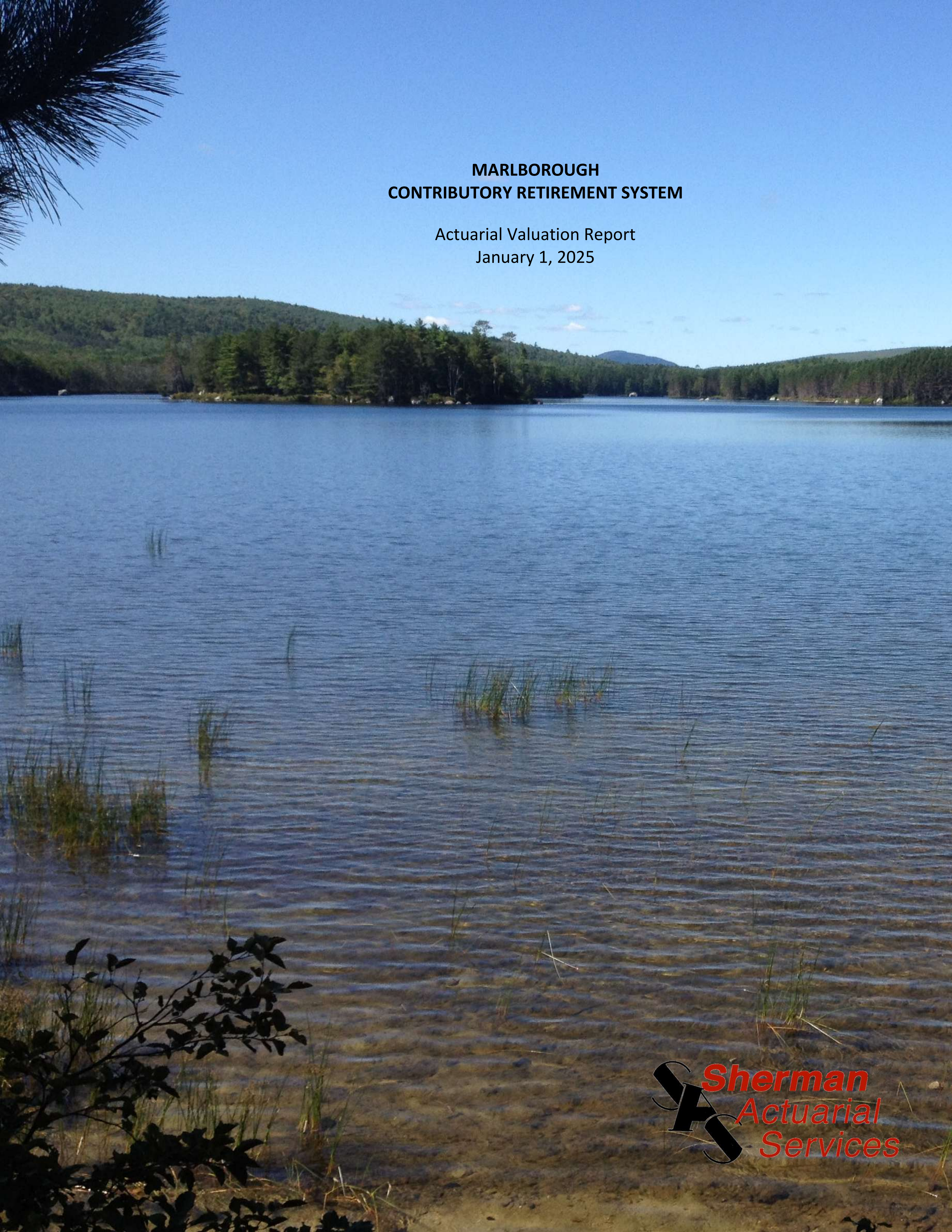
MARLBOROUGH
CONTRIBUTORY RETIREMENT SYSTEM

Actuarial Valuation Report
January 1, 2025



Sherman Actuarial Services

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Report Summary:

Highlights	**January 1, 2023**	**January 1, 2025**
Contributions		
Funding Schedule FY 2026	$11,682,752	$10,650,851
Funding Schedule FY 2027	12,164,950	$12,086,198
Funded Ratios		
GAS No. 25	84.1%	88.5%
Participants		
Actives	610	648
Retirees and Beneficiaries	458	462
Inactives	310	381
Disabled	41	38
Total	1,419	1,529
Payroll		
Payroll of Active Members	$38,056,581	$41,785,163
Average Payroll	62,388	64,483
Normal Cost		
Employer	953,877	990,322
Employee	3,463,432	3,823,731
Administrative Expenses	365,000	371,000
Total	4,782,309	5,185,053
Actuarial Accrued Liabilities		
Actives	96,183,034	91,131,721
Retirees, Beneficiaries, Disabilities and Inactives	173,788,207	189,702,226
Total	269,971,241	280,833,947
Actuarial Value of Assets	226,935,363	248,670,905
Unfunded Actuarial Accrued Liabilities	$43,035,878	$32,163,042

Introduction

This report presents the findings of an actuarial valuation as of January 1, 2023, of Marlborough Contributory Retirement System.

The actuarial valuation is based on:

- Provisions Chapter 32 of the Massachusetts General Laws, "M.G.L", as of January 1, 2025.
- Employee data provided by the Retirement Board
- Asset information reported to the Public Employee Retirement Administration Commission by the Marlborough Retirement System
- Actuarial assumptions approved by the Retirement Board

The valuation and appropriation forecast are prepared in accordance with Chapter 32 of the M.G.L. as of January 1, 2025.

The valuation and forecast do not account for:

- Any subsequent changes in the law
- Chapter 32 of the M.G.L., Section 3(8)(c) transfers between systems
- State-mandated benefits
- Cost-of-living increases granted to retired members between 1982 and 1997. The cost of these benefits has been assumed by the State under Proposition Two and One-Half.

Actuarial Experience

In performing the actuarial valuation, various assumptions are made regarding such factors as mortality, retirement, disability, and withdrawal rates as well as both payroll, salary increases, and investment returns. A comparison of the current valuation and the prior valuation is made to determine how closely actual experience corresponded to anticipated occurrences. This analysis of the system provides insight into the overall quality of the actuarial assumptions and helps explain any change in the annual appropriation.

During the last two years, based on the 2023 actuarial assumptions and plan provisions, the total unfunded actuarial accrued liability decreased to $28,971,523. The decrease is the result of payments against the unfunded actuarial liability, offset by net unfavorable actuarial experience during the preceding year. The sources of change in the unfunded liability are as follows:

Expected Unfunded Actuarial Accrued Liability	24,471,268
Asset loss	3,152,133
Salary gain	(75,142)
New Entrants	1,963,282
Actives - Retirements	(3,664,225)
Actives - Terminations	(85,752)
Actives – Mortality	(91,313)
Actives - Disabilities	1,324,779
Inactive Mortality	(5,935,662)
Inactive – Data adjustments	7,389,956
Other	484,446
Benefit Payments	37,754
Unfunded Actuarial Accrued Liability	28,971,523

The COLA base was increased to $15,000. This increased the unfunded actuarial accrued liability by $1,131,357 to $32,163,042. It also increased the employer portion of the Normal Cost by $15,033 to $990,322.

Actuarial Costs and Liabilities:

Normal Costs

The normal cost is the sum of the individual normal costs determined for each member as if the assumptions underlying the cost determinations had been exactly realized. An individual normal cost represents that part of the cost of a member's future benefits which are assigned to the current year as if the costs are to remain level as a percentage of the member's pay. Benefits payable under all circumstances (i.e., retirement, death, disability, and terminations) are included in this calculation. Anticipated employee contributions to be made during the year are subtracted from the total normal cost to determine employer normal cost. The total normal cost is divided by total payroll to determine the normal cost as a percent of pay. The normal cost is shown in Table I.

Table I

	January 1, 2023	January 1, 2025
Superannuation	$2,618,226	$2,833,741
Termination	1,170,215	1,305,086
Death	142,483	155,890
Disability	486,385	519,336
Administrative Expenses	365,000	371,000
Total Normal Cost	4,782,309	5,185,053
% of Pay	12.6%	12.4%
Employee Contributions	3,463,432	3,823,731
% of Pay	9.1%	9.2%
Employer Normal Cost	$1,318,877	$1,361,322
% of Pay	3.5%	3.3%

Present Value of Actuarial Accrued Liabilities

The actuarial accrued liabilities (AAL) represents today's value of all benefits based on the past service of the actives and inactives. The AAL can be compared to the assets to determine the funded status of the Plan. The value of these earned benefits is shown in Table II below.

Table II

	January 1, 2023	January 1, 2025
Actives		
Superannuations	$93,366,184	$87,991,717
Termination	(2,365,176)	(1,955,378)
Death	1,333,290	1,355,237
Disability	3,848,736	3,740,145
Retirees and Inactives		
Retirees and Beneficiaries	146,522,149	161,255,356
Terminated (Refund)	3,834,744	3,834,936
Disabled	23,431,314	24,611,934
Total	$269,971,241	$280,833,947

Present Value of Future Benefits

The present value of future benefits represents today's value of all benefits earned by the inactive participants as well as all benefits earned and expected to be earned in the coming years by the active participants. The difference between the present value of future benefits and the present value of actuarial accrued liabilities is the value of benefits to be earned in the coming years. The value of the total expected benefits is shown in Table III.

Table III

	January 1, 2023	January 1, 2025
Actives		
Superannuation	$112,649,334	$109,051,645
Termination	$7,169,710	8,804,630
Death	$2,391,870	2,525,488
Disability	$7,574,082	7,823,767
Retirees and Inactives		
Retirees and Beneficiaries	146,522,149	161,255,356
Terminated (Refund)	3,834,744	3,834,936
Disabled	23,431,314	24,611,934
Total	$303,573,203	$317,907,756

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Funded Status and Appropriations:

Market Value of Plan Assets

The trust fund composition on a market value basis is shown in Table IV.

Table IV

	January 1, 2023	January 1, 2025
Cash equivalents	$380,115	$651,036
Short term investments	0	0
Fixed income securities	51,022,535	52,529,245
Equities	69,841,345	69,542,602
International	46,642,184	79,514,762
Real Estate	11,128,772	8,935,780
Venture Capital	0	0
Other	25,705,579	28,595,508
Accounts receivable	339,778	160,317
Accounts payable	(45,653)	(195,035)
Accrued income	1,295	3,613
Total Market Value	$205,015,950	$239,737,828
Total Actuarial Value	$226,935,363	$248,670,905

Actuarial Value of Assets

The actuarial value of assets is determined by projecting the actuarial value of assets as of the beginning of the prior plan year with the assumed rate of return during that year 7.25% and accounting for deposits and disbursements with interest at the assumed rate of return. An adjustment is then applied to recognize the difference between the actual investment return and expected return over a five year period. This preliminary actuarial value is not allowed to differ from the market value of assets by more than 20%. The calculation of the actuarial value of assets as of January 1, 2025 is presented in Table V.

Table V

		January 1, 2025
(1)	Market value at January 1, 2024	$227,716,637
(2)	2024 Contributions	$16,344,965
(3)	2024 Benefit Payments	($21,328,859)
(4)	Net interest adjustment at 7.25% on (1), (2), and (3) to December 31, 2024	$16,328,790
(5)	Expected market value on January 1, 2025 (1) + (2) + (3) + (4)	$239,061,533
(6)	Actual market value on January 1, 2025	$239,737,828
(7)	2024 (Gain) / Loss	($676,295)
(8)	80% of 2024 (Gain) / Loss	($541,036)
(9)	2023 (Gain) / Loss	($11,614,992)
(10)	60% of 2023 (Gain) / Loss	($6,968,995)
(11)	2022 (Gain) / Loss	$47,719,842
(12)	40% of 2022 (Gain) / Loss	$19,087,937
(13)	2021 (Gain) / Loss	($13,224,144)
(14)	20% of 2021 (Gain) / Loss	($2,644,829)
(15)	Actuarial value on January 1, 2025, (6) + (8) + (10) + (12) + (14)	$248,670,905
(16)	but not less than 80% nor greater than 120% of (6)	$248,670,905
	Ratio of actuarial value to market value	103.73%
	2024 Market Value Return on investments	7.81%
	2024 Actuarial Value Return on investments	5.73%
	2023 Market Value Return on investments	13.41%
	2023 Actuarial Value Return on investments	6.62%

Unfunded Actuarial Accrued Liabilities

Under the Entry Age Normal Actuarial Cost Method, the Actuarial Accrued Liability represents what the accumulated assets would have been as of the valuation date if:

- current plan provisions and assumptions had always been in effect,
- experience conformed exactly to assumptions, and
- the normal cost had been contributed each year since inception.

The actuarial value of the Fund's assets as of the end of the prior year are subtracted from the Actuarial Accrued Liability (AAL) to determine the Unfunded Actuarial Accrued Liability (UAAL) as of the valuation date. Over time, annual pension contributions will accumulate Plan assets equal to the AAL, and the UAAL will be eliminated. Thereafter, annual contributions equal to the normal cost will keep the Plan's assets and liabilities in balance. The UAAL is developed in Table VI.

Table VI

	January 1, 2023	January 1, 2025
Actuarial Accrued Liability	$269,971,241	$280,833,947
Actuarial Assets	226,935,363	248,670,905
Unfunded Actuarial Accrued Liability	$43,035,878	$32,163,042
Funded Status	84.1%	88.5%

Appropriations

The pension appropriation for the upcoming fiscal years have been calculated in accordance with the requirements set forth in Sections 22D and 22F of Chapter 32 of the Massachusetts General Laws. These amounts were calculated to comply with the June 30, 2040, full funding mandate for all accrued liabilities. The pension appropriation is the sum of the:

- Employer normal cost,
- Increasing amortization of the unfunded actuarial accrued liability by June 30, 2028
  $ 32,163,042 over 3.4 years with 2.0% increasing payments
- Interest adjustment for payments deposited at the beginning of the fiscal year.

The pension appropriation is shown in Table VII.

Table VII

	January 1, 2023	January 1, 2025
Normal cost	$1,318,877	$1,361,322
Amortization payment of the accrued liability	9,060,031	10,035,835
Total cost	$10,378,908	$11,397,157
% of Pay	27.3%	27.3%
Fiscal 2026 cost	$11,682,752	$10,650,851
Fiscal 2027 cost	$12,164,950	$12,086,198

Appropriation Forecast

The following exhibit forecasts employer and employee contributions over the next 32 years under the adopted funding schedule.

Note that the forecast is based upon an "open group" method. This method assumes that sufficient employees will be hired each year to keep the number constant. The total payroll of the system is expected to increase 4.0% per year. The employee contribution rate is expected to increase to 10.5% by 2042 as members contributing base percentages 5%, 7%, and 8% are replaced by new members, whose base contribution is 9%. Payments are assumed to be made at the beginning of the year.

The employer total cost is expected to increase during the next 3 years until the unfunded liabilities are substantially paid off, at which time only the normal cost will remain. The total cost represents about 28% of payroll, increasing to 12.7% by the time the unfunded liabilities are fully paid off, leaving only a normal cost of about 3.0% thereafter. The decrease in the cost as a percentage of payroll is a result of the increase in member deductions.

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Appropriation Forecast

Fiscal Year Ending	Employee Contribution	Employer Normal Cost with Interest	Amortization Payments with Interest	Employer Total Cost with Interest	Employer Total Cost % of Payroll	Unfunded Liability	Funded Ratio %**
2026	$3,823,731	$1,409,807	$10,272,945	$11,682,752	28.0	$32,163,042	88.5
2027	$4,013,321	$1,428,253	$10,657,945	$12,086,198	27.8	$23,860,477	91.5
2028	$4,211,961	$1,445,919	$10,871,103	$12,317,022	27.3	$14,552,825	94.9
2029	$4,420,071	$1,462,713	$4,504,313	$5,967,026	12.7	$4,349,620	98.5
2030	$4,638,090	$1,478,537	$0	$1,478,537	3.0	$229	100.0
2031	$4,866,479	$1,493,287	$0	$1,493,287	2.9	$246	100.0
2032	$5,105,717	$1,506,851	$0	$1,506,851	2.9	$264	100.0
2033	$5,356,309	$1,519,111	$0	$1,519,111	2.8	$283	100.0
2034	$5,618,779	$1,529,940	$0	$1,529,940	2.7	$304	100.0
2035	$5,893,676	$1,539,206	$0	$1,539,206	2.6	$326	100.0
2036	$6,181,575	$1,546,765	$0	$1,546,765	2.5	$349	100.0
2037	$6,483,076	$1,552,466	$0	$1,552,466	2.4	$375	100.0
2038	$6,798,806	$1,556,148	$0	$1,556,148	2.3	$402	100.0
2039	$7,129,422	$1,557,641	$0	$1,557,641	2.2	$431	100.0
2040	$7,475,610	$1,556,763	$0	$1,556,763	2.2	$462	100.0
2041	$7,838,085	$1,553,323	$0	$1,553,323	2.1	$496	100.0
2042	$8,217,597	$1,547,117	$0	$1,547,117	2.0	$531	100.0
2043	$8,546,301	$1,609,002	$0	$1,609,002	2.0	$570	100.0
2044	$8,888,153	$1,673,362	$0	$1,673,362	2.0	$611	100.0
2045	$9,243,679	$1,740,296	$0	$1,740,296	2.0	$656	100.0
2046	$9,613,426	$1,809,908	$0	$1,809,908	2.0	$703	100.0
2047	$9,997,963	$1,882,304	$0	$1,882,304	2.0	$754	100.0
2048	$10,397,882	$1,957,597	$0	$1,957,597	2.0	$809	100.0
2049	$10,813,797	$2,035,900	$0	$2,035,900	2.0	$867	100.0
2050	$11,246,349	$2,117,336	$0	$2,117,336	2.0	$930	100.0
2051	$11,696,203	$2,202,030	$0	$2,202,030	2.0	$998	100.0
2052	$12,164,051	$2,290,111	$0	$2,290,111	2.0	$1,070	100.0
2053	$12,650,613	$2,381,716	$0	$2,381,716	2.0	$1,148	100.0
2054	$13,156,637	$2,476,984	$0	$2,476,984	2.0	$1,231	100.0
2055	$13,682,903	$2,576,063	$0	$2,576,063	2.0	$1,320	100.0
2056	$14,230,219	$2,679,106	$0	$2,679,106	2.0	$1,416	100.0
2057	$14,799,428	$2,786,270	$0	$2,786,270	2.0	$1,519	100.0

** Beginning of Fiscal Year

EXHIBITS

Exhibit 1 - Age/Service Distribution with Salary as of January 1, 2025

Attained Age	Average Salary <5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	Total
< 20	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
20-24	2	0	0	0	0	0	0	0	0	2
	23,636	0	0	0	0	0	0	0	0	23,636
25-29	45	0	0	0	0	0	0	0	0	45
	40,765	0	0	0	0	0	0	0	0	40,765
30-34	69	11	0	0	0	0	0	0	0	80
	48,471	73,812	0	0	0	0	0	0	0	51,955
35-39	44	38	3	0	0	0	0	0	0	85
	52,245	78,250	104,648	0	0	0	0	0	0	65,721
40-44	32	10	24	6	0	0	0	0	0	72
	52,278	78,710	91,016	70,226	0	0	0	0	0	70,358
45-49	20	13	14	13	3	0	0	0	0	63
	47,338	62,794	93,599	89,923	60,573	0	0	0	0	70,225
50-54	24	5	6	5	11	4	0	0	0	55
	40,821	75,438	61,507	74,470	99,265	63,270	0	0	0	62,605
55-59	19	8	7	3	8	8	2	0	0	55
	34,133	51,018	45,925	77,806	76,270	114,970	115,165	0	0	61,306
60-64	13	16	17	15	7	12	7	2	0	89
	48,069	59,693	60,842	53,884	70,278	95,552	114,316	115,339	0	68,450
65-69	10	10	10	10	16	8	2	4	0	70
	36,770	72,474	75,494	60,607	58,175	77,530	73,084	99,343	0	64,972
70+	3	7	3	4	9	0	3	3	1	33
	42,461	43,711	75,812	37,246	37,523	0	53,672	50,450	82,411	54,216
Total Employees	281	118	84	56	54	32	14	9	1	649
Average Salary	45,882	69,153	77,570	67,133	67,486	91,866	95,552	86,600	82,411	62,186

Exhibit 2 - Retiree Distribution as of January 1, 2025

	Number of Employees			Total Payments		
Attained Age	Female	Male	Total	Female	Male	Total
< 20	1	0	0	53,859	0	53,859
20-24	0	0	0	0	0	0
25-29	0	0	0	0	0	0
30-34	1	0	0	4272	0	4,272
35-39	0	0	0	0	0	0
40-44	0	0	0	0	0	0
45-49	0	1	1	0	34,895	34,895
50-54	0	3	3	0	194,493	194,493
55-59	8	15	23	85,114	822,791	907,905
60-64	28	35	63	590,546	2,388,092	2,978,638
65-69	47	44	91	870,984	2,345,019	3,216,003
70-74	57	48	105	1,219,256	2,267,939	3,487,195
75-79	44	30	74	963,681	1,193,925	2,157,606
80-84	26	29	55	619,573	1,227,154	1,846,727
85-89	17	8	25	383,238	316,041	699,279
90-94	9	7	16	221,223	233,759	454,982
95+	3	0	3	62,679	0	62,679
Total	241	220	459	5,074,425	11,024,108	16,098,532
Average (Age/Payment)	73.78	71.49	72.68	21,056	50,110	35,073
Frequency Percent	52.5	47.5	100.0	31.5	68.5	100.0

Exhibit 3 - Disabled Retiree Distribution as of January 1, 2025

	Number of Employees			Total Payments		
Attained Age	Female	Male	Total	Female	Male	Total
< 20	0	0	0	0	0	0
20-24	0	0	0	0	0	0
25-29	0	0	0	0	0	0
30-34	0	0	0	0	0	0
35-39	0	0	0	0	0	0
40-44	1	1	2	55,593	73,729	129,322
45-49	0	1	1	0	54,323	54,323
50-54	0	2	2	0	117,868	117,868
55-59	2	3	5	101,431	234,144	335,576
60-64	1	10	11	54,671	646,823	701,494
65-69	0	5	5	0	243,378	243,378
70-74	1	6	7	31,145	312,478	343,623
75-79	0	2	2	0	98,187	98,187
80-84	1	2	3	17,856	56,387	74,243
85-89	0	0	0	0	0	0
90-94	0	0	0	0	0	0
95-99	0	1	1	0	38,472	38,472
Total	6	33	39	260,697	1,875,789	2,136,486
Average (Age/Payment)	62.3	66.3	65.6	43,449	56,842	54,782
Frequency Percent	15.4	84.6	100.0	12.2	87.8	100.0

EXHIBIT 4 - CASHFLOW FORECAST:

The following is a 30 year forecast of benefit payments net of state reimbursable COLA payments, Contribution Income and Investment Returns.

Plan Year Ending	Benefit Payments	Employee Contributions	Employer Contributions	Investment Returns	Net change in plan assets
2025	$23,757,665	$3,823,731	$11,682,752	$17,473,468	$9,222,286
2026	20,545,886	4,013,321	12,086,198	18,273,110	13,826,743
2027	21,139,493	4,211,961	12,317,022	19,260,477	14,649,968
2028	21,764,610	1,765,812	5,967,026	20,072,049	6,040,277
2029	22,424,284	4,638,090	1,478,537	20,516,951	4,209,294
2030	23,030,202	4,866,479	1,493,287	20,799,008	4,128,572
2031	23,560,602	5,105,717	1,506,851	21,077,903	4,129,869
2032	23,994,938	5,356,309	1,519,111	21,360,315	4,240,797
2033	24,343,205	2,680,326	1,529,940	21,653,840	1,520,901
2034	24,696,528	5,893,676	1,539,206	21,963,037	4,699,391
2035	25,054,978	6,181,575	1,546,765	22,289,465	4,962,827
2036	25,418,631	6,483,076	1,552,466	22,634,821	5,251,731
2037	25,787,563	6,798,806	1,556,148	23,000,951	5,568,343
2038	26,161,849	7,129,422	1,557,641	23,389,866	5,915,081
2039	26,541,567	3,676,708	1,556,763	23,803,752	2,495,656
2040	26,926,797	7,838,085	1,553,323	24,244,983	6,709,594
2041	27,317,618	8,217,597	1,547,117	24,716,139	7,163,235
2042	27,714,112	8,546,301	1,609,002	25,217,577	7,658,768
2043	28,116,360	8,888,153	1,673,362	25,754,585	8,199,740
2044	28,524,447	9,243,679	1,740,296	26,330,449	8,789,978
2045	28,938,456	9,613,426	1,809,908	26,948,731	9,433,608
2046	29,358,475	9,997,963	1,882,304	27,613,292	10,135,084
2047	29,784,590	10,397,882	1,957,597	28,328,315	10,899,204
2048	30,216,890	10,813,797	2,035,900	29,098,335	11,731,142
2049	30,655,464	11,246,349	2,117,336	29,928,255	12,636,476
2050	31,100,404	11,696,203	2,202,030	30,823,386	13,621,215
2051	31,551,802	12,164,051	2,290,111	31,789,474	14,691,834
2052	32,009,751	12,650,613	2,381,716	32,832,733	15,855,311
2053	32,474,347	13,156,637	2,476,984	33,959,885	17,119,159
2054	33,443,786	13,682,903	2,576,063	35,160,453	17,975,634

EXHIBIT 5 – SUMMARY OF PLAN PROVISIONS:

This summary is prepared in accordance with Chapter 32 as of January 1, 2025, and does not take into account any subsequent changes.

1. Administration

Each of the 104 contributory retirement systems for public employees of the Commonwealth of Massachusetts are guided by the applicable provisions of Chapter 32 of the Massachusetts General Laws and other applicable statutes. Although these boards operate semi-independently, there is a uniform set of rules governing benefits, eligibility, contributions, financing, and accounting.

2. Participation

Participation is mandatory for all full-time employees whose employment commences prior to age 65. Eligibility with respect to part-time, professional, temporary, or intermittent employment is governed by the local board. Membership is optional for certain elected officials, State officials appointed by the Governor, and certain hospital interns.

There are four classes of membership as follows:

(i) Group 1: Most general employees in State and local government

(ii) Group 2: Certain specified hazardous duty positions

(iii) Group 3: State police officers and inspectors

(iv) Group 4: Local police officers, firefighters, and designated employees of the municipal light department.

For members in more than one group, participation will be proportional.

Chapter 176 of the Acts of 2011 created different plan provisions within these groups for those hired on or after April 2, 2012.

3. Salary

Salary is defined as gross regular compensation. Salary does not include bonuses, overtime, severance pay, unused sick leave credit, or other similar compensation.

4. Member Contributions

Member contributions vary depending upon date hired as follows:

Date of Hire	Member Contribution Rate
Prior to 1975	5.0% of Salary
1975 to 1983	7.0% of Salary
1984 to 1996	8.0% of Salary
1996 and Later plus	9.0% of Salary
1979 and Later	2.0% of Salary in excess of $30,000

For Group 1 employees who become members on or after April 2, 2012, the Contribution Rate shall be 6% after the completion of 30 years of service.

5. Average Salary

Average salary is used to determine a participant's benefit. It is defined as the average salary during the three consecutive-year period that produces the highest average. (Alternatively, if a greater amount results, it is the average rate of salary earned during the period or periods, whether or not consecutive, that constitutes the last three years preceding retirement.). For employees who become members on or after April 2, 2012, the averaging period shall be five years.

6. Creditable Service

In general, creditable service is awarded during the period in which a member contributes to the retirement system.

7. **Service Retirement**

a. Eligibility:

For an employee to be eligible for service retirement (also referred to as superannuation), one of the following conditions must be met:

(i) completion of 20 years of service, if hired before April 2, 2012

(ii) for an employee hired prior to January 1, 1978, attainment of age 55 as an active member

(iii) for an employee hired on or after January 1, 1978, attainment of age 55 as an active member and completion of ten years of service

(iv) for a Group 1 employee hired on or after April 2, 2012, attainment of age 60 and completion of ten years of service

b. Benefit Amount:

The retirement allowance is determined as a product of the participant's Benefit Rate times Average Salary times Creditable Service, where Benefit Rate is determined from the following table for those hired prior to April 2, 2012:

Age at Retirement	Percentage of Average Salary Group 1	Group 2	Group 4
65 or Over	.025	.025	.025
64	.024	.025	.025
63	.023	.025	.025
62	.022	.025	.025
61	.021	.025	.025
60	.020	.025	.025
59	.019	.024	.025
58	.018	.023	.025
57	.017	.022	.025
56	.016	.021	.025
55	.015	.020	.025
54	.014	.014	.024
53	.013	.013	.023
52	.012	.012	.022
51	.011	.011	.021
50	.010	.010	.020
49	.009	.009	.019
48	.008	.008	.018
47	.007	.007	.017
46	.006	.006	.016
45	.005	.005	.015
44	.004	.004	.004
43	.003	.003	.003
42	.002	.002	.002
41	.001	.001	.001

For those hired after April 1, 2012 who retire with less than 30 years of service, the following rates are applied:

Age at	Percentage of Average Salary		
Retirement	Group 1	Group 2	Group 4
67 or Over	.0250	.0250	.0250
66	.0235	.0250	.0250
65	.0220	.0250	.0250
64	.0205	.0250	.0250
63	.0190	.0250	.0250
62	.0175	.0250	.0250
61	.0160	.0235	.0250
60	.0145	.0220	.0250
59		.0205	.0250
58		.0190	.0250
57		.0175	.0250
56		.0160	.0235
55		.0145	.0220
54			.0205
53			.0190
52			.0175
51			.0160
50			.0145

For those hired after April 1, 2012 who retire with at least 30 years of service, the following rates are applied:

Age at Retirement	Percentage of Average Salary Group 1	Group 2	Group 4
67 or Over	.02500	.02500	.02500
66	.02375	.02500	.02500
65	.02250	.02500	.02500
64	.02125	.02500	.02500
63	.02000	.02500	.02500
62	.01875	.02500	.02500
61	.01750	.02375	.02500
60	.01625	.02250	.02500
59		.02125	.02500
58		.02000	.02500
57		.01875	.02500
56		.01750	.02375
55		.01625	.02250
54			.02125
53			.02000
52			.01875
51			.01750
50			.01625

8. Deferred Vested Retirement

a. Eligibility:

A participant who has completed ten or more years of creditable service is eligible for a deferred vested retirement benefit. If termination is involuntary, the participant is vested after six years.

b. Benefit Amount:

The participant's accrued benefit is payable commencing at age 55, or may be deferred until later at the employee's option.

c. Refund of Contributions:

In lieu of the deferred pension benefit, a member may elect to receive a refund of their accumulated contributions with interest.

9. Accidental Disability

a. Eligibility:

Participants are eligible for an accidental disability benefit, regardless of service or age, if they become permanently and totally incapacitated for further duty as a result of personal injury sustained while in the performance of duties.

b. Benefit Amount:

The accidental disability amount is 72% of annual salary plus $450 per year for each child plus an additional annuity based upon accumulated Member Contributions with credited interest.

10. Ordinary Disability

a. Eligibility:

An ordinary disability occurs when a member becomes permanently and totally disabled due to sickness or injury that is not job related. In order to be eligible for an ordinary disability benefit, a member must have ten years of service (and be less than age 55 or age 60 if hired on or after April 2, 2012).

b. Benefit Amount:

The ordinary disability amount is equal to the accrued retirement benefit as if the member were age 55 (age 60 if hired on or after April 2, 2012). If the member was a veteran, the benefit is 50% of the member's final rate of Salary during the preceding 12 months, plus an annuity based upon accumulated Member Contributions plus credited interest. If the participant is over age 55 (age 60 if hired on or after April 2, 2012), he will receive not less than the superannuation allowance to which he is entitled.

11. Survivor Benefits

a. Occupational Death:

The survivors of a member who dies due to an occupational injury will be entitled to a lump sum return of contributions plus a pension benefit equal to 72% of the participant's annual Salary.

b. Non-Occupational Death:

Upon the death of a member other than due to an occupational injury, the designated beneficiary will be entitled to a retirement benefit as if Option C had been elected with a minimum of $250 per month to the surviving spouse, plus $120 for the first child, plus $90 for each additional child. If no beneficiary is designated and if the employee worked two years, and is married at least one year, the spouse may elect benefits. If there is no designated beneficiary or surviving spouse, then member contributions are returned. If there are dependent children but no surviving spouse, they may elect minimum survivor benefits of $250 per month plus $120 for the first child and $90 for each additional child.

c. Refund of Contributions:

Upon the death of a member not entitled to survivor benefits, the beneficiary is entitled to a refund of all member contributions with interest.

12. Cost-of-Living Increases

In accordance with the adoption of Chapter 17 of the Acts of 1997, the granting of a cost-of-living adjustment will be determined by an annual vote by the Retirement Board. The amount of increase will be based upon the Consumer Price Index, limited to a maximum of 3.0%, beginning on July 1. All retirees, disabled retirees, and beneficiaries who have been receiving benefits payments for at least one year as of July 1 are eligible for the adjustment. The maximum amount of pension benefit subject to a COLA is $15,000. All COLAs granted to members after 1981 and prior to July 1, 1998 are deemed to be an obligation of the State and are not the liability of the Retirement System.

13. Postretirement Death Benefits

Any benefits following the death of a member after retirement are based upon the form of benefit the participant elected at the time of retirement. There are three available forms as follows:

(i) Option A – Life annuity

(ii) Option B – Life annuity with death benefit equal to excess of member contributions plus credited interest to retirement over annuity benefit paid to member

(iii) Option C – Life annuity with 66-2/3% of benefit continued after death of member to designated joint annuitant

EXHIBIT 6 – ACTUARIAL METHODS AND ASSUMPTIONS:

The actuarial cost method, factors, and assumptions used in determining cost estimates are presented below.

1. Member Data

The member data used in the determination of cost estimates consist of pertinent information with respect to the active, inactive, retired, and disabled members of the employer as supplied by the employer to the actuary.

2. Valuation Date

January 1, 2025.

3. Actuarial Cost Method

The costs of the Plan have been determined in accordance with the individual entry age normal actuarial cost method.

4. Rate of Investment Return

It is assumed that the assets of the fund will accumulate at a compound annual rate of 7.25% per annum.

5. Salary Scale

It is assumed that salaries including longevity will increase at a rate of 3.75% per year.

6. Cost-of-Living Increases

Cost-of-living increases have been assumed to be 3.0% of the lesser of the pension amount and $15,000 per year.

7. Value of Investments

Assets held by the fund are valued at market value as reported by the Public Employees' Retirement Administration Commission (PERAC). The actuarial value of assets is determined using a five-year smoothing of asset returns greater than or less than the assumed rate of return.

8. Annual Rate of Withdrawal Prior to Retirement

Based on an analysis of experience, the assumed annual rates of withdrawal may best be illustrated by the following rates at the following ages:

Service	General Employees	Police and Fire Employees
0	0.2080	0.1500
5	0.1020	0.1000
10	0.0650	0.0600
15	0.0417	0.0600
20	0.0400	0.0000
30	0.0000	0.0000

9. Annual Rate of Mortality

It is assumed that mortality for is represented by the various SOA Pub-2010 Public Retirement Plans Mortality Tables specific to the Group, Pre-retirement versus Post, Disabled and Beneficiaries, with Scale MP-2018 improvements until 2025.

10. Service Retirement

Based on an analysis of experience, the assumed annual retirement rates are illustrated at the following ages for those hired prior to April 2, 2012:

Age	Male General Employees	Female General Employees	Male and Female Police and Fire Employees
50	0.0360	0.1019	0.0382
51	0.0405	0.0714	0.0351
52	0.0437	0.0562	0.0436
53	0.0366	0.0448	0.0527
54	0.0451	0.0488	0.0999
55	0.0477	0.0469	0.1110
56	0.0574	0.0518	0.1413
57	0.0632	0.0509	0.1292
58	0.0765	0.0552	0.1499
59	0.0917	0.0645	0.1679
60	0.1057	0.0774	0.1871
61	0.1224	0.1038	0.2073
62	0.1473	0.1168	0.2176
63	0.1777	0.1440	0.3338
64	0.2136	0.1708	0.5664
65	0.2615	0.1939	1.00000
66	0.2682	0.1959	1.00000
67	0.2500	0.2000	1.00000
68	0.2500	0.2000	1.00000
69	0.2500	0.2000	1.00000
70 to 76	0.2500	0.2500	1.00000
77 to 79	0.3500	0.2500	1.00000
80	1.0000	1.0000	1.00000

Based on an analysis of experience, the assumed annual retirement rates are illustrated at the following ages for those hired on or after April 2, 2012:

Age	Male General Employees	Female General Employees	Male and Female Police and Fire Employees
50	0.0000	0.0000	0.0191
51	0.0000	0.0000	0.0176
52	0.0000	0.0000	0.0436
53	0.0000	0.0000	0.0211
54	0.0000	0.0000	0.0266
55	0.0000	0.0000	0.0370
56	0.0000	0.0000	0.1060
57	0.0000	0.0000	0.1938
58	0.0000	0.0000	0.1499
59	0.0000	0.0000	0.1119
60	0.0477	0.0469	0.0936
61	0.0574	0.0518	0.1555
62	0.0632	0.0509	0.1741
63	0.0765	0.0552	0.2670
64	0.0917	0.0645	0.4720
65	0.1057	0.0774	0.2500
66	0.1224	0.1038	0.3000
67	0.1473	0.1168	1.0000
68	0.1777	0.1440	1.0000
69	0.2136	0.1708	1.0000
70	0.2615	0.1939	1.0000
70 to 76	0.2682	0.1959	1.0000
77 to 79	0.2500	0.2000	1.0000
80	0.2500	0.2000	1.0000

12. Annual Rate of Disability Prior to Retirement

Based on an analysis of experience, the assumed annual rates of disability may best be illustrated by the following probabilities at the following ages:

Attained Age	General Employees	Police and Fire Employees
20	0.000100	0.000500
30	0.000152	0.000967
40	0.000663	0.002500
50	0.001271	0.007634

In addition, it is assumed for the general employees that 20% of all disabilities are ordinary (80% are service connected). For police and fire employees, 10% of all disabilities are assumed to be ordinary (90% are service connected).

13. Family Composition

It is assumed that 80% of all members will be survived by a spouse and that females (males) are three years younger (older) than members.

14. Administrative Expenses

The normal cost is increased by an amount equal to the anticipated administrative expenses for the upcoming fiscal year. The amount for fiscal year 2025 is $371,000 and is anticipated to increase at 4.5% per year.

EXHIBIT 7 – GLOSSARY OF TERMS:

This glossary summarizes the technical terms contained in this report.

1. **Actuarial Accrued Liability**

   That portion of the Actuarial Present Value of plan benefits that is not provided for by future employer Normal Costs or employee contributions.

2. **Actuarial Assumptions**
   Assumptions as to the occurrence of future events affecting the Retirement System such as:

   - Rates of investment returns
   - Increases in a member's salary
   - Inflation
   - The probability of mortality, turnover, disablement
   - Retirement at each age and other relevant items

3. **Actuarial Cost Method**

   A procedure for allocating the Actuarial Present Value of pension plan benefits between Normal Cost and Actuarial Accrued Liability.

4. **Actuarial Present Value**

   The single sum amount required at the valuation date that is required to provide for anticipated future events based upon the terms of the plan and the Actuarial Assumptions.

5. **Forecast**

   A projection of future benefit payments or contribution requirements based upon the terms of the plan, the current asset amounts, the Actuarial Assumptions, and additional assumptions as to the replacement of terminating employees with new employees.

6. Normal Cost

That portion of the Actuarial Present Value of future benefits that is assigned to the current year.

7. Unfunded Actuarial Accrued Liability

That portion of the Actuarial Accrued Liability that is not provided for by current actuarial value of assets.

8. Valuation Method

The method used to divide the cost of future benefits among the Actuarial Accrued Liability, the current year's Normal Costs, and future years' Normal Costs. The resulting current funding requirement is then determined as the current year's Normal Cost plus the payment necessary to amortize the Unfunded Actuarial Liability.

9. Vested Liability

That portion of the Actuarial Present Value of Accrued Benefits that a member would be entitled to if the member terminated employment with the employer as of the valuation date.

CERTIFICATION:

This report fairly represents the actuarial position of the Marlborough Retirement System contributing as of January 1, 2025, in accordance with generally accepted actuarial principles applied consistently with the preceding valuation. In our opinion, the actuarial assumptions used to compute actuarial accrued liability and normal cost are reasonably related to plan experience and to reasonable expectations, and represents our best estimate of anticipated plan experience.

The funded status measure is appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations. The funded status measure is appropriate for assessing the need for or the amount of future contributions. The funded status measure would be different if the measure reflected the market value of assets rather than the actuarial value of assets.

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. Due to the limited scope of our assignment, we did not perform an analysis of the potential range of such future measurements.

The report was prepared under the supervision of Daniel Sherman, an Associate of the Society of Actuaries and a Member of the American Academy of Actuaries, who takes responsibility for the overall appropriateness of the analysis, assumptions and results. Daniel Sherman is deemed to meet the General Qualification Standard and the basic education and experience requirement in the pension area. Based on over thirty years of performing valuations of similar complexity, Mr. Sherman is qualified by experience. Daniel Sherman has met the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Sherman Actuarial Services, LLC

Daniel W. Sherman

Daniel W. Sherman, ASA, MAAA

September, 2025

BREAKOUTS

https://shermanactuary-my.sharepoint.com/personal/dan_shermanactuary_com/Documents/Recovered Data/Marlborough/Val25/[Marlb2025_Val 7_25 15k COLA v2.xlsm]Actuarybreak

Breakouts

	Total	City	Fire	Police	School	Water	Sewer	Housing
(1) Payroll of Active Participants	$41,785,163	$11,148,011	$7,158,904	$7,619,614	$13,393,781	$1,286,581	$640,416	$537,856
Pecentage of Total Payroll	100.00%	26.68%	17.13%	18.24%	32.05%	3.08%	1.53%	1.29%
(2) Normal Cost								
(a) Employee	3,823,731	1,031,307	668,502	728,268	1,162,480	122,556	61,300	49,318
(b) Employer	990,322	179,964	216,864	256,295	323,004	9,631	(114)	4,678
(c) Expenses	371,000	93,348	68,232	75,876	114,480	10,187	4,715	4,161
(d) Total Employer Normal Cost	1,361,322	273,312	285,096	332,171	437,484	19,818	4,601	8,839
(a) Accrued Liability	280,833,947	69,291,948	67,239,687	72,951,841	55,233,757	12,490,620	1,471,273	2,154,823
(4) Total Employer Contribution								
(a) Amortizations	10,035,835	2,476,205	2,402,866	2,606,995	1,973,824	446,363	52,578	77,004
(b) Employer Normal Cost	990,322	179,964	216,864	256,295	323,004	9,631	(114)	4,678
(c) Administrative Expenses*	371,000	93,348	68,232	75,876	114,480	10,187	4,715	4,161
(d) Total Appropriation	$11,397,157	$2,749,517	$2,687,962	$2,939,166	$2,411,308	$466,181	$57,179	$85,843
(e) As a percentage of Payroll	27.28%	24.66%	37.55%	38.57%	18.00%	36.23%	8.93%	15.96%
(5) Fiscal 2027 Appropriation	$12,086,198	$2,915,745	$2,850,468	$3,116,860	$2,557,089	$494,365	$60,636	$91,033
Percent of Total Appropriation	100.00%	24.12%	23.58%	25.79%	21.16%	4.09%	0.50%	0.75%
(6) Fiscal 2028 Appropriation	$12,317,022	$2,971,430	$2,904,907	$3,176,387	$2,605,925	$503,807	$61,794	$92,772
Percent of Total Appropriation	100.00%	24.12%	23.58%	25.79%	21.16%	4.09%	0.50%	0.75%