



THE CITY OF BRISTOL POSTEMPLOYMENT BENEFITS OTHER THAN PENSIONS

**Actuarial Valuation as of July 1, 2022
To Determine Funding for Fiscal Year 2023-24**

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Certification

We have performed an actuarial valuation of the Plan as of July 1, 2022 to determine funding for fiscal year 2023-24. This report presents the results of our valuation.

The ultimate cost of an Other Post-Employment Benefits (OPEB) plan is the total amount needed to provide benefits for plan members and beneficiaries and to pay the expenses of administering the plan. OPEB costs are met by contributions and by investment return on plan assets. The principal purpose of this report is to set forth an actuarial recommendation of the contribution, or range of contributions, which will properly fund the plan, in accordance with applicable actuarial standards of practice. In addition, this report provides:

- A valuation of plan assets and liabilities to review the year-to-year progress of funding.
- Review of plan experience since the previous valuation to ascertain whether the assumptions and methods employed for valuation purposes are reflective of actual events and remain appropriate for prospective application.
- Assessment of the relative funded position of the plan, i.e., through a comparison of plan assets and projected plan liabilities.
- Comments on any other matters which may be of assistance in the funding and operation of the plan.

This report may not be used for purposes other than those listed above without Milliman's prior written consent. If this report is distributed to other parties, it must be copied in its entirety, including this certification section.

Milliman's work is prepared solely for the internal business use of the City of Bristol ("City"). To the extent that Milliman's work is not subject to disclosure under applicable public records laws, Milliman's work may not be provided to third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of its work product. Milliman's consent to release its work product to any third party may be conditioned on the third party signing a Release, subject to the following exceptions: (a) the City may provide a copy of Milliman's work, in its entirety, to the City's professional service advisors who are subject to a duty of confidentiality and who agree to not use Milliman's work for any purpose other than to benefit the City; and (b) the City may provide a copy of Milliman's work, in its entirety, to other governmental entities, as required by law. No third party recipient of Milliman's work product should rely upon Milliman's work product. Such recipients should engage qualified professionals for advice appropriate to their own specific needs.

In preparing this report, we relied on employee census data and financial information as of the valuation date, furnished by the City. We performed a limited review of the data used directly in our analysis for reasonableness and consistency and have found them to be reasonably consistent and comparable with data used for other purposes. If the underlying data or information is inaccurate or incomplete, the results of our analysis may likewise be inaccurate or incomplete and our calculations may need to be revised. If there are material defects in the data, it is possible that they would be uncovered by a detailed, systematic review and comparison of the data to search for data values that are questionable or for relationships that are materially inconsistent. Such a review was beyond the scope of our assignment.

Certification

The calculations reported herein have been made on a basis consistent with our understanding of the plan provisions. Additional determinations may be needed for purposes other than determining funding amounts, such as judging benefit security at plan termination or meeting employer accounting requirements. On the basis of the foregoing, we hereby certify that, to the best of our knowledge, this report is complete and accurate and all costs and liabilities were determined in conformance with generally accepted actuarial principles and practices.

The valuation results were developed using models employing standard actuarial techniques. In addition to the models described previously, Milliman has developed certain models to develop the expected long term rate of return on assets and estimate the claim costs and trend used in this analysis. We have reviewed the models, including their inputs, calculations, and outputs for consistency, reasonableness, and appropriateness to the intended purpose and in compliance with generally accepted actuarial practice and relevant actuarial standards of practice. The models, including all input, calculations, and output may not be appropriate for any other purpose.

Information relating to periods prior to July 1, 2018 was taken from reports prepared by the prior actuary.

We further certify that, in our opinion, each actuarial assumption, method and technique used is reasonable taking into account the experience of the Plan and reasonable expectations. Future actuarial measurements may differ significantly from the current measurements presented in this report due to factors such as, but not limited to, 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 the actuarial assignment, we did not perform an analysis of the potential range of such future measurement.

The consultants who worked on this assignment are actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

The undersigned are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.



Rebecca A. Sielman, FSA
Consulting Actuary

Section I - Executive Summary Changes Since the Prior Valuation

Demographic Changes and Plan Experience

From July 1, 2020 to July 1, 2022, the overall membership increased from 2,086 to 2,190. The number of active members increased from 1,519 to 1,622, and the total number of members and spouses/dependents receiving benefits increased from 567 to 568.

The average age of active members decreased slightly from 46.5 to 44.8, and the average age of members receiving benefits decreased slightly from 66.1 to 65.8.

Plan Changes

None.

Changes in Actuarial Methods and Assumptions

We updated certain demographic assumptions based on the 2021 Experience Study, the assumptions used in the June 30, 2020 Actuarial Valuation Report for the Connecticut State Teachers' Retirement System, and the updated MP 2021 mortality improvement scale. These changes increased the Unfunded Accrued Liability by about \$1.9 million and increased the Actuarially Determined Contribution by about \$146,000.

We lowered the discount rate to 6.50% from 7.00%. This change increased the Unfunded Accrued Liability by about \$3.26 million and increased the Actuarially Determined Contribution by about \$369,000.

Other Significant Changes

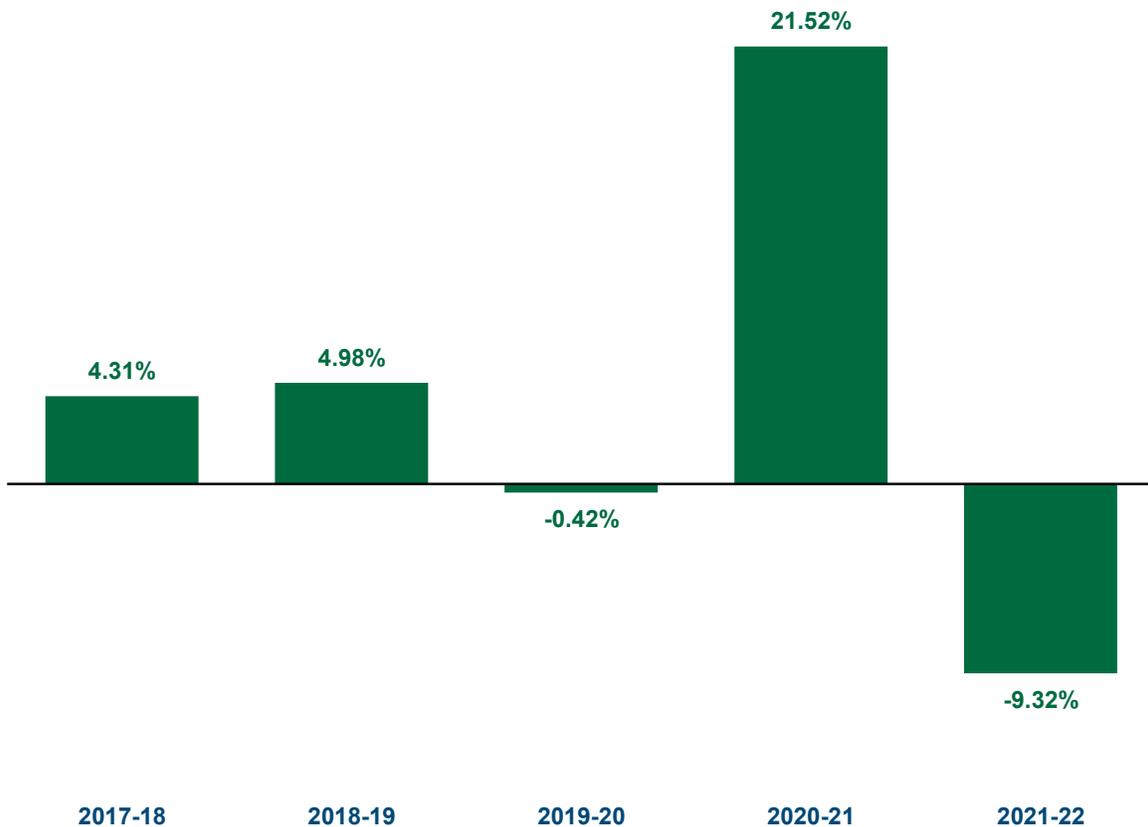
Although it is possible that the COVID-19 pandemic could have a material impact on the projected mortality, liabilities, and contribution requirements, we have chosen not to make an adjustment in the projections at this time, given the substantial current uncertainty regarding the impact of COVID-19 on mortality and plan costs, including whether the pandemic will increase or decrease mortality during the term of our projections. We will be monitoring this development closely and may adjust future projections to reflect the impact of COVID-19, if and when it becomes appropriate.

Section I - Executive Summary Assets

The Market Value is a snapshot of the plan's investments as of the valuation date. For the two-year period since the last valuation, the plan's Market Value changed as follows:

Value as of July 1, 2020	\$14,091,431
City and Active Member Contributions	16,927,701
Investment Income	1,355,920
Benefit Payments and Administrative Expenses	(13,130,190)
Value as of July 1, 2022	19,244,862

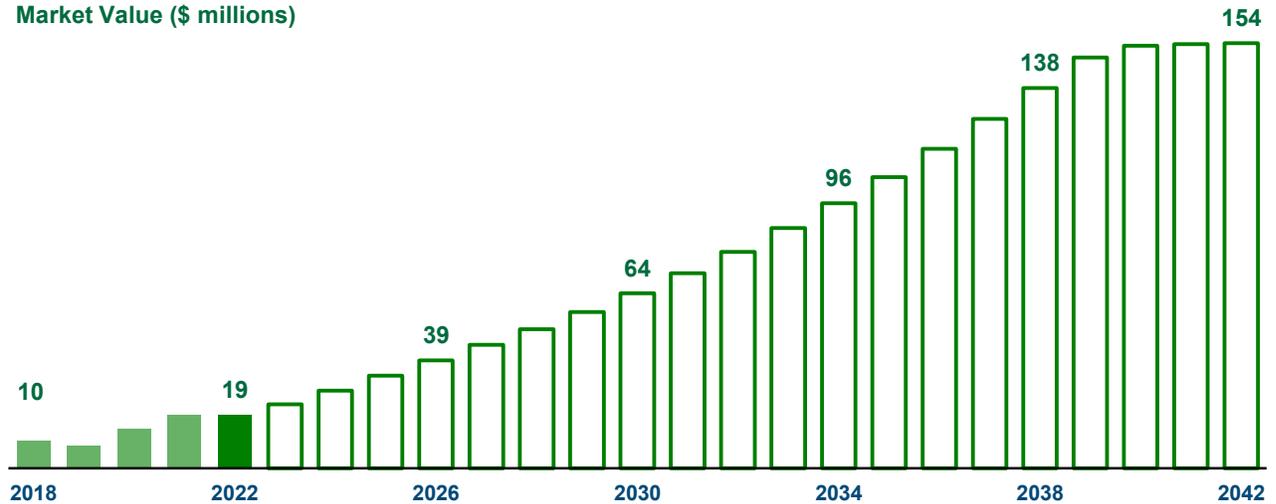
For fiscal year 2020-21, the plan's assets earned 21.52% on a Market Value basis. For fiscal year 2021-22, the plan's assets earned -9.32% on a Market Value basis. Historical rates of return are shown in the graph below.



Section I - Executive Summary Assets (continued)

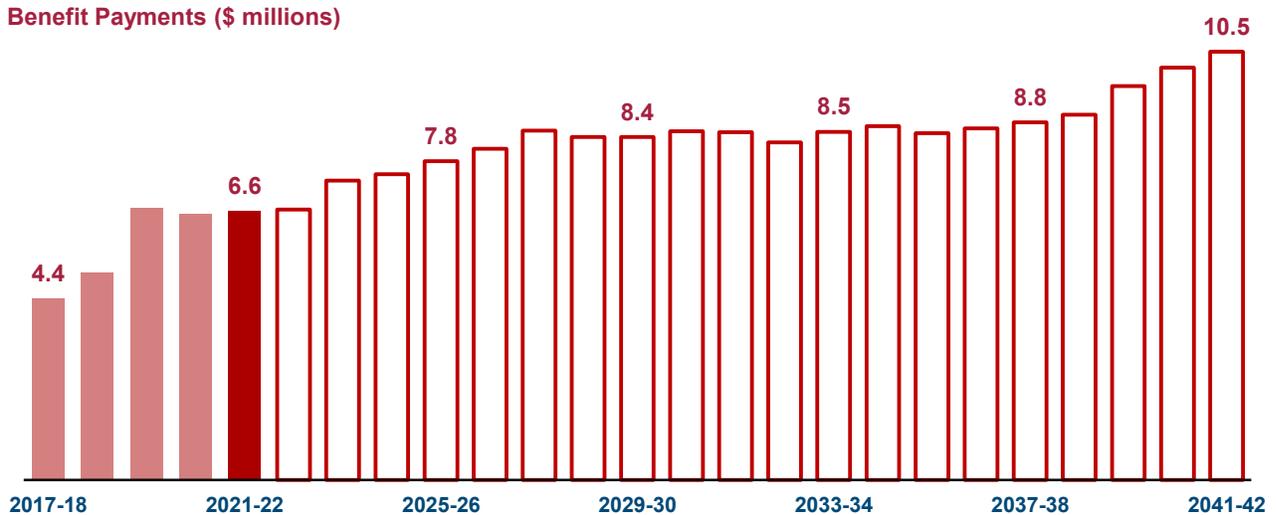
The graph below shows how this year's asset values compare to where the plan's assets have been over the past several years and how they are projected to change over the next 20 years. For purposes of this projection, we have assumed that the City always contributes the Actuarially Determined Contribution and the investments always earn the assumed interest rate each year.

Market Value (\$ millions)



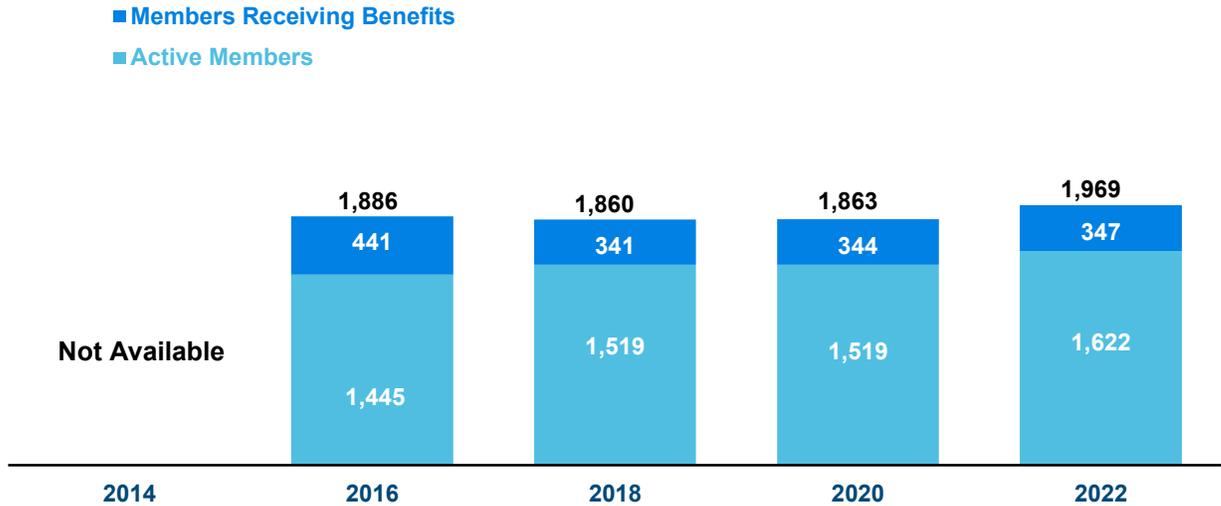
In 2021-22, the plan paid out \$6.6 million in benefits to members. Over the next 20 years, the plan is projected to pay out a total of \$170 million in benefits to members.

Benefit Payments (\$ millions)



Section I - Executive Summary Membership

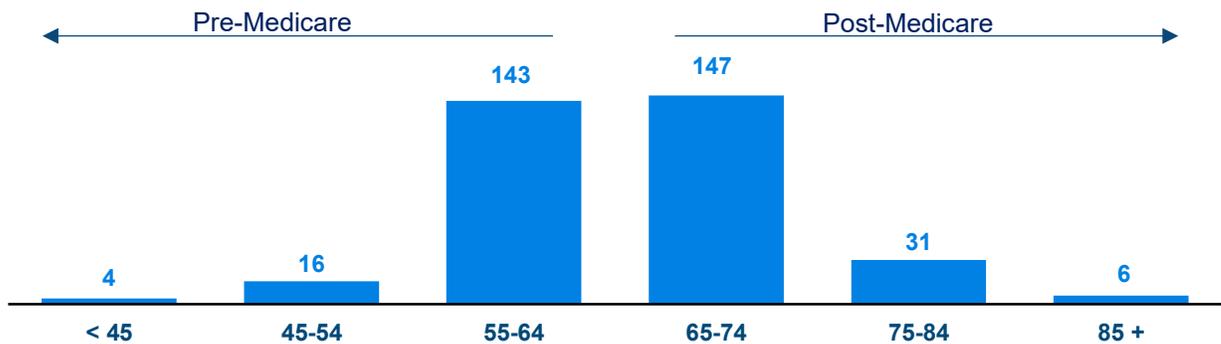
There are two basic categories of plan members included in the valuation: (1) members who are receiving benefits and (2) active employees who have met the eligibility requirements for membership.



Members Receiving Benefits on July 1, 2022

	Members	Spouses	Average Age
City	122	84	Members 65.8
Water	15	10	Spouses/dependents 63.1
Police	57	52	
Fire	24	21	
BOE Certified	58	9	
BOE Non-Certified	<u>71</u>	<u>45</u>	
Total	347	221	

The members receiving benefits fall across a wide distribution of ages:



Section I - Executive Summary Membership (continued)

Active Members on July 1, 2022

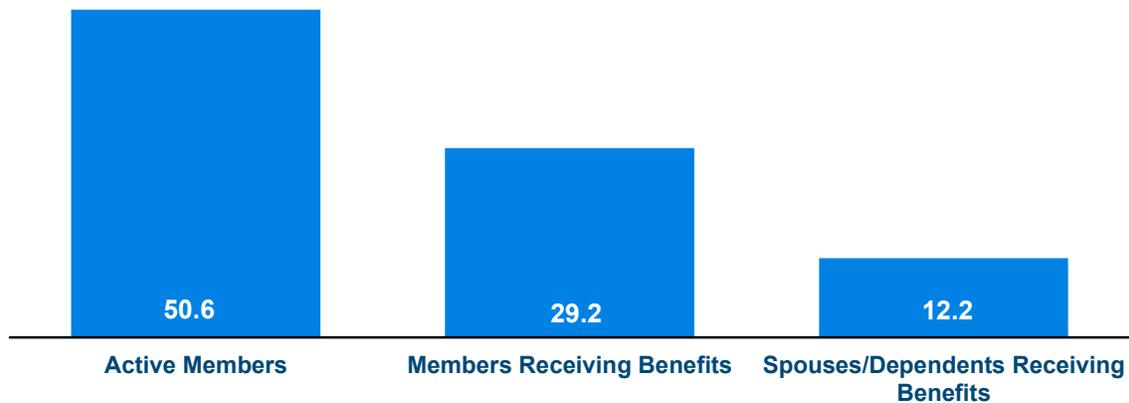
City	308	Average Age	44.8
Water	36	Average Service	11.4
Police	115	Payroll	\$118,076,604
Fire	94	Average Payroll	72,797
BOE Certified	663		
BOE Non-Certified	406		
Total	1,622		

The table below illustrates the age and years of service of the active membership:

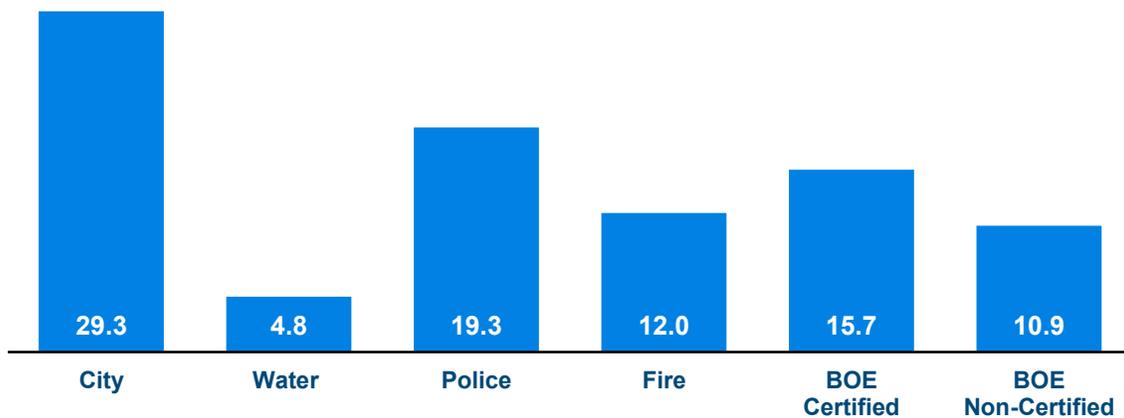
Age	Years of Service							Total
	0-4	5-9	10-14	15-19	20-24	25-29	30+	
< 25	50							50
25-29	119	17						136
30-34	104	71	11					186
35-39	84	55	39	35				213
40-44	62	40	30	76	22			230
45-49	45	28	30	59	53	4		219
50-54	46	31	27	44	51	29	11	239
55-59	28	23	23	47	36	16	14	187
60-64	15	18	16	26	27	7	17	126
65+		5	11	6	4	2	8	36
Total	553	288	187	293	193	58	50	1,622

Section I - Executive Summary Accrued Liability

The Accrued Liability as of July 1, 2022 is \$91,959,900 and consists of the following pieces (\$ millions):



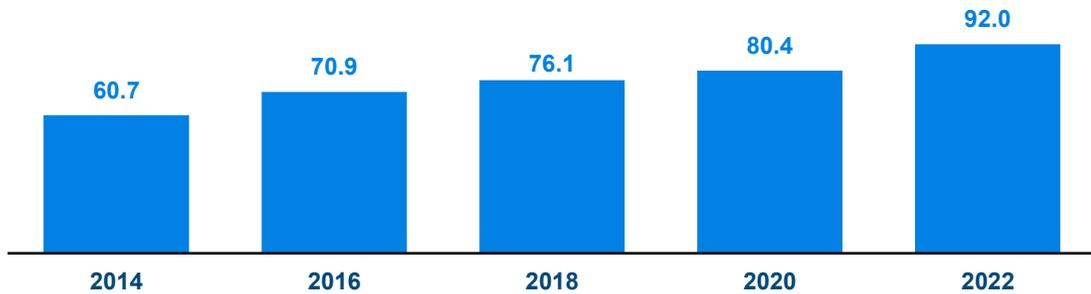
The breakdown of the Accrued Liability by department is shown below (\$ millions):



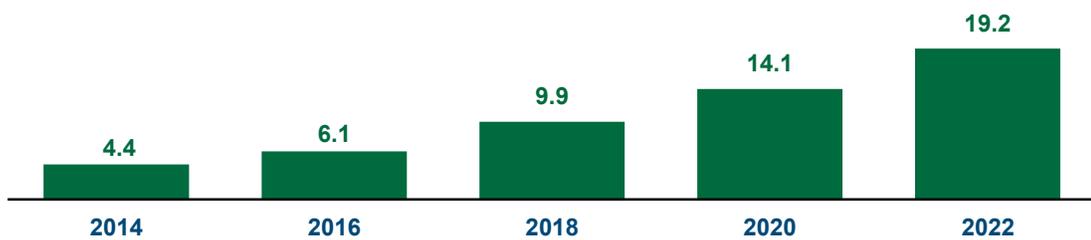
Section I - Executive Summary Funded Status

The Accrued Liability grows over time as active members earn additional benefits, and goes down over time as members receive benefits; it may also change when there are changes to the plan provisions or changes in the actuarial assumptions. The Unfunded Accrued Liability is the dollar difference between the Accrued Liability and the Actuarial Value of Assets; the Funded Ratio is the ratio of the two.

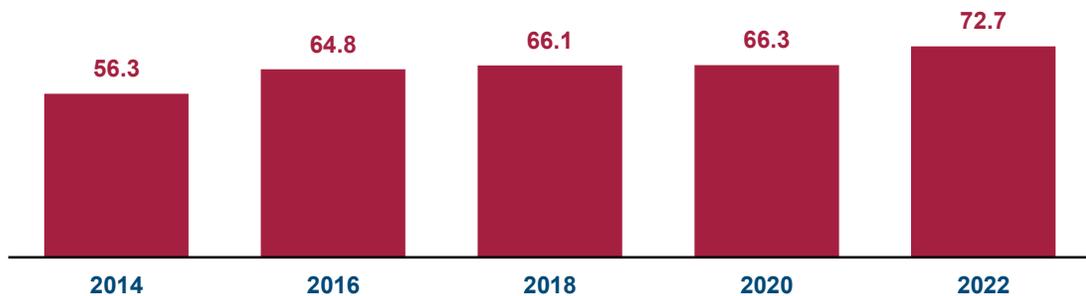
Accrued Liability (\$ millions)



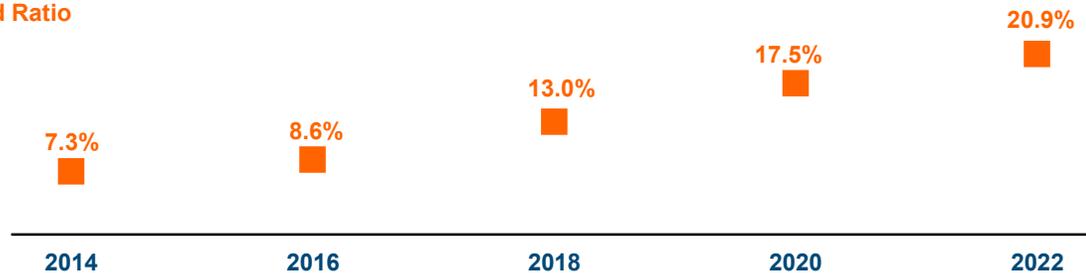
Market Value of Assets (\$ millions)



Unfunded Accrued Liability (\$ millions)

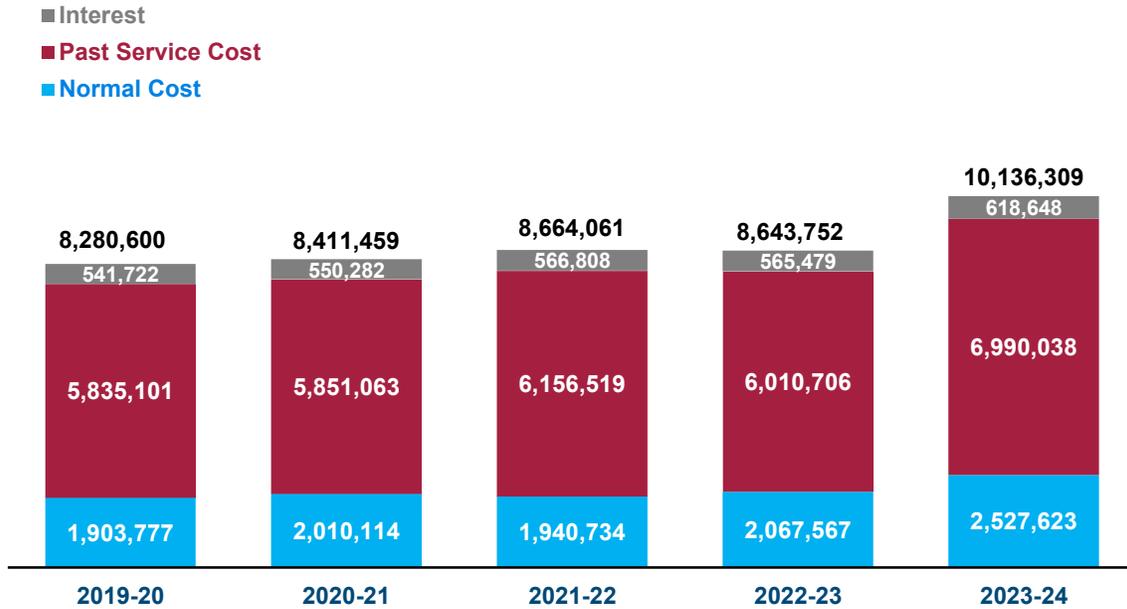


Funded Ratio



Section I - Executive Summary Actuarially Determined Contribution

The Actuarially Determined Contribution consists of three pieces: a Normal Cost payment to fund the benefits earned each year, a Past Service Cost to gradually reduce any unfunded or surplus liability, and Interest to reflect the timing of the contribution relative to the valuation date. The chart below shows the Actuarially Determined Contribution for the past five fiscal years.

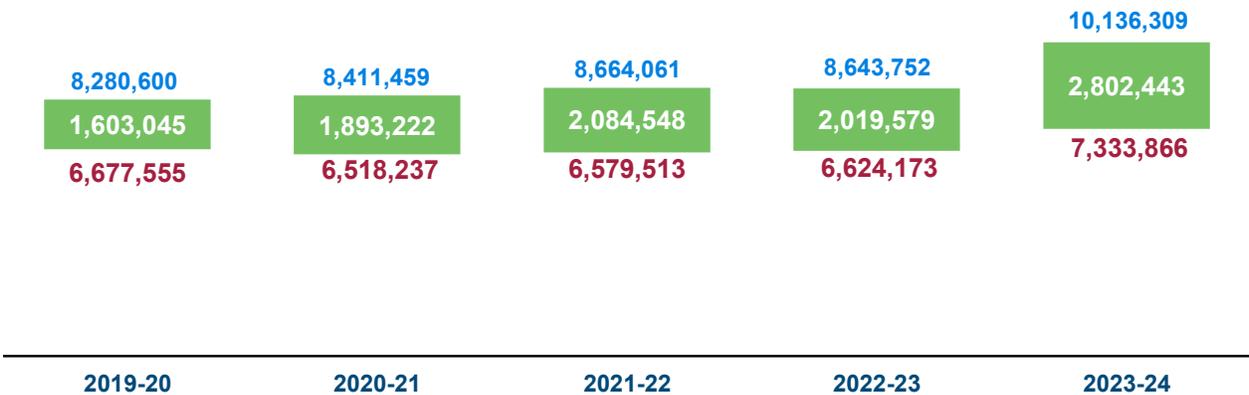


Section I - Executive Summary Net Budget Impact

The City is currently paying healthcare benefits outside of the OPEB Trust. In addition to calculating the Actuarially Determined Contribution, we also calculate the Net Budget Impact, which is the amount of additional cash contribution the City should make to the OPEB trust in order to fully fund the Actuarially Determined Contribution. The Net Budget Impact is found by subtracting the Expected Benefit Payments from the Actuarially Determined Contribution.

The chart below shows the Net Budget Impact for the past five fiscal years.

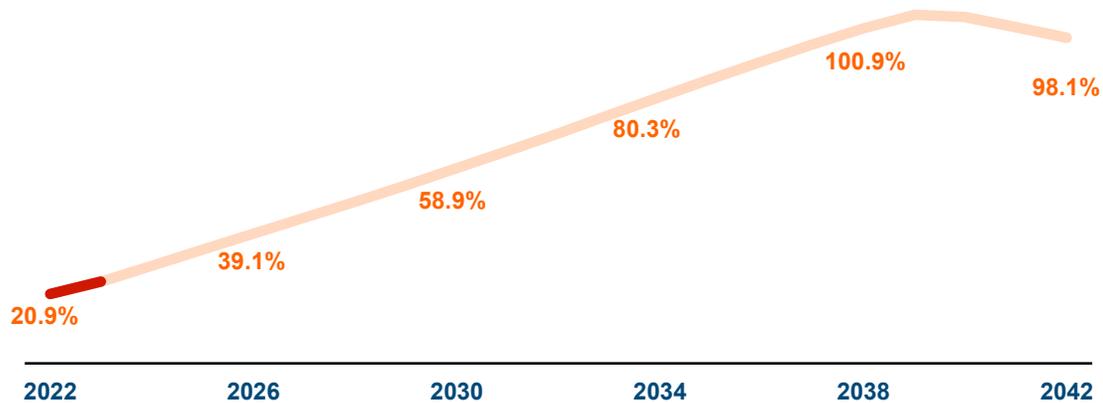
Actuarially Determined Contribution
Net Budget Impact
Expected Benefit Payments



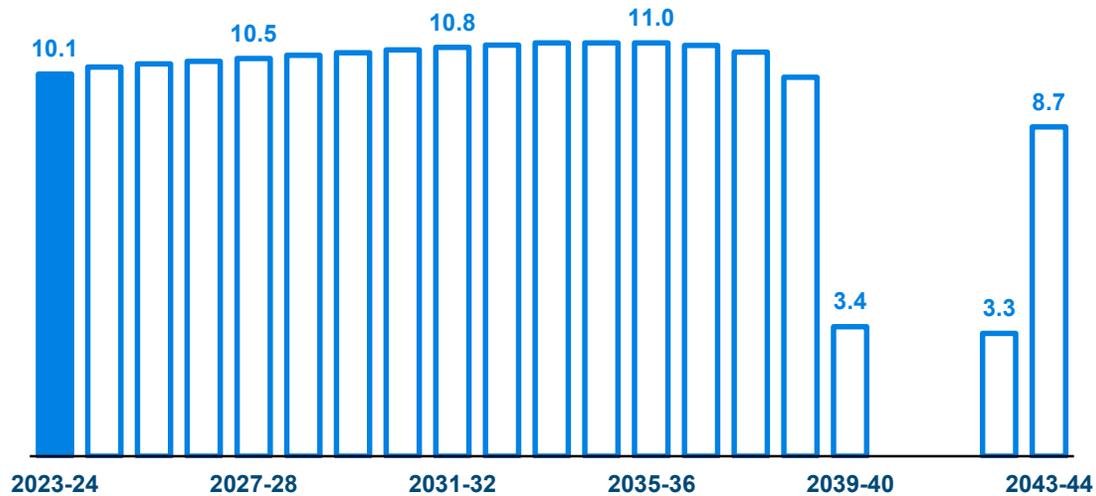
Section I - Executive Summary Long-Range Forecast

If the City pays the Actuarially Determined Contribution each year, the investments earn exactly the assumed interest rate each year, and there are no changes in the plan provisions or in the actuarial methods and assumptions, then we project the following changes in the plan's funded status and the long-range contribution levels:

Funded Ratio



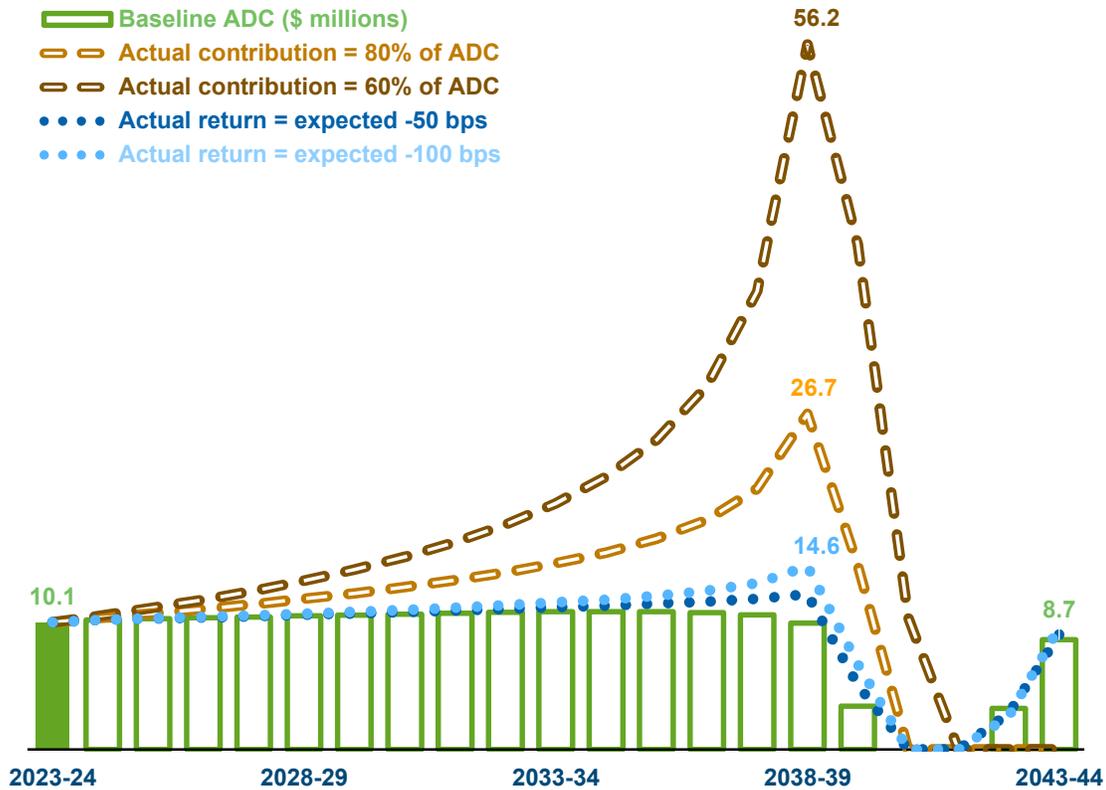
Actuarially Determined Contribution (\$ millions)



To the extent that there are future investment or liability gains or losses, changes in the actuarial assumptions or methods, or plan changes, the actual valuation results will differ from these forecasts. Please see Section III C for more details of the long range forecast.

Section I - Executive Summary Long-Range Forecast (continued)

Benefits are paid for through a combination of contributions from the City and from employees, and from investment income. If the City pays less than the Actuarially Determined Contribution each year, or if the investments persistently earn less than the assumed interest rate, then the plan's funded status would suffer, and to compensate, the City's contribution levels would be pushed higher. The risks of underfunding and underearning are illustrated in the hypothetical scenarios below:



The scenarios illustrated above are based on deterministic projections that assume emerging plan experience always exactly matches the actuarial assumptions; in particular that actual asset returns will be constant in every year of the projection period. Variation in asset returns, contribution amounts, and many other factors may have a significant impact on the long-term financial health of the plan, the liquidity constraints on plan assets, and the City's future contribution levels. Stochastic projections could be prepared that would enable the City to understand the potential range of future results based on the expected variability in asset returns and other factors. Such analysis was beyond the scope of this engagement.

Section I - Executive Summary Summary of Principal Results

Membership as of	July 1, 2020	July 1, 2022
Active Members	1,519	1,622
Members Receiving Benefits	<u>344</u>	<u>347</u>
Total Count	1,863	1,969
Payroll	\$105,736,504	\$118,076,604
Assets and Liabilities as of	July 1, 2020	July 1, 2022
Market Value of Assets	\$14,091,431	\$19,244,862
Accrued Liability for Active Members	46,406,844	50,569,618
Accrued Liability for Members Receiving Benefits	<u>33,948,574</u>	<u>41,390,282</u>
Total Accrued Liability	80,355,418	91,959,900
Unfunded Accrued Liability	66,263,987	72,715,038
Funded Ratio	17.5%	20.9%
Actuarially Determined Contribution for Fiscal Year	2021-22	2023-24
Normal Cost	\$1,940,734	\$2,527,623
Past Service Cost	6,156,519	6,990,038
Interest	<u>566,808</u>	<u>618,648</u>
Actuarially Determined Contribution	8,664,061	10,136,309
Allocated to City	\$2,467,433	\$2,767,516
Allocated to Water	479,056	573,106
Allocated to Police	1,891,854	2,179,547
Allocated to Fire	1,084,829	1,328,022
Allocated to BOE Certified	1,441,667	1,755,851
Allocated to BOE Non-Certified	<u>1,299,222</u>	<u>1,532,267</u>
Total	8,664,061	10,136,309

Section II - Plan Assets

A. Summary of Fund Transactions

Market Value as of July 1, 2020	\$14,091,431
City Contributions	7,818,237
Member Contributions	600,849
Net Investment Income	3,235,041
Benefit Payments	(6,518,237)
Administrative Expenses	(24,080)
 Market Value as of June 30, 2021	 19,203,241
Approximate Rate of Return, 2020-21*	21.52%
 Market Value as of July 1, 2021	 \$19,203,241
City Contributions	7,858,513
Member Contributions	650,102
Net Investment Income	(1,879,121)
Benefit Payments	(6,579,513)
Administrative Expenses	(8,360)
 Market Value as of June 30, 2022	 19,244,862
Approximate Rate of Return, 2021-22*	-9.32%

* The rates shown here are not the dollar or time weighted investment yield rate which measures investment performance. They are an approximate net return assuming all activity occurred on average midway through the fiscal year.

Section III - Development of Contribution

A. Summary of Liabilities

We have calculated the Accrued Liability separately for 6 groups, who are eligible for different OPEB benefits. We have broken the accrued liability into several pieces: benefits that are expected to be paid prior to age 65 (i.e. prior to Medicare) and after age 65 (i.e. after Medicare) to current active members and their covered dependents after retirement, and the same figures for members who have already retired and are currently receiving benefits. In all cases, the Accrued Liability only reflects benefits that are paid for by the City, taking into account any implicit rate subsidies.

	City	Water	Police	Fire	BOE Certified	BOE Non-Certified	Total
Current active members							
Members Under Age 65	\$7,341,023	\$1,588,819	\$4,866,877	\$3,618,903	\$2,203,616	\$3,853,426	\$23,472,664
Members Over Age 65	2,426,116	402,984	666,418	1,028,629	86,117	789,064	5,399,328
Spouses/Dependents Under Age 65	5,624,077	1,391,648	4,175,195	3,816,248	816,087	1,953,357	17,776,612
Spouses/Dependents Over Age 65	<u>1,891,559</u>	<u>240,977</u>	<u>286,980</u>	<u>395,416</u>	<u>61,140</u>	<u>1,044,942</u>	<u>3,921,014</u>
Total	17,282,775	3,624,428	9,995,470	8,859,196	3,166,960	7,640,789	50,569,618
Current members receiving benefits							
Members Under Age 65	4,566,366	604,670	4,354,623	1,398,694	513,152	1,087,281	12,524,786
Members Over Age 65	2,602,710	104,397	815,145	377,483	11,860,142	881,957	16,641,834
Spouses/Dependents Under Age 65	3,285,219	364,586	3,435,908	1,107,842	154,561	827,573	9,175,689
Spouses/Dependents Over Age 65	<u>1,590,098</u>	<u>74,137</u>	<u>742,522</u>	<u>220,334</u>	<u>0</u>	<u>420,882</u>	<u>3,047,973</u>
Total	12,044,393	1,147,790	9,348,198	3,104,353	12,527,855	3,217,693	41,390,282
Total Accrued Liability	29,327,168	4,772,218	19,343,668	11,963,549	15,694,815	10,858,482	91,959,900
Accrued Liability Sensitivity							
		1% Decrease		Baseline		1% Increase	
Discount Rate		98,967,864		91,959,900		85,604,419	
Trend Rate		84,278,580		91,959,900		100,797,069	

Section III - Development of Contribution

B. Actuarially Determined Contribution

The Actuarially Determined Contribution (ADC) for the OPEB program consists of three pieces: a **Normal Cost** (the cost of benefits earned each year) plus a **Past Service Cost** (a catch-up accrual to amortize the Unfunded Accrued Liability as a level annual amount) plus **Interest** to reflect the timing lag between the valuation date and the fiscal year. On this basis, the ADC is determined as follows:

	City	Water	Police	Fire	BOE Certified	BOE Non-Certified	Total
Accrued Liability	\$29,327,168	\$4,772,218	\$19,343,668	\$11,963,549	\$15,694,815	\$10,858,482	\$91,959,900
Market Value of Assets*	9,101,044	158,943	5,219,136	4,765,739	0	0	19,244,862
Unfunded Accrued Liability	20,226,124	4,613,275	14,124,532	7,197,810	15,694,815	10,858,482	72,715,038
Funded Ratio	31.0%	3.3%	27.0%	39.8%	0.0%	0.0%	20.9%
Amortization Period	16	16	16	16	16	16	16
Amortization Growth Rate	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Past Service Cost	1,944,321	443,470	1,357,780	691,920	1,508,730	1,043,817	6,990,038
Total Normal Cost	967,077	132,232	861,382	626,965	138,488	393,916	3,120,060
Employee Contributions	315,534	38,020	174,448	73,035	0	0	601,037
Expenses**	2,743	446	1,809	1,119	1,468	1,015	8,600
Net Normal Cost	654,286	94,658	688,743	555,049	139,956	394,931	2,527,623
Interest	168,909	34,978	133,024	81,053	107,165	93,519	618,648
ADC for FY 2023-24	2,767,516	573,106	2,179,547	1,328,022	1,755,851	1,532,267	10,136,309
Expected Benefit Payouts	(2,651,933)	(376,526)	(1,621,171)	(711,228)	(1,011,331)	(961,677)	(7,333,866)
Net Budget Impact	115,583	196,580	558,376	616,794	744,520	570,590	2,802,443

* Allocation provided by the City

** Allocated in proportion to each group's Accrued Liability

Section III - Development of Contribution

C. Long Range Forecast

This forecast is based on the results of the July 1, 2022 actuarial valuation and assumes that the City will pay the Actuarially Determined Contribution each year, the assets will return the assumed interest rate on a market value basis each year, and there are no future changes in the actuarial methods or assumptions or in the plan provisions. For purposes of this forecast the amortization period declines to 1 year to illustrate the progress of the plan towards becoming fully funded; in actual practice the amortization period will not be less than 10 years in order to shield the City from contribution volatility. Actual results at each point in time will yield different values, reflecting the actual experience of the plan membership and assets.

Valuation Date	Values as of the Valuation Date				Fiscal Year	Cash Flows Projected to the Following Fiscal Year			
	Accrued Liability	Actuarial Value of Assets	Unfunded Accrued Liability	Funded Ratio		City Contributions	Member Contributions	Benefit Payments	Net Cash Flows
7/1/2022	\$91,959,900	\$19,244,862	\$72,715,038	20.9%	2023-24	\$10,136,309	\$619,068	(\$7,333,866)	\$3,421,511
7/1/2023	94,053,000	23,193,000	70,860,000	24.7%	2024-25	10,316,000	638,000	(7,491,000)	3,463,000
7/1/2024	96,031,000	28,224,000	67,807,000	29.4%	2025-26	10,403,000	657,000	(7,808,000)	3,252,000
7/1/2025	98,096,000	33,624,000	64,472,000	34.3%	2026-27	10,475,000	676,000	(8,116,000)	3,035,000
7/1/2026	100,087,000	39,158,000	60,929,000	39.1%	2027-28	10,546,000	697,000	(8,561,000)	2,682,000
7/1/2027	102,009,000	44,827,000	57,182,000	43.9%	2028-29	10,628,000	718,000	(8,401,000)	2,945,000
7/1/2028	103,688,000	50,500,000	53,188,000	48.7%	2029-30	10,696,000	739,000	(8,401,000)	3,034,000
7/1/2029	105,753,000	56,812,000	48,941,000	53.7%	2030-31	10,772,000	761,000	(8,542,000)	2,991,000
7/1/2030	108,108,000	63,626,000	44,482,000	58.9%	2031-32	10,841,000	784,000	(8,516,000)	3,109,000
7/1/2031	110,595,000	70,839,000	39,756,000	64.1%	2032-33	10,904,000	808,000	(8,273,000)	3,439,000
7/1/2032	113,415,000	78,641,000	34,774,000	69.3%	2033-34	10,965,000	832,000	(8,531,000)	3,266,000
7/1/2033	116,587,000	87,291,000	29,296,000	74.9%	2034-35	10,961,000	857,000	(8,670,000)	3,148,000
7/1/2034	119,897,000	96,325,000	23,572,000	80.3%	2035-36	10,964,000	883,000	(8,499,000)	3,348,000
7/1/2035	123,453,000	105,824,000	17,629,000	85.7%	2036-37	10,897,000	909,000	(8,615,000)	3,191,000
7/1/2036	127,614,000	116,145,000	11,469,000	91.0%	2037-38	10,713,000	936,000	(8,758,000)	2,891,000
7/1/2037	132,097,000	126,975,000	5,122,000	96.1%	2038-39	10,052,000	964,000	(8,946,000)	2,070,000
7/1/2038	136,932,000	138,199,000	(1,267,000)	100.9%	2039-40	3,433,000	993,000	(9,647,000)	(5,221,000)
7/1/2039	142,134,000	149,306,000	(7,172,000)	105.0%	2040-41	0	1,023,000	(10,099,000)	(9,076,000)
7/1/2040	147,136,000	153,606,000	(6,470,000)	104.4%	2041-42	0	1,054,000	(10,493,000)	(9,439,000)
7/1/2041	152,186,000	154,204,000	(2,018,000)	101.3%	2042-43	3,255,000	1,086,000	(10,698,000)	(6,357,000)

Section III - Development of Contribution
D. History of Funded Status

Valuation Date	Actuarial Value of Assets	Accrued Liability	Unfunded Accrued Liability	Funded Ratio
July 1, 2014	\$4,439,558	\$60,732,614	\$56,293,056	7.3%
July 1, 2016	6,127,608	70,896,937	64,769,329	8.6%
July 1, 2018	9,926,387	76,070,729	66,144,342	13.0%
July 1, 2020	14,091,431	80,355,418	66,263,987	17.5%
July 1, 2022	19,244,862	91,959,900	72,715,038	20.9%

Section III - Development of Contribution
E. History of City Contributions

Fiscal Year	Actuarially Determined Contribution	Actual City Contribution	Contribution Deficiency (Excess)
2015-16	\$7,308,579	\$3,961,206	\$3,347,373
2016-17	7,256,765	6,583,891	672,874
2017-18	6,234,993	5,801,097	433,896
2018-19	7,208,338	7,917,323	(708,985)
2019-20	8,280,600	8,127,555	153,045
2020-21	8,411,459	7,818,237	593,222
2021-22	8,664,061	7,858,513	805,548
2022-23	8,643,752	TBD	TBD
2023-24	10,136,309	TBD	TBD

Section IV - Membership Data
A. Statistics of Active Membership

		As of July 1, 2020	As of July 1, 2022
Number of Active Members	City	311	308
	Water	37	36
	Police	119	115
	Fire	84	94
	BOE Certified	635	663
	BOE Non-Certified	<u>333</u>	<u>406</u>
	Total	1,519	1,622
	Average Age	City	47.2
Water		46.3	47.8
Police		38.7	38.0
Fire		45.7	43.1
BOE Certified		45.1	43.4
BOE Non-Certified		51.5	48.9
Total		46.5	44.8
Average Service		City	10.6
	Water	12.7	13.8
	Police	12.9	11.7
	Fire	17.3	14.7
	BOE Certified	13.7	12.9
	BOE Non-Certified	11.5	9.4
	Total	12.7	11.4

Section IV - Membership Data

B. Distribution of Active Members as of July 1, 2022

City

Age	Years of Service							Total
	0-4	5-9	10-14	15-19	20-24	25-29	30+	
< 25	9							9
25-29	28	3						31
30-34	25	14	1					40
35-39	19	12	6	2				39
40-44	13	13	4	4	2			36
45-49	8	4	5	6	2			25
50-54	6	6	6	7	6	6	5	42
55-59	11	6	7	9	8	2	3	46
60-64	8	9	3	5	5		1	31
65+		1	4	2	1		1	9
Total	127	68	36	35	24	8	10	308

Water

Age	Years of Service							Total
	0-4	5-9	10-14	15-19	20-24	25-29	30+	
< 25								0
25-29	1							1
30-34	1	4						5
35-39	1	1		1				3
40-44	2	1						3
45-49		1	1	1	1			4
50-54			3	4	2	1	2	12
55-59	1		1	1	3			6
60-64			1	1				2
65+								0
Total	6	7	6	8	6	1	2	36

Police

Age	Years of Service							Total
	0-4	5-9	10-14	15-19	20-24	25-29	30+	
< 25	6							6
25-29	14	4						18
30-34	3	17	7					27
35-39	1	8	8	7				24
40-44		1	2	6	2			11
45-49	1	1	2	4	3	2		13
50-54		1		2	3	2	2	10
55-59			1	1	1	1		4
60-64						1	1	2
65+								0
Total	25	32	20	20	9	6	3	115

Section IV - Membership Data

B. Distribution of Active Members as of July 1, 2022

Fire

Age	Years of Service							Total
	0-4	5-9	10-14	15-19	20-24	25-29	30+	
< 25	5							5
25-29	7	1						8
30-34	8	4						12
35-39	4	2	5					11
40-44	1		6	11	2			20
45-49			1	7				8
50-54			1	4	6	2		13
55-59		1	1	1	2		5	10
60-64							7	7
65+								0
Total	25	8	14	23	10	2	12	94

BOE Certified

Age	Years of Service							Total
	0-4	5-9	10-14	15-19	20-24	25-29	30+	
< 25	15							15
25-29	53	9						62
30-34	49	27	2					78
35-39	32	25	18	23				98
40-44	20	16	14	53	16			119
45-49	11	11	14	33	44	2		115
50-54	11	8	10	13	28	16		86
55-59	1	4	8	12	9	11	6	51
60-64		2	1	9	5	3	4	24
65+			3	2	1	2	7	15
Total	192	102	70	145	103	34	17	663

BOE Non-Certified

Age	Years of Service							Total
	0-4	5-9	10-14	15-19	20-24	25-29	30+	
< 25	15							15
25-29	16							16
30-34	18	5	1					24
35-39	27	7	2	2				38
40-44	26	9	4	2				41
45-49	25	11	7	8	3			54
50-54	29	16	7	14	6	2	2	76
55-59	15	12	5	23	13	2		70
60-64	7	7	11	11	17	3	4	60
65+		4	4	2	2			12
Total	178	71	41	62	41	7	6	406

Section IV - Membership Data
C. Information on Members Receiving Benefits

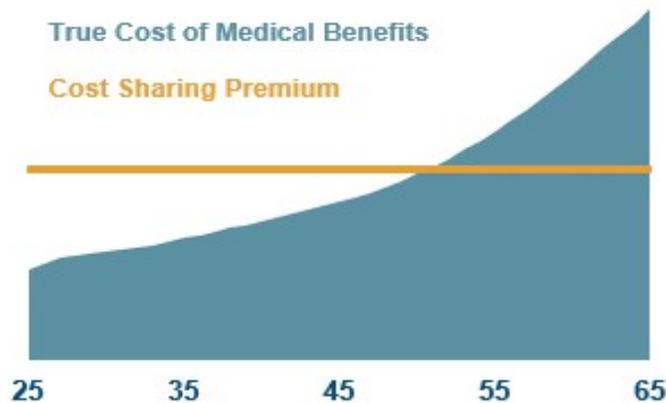
	As of July 1, 2020	As of July 1, 2022
Members Receiving Benefits		
City	115	122
Water	18	15
Police	57	57
Fire	21	24
BOE Certified	60	58
BOE Non-Certified	<u>73</u>	<u>71</u>
Total	344	347
Member Average Age		
City	66.8	66.0
Water	63.1	63.6
Police	59.8	59.7
Fire	64.6	62.4
BOE Certified	71.6	72.5
BOE Non-Certified	66.5	66.7
Total	66.1	65.8
Spouses/Dependents Receiving Benefits		
City	89	84
Water	12	10
Police	47	52
Fire	19	21
BOE Certified	8	9
BOE Non-Certified	<u>48</u>	<u>45</u>
Total	223	221
Spouse/Dependent Average Age		
City	65.8	65.0
Water	61.8	63.2
Police	58.8	59.3
Fire	62.6	61.9
BOE Certified	59.8	61.8
BOE Non-Certified	64.4	64.8
Total	63.3	63.1

Section V - Healthcare Information

A. Introduction

In many cases, the cost sharing premium is lower than the true cost of providing the medical benefits, for two reasons:

- The cost sharing premium is usually a fixed amount such as a COBRA premium that does not take into account the age of the retiree and his/her dependents. Since medical costs generally increase with age, the cost sharing premium is often lower than the true cost of the medical benefits:



- The cost sharing premium is usually a blended rate that takes into account the cost of medical benefits for active employees as well as retirees. Medical costs are generally higher for retirees than for active employees of the same age. This means that, again, the cost sharing premium is often lower than the true cost of the medical benefits.

Because of these two factors, a retiree who is paying 100% of the cost sharing premium is most likely not paying 100% of the true cost of the medical benefits. This situation is known as an "implicit rate subsidy." GASB 74 and 75 require the plan sponsor to measure the liability for this subsidy; that is, the difference between the true cost of the medical benefits and the cost sharing premiums paid by the retiree. To do this, our valuation consists of several steps:

First, we calculate the liability for the true cost of medical benefits expected to be received by retirees and their dependents. This liability is based on factors developed by Milliman's health actuaries that reflect how the cost of medical benefits varies by age and gender, as well as the other assumptions discussed in Appendix B. We term this amount the "gross liability."

Next, we calculate the liability for the future premiums expected to be paid by the retiree for their own and their dependents' coverage. This liability is based on the current premium rates without adjustment for age or gender. It also is based on the terms of the Postemployment Benefits Other Than Pensions – different retirees pay different percentages based on their union, date of retirement, age at retirement, and other factors. We term this amount the "offset liability."

Finally, the net liability for the City is calculated as the difference between the gross liability and the offset liability.

Section V - Healthcare Information

B. Current Premiums

Based on current plan elections, we developed the following blended annual premiums as of July 1, 2022:

Pre-65 Medical Plan	Employee	Spouse
BOE Certified	\$10,839.48	\$11,870.76
All Others	12,485.16	13,898.40
Post-65 Medical Plan	5,849.04	6,966.72
Dental Premium	313.68	542.76

Section V - Healthcare

C. Expected Healthcare Costs

Milliman's Health Cost Guidelines were used to develop the expected true cost of healthcare benefits by age and gender, separately for employees and spouses. Representative healthcare cost factors are shown in the tables below. These factors were then applied to the plan's healthcare rates for the year beginning July 1, 2022 to arrive at the expected annual per capita claims costs for a 65-year-old, which are also shown below.

Medical for BOE Certified

Age	Employee		Spouse	
	Male	Female	Male	Female
45	0.44140	0.66620	0.39120	0.54780
55	0.66370	0.75410	0.62050	0.72010
65	1.00000	1.00000	1.00000	1.00000
75	1.51640	1.40100	1.64520	1.50380
85	1.95010	1.74840	2.11570	1.87660

Age 65 per capita claims cost

All Periods	\$21,634.04	\$20,878.39	\$19,940.57	\$19,451.94
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Medical for All Others

Age	Employee		Spouse	
	Male	Female	Male	Female
45	0.44140	0.66620	0.39120	0.54780
55	0.66370	0.75410	0.62050	0.72010
65	1.00000	1.00000	1.00000	1.00000
75	1.36230	1.26580	1.36230	1.26580
85	1.41030	1.24170	1.41030	1.24170

Age 65 per capita claims cost

Pre-65	\$25,067.03	\$24,191.46	\$23,104.82	\$22,538.66
Post-65	5,430.24	5,072.92	5,430.24	5,072.92

Dental for All Groups

Age	Employee		Spouse	
	Male	Female	Male	Female
45	0.63390	0.74850	0.71510	0.80540
55	0.77690	0.86650	0.82670	0.89690
65	1.00000	1.00000	1.00000	1.00000
75	1.09980	1.03890	1.07660	1.02990
85	1.09980	1.03890	1.07660	1.02990

Age 65 per capita claims cost

All Periods	\$458.17	\$447.74	\$589.30	\$578.72
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Appendix A - Actuarial Funding Method

The actuarial funding method used in the valuation of this Plan is known as the Entry Age Normal Method. The Actuarially Determined Contribution consists of three pieces: Normal Cost plus a Past Service Cost payment to gradually eliminate the Unfunded Accrued Liability plus Interest to reflect the timing of the contribution relative to the valuation date.

The Normal Cost is determined by calculating the present value of future benefits for present active Members that will become payable as the result of death, disability, retirement or termination. This cost is then spread as a level percentage of earnings from entry age to termination as an Active Member. If Normal Costs had been paid at this level for all prior years, a fund would have accumulated. Because this fund represents the portion of benefits that would have been funded to date, it is termed the Accrued Liability. In fact, it is calculated by adding the present value of benefits for Retired Members and Terminated Vested Members to the present value of benefits for Active Members and subtracting the present value of future Normal Cost contributions.

The funding cost of the Plan is derived by making certain specific assumptions as to rates of interest, mortality, turnover, etc. which are assumed to hold for many years into the future. Since actual experience may differ somewhat from the assumptions, the costs determined by the valuation must be regarded as estimates of the true costs of the Plan.

The Unfunded Accrued Liability is the excess of the Accrued Liability over the assets which have been accumulated for the plan. This Unfunded Accrued Liability is amortized as a level dollar amount over a closed 20 year period starting July 1, 2018. The amortization period will decrease each year until it reaches 10 years, after which time it will remain at 10 years.

The long-range forecasts included in this report have been developed by assuming that members will terminate, retire, become disabled, and die according to the actuarial assumptions with respect to these causes of decrement, and that pay increases, cost of living adjustments, and so forth will likewise occur according to the actuarial assumptions. For those unions whose new employees are eligible to participate in this plan, members who are projected to leave active employment are assumed to be replaced by new active members with the same age, service, gender, and pay characteristics as those hired in the past few years.

Appendix B - Actuarial Assumptions

Each of the assumptions used in this valuation (except for BOE Certified) was set based on a formal study of the plan's experience for the period July 1, 2015 through July 1, 2020 which reflected industry standard published tables and data, the particular characteristics of the plan, relevant information from the plan sponsor or other sources about future expectations, and our professional judgment regarding future plan experience. We believe the assumptions are reasonable for the contingencies they are measuring, and are not anticipated to produce significant cumulative actuarial gains or losses over the measurement period.

Discount Rate 6.50% (prior: 7.00%)

Inflation Rate 2.40% (prior: 2.70%)

Amortization Growth Rate 0%

Medical Trend The medical trend assumption used in this valuation is based on long-term healthcare trend rates generated by the Society of Actuaries' Getzen Trend Model and was developed with the July 1, 2022 actuarial valuation. Inputs to the model are consistent with other assumptions used in the valuation.

Year Beginning	Trend Rate	Year Beginning	Trend Rate
2022	5.90%	2030	4.50%
2023	6.40%	2031	4.30%
2024	6.50%	2032	4.20%
2025	6.00%	2059	4.30%
2026	5.30%	2061	4.20%
2027	5.00%	2066	4.10%
2028	4.80%	2068	4.00%
2029	4.60%	2070	3.90%
		2073	3.80%

Dental Trend 4.00%

Salary Scale **BOE Certified:** Salaries are assumed to increase based on service as follows.

Service	Rate	Service	Rate
0	6.50%	14	4.75%
1	6.25%	15	4.50%
2-9	6.00%	16	4.00%
10-11	5.50%	17	3.75%
12	5.25%	18	3.50%
13	5.00%	19	3.25%
		20+	3.00%

Appendix B - Actuarial Assumptions

Salary Scale	Service	Police	Fire	City/ BOE Non-Cert
	1	11.00%	10.00%	10.00%
	2	7.00%	10.00%	5.00%
	3	7.00%	7.00%	5.00%
	4	3.25%	3.25%	5.00%
	5	3.25%	3.25%	4.00%
	10	4.00%	3.25%	4.00%
	15	3.25%	3.25%	3.50%
	26+	3.25%	3.25%	3.00%

Mortality

BOE Certified#: PubT-2010 Mortality Table for Employees and Healthy Annuitants (adjusted 105% for males and 103% for females at ages 82 and above) with generational projection of future improvements per the MP-2021 Ultimate scale. The PubT-2010 Contingent Survivor Table projected generationally per the MP-2021 Ultimate scale and set forward 1 year for both males and females is used for survivors and beneficiaries. This assumption includes a margin for improvements in longevity beyond the valuation date.

Current: **Police and Fire:** PubS-2010 Mortality Table with generational projection per the MP-2021 ultimate scale, with employee rates before benefit commencement and healthy or disabled annuitant rates after benefit commencement. This assumption includes a margin for improvements in longevity beyond the valuation date.

Prior: RP-2000 Mortality Table for Employees and Healthy Annuitants with generational projection per Scale BB.

Current: **All Others:** PubG-2010 Mortality Table with generational projection per the MP-2021 ultimate scale, with employee rates before benefit commencement and healthy or disabled annuitant rates after benefit commencement. This assumption includes a margin for improvements in longevity beyond the valuation date.

Prior: RP-2000 Mortality Table for Employees and Healthy Annuitants with generational projection per Scale BB.

Appendix B - Actuarial Assumptions

Turnover

BOE Certified#: rates based on gender and length of service for the first ten years and gender and age thereafter.

Service	Male	Female
0-1	15.00%	12.00%
1-2	11.00%	11.00%
2-3	8.50%	9.50%
3-4	7.00%	8.00%
4-5	5.50%	7.50%
5-6	4.50%	7.00%
6-7	4.00%	6.50%
7-8	3.50%	6.00%
8-9	3.50%	5.50%
9-10	3.50%	5.00%
10+	1.80%	6.00%

Age	Male	Female
25	1.80%	6.00%
35	1.80%	4.25%
45	1.80%	2.00%
55	4.00%	3.90%

Current: **City**

Service	Rate
<5	10.00%
5-7	5.00%
8-9	2.00%
10-11	5.00%
12-14	3.00%
15-24	1.50%
25+	0.00%

Police and Fire

None

Prior:	Age	Police	Fire	City/ BOE Non-Cert
	20	5.00%	5.00%	18.00%
	25	5.00%	5.00%	18.00%
	30	2.00%	2.00%	12.00%
	35	1.00%	0.00%	7.00%
	40	1.00%	0.00%	5.00%
	45	1.00%	0.00%	2.50%
	50	0.00%	0.00%	1.75%
	55	0.00%	0.00%	1.00%

Appendix B - Actuarial Assumptions

Retirement

BOE Certified#: Rates based on age, eligibility for pension benefits, and gender.

Age	Unreduced			
	< 35 years of service		35+ years of service	
	Male	Female	Male	Female
50-59			35.00%	30.00%
60	20.00%	20.00%	30.00%	30.00%
61	20.00%	20.00%	30.00%	30.00%
62	22.50%	20.00%	30.00%	30.00%
63	22.50%	20.00%	30.00%	30.00%
64	25.00%	25.00%	30.00%	30.00%
65	27.50%	32.50%	35.00%	37.50%
66	27.50%	30.00%	35.00%	37.50%
67-74	27.50%	30.00%	30.00%	32.50%
75	100.00%	100.00%	100.00%	100.00%

Age	Proratable		Reduced	
	Male	Female	Male	Female
	50-52			1.50%
53			1.50%	1.75%
54			2.00%	2.25%
55			3.00%	3.00%
56			4.00%	3.75%
57			5.00%	4.50%
58			6.50%	5.50%
59			8.00%	7.00%
60	6.00%	5.00%		
61	6.00%	6.00%		
62	6.00%	7.00%		
63	9.00%	8.00%		
64	12.00%	9.00%		
65	15.00%	12.00%		
66-68	18.00%	15.00%		
69-79	28.50%	15.00%		
80	100.00%	100.00%		

Appendix B - Actuarial Assumptions

Retirement

Members who have satisfied normal retirement eligibility are assumed to retire according to the following rates:

City and BOE Non-Certified

Current:	Age	Attained Rule of 80	Not Yet Attained
	55	50%	2%
	56-59	20%	2%
	60	22%	2%
	61	25%	2%
	62	40%	2%
	63	30%	2%
	64	25%	2%
	65	28%	2%
	66	40%	2%
	67-69	25%	2%
	70-74	30%	30%
	75+	100%	100%

Prior:	Age	Attained Rule of 80	Not Yet Attained
	53-54	10%	0%
	55-56	22%	1%
	57-59	20%	1%
	60-61	25%	2%
	62	25%	5%
	63	28%	5%
	64	25%	5%
	65	20%	10%
	66-69	30%	10%
	70	100%	100%

Fire: Members who have satisfied normal retirement eligibility are assumed to retire according to the following rates.

Age	Current Rate	Prior Rate
49	5%	10%
50-54	10%	5%
55-56	10%	10%
57-59	10%	15%
60	40%	50%
61	40%	70%
62-64	40%	40%
65+	100%	100%

Appendix B - Actuarial Assumptions

Retirement

Police: Members who have satisfied normal retirement eligibility are assumed to retire according to the following rates.

Current:	Service	Rate
	25	35%
	26+	10%
	Age	Rate
	65+	100%
Prior:	Age	Rate
	47-49	25%
	50	40%
	51-54	25%
	55-57	25%
	58-59	40%
	60-64	30%
	65+	100%

Disability

BOE Certified[#]: Rates based on age and gender.

Age	Male	Female
20	0.0200%	0.0200%
30	0.0200%	0.0200%
40	0.0300%	0.0600%
50	0.1500%	0.1500%
60	0.1500%	0.1500%

City and BOE Non-Certified: Current: 50% of the 1985 Pension Disability Table (DP-85) Class 1. 40% of disabilities are assumed to be service-connected.

Prior: None.

Police and Fire: 1985 Pension Disability Table (DP-85) Class 4 with 100% of disabilities assumed to be service-connected.

Future Retiree Coverage

60% of **BOE Certified** and **Non-Certified**, and 95% of **All Other** active members are assumed to elect coverage at retirement.

Future Dependent Coverage

80% of current active members are assumed to elect dependent coverage at retirement. All female spouses are assumed to be 3 years younger than males.

Appendix B - Actuarial Assumptions

Future Post-65 Coverage

Teachers: 50% of current actives and pre-65 retirees are assumed either to enroll in retiree health coverage through the Connecticut State Teachers Retirement System at age 65, or transfer to a Medicare Supplement Plan. 95% of current actives and pre-65 retirees are assumed to be Medicare-eligible.

All Others: N/A.

Valuation of Benefits for Children

Benefits attributed to children have been excluded from this valuation for all groups, as they were determined to be de minimis.

Certain actuarial demographic assumptions for Teachers and Administrators are based on the assumptions used in the June 30, 2020 valuation of the Connecticut State Teachers' Retirement System.

Appendix C - Summary of Plan Provisions

This exhibit summarizes the major provisions of the Plan. It is not intended to be, nor should it be interpreted as a complete statement of all plan provisions. All eligibility requirements and benefit amounts shall be determined in strict accordance with the plan document itself. To the extent that this summary does not accurately reflect the plan provisions, then the results of this valuation may not be accurate.

Eligibility	Teachers and Administrators (BAPS): Age 55 with 20 Years of Service Police: Retirement with 25 Years of Service or Disabled with any Years of Service Fire: Retirement at (i) any age with 25 Years of Service or (ii) age 65 with 20 Years of Service or Disabled with any Years of Service All Others: Rule of 80 with minimum age 55
Benefits	Teachers: Medical, drug and dental coverage for self and spouse with a \$700 annual subsidy* for the first 7 years of retirement. Teachers not eligible for Medicare can stay on the plan after age 65. BAPS: Medical, drug and dental coverage for self and spouse with a \$750 annual subsidy* for the first 7 years of retirement. BAPS retirees hired after July 1, 2017 are not eligible for the subsidy. AFSCME 2267: Full-time employees and 10 month employees retired before July 1, 2013 receive medical and drug coverage for self and spouse for 10 years and pay the active cost share (currently 17%). Retirees can continue on Medicare supplement plans at age 65. 10 month employees who retire on or after July 1, 2013 receive the same coverage as above, but for 5 years. AFSCME 818: Retirees hired before July 1, 2004 receive medical and drug coverage for self and spouse for 10 years and pay the active cost share (currently 19%). Retirees can continue on Medicare supplement plans at age 65. Retirees hired after July 1, 2004 receive medical and drug coverage for self only for 5 years and pay the active cost share (currently 19%). AFSCME 3551: Retirees hired before July 1, 1992 receive medical, drug, and dental coverage for self and spouse at no cost for the first 5 years following retirement and pay the active cost share (currently 18%) for the next 5 years. Retirees can continue on Medicare supplement plans at age 65. Retirees hired after July 1, 1992 can elect the same coverage at their own expense.

*Only Teachers and BAPs who retire at Normal Retirement (age 60 with 20 Years of Service or 35 Years of Service) are eligible for the BOE subsidy.

Appendix C - Summary of Plan Provisions

Benefits

Certified Non-Bargaining: Retirees receive medical, drug, and dental coverage for self and spouse for 10 years at 16% cost sharing. Retirees go on to the state plan at age 65.

Non-Certified Non-Bargaining: Retirees receive medical, drug, and dental coverage for self and spouse for 10 years at no cost. Retirees can continue on Medicare supplement plans at age 65.

City: Retirees receive medical and drug coverage for self and spouse for 10 years when hired before the respective dates in the below table. Retirees hired after the dates in the table receive 5 years of coverage. Effective cost shares are also shown in the table. Retirees can continue on Medicare supplement plans at age 65.

Group	Effective Date	Cost Share
Local 1338	12/1/2010	None
Local 233	9/8/2010	None
BPSA	6/30/2011	None
Non Bargaining	4/11/2011	None
Health District	07/01/2012*	5.0%

* 10 month health aides hired before this date get 5 years of coverage instead of 10 years. 10 month health aides hired after this date can elect coverage at their own expense.

Fire: Retirees receive medical and drug coverage for self and spouse for 10 years at no cost. Retirees can continue on Medicare supplement plans at age 65. Retirees may elect to defer their retiree health coverage until the retiree reaches a maximum of age 55. Benefits will be the same if a retiree elects immediate or deferred commencement.

Police: Retirees receive medical and drug coverage for self and spouse for 10 years at no cost. Retirees can continue on Medicare supplement plans at age 65. Some current Police retirees are eligible to receive benefits for 15 years and are identified by the City.

Employee Contributions

City: Employees contribute 1.50% of compensation to the OPEB Program.

Fire: Effective July 1, 2020, employees contribute 1.00% of compensation to the OPEB Program.

Police: Officers hired before March 10, 2020 contribute 1.625% of compensation to the OPEB Program and officers hired on or after March 10, 2020 contribute 1.875% of compensation to the OPEB Program.

BOE (all groups): None.

Appendix D - Glossary

Actuarial Cost Method - This is a procedure for determining the Actuarial Present Value of Benefits and allocating it to time periods to produce the Actuarial Accrued Liability and the Normal Cost.

Accrued Liability - This is the portion of the Actuarial Present Value of Benefits attributable to periods prior to the valuation date by the Actuarial Cost Method (i.e., that portion not provided by future Normal Costs).

Actuarial Assumptions - With any valuation of future benefits, assumptions of anticipated future events are required. If actual events differ from the assumptions made, the actual cost of the plan will vary as well. Some examples of key assumptions include the interest rate, salary scale, and rates of mortality, turnover and retirement.

Actuarial Present Value of Benefits - This is the present value, as of the valuation date, of future payments for benefits and expenses under the Plan, where each payment is: a) multiplied by the probability of the event occurring on which the payment is conditioned, such as the probability of survival, death, disability, termination of employment, etc.; and b) discounted at the assumed interest rate.

Actuarial Value of Assets - This is the value of cash, investments and other property belonging to the plan, typically adjusted to recognize investment gains or losses over a period of years to dampen the impact of market volatility on the Actuarially Determined Contribution.

Actuarially Determined Contribution (“ADC”) - This is the employer’s periodic contributions to a defined benefit plan, calculated in accordance with actuarial standards of practice.

Attribution Period - The period of an employee’s service to which the expected benefit obligation for that employee is assigned. The beginning of the attribution period is the employee’s date of hire and costs are spread across all employment.

Interest Rate - This is the long-term expected rate of return on any investments set aside to pay for the benefits. In a financial reporting context (e.g., GASB 75) this is termed the Discount Rate.

Normal Cost - This is the portion of the Actuarial Present Value of Benefits allocated to a valuation year by the Actuarial Cost Method.

Past Service Cost - This is a catch-up payment to fund the Unfunded Accrued Liability over time (generally 10 to 30 years). A closed amortization period is a specific number of years counted from one date and reducing to zero with the passage of time; an open amortization period is one that begins again or is recalculated at each valuation date. Also known as the Amortization Payment.

Return on Plan Assets - This is the actual investment return on plan assets during the fiscal year.

Unfunded Accrued Liability - This is the excess of the Accrued Liability over the Actuarial Value of Assets.