



**WATERTOWN
CONTRIBUTORY RETIREMENT SYSTEM**

Actuarial Valuation Report
January 1, 2021

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Report Summary:

<u>Highlights</u>	<u>January 1, 2020</u>	<u>January 1, 2021</u>
<u>Contributions</u>		
Funding Schedule FY 2022	\$7,666,647	\$7,666,647
Funding Schedule FY 2023	1,172,174	1,307,563
<u>Funded Ratios</u>		
GAS No. 25	91.5%	98.3%
<u>Participants</u>		
Actives	528	522
Retirees and Beneficiaries	363	370
Vested	0	0
Inactives	176	196
Disabled	<u>63</u>	<u>61</u>
Total	1,130	1,149
<u>Payroll</u>		
Payroll of Active Members	\$35,322,996	\$36,198,757
Average Payroll	66,900	69,346
<u>Normal Cost</u>		
Employer	551,680	544,752
Employee	3,178,126	3,270,805
Administrative Expenses	<u>340,000</u>	<u>340,000</u>
Total	4,069,806	4,155,557
<u>Actuarial Accrued Liabilities</u>		
Actives	95,452,630	97,080,468
Retirees, Beneficiaries, Disabilities and Inactives	<u>138,633,247</u>	<u>144,227,295</u>
Total	234,085,877	241,307,763
<u>Actuarial Value of Assets</u>	<u>214,181,849</u>	<u>237,309,997</u>
<u>Unfunded Actuarial Accrued Liabilities</u>	\$19,904,028	\$3,997,766

Introduction

The purpose of this report is to present the findings of an actuarial valuation as of January 1, 2021, of Watertown Contributory Retirement System.

The actuarial valuation is based on:

- Provisions Chapter 32 of the Massachusetts General Laws, "M.G.L", as of January 1, 2021.
- Employee data provided by the Retirement Board
- Asset information reported to the Public Employee Retirement Administration Commission by the Watertown 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, 2021.

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, the total unfunded actuarial accrued liability decreased by 79.9% to \$3,997,766. The decrease is the result of a payment against the unfunded accrued liability and net favorable actuarial experience during the preceding year. The sources of (Gain) and Loss are as follows:

Asset	(19,629,958)
Salary Increase	(14,679)
New Participants	659,982
Active – Retirement	(1,051,950)
Active – Termination	(166,979)
Active – Mortality	(35,591)
Active – Disability	482,247
Inactive - Mortality	(428,724)
Inactive - Data Adjustments	2,985,707
Other, including data, contribution interest, etc	(8,545)
Benefit Payments	<u>(1,069,092)</u>
Total (Gain) / Loss	(18,277,582)

The assumed return on investments was decreased to 7.75%. This increased the Normal Cost and Accrued Liability by \$35,756 and \$1,143,891, respectively.

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

	<u>January 1, 2020</u>	<u>January 1, 2021</u>
Superannuation	\$2,334,998	\$2,379,401
Termination	820,368	839,747
Death	104,727	109,448
Disability	469,713	486,961
Administrative Expenses	<u>340,000</u>	<u>340,000</u>
Total Normal Cost	4,069,806	4,155,557
% of Pay	11.5%	11.5%
Employee Contributions	3,178,126	3,270,805
% of Pay	9.0%	9.0%
Employer Normal Cost	\$891,680	\$884,752
% of Pay	2.5%	2.4%

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	<u>January 1, 2020</u>	<u>January 1, 2021</u>
Actives			
Superannuations		\$87,018,613	\$88,209,999
Termination		3,123,812	3,364,674
Death		1,341,792	1,374,408
Disability		3,968,413	4,131,387
Retirees and Inactives			
Retirees and Beneficiaries		105,838,335	111,714,228
Vested		0	0
Terminated (Refund)		2,162,187	2,792,585
Disabled		<u>30,632,725</u>	<u>29,720,482</u>
Total		<u>\$234,085,877</u>	<u>\$241,307,763</u>

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

	<u>January 1, 2020</u>	<u>January 1, 2021</u>
Actives		
Superannuation	\$102,808,830	\$104,468,913
Termination	6,338,691	6,655,949
Death	2,043,820	2,111,094
Disability	7,380,329	7,723,534
Retirees and Inactives		
Retirees and Beneficiaries	105,838,335	111,714,228
Vested	0	0
Terminated (Refund)	2,162,187	2,792,585
Disabled	<u>30,632,725</u>	<u>29,720,482</u>
Total	<u>\$257,204,917</u>	<u>\$265,186,785</u>

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

	<u>January 1, 2020</u>	<u>January 1, 2021</u>
Cash equivalents	\$1,143,367	\$455,512
Short term investments	0	0
Fixed income securities	40,871,656	43,155,711
Equities	64,639,875	75,793,555
International	52,218,192	61,933,961
Real Estate	21,830,976	21,843,359
Venture Capital	0	0
Other	38,516,699	46,736,300
Accounts receivable	263,454	240,763
Accounts payable	(34,990)	(32,038)
Accrued income	<u>604</u>	<u>0</u>
Total Market Value	\$219,449,833	\$250,127,123
Total Actuarial Value	\$214,181,849	\$237,309,997

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 (7.8%) 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 10%. The calculation of the actuarial value of assets as of January 1, 2021 is presented in Table V.

Table V

	<u>January 1, 2021</u>
(1) Market value at January 1, 2020	\$219,449,833
(2) 2020 Contributions	\$18,906,450
(3) 2020 Payments	(\$16,193,183)
(4) Net interest adjustment at 7.8% on (1), (2), and (3) to December 31, 2020	\$17,443,711
(5) Expected market value on January 1, 2021	\$239,606,811
(1) + (2) + (3) + (4)	
(6) Actual market value on January 1, 2021	\$250,127,123
(7) 2020 (Gain) / Loss	(\$10,520,312)
(8) 80% of 2020 (Gain) / Loss	(\$8,416,250)
(9) 2019 (Gain) / Loss	(\$20,207,129)
(10) 60% of 2019 (Gain) / Loss	(\$12,124,277)
(11) 2018 (Gain) / Loss	\$25,378,514
(12) 40% of 2018 (Gain) / Loss	\$10,151,406
(13) 2017 (Gain) / Loss	(\$12,140,022)
(14) 20% of 2017 (Gain) / Loss	(\$2,428,004)
Actuarial value on January 1, 2021, (6) + (8) + (10) + (12) + (14)	
(15) but not less than 90% nor greater than 110% of (6)	\$237,309,997
(16) Ratio of actuarial value to market value	94.88%
(17) Market Value Return for 2019	18.9%
(18) Actuarial Value Return for 2019	6.8%
(19) Market Value Return for 2020	12.7%
(20) Actuarial Value Return for 2020	9.5%

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

	<u>January 1, 2020</u>	<u>January 1, 2021</u>
Actuarial Accrued Liability	\$234,085,877	\$241,307,763
Actuarial Assets	<u>214,181,849</u>	<u>237,309,997</u>
Unfunded Actuarial Accrued Liability	\$19,904,028	\$3,997,766
Funded Status	91.5%	98.3%

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, 2028, 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, 2021
\$ 6,501,347 by 2022
- Increasing amortization of the Housing Authority liability by June 30, 2023
\$ 455,438 over 2 years with 4.0% increasing payments
- Interest adjustment for payments deposited at the beginning of the fiscal year.

The pension appropriation is shown in Table VII.

Table VII

	<u>January 1, 2020</u>	<u>January 1, 2021</u>
Normal cost	\$891,680	\$884,752
Amortization payment of the accrued liability	19,258,655	3,542,328
Amortization payment of Housing Authority liability	<u>222,889</u>	<u>231,752</u>
Total cost	\$20,373,224	\$4,658,832
% of Pay	57.7%	12.9%
Fiscal 2022 cost	\$7,666,647	\$7,666,647
Fiscal 2023 cost	\$1,172,174	\$1,307,563

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 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 is designed to increase the funded ratio until reaching 105%. It is then designed to maintain a funded ratio of 105%. The total cost represents less than 3% of payroll. The decrease in the cost as a percentage of payroll is a result of the increase in member deductions.

Appropriation Forecast

Fiscal Year	Employer Employee Contribution	Employer Normal Cost with Interest	Amortization Payments with Interest	Employer Total Cost with Interest	Employer Total Cost % of Payroll	Unfunded Accrued Liability	Funded Ratio %**
2022	\$3,270,805	\$918,396	\$6,748,251	\$7,666,647	21.2	\$3,997,766	98.3
2023	\$3,441,013	\$914,259	\$393,304	\$1,307,563	3.5	(\$2,809,008)	101.2
2024	\$3,619,605	\$908,321	\$224,198	\$1,132,519	2.9	(\$3,440,616)	101.4
2025	\$3,806,979	\$900,445	\$230,645	\$1,131,090	2.8	(\$3,948,837)	101.6
2026	\$4,003,551	\$890,485	\$239,009	\$1,129,494	2.7	(\$4,503,392)	101.7
2027	\$4,209,757	\$878,288	\$249,433	\$1,127,721	2.6	(\$5,109,938)	101.9
2028	\$4,426,055	\$863,691	\$264,514	\$1,128,205	2.5	(\$5,774,722)	102.2
2029	\$4,652,921	\$846,520	\$281,685	\$1,128,205	2.4	(\$6,507,277)	102.4
2030	\$4,890,854	\$826,594	\$301,611	\$1,128,205	2.3	(\$7,315,107)	102.6
2031	\$5,140,377	\$803,720	\$324,485	\$1,128,205	2.2	(\$8,207,013)	102.9
2032	\$5,402,037	\$777,693	\$350,512	\$1,128,205	2.1	(\$9,192,689)	103.2
2033	\$5,676,405	\$748,297	\$379,908	\$1,128,205	2.0	(\$10,282,800)	103.5
2034	\$5,964,079	\$715,306	\$412,899	\$1,128,205	1.9	(\$11,489,067)	103.9
2035	\$6,265,684	\$678,479	\$449,726	\$1,128,205	1.9	(\$12,824,369)	104.2
2036	\$6,581,876	\$637,560	\$490,645	\$1,128,205	1.8	(\$14,302,837)	104.6
2037	\$6,845,151	\$663,063	(\$432,582)	\$230,481	0.4	(\$15,939,977)	105.0
2038	\$7,118,957	\$689,585	(\$684,247)	\$5,338	0.0	(\$16,709,218)	105.1
2039	\$7,403,716	\$717,169	(\$717,169)	\$0	0.0	(\$17,266,906)	105.2
2040	\$7,699,864	\$745,855	(\$709,767)	\$36,088	0.0	(\$17,832,342)	105.2
2041	\$8,007,859	\$775,690	(\$741,706)	\$33,984	0.0	(\$18,449,575)	105.2
2042	\$8,328,173	\$806,717	(\$784,892)	\$21,825	0.0	(\$19,080,229)	105.2
2043	\$8,661,300	\$838,986	(\$810,774)	\$28,212	0.0	(\$19,713,226)	105.1
2044	\$9,007,752	\$872,545	(\$846,410)	\$26,135	0.0	(\$20,367,392)	105.1
2045	\$9,368,062	\$907,447	(\$601,459)	\$305,988	0.3	(\$21,033,858)	105.0
2046	\$9,742,785	\$943,745	(\$332,748)	\$610,997	0.7	(\$22,015,910)	105.0
2047	\$10,132,496	\$981,495	(\$656,808)	\$324,687	0.3	(\$23,363,607)	105.1
2048	\$10,537,796	\$1,020,755	(\$363,369)	\$657,386	0.7	(\$24,466,576)	105.1
2049	\$10,959,308	\$1,061,585	(\$379,721)	\$681,864	0.7	(\$25,971,205)	105.1
2050	\$11,397,680	\$1,104,048	(\$396,808)	\$707,240	0.7	(\$27,574,824)	105.1
2051	\$11,853,587	\$1,148,210	(\$403,146)	\$745,064	0.7	(\$29,284,312)	105.1
2052	\$12,327,731	\$1,194,139	(\$337,030)	\$857,109	0.7	(\$31,119,456)	105.1
2053	\$12,820,840	\$1,241,904	(\$352,197)	\$889,707	0.7	(\$33,168,063)	105.1

** Beginning of Fiscal Year

EXHIBITS

[https://shermanactuary-my.sharepoint.com/personal/dan_shermanactuary_com/Documents/Recovered Data/Watertown/Val21/Report\[ACT1.xls\]Actives](https://shermanactuary-my.sharepoint.com/personal/dan_shermanactuary_com/Documents/Recovered%20Data/Watertown/Val21/Report[ACT1.xls]Actives)

Exhibit 1 - Age/Service Distribution with Salary as of January 1, 2021

Attained Age	Average Salary	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	17	0	0	0	0	0	0	0	0	17
	55,068	0	0	0	0	0	0	0	0	55,068
25-29	48	4	0	0	0	0	0	0	0	52
	55,102	54,966	0	0	0	0	0	0	0	55,092
30-34	34	22	2	0	0	0	0	0	0	58
	56,922	66,044	92,276	0	0	0	0	0	0	61,601
35-39	20	22	16	5	0	0	0	0	0	63
	56,984	74,486	89,994	99,958	0	0	0	0	0	74,890
40-44	15	7	6	11	5	0	0	0	0	44
	48,492	53,790	55,939	94,685	100,331	0	0	0	0	67,790
45-49	11	12	5	22	14	2	0	0	0	66
	47,070	56,372	63,884	89,914	100,171	76,454	0	0	0	76,471
50-54	6	8	8	6	12	7	3	0	0	50
	45,515	58,624	43,574	53,744	100,024	119,190	133,259	0	0	76,951
55-59	14	12	9	10	14	5	10	3	0	77
	37,285	51,675	47,957	66,118	77,434	97,841	86,578	122,633	0	65,478
60-64	4	7	6	8	14	10	6	5	2	62
	39,428	55,191	46,988	45,998	52,651	63,500	96,038	120,518	109,549	63,935
65-69	3	6	6	4	3	3	2	0	1	28
	71,438	47,510	48,185	36,561	59,601	88,227	70,460	0	224,835	62,285
70+	2	0	0	0	0	0	1	1	0	4
	35,088	0	0	0	0	0	53,677	62,357	0	46,552
Total Employees	174	100	58	66	62	27	22	9	3	521
Average Salary	52,520	61,250	62,599	76,020	82,328	88,004	92,563	114,761	147,978	66,997

Exhibit 2 - Retiree Distribution as of January 1, 2021

Attained Age	Number of Employees			Total Payments		
	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	0	0	0	0	0
45-49	0	0	0	0	0	0
50-54	3	0	3	164,089	0	164,089
55-59	3	11	14	191,403	484,695	676,098
60-64	20	19	39	430,395	1,056,116	1,486,511
65-69	24	36	60	607,594	1,755,161	2,362,755
70-74	46	40	86	1,268,731	1,639,536	2,908,267
75-79	28	29	57	594,850	1,297,032	1,891,883
80-84	25	16	41	538,603	497,355	1,035,958
85-89	20	15	35	421,263	538,522	959,785
90-94	15	6	21	244,023	198,542	442,565
95+	10	4	14	141,485	129,078	270,563
Total	194	176	370	4,602,436	7,596,037	12,198,473
Average (Age/Payment)	76.89	73.74	75.39	23,724	43,159	32,969
Frequency Percent	52.4	47.6	100	37.7	62.3	100

Exhibit 3 - Disabled Retiree Distribution as of January 1, 2021

Attained Age	Number of Employees			Total Payments		
	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	2	3	5	123,951	188,111	312,062
45-49	1	0	1	25,539	0	25,539
50-54	1	5	6	20,611	249,651	270,262
55-59	1	4	5	59,356	201,485	260,841
60-64	0	8	8	0	553,408	553,408
65-69	2	6	8	51,891	355,419	407,311
70-74	0	9	9	0	379,071	379,071
75-79	0	11	11	0	380,849	380,849
80-84	1	3	4	28,654	90,966	119,620
85-89	1	0	1	12,710	0	12,710
90-94	1	3	4	5,679	109,068	114,747
95-99	0	0	0	0	0	0
Total	10	52	62	328,393	2,508,027	2,836,420
Average (Age/Payment)	64.6	68.32	67.72	32,839	48,231	45,749
Frequency Percent	16.1	83.9	100	11.6	88.4	100

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
2021	\$19,550,219	\$3,270,805	\$7,666,647	\$17,938,501	\$9,325,733
2022	17,400,233	3,441,013	1,307,563	18,393,637	5,741,980
2023	18,064,289	3,619,605	1,132,519	18,808,533	5,496,369
2024	18,764,344	3,806,979	1,131,090	19,206,753	5,380,478
2025	19,401,993	4,003,551	1,129,494	19,598,512	5,329,565
2026	19,975,901	4,209,757	1,127,721	19,988,912	5,350,489
2027	20,549,855	4,426,055	1,128,205	20,381,296	5,385,701
2028	21,048,953	4,652,921	1,128,205	20,779,427	5,511,601
2029	21,504,990	4,890,854	1,128,205	21,189,177	5,703,246
2030	21,907,523	5,140,377	1,128,205	21,616,057	5,977,116
2031	22,275,025	5,402,037	1,128,205	22,065,757	6,320,975
2032	22,588,807	5,676,405	1,128,205	22,544,434	6,760,237
2033	22,840,842	5,964,079	1,128,205	23,059,806	7,311,248
2034	23,051,048	6,265,684	1,128,205	23,619,800	7,962,641
2035	23,135,389	6,581,876	1,128,205	24,235,418	8,810,111
2036	23,127,550	6,845,151	230,481	24,842,947	8,791,029
2037	23,117,943	7,118,957	5,338	25,500,951	9,507,303
2038	23,033,456	7,403,716	0	26,234,099	10,604,358
2039	22,898,358	7,699,864	36,088	27,057,146	11,894,741
2040	22,716,929	8,007,859	33,984	27,978,729	13,303,644
2041	22,514,016	8,328,173	21,825	29,009,262	14,845,244
2042	22,244,235	8,661,300	28,212	30,162,957	16,608,234
2043	21,926,104	9,007,752	26,135	31,454,164	18,561,948
2044	21,541,612	9,368,062	305,988	32,920,843	21,053,281
2045	21,111,072	9,742,785	610,997	34,583,972	23,826,682
2046	20,656,735	10,132,496	324,687	36,416,778	26,217,226
2047	20,193,942	10,537,796	657,386	38,482,791	29,484,031
2048	19,723,923	10,959,308	681,864	40,778,002	32,695,251
2049	19,241,167	11,397,680	707,240	43,322,253	36,186,006
2050	19,815,563	11,853,587	745,064	46,097,404	38,880,492

amounts in thousands

EXHIBIT 5 – SUMMARY OF PLAN PROVISIONS:

This summary is prepared in accordance with Chapter 32 as of January 1, 2021, 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:

<u>Date of Hire</u>	<u>Member Contribution Rate</u>
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:

<u>Age at Retirement</u>	<u>Percentage of Average Salary</u>		
	<u>Group 1</u>	<u>Group 2</u>	<u>Group 4</u>
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:

<u>Age at Retirement</u>	<u>Percentage of Average Salary</u>		
	<u>Group 1</u>	<u>Group 2</u>	<u>Group 4</u>
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		
	<u>Group 1</u>	<u>Group 2</u>	<u>Group 4</u>
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. Members with ten or more years of service are entitled to 100% of the credited interest on their contributions. Members with five to ten years of service are entitled to 50% of the credited interest on their contributions. No credited interest is provided for members with less than five years of service.

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 \$13,000. 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, 2021.

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, net of investment expenses. The prior valuation assumed 7.80%.

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 \$13,000 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, with a 10% corridor.

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:

<u>Service</u>	<u>General Employees</u>	<u>Police and Fire Employees</u>
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:

<u>Age</u>	<u>Male General Employees</u>	<u>Female General Employees</u>	<u>Male and Female Police and Fire Employees</u>
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:

<u>Age</u>	<u>Male General Employees</u>	<u>Female General Employees</u>	<u>Male and Female Police and Fire Employees</u>
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

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:

<u>Attained Age</u>	<u>General Employees</u>	<u>Police and Fire Employees</u>
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 2021 is \$340,000 and is anticipated to increase at 4% 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 projected 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 projected 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. Actuarial 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:

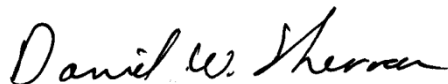
This report fairly represents the actuarial position of the Town of Watertown Retirement System contributing as of January 1, 2021, in accordance with generally accepted actuarial principles applied consistently with the preceding valuation. The economic assumptions were selected by the Retirement Board. 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, ASA, MAAA
January, 2022

BREAKOUTS

Breakouts

	<u>Total</u>	<u>All Others</u>	<u>Housing</u>
(1) Participants			
(a) Actives	522	508	14
(b) Retirees	370	360	10
(c) Inactives	196	193	3
(d) Disabled Retirees	<u>61</u>	<u>60</u>	<u>1</u>
(e) Total	1149	1121	28
(2) Payroll of Active Participants	\$36,198,757	\$35,198,386	\$1,000,371
(3) Normal Cost			
(a) Total Normal Cost	4,155,557	4,033,988	121,569
(b) Expected Employee Contributions	3,270,805	3,181,645	89,160
(c) Administrative Expenses	<u>340,000</u>	<u>330,053</u>	<u>9,947</u>
(d) Net Employer Normal Cost (a) - (b)	884,752	852,343	32,409
(4) Actuarial Accrued Liability	241,307,763	235,081,918	6,225,845
(5) Assets*	<u>237,309,997</u>	<u>231,187,296</u>	<u>6,122,701</u>
(6) Unfunded Actuarial Accrued Liability (4) - (5)	3,997,766	3,894,622	103,144
(7) Amortizations*	3,774,080	3,542,328	231,752
(8) Total Required Employer Contributions (3d) + (7)	4,658,832	4,394,672	264,160
(9) Fiscal 2022 Cost	\$7,666,647	\$7,459,084	\$207,563
(10) Fiscal 2023 Cost	\$1,307,563	\$1,100,000	\$207,563
(11) Fiscal 2024 Cost	\$1,132,519	\$1,100,000	\$32,519
(12) Fiscal 2025 Cost	\$1,131,090	\$1,100,000	\$31,090
(13) Fiscal 2026 Cost	\$1,129,494	\$1,100,000	\$29,494
(14) Fiscal 2027 Cost	\$1,127,721	\$1,100,000	\$27,721
Percentage of Total Cost	100.0%	84.1%	15.9%

* Allocation is based on the ratio of the Unfunded Actuarial Accrued Liability
The Housing Authority's Unfunded Liability is amortized to 2023