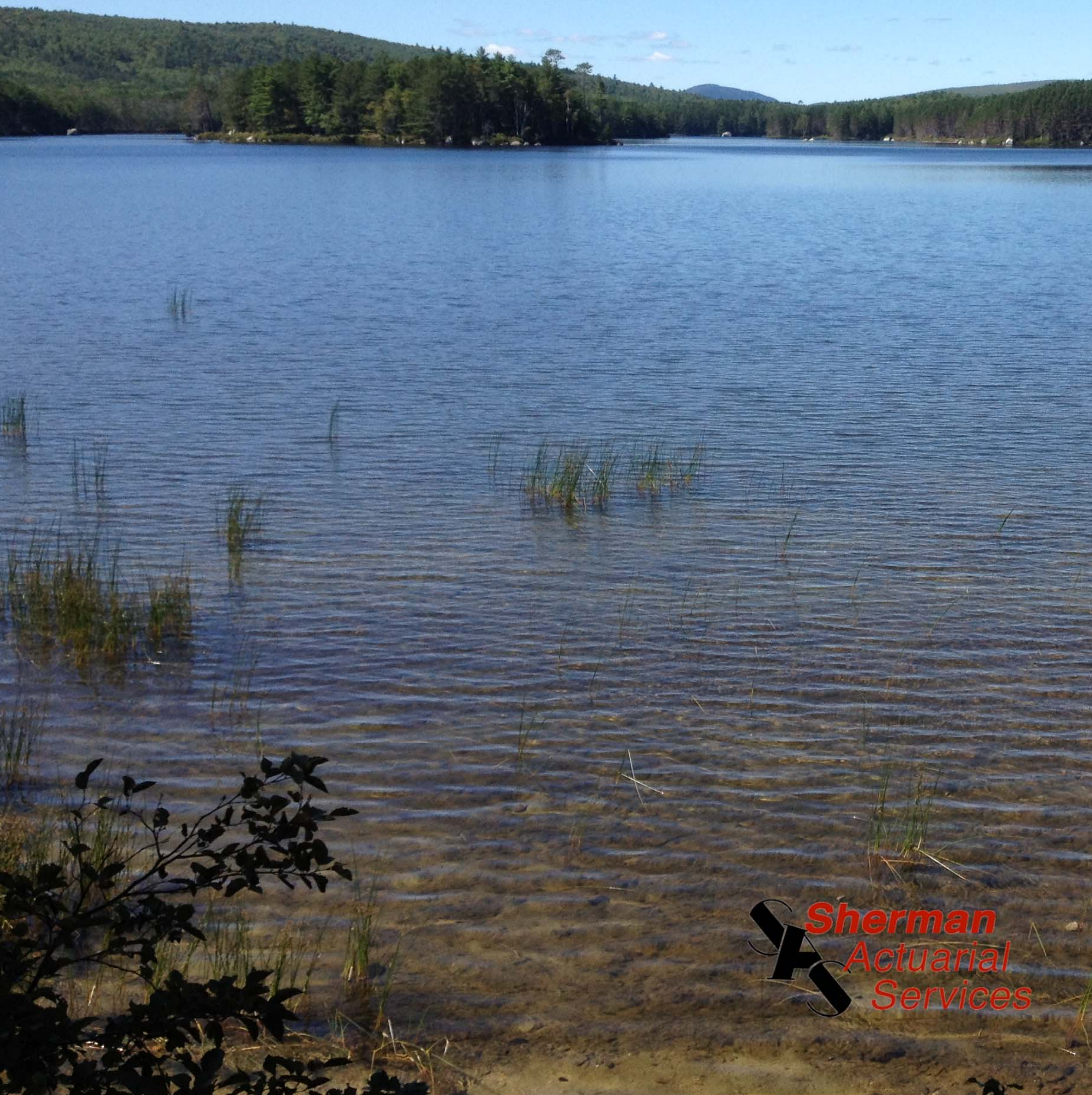
TAUNTON
CONTRIBUTORY RETIREMENT SYSTEM

Actuarial Valuation Report
January 1, 2020



Sherman Actuarial Services

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Report Summary:

Highlights	**January 1, 2018**	**January 1, 2020**
Contributions		
Funding Schedule FY 2021	$17,023,066	$17,023,066
Funding Schedule FY 2022	17,321,583	18,794,418
Funded Ratios		
Funding	79.6%	74.5%
Participants		
Actives	1,073	1,061
Retirees and Beneficiaries	778	815
Inactives	189	239
Disabled	89	92
Total	2,129	2,207
Payroll		
Payroll of Active Members	$62,755,282	$67,239,674
Average Payroll	58,486	63,374
Normal Cost		
Employer	2,528,502	2,531,557
Employee	5,646,140	6,077,886
Administrative Expenses	600,000	650,000
Total	8,774,642	9,259,443
Actuarial Accrued Liabilities		
Actives	164,143,978	189,862,793
Retirees, Beneficiaries, Disabilities and Inactives	234,034,760	275,147,972
Total	398,178,738	465,010,765
Actuarial Value of Assets	317,021,969	346,384,426
Unfunded Actuarial Accrued Liabilities	$81,156,769	$118,626,339

Introduction

This report presents the findings of an actuarial valuation as of January 1, 2020, of Taunton Contributory Retirement System.

The actuarial valuation is based on:

- Provisions Chapter 32 of the Massachusetts General Laws, "M.G.L", as of January 1, 2020.
- Employee data provided by the Retirement Board
- Asset information reported to the Public Employee Retirement Administration Commission by the City of Taunton Contributory 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, 2020.

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 year, based on the 2018 actuarial assumptions and plan provisions, the total unfunded actuarial accrued liability increased by 20.7% to $97,857,511. The increase is the result net unfavorable actuarial experience during the preceding years. The sources of actuarial (gains) and losses are as follows:

Assets	12,449,929
Retirements	8,464,519
Terminations	(974,619)
Death while active	(464,253)
Disabled while active	(688,451)
Salary	4,936,998
New Participants	1,334,372
Inactive Mortality and data	4,109,855
Benefit Payments	(3,290,306)
Other	5,575,006
Total (Gain) / Loss	38,437,963

In addition, the mortality assumptions were updated based on the recent Society of Actuaries study of public sector pension plans. The change increased the actuarial accrued liability by $20,768,828.

https://shermanactuary-my.sharepoint.com/personal/dan_shermanactuary_com/Documents/Recovered Data/Taunton/2020/[Taunton2020_Val - 775% proposed Mortality.xlsm]Inputs

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, 2018	January 1, 2020
Superannuation	$5,250,732	$5,708,351
Termination	1,294,158	1,366,039
Death	428,354	275,574
Disability	1,201,398	1,259,479
Administrative Expenses	600,000	650,000
Total Normal Cost	8,774,642	9,259,443
% of Pay	14.0%	13.8%
Employee Contributions	5,646,140	6,077,886
% of Pay	9.0%	9.0%
Employer Normal Cost	$3,128,502	$3,181,557
% of Pay	5.0%	4.7%

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, 2018	January 1, 2020
Actives		
Superannuations	$157,404,384	$184,571,962
Termination	(4,281,869)	(4,496,646)
Death	4,617,459	2,825,246
Disability	6,404,004	6,962,231
Retirees and Inactives		
Retirees and Beneficiaries	201,947,343	237,461,469
Terminated (Refund)	2,281,858	3,041,201
Disabled	29,805,559	34,645,302
Total	$398,178,738	$465,010,765

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, 2018	January 1, 2020
Actives		
Superannuation	$197,976,401	$228,576,855
Termination	5,733,248	6,144,022
Death	7,817,069	4,998,706
Disability	16,840,166	17,894,253
Retirees and Inactives		
Retirees and Beneficiaries	201,947,343	237,461,469
Terminated (Refund)	2,281,858	3,041,201
Disabled	29,805,559	34,645,302
Total	$462,401,644	$532,761,808

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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, 2018	January 1, 2020
Cash equivalents	$5,748,262	$6,705,272
Short term investments	747,383	0
Fixed income securities	47,547,904	47,464,103
Equities	156,755,607	184,768,001
International	52,933,199	58,562,948
Real Estate	37,880,420	36,128,157
Venture Capital	0	0
Other	12,203,951	10,876,902
Accounts receivable	8,282,125	16,280,422
Accounts payable	(322,910)	(66,898)
Accrued income	197,794	143,988
Total Market Value	$321,973,735	$360,862,895
Total Actuarial Value	$317,021,969	$346,384,426

Actuarial Value of Assets

The actuarial value of assets is determined by projecting the market value of assets as of the beginning of the prior plan year with the assumed rate of return during that year (7.75%) 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, 2020 is presented in Table V.

Table V

		January 1, 2020
(1)	Market value at January 1, 2019	$304,094,669
(2)	2019 Contributions	$24,946,175
(3)	2019 Payments	($29,530,694)
(4)	Net interest adjustment at 7.75% on (1), (2), and (3) to December 31, 2019	$23,374,883
(5)	Expected market value on January 1, 2020 (1) + (2) + (3) + (4)	$322,885,033
(6)	Actual market value on January 1, 2020	$360,862,895
(7)	2019 (Gain) / Loss	($37,977,862)
(8)	80% of 2019 (Gain) / Loss	($30,382,290)
(9)	2018 (Gain) / Loss	$38,666,553
(10)	60% of 2018 (Gain) / Loss	$23,199,932
(11)	2017 (Gain) / Loss	($20,460,422)
(12)	40% of 2017 (Gain) / Loss	($8,184,169)
(13)	2016 (Gain) / Loss	$4,440,290
(14)	20% of 2016 (Gain) / Loss	$888,058
(15)	Actuarial value on January 1, 2020, (6) + (8) + (10) + (12) + (14) but not less than 80% nor greater than 120% of (6)	$346,384,426
(16)	Ratio of actuarial value to market value	95.99%
(17)	Market Value Return for 2018	-4.34%
(18)	Market Value Return for 2019	20.33%
(19)	Actuarial Value Return for 2018	4.89%
(20)	Actuarial Value Return for 2019	6.91%

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, 2018	January 1, 2020
Actuarial Accrued Liability	$398,178,738	$465,010,765
Actuarial Assets	317,021,969	346,384,426
Unfunded Actuarial Accrued Liability	$81,156,769	$118,626,339
Funded Status	79.6%	74.5%

Appropriations

The pension appropriation for the upcoming fiscal years have been calculated in accordance with the requirements set forth in Section 22D 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, 2030
  $ 117,555,738 over 10 years with 4.5% increasing payments
- Increasing amortization of the FY04 Appropriation Deferral by June 30, 2026
  $ 948,599 over 6 years with 4.5% increasing payments
- Increasing amortization of the 2004 Early Retirement Incentive by June 30, 2021
  $ 122,002 over 1 years with 4.5% increasing payments
- Interest adjustment for payments contributed quarterly over fiscal year.

The pension appropriation for FYE22 is shown in Table VII.

Table VII

	January 1, 2018	January 1, 2020
Normal cost	$3,128,502	$3,181,557
Amortization of the unfunded accrued liability	11,789,445	13,440,618
Amortization of the FY04 Deferral	132,178	132,178
Amortization payment of 2004 ERI liability	94,106	94,106
Total cost before interest adjustments	$15,144,231	$16,848,459
Fiscal 2021 cost	$16,346,018	$17,023,066
Fiscal 2022 cost	$16,598,250	$18,794,418

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 4.5% per year. The employee contribution rate is expected to increase to 10.5% by 2036 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 9 years until the unfunded liabilities are substantially paid off, at which time only the normal cost will remain. The total cost represents 26.7% of payroll, decreasing to 25.6% by the time the unfunded liabilities are fully paid off, leaving only a normal cost of about 3.5% 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	Payroll*	Employee Contribution	Employer Normal Cost with Interest	Amortization Payments with Interest	Employer Total Cost with Interest	Employer Total Cost % of Payroll	Funded Ratio %**
2021	$67,239,674	$6,077,886	$3,395,551	$13,627,515	$17,023,066	25.3	74.3
2022	$70,265,459	$6,419,823	$3,475,316	$15,319,102	$18,794,418	26.7	76.0
2023	$73,427,405	$6,780,227	$3,555,384	$16,008,461	$19,563,845	26.6	78.1
2024	$76,731,638	$7,160,066	$3,635,620	$16,728,842	$20,364,462	26.5	80.2
2025	$80,184,562	$7,560,362	$3,715,878	$17,481,640	$21,197,518	26.4	82.5
2026	$83,792,867	$7,982,185	$3,795,997	$18,268,313	$22,064,310	26.3	85.0
2027	$87,563,546	$8,426,662	$3,875,802	$18,853,491	$22,729,293	26.0	87.6
2028	$91,503,906	$8,894,978	$3,955,103	$19,701,898	$23,657,001	25.9	90.4
2029	$95,621,582	$9,388,379	$4,033,692	$20,588,484	$24,622,176	25.7	93.4
2030	$99,924,553	$9,908,174	$4,111,345	$21,514,966	$25,626,311	25.6	96.6
2031	$104,421,158	$10,455,738	$4,187,818	$0	$4,187,818	4.0	100.0
2032	$109,120,110	$11,032,519	$4,262,849	$0	$4,262,849	3.9	100.0
2033	$114,030,515	$11,640,038	$4,336,152	$0	$4,336,152	3.8	100.0
2034	$119,161,888	$12,279,893	$4,407,421	$0	$4,407,421	3.7	100.0
2035	$124,524,173	$12,953,763	$4,476,322	$0	$4,476,322	3.6	100.0
2036	$130,127,761	$13,663,415	$4,542,500	$0	$4,542,500	3.5	100.0
2037	$135,983,510	$14,278,269	$4,746,913	$0	$4,746,913	3.5	100.0
2038	$142,102,768	$14,920,791	$4,960,524	$0	$4,960,524	3.5	100.0
2039	$148,497,392	$15,592,226	$5,183,747	$0	$5,183,747	3.5	100.0
2040	$155,179,775	$16,293,876	$5,417,016	$0	$5,417,016	3.5	100.0
2041	$162,162,865	$17,027,101	$5,660,781	$0	$5,660,781	3.5	100.0
2042	$169,460,194	$17,793,320	$5,915,517	$0	$5,915,517	3.5	100.0
2043	$177,085,902	$18,594,020	$6,181,715	$0	$6,181,715	3.5	100.0
2044	$185,054,768	$19,430,751	$6,459,892	$0	$6,459,892	3.5	100.0
2045	$193,382,233	$20,305,134	$6,750,587	$0	$6,750,587	3.5	100.0
2046	$202,084,433	$21,218,865	$7,054,364	$0	$7,054,364	3.5	100.0
2047	$211,178,233	$22,173,714	$7,371,810	$0	$7,371,810	3.5	100.0
2048	$220,681,253	$23,171,532	$7,703,541	$0	$7,703,541	3.5	100.0
2049	$230,611,909	$24,214,250	$8,050,201	$0	$8,050,201	3.5	100.0
2050	$240,989,445	$25,303,892	$8,412,460	$0	$8,412,460	3.5	100.0
2051	$251,833,970	$26,442,567	$8,791,021	$0	$8,791,021	3.5	100.0
2052	$263,166,499	$27,632,482	$9,186,616	$0	$9,186,616	3.5	100.0

* Calendar basis

** Beginning of Fiscal Year

EXHIBITS

Exhibit 1 - Age/Service Distribution with Salary as of January 1, 2020

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	19	1	0	0	0	0	0	0	0	20
	27,883	0	0	0	0	0	0	0	0	28,858
25-29	59	11	1	0	0	0	0	0	0	71
	47,568	73,767	21,201	0	0	0	0	0	0	51,255
30-34	60	26	6	0	0	0	0	0	0	92
	55,156	65,355	94,672	0	0	0	0	0	0	60,615
35-39	36	14	25	9	0	0	0	0	0	84
	55,920	73,429	71,858	74,246	0	0	0	0	0	65,545
40-44	29	15	17	27	5	0	0	0	0	93
	40,622	76,292	83,393	81,874	72,978	0	0	0	0	67,910
45-49	27	20	18	18	40	5	2	0	0	130
	40,441	57,616	53,808	92,121	102,896	85,918	0	0	0	74,822
50-54	33	27	29	19	28	23	18	2	0	179
	50,804	46,505	51,809	71,040	90,521	106,323	102,847	85,619	0	71,435
55-59	25	19	22	35	32	25	30	11	1	200
	36,158	50,928	50,913	47,693	61,077	79,765	95,595	75,249	77,881	61,915
60-64	13	10	17	21	32	14	15	9	2	133
	40,274	58,281	45,847	54,276	56,598	44,059	59,760	101,057	111,295	56,256
65-69	1	6	4	6	8	7	5	4	3	44
	43,986	61,616	45,036	61,831	57,252	45,509	47,762	52,037	103,771	56,811
70+	3	0	0	2	4	1	5	0	1	16
	27,378	0	0	75,493	33,180	77,284	45,815	0	95,959	48,010
Total Employees	305	149	139	137	149	75	75	26	7	1,062
Average Salary	46,422	60,478	60,101	67,283	76,320	78,424	81,112	81,409	101,106	63,334

Exhibit 2 - Retiree Distribution as of January 1, 2020

	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	2	3	19,662	66,759	86,421
45-49	0	2	2	0	43,712	43,712
50-54	3	7	10	38,726	230,357	269,083
55-59	20	17	37	217,108	1,103,296	1,320,404
60-64	41	69	110	626,577	3,976,919	4,603,496
65-69	98	90	188	1,855,518	4,374,462	6,229,980
70-74	79	75	154	1,547,248	3,134,147	4,681,395
75-79	70	59	129	1,275,772	2,051,534	3,327,306
80-84	32	36	68	559,260	1,062,782	1,622,043
85-89	22	35	57	365,911	990,993	1,356,904
90-94	15	14	29	187,299	229,099	416,398
95+	14	14	28	157,786	202,137	359,923
Total	395	420	815	6,850,868	17,466,197	24,317,065
Average (Age/Payment)	32.32	73	73.16	17,344	41,586	29,837
Frequency Percent	48.5	51.5	100.0	28.2	71.8	100.0

Exhibit 3 - Disabled Retiree Distribution as of January 1, 2020

	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	1	0	1	22,759	0	22,759
40-44	0	0	0	0	0	0
45-49	1	2	3	29,491	70,073	99,564
50-54	3	6	9	121,855	344,666	466,521
55-59	4	6	10	76,668	277,638	354,306
60-64	2	10	12	69,383	450,628	520,011
65-69	6	11	17	142,158	484,694	626,852
70-74	0	18	18	0	747,940	747,940
75-79	3	10	13	37,429	398,071	435,499
80-84	1	4	5	10,113	145,988	156,101
85-89	0	2	2	0	37,729	37,729
90-94	0	1	1	0	25,335	25,335
95-99	0	1	1	0	16,046	16,046
Total	21	71	92	509,855	2,998,808	3,508,664
Average (Age/Payment)	62.84	68.89	67.51	24,279	42,237	38,138
Frequency Percent	22.8	77.2	100.0	14.5	85.5	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
2020	$32,822,168	$6,077,886	$17,023,066	$26,490,001	$16,768,785
2021	31,218,750	6,419,823	18,794,418	26,832,836	20,828,326
2022	32,851,233	6,780,227	19,563,845	28,387,754	21,880,593
2023	34,453,115	7,160,066	20,364,462	30,025,731	23,097,144
2024	35,983,649	7,560,362	21,197,518	31,761,070	24,535,301
2025	37,655,155	7,982,185	22,064,310	33,602,900	25,994,241
2026	39,272,499	8,426,662	22,729,293	35,558,008	27,441,465
2027	40,937,861	8,894,978	23,657,001	37,626,073	29,240,192
2028	42,519,024	9,388,379	24,622,176	39,837,222	31,328,752
2029	43,843,264	9,908,174	25,626,311	42,220,518	33,911,739
2030	45,190,805	10,455,738	4,187,818	44,573,949	14,026,700
2031	46,579,764	11,032,519	4,262,849	45,604,676	14,320,281
2032	48,011,412	11,640,038	4,336,152	46,656,696	14,621,473
2033	49,487,063	12,279,893	4,407,421	47,730,568	14,930,819
2034	51,008,069	12,953,763	4,476,322	48,826,900	15,248,916
2035	52,575,823	13,663,415	4,542,500	49,946,339	15,576,431
2036	54,191,763	14,278,269	4,746,913	51,080,681	15,914,100
2037	55,857,369	14,920,791	4,960,524	52,238,792	16,262,737
2038	57,574,169	15,592,226	5,183,747	53,421,440	16,623,244
2039	59,343,735	16,293,876	5,417,016	54,629,462	16,996,618
2040	61,167,690	17,027,101	5,660,781	55,863,768	17,383,960
2041	63,047,704	17,793,320	5,915,517	57,125,349	17,786,481
2042	64,985,502	18,594,020	6,181,715	58,415,291	18,205,524
2043	66,982,859	19,430,751	6,459,892	59,734,776	18,642,561
2044	69,041,605	20,305,134	6,750,587	61,085,101	19,099,217
2045	71,163,627	21,218,865	7,054,364	62,467,681	19,577,283
2046	73,350,871	22,173,714	7,371,810	63,884,071	20,078,724
2047	75,605,341	23,171,532	7,703,541	65,335,971	20,605,703
2048	77,929,103	24,214,250	8,050,201	66,825,245	21,160,593
2049	80,324,286	25,303,892	8,412,460	68,353,938	21,746,004

EXHIBIT 5 – SUMMARY OF PLAN PROVISIONS:

This summary is prepared in accordance with Chapter 32 as of January 1, 2020, 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

(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	Percentage of Average Salary		
Retirement	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. <u>Survivor Benefits</u>

a. <u>Occupational Death</u>:

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. <u>Non-Occupational Death</u>:

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. <u>Refund of Contributions</u>:

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. <u>Cost-of-Living Increases</u>

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, 2020.

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 7.75% per annum.

5. Salary Scale

It is assumed that salaries including longevity will increase at a rate of 3.5% 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	0.0150
5	0.1020	0.0150
10	0.0650	0.0150
15	0.0417	0.0150
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-2019 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	0.0144
51	0.0405	0.0714	0.0144
52	0.0437	0.0562	0.0123
53	0.0366	0.0448	0.0210
54	0.0451	0.0488	0.0569
55	0.0477	0.0469	0.0879
56	0.0574	0.0518	0.0931
57	0.0632	0.0509	0.0897
58	0.0765	0.0552	0.0846
59	0.0917	0.0645	0.1022
60	0.1057	0.0774	0.1455
61	0.1224	0.1038	0.1844
62	0.1473	0.1168	0.2741
63	0.1777	0.1440	0.1984
64	0.2136	0.1708	0.4139
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	0.0072
51	0.0000	0.0000	0.0072
52	0.0000	0.0000	0.0062
53	0.0000	0.0000	0.0105
54	0.0000	0.0000	0.0105
55	0.0000	0.0000	0.0389
56	0.0000	0.0000	0.0631
57	0.0000	0.0000	0.0897
58	0.0000	0.0000	0.0846
59	0.0000	0.0000	0.1022
60	0.0477	0.0469	0.1455
61	0.0574	0.0518	0.1844
62	0.0632	0.0509	0.2741
63	0.0765	0.0552	0.1984
64	0.0917	0.0645	0.4139
65	0.1057	0.0774	1.0000
66	0.1224	0.1038	1.0000
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	1.0000	1.0000	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 30% of all disabilities are ordinary (70% are service connected). For police and fire employees, 5% of all disabilities are assumed to be ordinary (95% 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 2022 is $650,000 and is anticipated to increase at 4.0% per year.

EXHIBIT 7 – GLOSSARY OF TERMS:

This glossary summarizes the technical terms contained in this report.

1. <u>Actuarial Accrued Liability</u>

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

2. <u>Actuarial Assumptions</u>

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. <u>Actuarial Cost Method</u>

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

4. <u>Actuarial Present Value</u>

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. <u>Forecast</u>

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 City of Taunton Retirement System contributing as of January 1, 2020, 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

April, 2020

BREAKOUTS

https://shermanactuary-my.sharepoint.com/personal/dan_shermanactuary_com/Documents/Recovered Data/Taunton/2020/[Taunton2020_Val - 775% proposed Mortality.xlsm]Breakouts

Breakouts

	Non-Light Subtotal	Total	City	GATRA	Landfill	Sewer	Water	Nursing Home	Light	Housing
(1) Participants										
(a) Actives	914	1,061	804	30	2	0	30	0	147	48
(b) Inactives	233	239	99	17	0	0	4	110	6	3
(c) Retirees and Beneficiaries	662	815	572	3	0	8	25	39	153	15
(e) Disabled Retirees	76	92	61	0	0	0	3	10	16	2
(f) Total	1,885	2,207	1,536	50	2	8	62	159	322	68
(2) Payroll of Active Participants	52,069,293	67,239,674	44,895,504	1,470,773	148,810	0	1,877,357	0	15,170,381	3,676,849
Percent of Total Payroll	77.44%	100.00%	66.77%	2.19%	0.22%	0.00%	2.79%	0.00%	22.56%	5.47%
(3) Normal Cost										
(a) Total Normal Cost	6,562,233	8,609,443	5,799,062	167,470	14,054	0	208,641	0	2,047,210	373,008
(b) Expected Employee Contributions	4,669,541	6,077,886	4,024,024	129,058	14,022	0	165,927	0	1,408,345	336,510
(c) Administrative Expenses	476,989	650,000	420,971	5,323	466	1,526	16,686	15,732	173,011	16,286
(d) Net Employer Normal Cost (a) - (b) + (c)	2,369,681	3,181,557	2,196,009	43,735	498	1,526	59,400	15,732	811,876	52,784
(4) Actuarial Accrued Liability	341,238,352	465,010,765	301,163,034	3,807,730	333,424	1,091,678	11,937,315	11,254,345	123,772,413	11,650,830
(5) Assets*	254,186,913	346,384,426	224,334,989	2,836,361	248,366	813,186	8,892,052	8,383,311	92,197,513	8,678,651
(6) Unfunded Actuarial Accrued Liability (4) - (5)	87,051,439	118,626,339	76,828,045	971,369	85,058	278,492	3,045,263	2,871,034	31,574,900	2,972,179
(7) Amortizations										
(a) Unfunded Actuarial Accrued Liability	9,155,420	12,476,232	8,080,200	102,161	8,946	29,290	320,278	301,954	3,320,812	312,592
(b) Early Retirement Incentive	122,002	122,002	112,298	0	0	0	0	9,703	0	0
(c) Holiday	127,051	170,447	116,608	0	68	1,134	5,030	4,212	43,396	0
(8) Total Required Employer Contributions (3d) + (7)	11,774,154	15,950,238	10,505,114	145,896	9,511	31,949	384,708	331,601	4,176,085	365,375
(9) Fiscal 2021 Cost	12,780,814	17,023,066	11,399,594	140,798	6,407	38,874	379,922	515,550	4,242,252	299,670
Percentage of total	75.08%	100.00%	66.97%	0.83%	0.04%	0.23%	2.23%	3.03%	24.92%	1.76%
(10) Fiscal 2022 Cost	13,842,083	18,794,418	12,365,080	176,615	10,967	36,782	452,625	370,855	4,952,335	429,161
Percentage of total	73.65%	100.00%	65.79%	0.94%	0.06%	0.20%	2.41%	1.97%	26.35%	2.28%
(11) Fiscal 2023 Cost	14,407,915	19,563,845	12,867,995	183,405	11,460	38,437	471,705	387,543	5,155,930	447,373
(12) Fiscal 2024 Cost	14,996,643	20,364,462	13,391,132	190,448	11,974	40,167	491,586	404,982	5,367,819	466,355
(13) Fiscal 2025 Cost	15,609,180	21,197,518	13,935,295	197,754	12,512	41,974	512,301	423,207	5,588,338	486,139
(14) Fiscal 2026 Cost	16,246,477	22,064,311	14,501,315	205,331	13,074	43,863	533,886	442,251	5,817,834	506,760

Appropriation Forecast - Municipal Light Plant

Fiscal Year Ending	Employer Normal Cost and Admin Expense	Unfunded Liability Amortization	ERI Amortization	Holiday Amortization	Employer Total Cost
2022	$877,033	$4,026,903	$0	$48,400	$4,952,335
2023	$897,238	$4,208,114	$0	$50,578	$5,155,930
2024	$917,487	$4,397,479	$0	$52,853	$5,367,819
2025	$937,741	$4,595,365	$0	$55,232	$5,588,338
2026	$957,960	$4,802,157	$0	$57,717	$5,817,834
2027	$978,099	$5,018,254	$0	$0	$5,996,353
2028	$998,112	$5,244,075	$0	$0	$6,242,187
2029	$1,017,944	$5,480,059	$0	$0	$6,498,003
2030	$1,037,541	$5,726,661	$0	$0	$6,764,202
2031	$1,056,840	$0	$0	$0	$1,056,840
2032	$1,075,775	$0	$0	$0	$1,075,775
2033	$1,094,274	$0	$0	$0	$1,094,274
2034	$1,112,259	$0	$0	$0	$1,112,259
2035	$1,129,647	$0	$0	$0	$1,129,647
2036	$1,146,348	$0	$0	$0	$1,146,348
2037	$1,197,933	$0	$0	$0	$1,197,933