



**NORWOOD  
CONTRIBUTORY RETIREMENT SYSTEM**

Actuarial Valuation Report  
January 1, 2020

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## **Introduction**

This report presents the findings of an actuarial valuation as of January 1, 2020, of Norwood 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 Norwood 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 two years, based on the 2018 actuarial assumptions and plan provisions, the total unfunded actuarial accrued liability increased by 6% to \$43,846,804. The increase is the result of net unfavorable actuarial experience during the preceding years. The sources of actuarial (gains) and losses are as follows:

Assets	3,182,378
Retirements	501,732
Terminations	(198,753)
Death while active	237,707
Disabled while active	2,625,710
Salary	9,474,816
New Participants	1,325,357
Inactive Mortality and data	1,418,231
Other	1,715,448
Benefit Payments	<u>443,107</u>
Total (Gain) / Loss	12,657,194

In addition, the actuarial assumptions were changed during this period. The investment return assumption was lowered to 7.6%. This increased the Actuarial Accrued Liability and the Normal Cost by \$3,077,921 and \$103,963, 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, 2018</u>	<u>January 1, 2020</u>
Superannuation	\$2,167,802	\$2,436,140
Termination	336,980	433,939
Death	195,646	213,061
Disability	494,878	551,170
Administrative Expenses	<u>375,000</u>	<u>375,000</u>
Total Normal Cost	3,570,306	4,009,310
% of Pay	11.0%	10.9%
Employee Contributions	2,844,899	3,228,904
% of Pay	8.7%	8.8%
Employer Normal Cost	\$725,407	\$780,406
% of Pay	2.2%	2.1%

**Present Value of Actuarial Accrued Liabilities**

The actuarial accrued liabilities (AAL) represents today's value of all benefits earned by the actives and inactive. 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.

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	<b>Table II</b>	<u>January 1, 2018</u>	<u>January 1, 2020</u>
Actives			
Superannuations		\$81,621,760	\$89,723,055
Termination		350,912	(4,075)
Death		2,561,163	2,890,879
Disability		2,980,797	3,386,165
Retirees and Inactives			
Retirees and Beneficiaries		88,946,640	100,034,567
Vested		0	0
Terminated (Refund)		955,022	961,685
Disabled		<u>18,143,006</u>	<u>20,002,843</u>
Total		\$195,559,300	\$216,995,119

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**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, 2018</u>	<u>January 1, 2020</u>
Actives		
Superannuation	\$98,098,593	\$109,300,237
Termination	2,814,509	3,451,822
Death	3,926,602	4,490,084
Disability	7,353,608	8,651,039
Retirees and Inactives		
Retirees and Beneficiaries	88,946,640	100,034,567
Vested	0	0
Terminated (Refund)	955,022	961,685
Disabled	<u>18,143,006</u>	<u>20,002,843</u>
Total	\$220,237,980	\$246,892,277



## 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, 2018</u>	<u>January 1, 2020</u>
Cash equivalents	\$1,405,941	\$1,291,608
Short term investments	0	0
Fixed income securities	27,282,328	22,313,793
Equities	53,521,718	50,896,628
International	49,075,318	43,473,119
Real Estate	21,228,701	24,664,375
Venture Capital	0	0
Other	12,532,271	36,676,614
Accounts receivable	370,425	105,517
Accounts payable	(487,582)	(222,848)
Accrued income	<u>25,992</u>	<u>20,333</u>
Total Market Value	\$164,955,112	\$179,219,139
Total Actuarial Value	\$157,572,627	\$170,070,394

**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**

	<u>January 1, 2020</u>
(1) Market value at January 1, 2019	\$154,038,066
(2) 2019 Contributions	\$9,459,027
(3) 2019 Payments	(\$14,137,508)
(4) Net interest adjustment at 7.75% on (1), (2), and (3) to December 31, 2019	\$11,756,659
(5) Expected market value on January 1, 2020	\$161,116,244
(1) + (2) + (3) + (4)	
(6) Actual market value on January 1, 2020	\$179,219,139
(7) 2019 (Gain) / Loss	(\$18,102,895)
(8) 80% of 2019 (Gain) / Loss	(\$14,482,316)
(9) 2018 (Gain) / Loss	\$19,211,963
(10) 60% of 2018 (Gain) / Loss	\$11,527,178
(11) 2017 (Gain) / Loss	(\$14,720,626)
(12) 40% of 2017 (Gain) / Loss	(\$5,888,251)
(13) 2016 (Gain) / Loss	(\$1,526,778)
(14) 20% of 2016 (Gain) / Loss	(\$305,356)
(15) Actuarial value on January 1, 2020, (6) + (8) + (10) + (12) + (14) but not less than 80% nor greater than 120% of (6)	\$170,070,394
(16) Ratio of actuarial value to market value	94.90%
(17) Actuarial Value Return for 2018	5.77%
(18) Actuarial Value Return for 2019	7.83%
(19) Market Value Return for 2018	-4.05%
(20) Market Value Return for 2019	19.68%

**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, 2018</u>	<u>January 1, 2020</u>
Actuarial Accrued Liability	\$195,559,300	\$216,995,119
Actuarial Assets	<u>157,572,627</u>	<u>170,070,394</u>
Unfunded Actuarial Accrued Liability	\$37,986,673	\$46,924,725
Funded Status	80.6%	78.4%

**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, 2032  
    \$ 45,630,321 over 12 years with 4.0% increasing payments
- Increasing amortization of the Early Retirement Incentive by June 30, 2028  
    \$ 1,161,860 over 8 years with 4.5% increasing payments
- Increasing amortization of the Early Retirement Incentive by June 30, 2028  
    \$ 132,544 over 8 years with 4.5% increasing payments
- Interest adjustment for payments deposited at the beginning August.

The pension appropriation is shown in Table VII.

**Table VII**

	<u>January 1, 2018</u>	<u>January 1, 2020</u>
Normal cost	\$725,407	\$780,406
Amortization payment of the prior accrued liability	3,808,178	4,253,716
Amortization payment of 2002 ERI liability	147,678	160,519
Amortization payment of 2003 ERI liability	16,847	18,312
Amortization payment of 2011 ERI liability	<u>95,151</u>	<u>0</u>
Total cost	\$4,793,261	\$5,212,953
% of Pay	14.7%	14.1%
Fiscal 2021 appropriation	\$5,471,210	\$5,471,210
Fiscal 2022 appropriation	\$5,632,799	\$6,001,729

## **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 2038 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 11 years until the unfunded liabilities are substantially paid off, at which time only the normal cost will remain. The total cost represents about 15.5% of payroll, decreasing to about 14% by the time the unfunded liabilities are fully paid off, leaving only a normal cost of about 1% thereafter. 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 %**
2021	\$3,228,904	\$816,965	\$4,654,245	\$5,471,210	14.9	\$47,224,704	78.2
2022	\$3,395,013	\$810,959	\$5,190,770	\$6,001,729	15.7	\$45,721,583	80.7
2023	\$3,569,245	\$803,166	\$5,399,379	\$6,202,545	15.6	\$43,859,290	83.1
2024	\$3,751,984	\$793,451	\$5,616,376	\$6,409,827	15.5	\$41,640,971	85.3
2025	\$3,943,630	\$781,675	\$5,842,099	\$6,623,774	15.4	\$39,030,945	87.4
2026	\$4,144,605	\$767,687	\$6,076,899	\$6,844,586	15.3	\$35,990,469	89.3
2027	\$4,355,349	\$751,329	\$6,321,142	\$7,072,471	15.2	\$32,477,496	91.2
2028	\$4,576,320	\$732,434	\$6,575,206	\$7,307,640	15.1	\$28,446,409	92.9
2029	\$4,808,001	\$710,826	\$6,573,260	\$7,284,086	14.4	\$23,847,731	94.5
2030	\$5,050,894	\$686,316	\$6,836,190	\$7,522,506	14.3	\$18,901,463	96.0
2031	\$5,305,526	\$658,709	\$7,109,638	\$7,768,347	14.2	\$13,308,931	97.4
2032	\$5,572,446	\$627,796	\$7,338,603	\$7,966,399	14.0	\$7,010,205	98.8
2033	\$5,852,232	\$593,355	\$0	\$593,355	1.0	(\$0)	100.0
2034	\$6,145,484	\$555,154	\$0	\$555,154	0.9	(\$0)	100.0
2035	\$6,452,834	\$512,948	\$0	\$512,948	0.8	(\$0)	100.0
2036	\$6,774,938	\$466,477	\$0	\$466,477	0.7	(\$0)	100.0
2037	\$7,112,486	\$415,468	\$0	\$415,468	0.6	(\$0)	100.0
2038	\$7,466,198	\$359,632	\$0	\$359,632	0.5	(\$0)	100.0
2039	\$7,836,827	\$298,664	\$0	\$298,664	0.4	\$0	100.0
2040	\$8,150,300	\$310,611	\$0	\$310,611	0.4	\$0	100.0
2041	\$8,476,312	\$323,035	\$0	\$323,035	0.4	\$0	100.0
2042	\$8,815,365	\$335,957	\$0	\$335,957	0.4	\$0	100.0
2043	\$9,167,979	\$349,395	\$0	\$349,395	0.4	\$0	100.0
2044	\$9,534,698	\$363,371	\$0	\$363,371	0.4	\$0	100.0
2045	\$9,916,086	\$377,906	\$0	\$377,906	0.4	\$0	100.0
2046	\$10,312,730	\$393,022	\$0	\$393,022	0.4	\$0	100.0
2047	\$10,725,239	\$408,743	\$0	\$408,743	0.4	\$0	100.0
2048	\$11,154,249	\$425,092	\$0	\$425,092	0.4	\$0	100.0
2049	\$11,600,419	\$442,096	\$0	\$442,096	0.4	\$0	100.0
2050	\$12,064,435	\$459,780	\$0	\$459,780	0.4	\$0	100.0
2051	\$12,547,013	\$478,171	\$0	\$478,171	0.4	\$0	100.0
2052	\$13,048,893	\$497,298	\$0	\$497,298	0.4	\$0	100.0

\*\* Beginning of Fiscal Year

## **EXHIBITS**

[https://shermanactuary.com/personal/dan\\_shermanactuary.com/Documents/Recovered Data/Norwood/Pension Val.20/Report\[ACTI.XLSJ\]Activities](https://shermanactuary.com/personal/dan_shermanactuary.com/Documents/Recovered%20Data/Norwood/Pension%20Report%20Report%20ACTI%20XLSJ/Activities)

**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
20-24	16	0	0	0	0	0	0	0	0	0	16
	28,187	0	0	0	0	0	0	0	0	0	28,187
25-29	43	7	74,349	0	0	0	0	0	0	0	50
	44,411	74,349	0	0	0	0	0	0	0	0	48,603
30-34	33	12	74,052	1	0	0	0	0	0	0	46
	54,683	74,052	79,831	0	0	0	0	0	0	0	60,283
35-39	22	23	76,933	12	2	0	0	0	0	0	59
	34,547	76,933	86,830	62,672	0	0	0	0	0	0	62,657
40-44	18	4	63,368	8	18	2	0	0	0	0	50
	39,179	63,368	85,508	84,728	69,659	0	0	0	0	0	66,143
45-49	26	10	41,977	7	9	8	3	0	0	0	63
	37,230	41,977	65,537	85,639	82,000	88,229	88,229	0	0	0	56,158
50-54	26	17	46,666	4	14	4	8	11	0	0	84
	41,415	46,666	46,974	53,379	83,150	93,618	109,947	109,947	0	0	60,670
55-59	21	16	40,163	26	10	11	7	8	5	0	104
	35,839	40,163	50,650	71,061	71,812	88,298	88,298	91,002	80,782	0	57,333
60-64	8	4	44,818	12	21	14	7	8	5	5	84
	33,368	44,818	57,473	47,722	49,129	62,921	62,921	101,949	81,086	134,254	61,412
65-69	5	3	81,622	5	8	5	4	2	0	2	34
	71,668	81,622	71,815	54,711	68,290	51,031	51,031	88,800	0	144,877	67,768
70+	2	2	54,393	1	2	4	6	2	3	1	23
	8,969	54,393	11,739	31,941	36,656	58,383	58,383	41,801	23,760	123,400	45,734
Total Employees	220	98	59,394	76	84	48	35	31	13	8	613
Average Salary	41,232	59,394	63,551	64,082	64,453	75,045	75,045	97,233	67,740	135,553	58,352



**Exhibit 2 - Retiree Distribution as of January 1, 2020**

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	1	0	1	5,504	0	5,504
50-54	2	2	4	48,803	36,063	84,866
55-59	10	13	23	110,601	603,429	714,030
60-64	21	28	49	281,239	1,512,995	1,794,234
65-69	31	36	67	772,720	1,789,825	2,562,545
70-74	47	27	74	1,236,015	1,208,489	2,444,505
75-79	32	23	55	703,826	782,336	1,486,163
80-84	17	12	29	380,296	357,883	738,179
85-89	26	7	33	372,576	265,816	638,392
90-94	14	7	21	193,666	220,494	414,159
95+	7	1	8	134,251	42,440	176,691
<b>Total</b>	<b>208</b>	<b>156</b>	<b>364</b>	<b>4,239,497</b>	<b>6,819,770</b>	<b>11,059,267</b>
<b>Average (Age/Payment)</b>	<b>75.93</b>	<b>71.23</b>	<b>73.92</b>	<b>20,382</b>	<b>43,716</b>	<b>30,383</b>
<b>Frequency Percent</b>	<b>57.1</b>	<b>42.9</b>	<b>100.0</b>	<b>38.3</b>	<b>61.7</b>	<b>100.0</b>

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

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	1	1	0	60,123	60,123
40-44	1	0	1	47,248	0	47,248
45-49	0	1	1	0	38,551	38,551
50-54	0	1	1	0	70,895	70,895
55-59	2	4	6	89,467	213,012	302,479
60-64	1	8	9	18,788	346,606	365,393
65-69	1	7	8	19,975	399,477	419,451
70-74	1	7	8	15,080	259,303	274,383
75-79	1	6	7	29,594	238,373	267,967
80-84	0	1	1	0	21,835	21,835
85-89	0	1	1	0	24,493	24,493
90-94	0	0	0	0	0	0
95-99	0	0	0	0	0	0
<b>Total</b>	<b>7</b>	<b>37</b>	<b>44</b>	<b>220,152</b>	<b>1,672,668</b>	<b>1,892,820</b>
<b>Average (Age/Payment)</b>	<b>62.89</b>	<b>66.89</b>	<b>66.25</b>	<b>31,450</b>	<b>45,207</b>	<b>43,019</b>
<b>Frequency Percent</b>	<b>15.9</b>	<b>84.1</b>	<b>100.0</b>	<b>11.6</b>	<b>88.4</b>	<b>100.0</b>

**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	\$15,818,516	\$3,228,904	\$5,471,210	\$12,615,056	\$5,496,654
2021	15,749,360	3,395,013	6,001,729	12,740,110	6,387,492
2022	16,321,416	3,569,245	6,202,545	13,206,340	6,656,714
2023	16,901,341	3,751,984	6,409,827	13,692,896	6,953,366
2024	17,408,104	3,943,630	6,623,774	14,204,893	7,364,193
2025	17,909,505	4,144,605	6,844,586	14,748,491	7,828,177
2026	18,417,905	4,355,349	7,072,471	15,327,277	8,337,192
2027	18,886,808	4,576,320	7,307,640	15,946,421	8,943,573
2028	19,362,932	4,808,001	7,284,086	16,604,174	9,333,329
2029	19,771,964	5,050,894	7,522,506	17,301,356	10,102,792
2030	20,117,104	5,305,526	7,768,347	18,059,618	11,016,386
2031	20,433,646	5,572,446	7,966,399	18,884,399	11,989,598
2032	20,716,527	5,852,232	593,355	19,576,135	5,305,196
2033	20,906,695	6,145,484	555,154	19,967,619	5,761,563
2034	21,049,493	6,452,834	512,948	20,395,480	6,311,769
2035	21,093,915	6,774,938	466,477	20,868,754	7,016,254
2036	21,143,340	7,112,486	415,468	21,395,311	7,779,925
2037	21,171,718	7,466,198	359,632	21,980,624	8,634,736
2038	21,072,499	7,836,827	298,664	22,635,596	9,698,589
2039	20,954,896	8,150,300	310,611	23,368,535	10,874,550
2040	20,846,630	8,476,312	323,035	24,190,159	12,142,875
2041	20,719,229	8,815,365	335,957	25,108,533	13,540,625
2042	20,539,744	9,167,979	349,395	26,134,710	15,112,340
2043	20,334,135	9,534,698	363,371	27,280,927	16,844,861
2044	20,159,209	9,916,086	377,906	28,557,271	18,692,054
2045	19,909,921	10,312,730	393,022	29,976,361	20,772,192
2046	19,649,330	10,725,239	408,743	31,553,531	23,038,183
2047	19,350,076	11,154,249	425,092	33,303,909	25,533,174
2048	19,069,985	11,600,419	442,096	35,242,723	28,215,253
2049	19,639,271	12,064,435	459,780	37,353,204	30,238,149

amounts in thousands

## **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:

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

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

### 5. **Average Salary**

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

### 6. **Creditable Service**

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

**7. Service Retirement**

a. Eligibility:

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

- (i) completion of 20 years of service, if hired before April 2, 2012
- (ii) for an employee hired prior to January 1, 1978, attainment of age 55 as an active member
- (iii) for an employee hired on or after January 1, 1978, attainment of age 55 as an active member and completion of ten years of service
- (iv) for a Group 1 employee hired on or after April 2, 2012, attainment of age 60 and completion of ten years of service

b. Benefit Amount:

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

<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		
	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 \$500 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 \$500 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 \$14,000. 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 7.6% per annum. The previous valuation used 7.75%.

### **5. Salary Scale**

It is assumed that salaries including longevity will increase at 3% 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 \$14,000 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 20% 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 both pre-retirement mortality and beneficiary mortality is represented by the RP-2014 Blue Collar Mortality with Scale MP-2014, gully 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:

<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
80	0.2500	0.2000	1.0000



## 12. Annual Rate of Disability Prior to Retirement

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

<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 2020 is \$375,000 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:

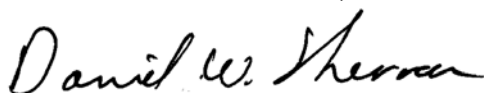
This report fairly represents the actuarial position of the Norwood Retirement System contributing as of January 1, 2020, in accordance with generally accepted actuarial principles applied consistently with the preceding valuation. In our opinion, the actuarial assumptions used to compute actuarial accrued 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



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Daniel W. Sherman, ASA, MAAA

November, 2020