	5.0%		
65	15.0%	12.0%		
70	28.5%	15.0%		
75	28.5%	15.0%		
80	100.0%	100.0%		

b. Table below provides a summary of the assumed rates of disability.

Annual Rates of Disability		
Age	Male	Female
20	0.020%	0.020%
25	0.020%	0.020%
30	0.020%	0.020%
35	0.020%	0.030%
40	0.030%	0.060%
45	0.080%	0.090%
50	0.150%	0.150%
55	0.150%	0.170%
60	0.150%	0.150%

c. Table below provides a summary of the assumed rates of withdrawal for active members prior to eligibility for retirement.

Annual Rates of Withdrawal					
			10 or more years of service		
Years of Service	Male	Female	Age	Male	Female
0	15.00%	12.00%	25	1.80%	6.00%
1	11.00	11.00	30	1.80	6.00
2	8.50	9.50	35	1.80	4.25
3	7.00	8.00	40	1.80	2.50
4	5.50	7.50	45	1.80	2.00
5	4.50	7.00	50	2.25	2.40
6	4.00	6.50	55	4.00	3.90
7	3.50	6.00	59	5.50	4.00
8	3.50	5.50			
9	3.50	5.00			

Pre-Retirement Mortality

The PubT-2010 Employee Table projected generationally with MP-2019 is used for both males and females while in active service. Representative values of the assumed annual rates of mortality while in active service are as follows:

Annual Rates of Death*		
Age	Male	Female
30	0.022%	0.014%
35	0.030%	0.020%
40	0.042%	0.031%
45	0.067%	0.048%
50	0.111%	0.073%
55	0.172%	0.107%
60	0.264%	0.161%
65	0.435%	0.270%

* Rates shown are for 2010, the base year of the table.

Post-Retirement Mortality

The PubT-2010 Healthy Retiree Table (adjusted 105% for males and 103% for females at ages 82 and above) projected generationally with MP-2019 is used for the period after service retirement. The PubT-2010 Disabled Retiree Table projected generationally with MP-2019 is used for the period after disability retirement. The PubT-2010 Contingent Survivor Table projected generationally with MP-2019 and set forward 1 year for both males and females is used for survivors and beneficiaries. Representative values of the assumed annual rates of mortality are as follows:

Annual Rates of Death*						
	Healthy		**Disabled**		**Survivor**	
Age	Male	Female	Male	Female	Male	Female
50	0.111%	0.073%	1.605%	1.483%	0.724%	0.342%
55	0.223%	0.193%	2.114%	1.742%	0.854%	0.476%
60	0.357%	0.287%	2.503%	1.956%	1.067%	0.667%
65	0.592%	0.446%	3.044%	2.256%	1.497%	0.973%
70	1.070%	0.770%	3.901%	2.862%	2.335%	1.478%
75	2.031%	1.461%	5.192%	4.003%	3.706%	2.371%
80	3.960%	2.868%	7.348%	6.007%	5.897%	3.985%
85	7.598%	5.548%	10.815%	9.331%	9.658%	7.122%
90	13.923%	10.392%	16.253%	13.665%	15.947%	12.596%

* Rates shown are for 2010, the base year of the tables

Asset Valuation Method

The actuarial value of assets recognizes a portion of the difference between the actual market value of assets and the expected actuarial value of assets, based on the assumed rate of investment return. The amount recognized each year is 25% of the difference between market value and expected actuarial value.

Actuarial Cost Method

The Entry Age Normal actuarial cost method allocates the plan's actuarial present value of future benefits to various periods based upon service. The portion of the present value of future benefits allocated to years of service prior to the valuation date is the actuarial accrued liability, and the portion allocated to years following the valuation date is the present value of future normal costs. The normal cost is determined for each active member as the level percent of payroll necessary to fully fund the expected benefits to be earned over the career of each individual active member. The normal cost is partially funded with active member contributions with the remainder funded by employer contributions.

The unfunded accrued liability is determined by subtracting the actuarial value of assets from the actuarial accrued liability. The UAAL as of June 30, 2018 is amortized over a closed 25-year period. Each new incremental UAAL beginning with the June 30, 2019 valuation will be amortized utilizing layered 25-year closed amortization bases established at the end of each plan year. Effective with the June 30, 2024 valuation, the remaining and future UAAL balances will be amortized utilizing the level dollar amortization method.

Payroll Growth Rate

The total annual payroll of active members is assumed to increase at an annual rate of 3.00%. This rate does not anticipate increases in the number of members.

Future Cost-of-living Increases

Members who retired prior to September 1, 1992 are assumed to receive an annual Cost-of-Living Adjustment (COLA) of 3.0%. Members who retired on or after September 1, 1992, and were hired prior to July 1, 2007, are assumed to receive an annual Cost-of-Living Adjustment (COLA) of 2.0%. Members who retired on or after September 1, 1992, and were hired on or after July 1, 2007, are assumed to receive an annual Cost-of-Living Adjustment (COLA) of 1.75%.

Marriage Assumption

85% of males and 75% of females assumed to be married, with female spouses 3 years younger than males.

Plan N Partial Refund Option (Normal Form of Payment):

For any member who retires having earned 10 or more years of service prior to July 1, 2019, upon death, the member's beneficiary will receive a lump sum payment of the member's contributions with interest to the member's date of retirement less 25% of the total payments received to the member's date of death. A 12-year Certain and Life payment form is used to approximate the Plan N option where available data does not allow liabilities to be calculated directly.

For any member who retires having earned less than 10 years of service prior to July 1, 2019, upon death, the member's beneficiary will receive a lump sum payment of the member's contributions with interest to the member's date of retirement less 50% of the total payments received to the member's date of death. A 9-year Certain and Life payment form is used to approximate the Plan N option where available data does not allow liabilities to be calculated directly.

Changes from Prior Valuation

None

APPENDIX C – PLAN PROVISIONS

Outlined below are the principal provisions of the system which were reflected in the results shown in this report.

Covered Employees

Any teacher, principal, superintendent or supervisor engaged in service of public schools, plus professional employees at State schools of higher education if they choose to be covered.

Annual Salary

Annual Salary rate for service as a Connecticut teacher during a school year excluding amounts paid for extra duty assignments, coaching, unused sick time, unused vacation or terminal pay.

Average Annual Salary

Average of Annual Salary received during three years of highest salary.

Credited Service

One month for each month of service as a teacher in Connecticut public schools, maximum 10 months for each school year. Ten months of credited service constitutes one year of Credited Service. Certain other types of teaching service, State employment, or war-time military service may be purchased prior to retirement, if the Member pays one-half the cost.

Normal Retirement

Eligibility - Age 60 with 20 years of Credited Service in Connecticut, or 35 years of Credited Service including at least 25 years of service in Connecticut.

Benefit - 2% of Average Annual Salary times years of Credited Service (maximum benefit is 75% of Average Annual Salary)

In addition, amounts derived from the accumulation of mandatory contributions made prior to July 1, 1989 and voluntary contributions by the teacher are payable.

Minimum Benefit: Effective January 1, 1999, Public Act 98-251 provides a minimum monthly retirement benefit of $1,200 to teachers who retire under the Normal Retirement provisions and who have completed at least 25 years of full time Connecticut service at retirement.

Early Retirement

Eligibility - 25 years of Credited Service including 20 years of Connecticut service, or age 55 with 20 years of Credited Service including 15 years of Connecticut service.

Benefit - Reduced normal retirement benefit. The early retirement factors currently in effect are 6% per year for the first five years by which early retirement precedes the minimum normal retirement age and 4% per year for the next five years by which early retirement precedes the minimum normal retirement age. Effective July 1, 1999, the reduction for individuals with 30 or more years of service is 3% for each year by which early retirement precedes the minimum retirement age.

Proratable Retirement

Eligibility - Age 60 with 10 years of Credited Service.

Benefit - 2% less 0.1% for each year less than 20 years of Average Annual Salary times years of Credited Service in Connecticut, plus 1% of Average Annual Salary times years of additional Credited Service time.

Disability Retirement

Eligibility - 5 years of Credited Service in Connecticut if not incurred in the performance of duty and no service requirement if incurred in the performance of duty.

Benefit - 2% of Average Annual Salary times Credited Service to date of disability, but not less than 15% of Average Annual Salary, nor more than 50% of Average Annual Salary. In addition, disability benefit under this plan (without regard to any cost-of-living adjustments) plus any initial award of Social Security benefits and workers' compensation cannot exceed Average Annual Salary.

Termination of Employment

Less than 5 years of Credited Service - Return mandatory contributions with interest.

5 or more years of Credited Service - Return employee mandatory contributions with interest and 1% contributions made prior to July 1, 1989 without interest.

10 or more years of Credited Service - Member is 100% vested in the accrued benefit based on Credited Service and Average Annual Salary as of the date of termination of covered employment. Benefits are payable at age 60 and early retirement reductions are based on the number of years of service the member would have had if they had continued to work until age 60.

Member may elect return of all contributions plus interest on employee mandatory contributions in lieu of vested benefit.

Pre-Retirement Death Benefits

A lump sum plus one of the following: survivor's benefit, return of all contributions with interest, or surviving spouse's benefit.

- Lump Sum: $1,000 for the first 5 years of Connecticut service plus $200 per year thereafter. Maximum benefit: $2,000.
- Survivor's Benefit: For active teachers who die while in service, the family maximum benefit payable to survivors is $1,500 per month. Each minor child is entitled to $300 per month. The surviving spouse's benefit is $300 per month if the member has 12 or less years of service. For each additional year of service, the surviving spouse's monthly benefit is increased $25, up to a maximum of $600.
- Accumulated contributions with interest plus dependent children's benefits as described in the "Survivor's Benefit" paragraph.
- Surviving Spouse's Benefit: An active member who is eligible for immediate retirement and who has named his or her spouse as primary beneficiary will be covered by a 100% Plan D co-participant option in the event of his or her death prior to retirement.

Benefit Options

Normal form: Partial Refund Option – For any member who retires having earned 10 or more years of service prior to July 1, 2019, 75% of total benefit is paid as a life annuity. If 25% of the benefits paid prior to death do not exceed the Member's mandatory contributions plus interest frozen at the date of the benefit commencement, the difference is paid to the Member's beneficiary. For any member who retires having earned less than 10 years of service prior to July 1, 2019, 50% of total benefit is paid as a life annuity. If 50% of the benefits paid prior to death do not exceed the Member's mandatory contributions plus interest frozen at the date of the benefit commencement, the difference is paid to the Member's beneficiary.

Optional Forms: 5-, 10-, 20-, or 25-year certain and life and 33-1/3%, 50%, 66-2/3%, 75%, or 100% co-participant annuity (if co-participant dies first, benefit reverts to unreduced amount). Amounts payable under the optional forms are determined on an actuarially equivalent basis as set by the board.

Cost-of-Living Allowance

For teachers who retired prior to September 1, 1992, pension benefit adjustments are made in accordance with increases in the Consumer Price Index, with a minimum of 3% and a maximum of 5% per annum.

For teachers who were members of the Teachers' Retirement System before July 1, 2007, and retire on or after September 1, 1992, pension benefit adjustments are made that are consistent with those provided for Social Security benefits on January 1 of the year granted, with a maximum of 6% per annum. If the return on assets in the previous year was less than 6.9%, the maximum increase is 1.5%.

For teachers who were members of the Teachers' Retirement System after July 1, 2007, pension benefit adjustments are made that are consistent with those provided for Social Security benefits on January 1 of the year granted, with a maximum of 5% per annum. If the return on assets in the previous year was less than 9.9%, the maximum increase is 3%, and if the return on the assets in the previous year was less than 6.9%, the maximum increase is 1.0%

Teachers' Mandatory Contribution

Effective July 1, 1992, each teacher is required to contribute 6% of annual salary for the pension benefit. Beginning January 1, 2018, each teacher is required to contribute 7% of annual salary. Beginning July 1, 2019, annual interest credited on mandatory contributions set at 4.0%.

State Contribution

The State's contribution requirement is determined in accordance with Section 10-183z (as amended by Section 88 of Public Act 19-117).

Early Retirement Incentive

A local or regional board of education may establish a retirement incentive plan. The plan shall provide for purchase of additional credited service by a board of education and a member of the system who chooses to participate in the plan, of additional credited service for such member and for payment by the board of education of not less than fifty per cent of the entire cost of such total cost. Any such plan shall specify a maximum number of years to be purchased, not to exceed five. Members must have attained age 50 and be eligible for retirement with the additional purchased service. The amount of service purchased cannot exceed the lesser of five years and one-fifth of the member's credited service.

APPENDIX D – GLOSSARY

Actuarial Accrued Liability - The difference between the actuarial present value of future benefits payments and the actuarial present value of future normal costs. Also referred to as "accrued liability."

Actuarial Assumptions - Estimates of expected future experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and salary increases. Demographic estimates (rates of mortality, disability, turnover and retirement) are generally based on past experience, modified for projected changes in conditions. Fiscal estimates (salary increases, inflation and real investment return) consist of the underlying rates in an inflation-free environment plus a provision for a long-term average rate of inflation.

Actuarial Cost Method - A mathematical budgeting procedure for allocating the dollar amount of the "actuarial present value of future benefit payments" between future normal cost and actuarial accrued liability.

Actuarial Present Value - The amount of funds currently required to provide a payment or series of payments in the future. It is determined by discounting future payments at predetermined rates of interest and by probabilities of payment. Also referred to as "present value."

Actuarial Value of Assets - The value of current plan assets recognized for valuation purposes.

Amortization - Paying off an interest-discounted amount with periodic payments of interest and principal, as opposed to paying off with a lump sum payment.

Experience Gain (Loss) - A measure of difference between actual experience and that expected based upon a set of actuarial assumptions during the period between two actuarial valuation dates, in accordance with the actuarial cost method being used.

Normal Cost - The annual cost assigned, under the actuarial funding method, to current and subsequent plan years.

Unfunded Actuarial Accrued Liability - The difference between the actuarial accrued liability and actuarial value of assets. Also referred to as "unfunded accrued liability."