CITY OF TAUNTON
CONTRIBUTORY RETIREMENT SYSTEM

Actuarial Valuation Report

January 1, 2018

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Report Summary:

Highlights	January 1, 2016	January 1, 2018
Contributions		
Funding Schedule FY 2019	$16,346,018	$16,346,018
Funding Schedule FY 2020	16,829,983	16,598,250
Funded Ratios		
GAS No. 25	74.9%	79.6%
Participants		
Actives	1,104	1,073
Retirees and Beneficiaries	736	778
Inactives	196	189
Disabled	86	89
Total	2,122	2,129
Payroll		
Payroll of Active Members	$59,156,684	$62,755,282
Average Payroll	53,584	58,486
Normal Cost		
Employer	2,559,053	2,528,502
Employee	5,235,481	5,646,140
Administrative Expenses	510,000	600,000
Total	8,304,534	8,774,642
Actuarial Accrued Liabilities		
Actives	164,343,443	164,143,978
Retirees, Beneficiaries, Disabilities and Inactives	207,460,511	234,034,760
Total	371,803,954	398,178,738
Actuarial Value of Assets	278,487,094	317,021,969
Unfunded Actuarial Accrued Liabilities	$93,316,860	$81,156,769

Introduction

This report presents the findings of an actuarial valuation as of January 1, 2018, 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, 2018.
- 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, 2018.

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 2016 actuarial assumptions and plan provisions, the total unfunded actuarial accrued liability decreased by 6.7% to $81,156,769. The decrease is the result of contributions to the fund and net unfavorable actuarial experience during the preceding years. The sources of actuarial (gains) and losses are as follows:

Assets	(528,550)
Retirements	(4,992,830)
Terminations	992,716
Death while active	(403,175)
Disabled while active	(1,390,057)
Salary	1,197,852
New Participants	1,013,642
Inactive Mortality and data	12,248,666
Benefit Payments	2,094,812
Other	(4,908,701)
Total (Gain) / Loss	5,324,373

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, 2016	January 1, 2018
Superannuation	$5,022,980	$5,250,732
Termination	1,218,788	1,294,158
Death	409,976	428,354
Disability	1,142,790	1,201,398
Administrative Expenses	510,000	600,000
Total Normal Cost	8,304,534	8,774,642
% of Pay	14.0%	14.0%
Employee Contributions	5,235,481	5,646,140
% of Pay	8.9%	9.0%
Employer Normal Cost	$3,069,053	$3,128,502
% of Pay	5.2%	5.0%

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, 2016	January 1, 2018
Actives		
Superannuations	$157,925,836	$157,404,384
Termination	(4,267,344)	(4,281,869)
Death	4,385,577	4,617,459
Disability	6,299,374	6,404,004
Retirees and Inactives		
Retirees and Beneficiaries	176,086,515	201,947,343
Terminated (Refund)	1,976,591	2,281,858
Disabled	29,397,405	29,805,559
Total	$371,803,954	$398,178,738

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, 2016	January 1, 2018
Actives		
Superannuation	$196,400,413	$197,976,401
Termination	5,065,662	5,733,248
Death	7,376,964	7,817,069
Disability	15,951,053	16,840,166
Retirees and Inactives		
Retirees and Beneficiaries	176,086,515	201,947,343
Terminated (Refund)	1,976,591	2,281,858
Disabled	29,397,405	29,805,559
Total	$432,254,603	$462,401,644

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, 2016	January 1, 2018
Cash equivalents	$9,826,944	$5,748,262
Short term investments	242,795	747,383
Fixed income securities	44,562,119	47,547,904
Equities	123,264,876	156,755,607
International	34,706,872	52,933,199
Real Estate	35,228,887	37,880,420
Venture Capital	0	0
Other	14,301,374	12,203,951
Accounts receivable	7,785,976	8,282,125
Accounts payable	(433,303)	(322,910)
Accrued income	241,185	197,794
Total Market Value	$269,727,725	$321,973,735
Total Actuarial Value	$278,487,094	$317,021,969

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, 2018 is presented in Table V.

Table V

		January 1, 2018
(1)	Market value at January 1, 2017	$283,060,790
(2)	2017 Contributions	$23,371,077
(3)	2017 Payments	($26,715,374)
(4)	Net interest adjustment at 8.00% on (1), (2), and (3) to December 31, 2017	$21,796,820
(5)	Expected market value on January 1, 2018	$301,513,313
	(1) + (2) + (3) + (4)	
(6)	Actual market value on January 1, 2018	$321,973,735
(7)	2017 (Gain) / Loss	($20,460,422)
(8)	80% of 2017 (Gain) / Loss	($16,368,338)
(9)	2016 (Gain) / Loss	$4,440,290
(10)	60% of 2016 (Gain) / Loss	$2,664,174
(11)	2015 (Gain) / Loss	$19,503,132
(12)	40% of 2015 (Gain) / Loss	$7,801,253
(13)	2014 (Gain) / Loss	$4,755,725
(14)	20% of 2014 (Gain) / Loss	$951,145
	Actuarial value on January 1, 2018, (6) + (8) + (10) + (12) + (14)	
(15)	but not less than 80% nor greater than 120% of (6)	$317,021,969
(16)	Ratio of actuarial value to market value	98.46%
(17)	Market Value Return for 2016	6.09%
(18)	Market Value Return for 2017	15.02%
(19)	Actuarial Value Return for 2016	7.41%
(20)	Actuarial Value Return for 2017	8.28%

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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, 2016	January 1, 2018
Actuarial Accrued Liability	$371,803,954	$398,178,738
Actuarial Assets	278,487,094	317,021,969
Unfunded Actuarial Accrued Liability	$93,316,860	$81,156,769
Funded Status	74.9%	79.6%

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, 2026
  $ 79,707,105 over 8 years with 2.5% increasing payments
- Increasing amortization of the FY04 Appropriation Deferral by June 30, 2026
  $ 1,124,508 over 8 years with 4.5% increasing payments
- Increasing amortization of the 2004 Early Retirement Incentive by June 30, 2021
  $ 325,156 over 3 years with 4.5% increasing payments
- Interest adjustment for payments contributed quarterly over fiscal year.

The pension appropriation for FYE10 is shown in Table VII.

Table VII

	January 1, 2016	January 1, 2018
Normal cost	$3,069,053	$3,128,502
Amortization of the unfunded accrued liability	11,125,003	11,789,445
Amortization of the FY04 Deferral	132,178	132,178
Amortization payment of 2002/2003 ERI liability	0	0
Amortization payment of 2004 ERI liability	94,106	94,106
Total cost before interest adjustments	$14,420,340	$15,144,231
Fiscal 2019 cost	$16,346,018	$16,346,018
Fiscal 2020 cost	$16,829,983	$16,598,250

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 2034 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 7 years until the unfunded liabilities are substantially paid off, at which time only the normal cost will remain. The total cost represents 25.3% of payroll, decreasing to 22.4% by the time the unfunded liabilities are fully paid off, leaving only a normal cost of about 4% 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 %**
2019	$62,755,282	$5,646,140	$3,338,928	$13,007,090	$16,346,018	26.0	79.7
2020	$65,579,270	$5,958,193	$3,427,303	$13,170,947	$16,598,250	25.3	82.3
2021	$68,530,337	$6,286,898	$3,516,871	$13,506,195	$17,023,066	24.8	84.8
2022	$71,614,202	$6,633,120	$3,607,559	$13,714,024	$17,321,583	24.2	87.4
2023	$74,836,841	$6,997,772	$3,699,288	$14,060,677	$17,759,965	23.7	89.9
2024	$78,204,499	$7,381,810	$3,791,967	$14,416,167	$18,208,134	23.3	92.5
2025	$81,723,701	$7,786,241	$3,885,497	$14,780,723	$18,666,220	22.8	95.0
2026	$85,401,268	$8,212,123	$3,979,765	$15,154,579	$19,134,344	22.4	97.5
2027	$89,244,325	$8,660,567	$4,074,649	$0	$4,074,649	4.6	100.0
2028	$93,260,320	$9,132,742	$4,170,014	$0	$4,170,014	4.5	100.0
2029	$97,457,034	$9,629,874	$4,265,710	$0	$4,265,710	4.4	100.0
2030	$101,842,601	$10,153,255	$4,361,575	$0	$4,361,575	4.3	100.0
2031	$106,425,518	$10,704,240	$4,457,429	$0	$4,457,429	4.2	100.0
2032	$111,214,666	$11,284,252	$4,553,078	$0	$4,553,078	4.1	100.0
2033	$116,219,326	$11,894,790	$4,648,309	$0	$4,648,309	4.0	100.0
2034	$121,449,195	$12,537,426	$4,742,892	$0	$4,742,892	3.9	100.0
2035	$126,914,409	$13,213,811	$4,836,573	$0	$4,836,573	3.8	100.0
2036	$132,625,558	$13,925,684	$4,929,082	$0	$4,929,082	3.7	100.0
2037	$138,593,708	$14,552,339	$5,150,891	$0	$5,150,891	3.7	100.0
2038	$144,830,425	$15,207,195	$5,382,681	$0	$5,382,681	3.7	100.0
2039	$151,347,794	$15,891,518	$5,624,901	$0	$5,624,901	3.7	100.0
2040	$158,158,444	$16,606,637	$5,878,022	$0	$5,878,022	3.7	100.0
2041	$165,275,574	$17,353,935	$6,142,533	$0	$6,142,533	3.7	100.0
2042	$172,712,975	$18,134,862	$6,418,947	$0	$6,418,947	3.7	100.0
2043	$180,485,059	$18,950,931	$6,707,799	$0	$6,707,799	3.7	100.0
2044	$188,606,887	$19,803,723	$7,009,650	$0	$7,009,650	3.7	100.0
2045	$197,094,197	$20,694,891	$7,325,085	$0	$7,325,085	3.7	100.0
2046	$205,963,436	$21,626,161	$7,654,714	$0	$7,654,714	3.7	100.0
2047	$215,231,790	$22,599,338	$7,999,176	$0	$7,999,176	3.7	100.0
2048	$224,917,221	$23,616,308	$8,359,139	$0	$8,359,139	3.7	100.0
2049	$235,038,496	$24,679,042	$8,735,300	$0	$8,735,300	3.7	100.0
2050	$245,615,228	$25,789,599	$9,128,388	$0	$9,128,388	3.7	100.0

* Calendar basis

** Beginning of Fiscal Year

EXHIBITS

Exhibit 1 - Age/Service Distribution with Salary as of January 1, 2018

Attained Age	Average Salary <5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	Total
< 20	1	0	0	0	0	0	0	0	0	1
	17,529	0	0	0	0	0	0	0	0	17,529
20-24	17	0	0	0	0	0	0	0	0	17
	35,321	0	0	0	0	0	0	0	0	35,321
25-29	52	4	1	0	0	0	0	0	0	57
	50,537	29,280	66,604	0	0	0	0	0	0	49,327
30-34	49	13	4	0	0	0	0	0	0	66
	55,683	59,442	88,335	0	0	0	0	0	0	58,402
35-39	32	18	25	10	0	0	0	0	0	85
	57,812	59,832	69,369	66,412	0	0	0	0	0	62,651
40-44	29	16	24	22	6	0	0	0	0	97
	43,831	62,110	67,652	75,994	98,526	0	0	0	0	63,418
45-49	41	22	15	27	42	12	1	0	0	161
	48,912	47,945	45,139	85,750	89,338	89,516	0	0	0	68,432
50-54	41	20	37	28	28	32	14	0	0	201
	45,307	48,906	50,181	42,894	71,847	95,029	84,150	0	0	60,515
55-59	32	21	16	40	22	28	24	8	0	193
	51,433	42,800	47,791	48,630	53,422	68,109	77,554	72,957	0	56,180
60-64	17	11	24	23	28	21	13	5	2	144
	45,649	33,384	48,947	41,896	55,817	60,103	67,562	103,644	103,670	53,545
65-69	5	3	2	9	6	5	10	1	1	42
	29,290	62,264	43,941	50,041	36,679	50,766	36,288	57,569	50,071	43,236
70+	0	1	0	2	2	1	3	1	0	10
	0	14,083	0	66,621	23,559	29,164	50,580	91,478	0	46,682
Total Employees	316	129	148	161	134	99	65	15	3	1,074
Average Salary	49,135	50,081	56,344	58,042	69,854	76,437	68,190	83,395	85,804	58,453

https://shermanactuary-my.sharepoint.com/personal/dan_shermanactuary_com/Documents/Recovered Data/Taunton/2018/Report/[RET1.xls]Retirees

Exhibit 2 - Retiree Distribution as of January 1, 2018

	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	0	1	1	0	25,958	25,958
45-49	1	2	3	1,617	19,131	20,748
50-54	0	7	7	0	276,471	276,471
55-59	17	24	41	283,205	1,348,753	1,631,958
60-64	45	58	103	686,016	3,277,619	3,963,635
65-69	86	87	173	1,685,680	4,048,833	5,734,513
70-74	70	73	143	1,300,442	2,687,127	3,987,569
75-79	54	46	100	942,614	1,552,050	2,494,665
80-84	34	43	77	476,429	1,238,066	1,714,495
85-89	26	38	64	442,332	801,058	1,243,391
90-94	20	22	42	214,557	321,126	535,683
95+	14	10	24	151,110	127,025	278,136
Total	367	411	778	6,184,003	15,723,219	21,907,222
Average (Age/Payment)	74.09	73.3	73.67	16,850	38,256	28,158
Frequency Percent	47.2	52.8	100.0	28.2	71.8	100.0

https://shermanactuary-my.sharepoint.com/personal/dan_shermanactuary_com/Documents/Recovered Data/Taunton/2018/Report/[DIS1.xls]Disabled

Exhibit 3 - Disabled Retiree Distribution as of January 1, 2018

	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	20,869	0	20,869
40-44	0	0	0	0	0	0
45-49	1	0	1	28,573	0	28,573
50-54	4	5	9	126,764	317,076	443,840
55-59	2	5	7	52,840	183,626	236,466
60-64	4	9	13	114,679	340,759	455,438
65-69	2	18	20	41,049	760,506	801,556
70-74	2	16	18	32,564	640,672	673,236
75-79	1	8	9	2,908	320,746	323,655
80-84	0	8	8	0	173,624	173,624
85-89	0	2	2	0	48,374	48,374
90-94	0	1	1	0	14,549	14,549
95-99	0	0	0	0	0	0
Total	17	72	89	420,246	2,799,933	3,220,179
Average (Age/Payment)	59.82	69.63	67.75	24,720	38,888	36,182
Frequency Percent	19.1	80.9	100.0	13.1	86.9	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
2018	$18,455,877	$5,646,140	$16,346,018	$23,685,848	$27,222,129
2019	19,298,727	5,958,193	16,598,250	25,899,537	29,157,254
2020	20,273,721	6,286,898	17,023,066	28,121,255	31,157,497
2021	21,330,634	6,633,120	17,321,583	30,493,654	33,117,723
2022	22,306,148	6,997,772	17,759,965	33,022,404	35,473,993
2023	23,282,310	7,381,810	18,208,134	35,733,842	38,041,476
2024	24,245,073	7,786,241	18,666,220	38,644,882	40,852,270
2025	25,332,636	8,212,123	19,134,344	41,769,140	43,782,971
2026	26,368,110	8,660,567	4,074,649	44,975,574	31,342,680
2027	27,405,181	9,132,742	4,170,014	47,361,330	33,258,905
2028	28,452,107	9,629,874	4,265,710	49,895,296	35,338,773
2029	29,510,408	10,153,255	4,361,575	52,590,109	37,594,531
2030	30,543,019	10,704,240	4,457,429	55,460,826	40,079,476
2031	31,515,759	11,284,252	4,553,078	58,526,526	42,848,097
2032	32,439,191	11,894,790	4,648,309	61,808,812	45,912,720
2033	33,287,575	12,537,426	4,742,892	65,331,619	49,324,362
2034	34,109,468	13,213,811	4,836,573	69,120,020	53,060,936
2035	34,904,612	13,925,684	4,929,082	73,199,227	57,149,381
2036	35,545,524	14,552,339	5,150,891	77,593,142	61,750,848
2037	36,043,435	15,207,195	5,382,681	82,348,624	66,895,065
2038	36,310,843	15,891,518	5,624,901	87,511,041	72,716,617
2039	36,587,660	16,606,637	5,878,022	93,123,739	79,020,738
2040	36,714,000	17,353,935	6,142,533	99,230,175	86,012,643
2041	36,711,735	18,134,862	6,418,947	105,882,795	93,724,869
2042	36,514,580	18,950,931	6,707,799	113,139,920	102,284,070
2043	36,250,365	19,803,723	7,009,650	121,062,299	111,625,307
2044	35,858,252	20,694,891	7,325,085	129,712,827	121,874,551
2045	35,216,270	21,626,161	7,654,714	139,166,483	133,231,088
2046	34,432,745	22,599,338	7,999,176	149,504,931	145,670,700
2047	33,556,200	23,616,308	8,359,139	160,810,233	159,229,480

EXHIBIT 5 – SUMMARY OF PLAN PROVISIONS:

This summary is prepared in accordance with Chapter 32 as of January 1, 2018, 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 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 Retirement	Percentage of Average Salary 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. <u>Member Data</u>

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. <u>Valuation Date</u>

January 1, 2018.

3. <u>Actuarial Cost Method</u>

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

4. <u>Rate of Investment Return</u>

It is assumed that the assets of the fund will accumulate at a compound annual rate of 7.75% per annum.

5. <u>Salary Scale</u>

It is assumed that salaries including longevity will increase at a rate of 3.5% per year.

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

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

7. <u>Value of Investments</u>

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 both pre-retirement mortality and beneficiary mortality is represented by the RP-2014 Blue Collar Mortality with Scale MP-2014, fully generational. Mortality for retired members for Group 1 and 2 is represented by the RP-2014 Blue Collar Mortality Table set forward five years for males and 3 years for females, fully generational. Mortality for retired members for Group 4 is represented by the RP-2014 Blue Collar Mortality Table set forward three years for males, and six years for females, fully generational. Mortality for disabled members for Group 1 and 2 is represented by the RP-2000 Mortality Table set forward six years. Mortality for disabled members for Group 4 is represented by the RP-2000 Mortality Table set forward two years. Generational adjusting is based on Scale MP-2014.

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 2018 is $600,000 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. 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 City of Taunton Retirement System contributing as of January 1, 2018, 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

October, 2018

BREAKOUTS

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Breakouts

	Non-Light Subtotal	Total	City	GATRA	Landfill	Sewer	Water	Nursing Home	Light	Housing
(1) Participants										
(a) Actives	925	1,073	753	34	2	0	30	62	148	44
(b) Inactives	184	189	102	10	0	0	2	67	5	3
(c) Retirees and Beneficiaries	620	778	546	3	0	8	26	23	158	14
(e) Disabled Retirees	72	89	59	0	0	0	3	9	17	1
(f) Total	1,801	2,129	1,460	47	2	8	61	161	328	62
(2) Payroll of Active Participants	48,225,215	62,755,282	39,628,577	1,459,796	133,327	0	1,510,355	2,457,586	14,530,067	3,035,574
Percent of Total Payroll	76.85%	100.00%	63.15%	2.33%	0.21%	0.00%	2.41%	3.92%	23.15%	4.84%
(3) Normal Cost										
(a) Total Normal Cost	6,137,249	8,174,642	5,148,196	168,332	12,408	0	169,816	288,779	2,037,393	349,718
(b) Expected Employee Contributions	4,291,755	5,646,140	3,534,143	127,345	12,329	0	129,310	213,490	1,354,385	275,138
(c) Administrative Expenses	434,464	600,000	384,083	5,003	360	1,505	15,204	15,571	165,536	12,738
(d) Net Employer Normal Cost (a) - (b) + (c)	2,279,958	3,128,502	1,998,136	45,990	439	1,505	55,710	90,860	848,544	87,318
(4) Actuarial Accrued Liability	288,323,839	398,178,738	254,889,401	3,319,860	239,056	998,917	10,090,003	10,333,216	109,854,899	8,453,386
(5) Assets*	229,557,690	317,021,969	202,937,857	2,643,206	190,332	795,318	8,033,459	8,227,100	87,464,279	6,730,417
(6) Unfunded Actuarial Accrued Liability (4) - (5)	58,766,149	81,156,769	51,951,544	676,654	48,724	203,599	2,056,544	2,106,116	22,390,620	1,722,969
(7) Amortizations										
(a) Unfunded Actuarial Accrued Liability	8,631,026	11,919,553	7,630,160	99,381	7,156	29,903	302,046	309,327	3,288,526	253,054
(b) Early Retirement Incentive	111,721	111,721	102,836	0	0	0	0	8,886	0	0
(c) Holiday	116,344	156,084	106,781	0	62	1,038	4,606	3,857	39,739	0
(8) Total Required Employer Contributions (3d) + (7)	11,139,050	15,315,859	9,837,913	145,370	7,657	32,446	362,362	412,929	4,176,810	340,372
(9) Fiscal 2019 Cost	12,103,766	16,346,018	10,722,546	140,798	6,407	38,874	379,922	515,550	4,242,252	299,670
Percentage of total	74.05%	100.00%	65.60%	0.86%	0.04%	0.24%	2.32%	3.15%	25.95%	1.83%
(10) Fiscal 2020 Cost	12,076,760	16,598,250	10,661,610	162,881	7,904	33,451	386,230	450,314	4,521,490	374,371
Percentage of total	72.76%	100.00%	64.23%	0.98%	0.05%	0.20%	2.33%	2.71%	27.24%	2.26%
(11) Fiscal 2021 Cost	12,386,602	17,023,066	10,935,306	167,016	8,103	34,310	396,051	461,972	4,636,464	383,845
(12) Fiscal 2022 Cost	12,567,535	17,321,584	11,090,095	171,236	8,308	35,192	406,104	463,079	4,754,049	393,522
(13) Fiscal 2023 Cost	12,885,681	17,759,965	11,370,931	175,542	8,517	36,097	416,393	474,795	4,874,284	403,406
(14) Fiscal 2024 Cost	13,210,928	18,208,134	11,658,048	179,933	8,731	37,026	426,923	486,769	4,997,206	413,497