



THE CLASSIFIED EMPLOYEES' RETIREMENT TRUST FUND OF THE CITY OF STAMFORD

**Actuarial Valuation as of July 1, 2018
To Determine Funding For Fiscal Year 2019-20**

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Certification

We have performed an actuarial valuation of the Plan as of July 1, 2018 to determine funding for fiscal year 2019-20. This report presents the results of our valuation.

The ultimate cost of a pension plan is the total amount needed to provide benefits for plan members and beneficiaries and to pay the expenses of administering the plan. Pension 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 government regulations. In addition, this report provides:

- A valuation of plan assets and liabilities to review the year-to-year progress of funding.
- Information needed to meet disclosure requirements.
- Review of plan experience for the previous year 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.

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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 ERISA and the related sections of the tax code. Additional determinations may be needed for purposes other than meeting funding requirements, 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. Figures for periods prior to July 1, 2018 have been obtained from actuarial valuation reports prepared by Hooker & Holcombe and from the City's Comprehensive Annual Financial Reports.

The calculations reported herein have been made on a basis consistent with our understanding of ERISA and the related sections of the tax code. Additional determinations may be needed for purposes other than meeting funding requirements, 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.

I further certify that, in my 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 pension actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

We 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

Plan Changes

Medicare Part B reimbursement payments are no longer being paid from the Plan, so the corresponding liability has been removed from this plan and transferred to the OPEB plan. This change lowered the Accrued Liability by about \$12.0 million.

Changes in Actuarial Methods and Assumptions

The interest rate assumption was lowered from 7.20% to 7.10% and the salary scale was modified to reflect a reduction in the inflation assumption from 2.75% to 2.60%. In addition, the assumption regarding the percentage of retiring participants that elect to trade in their unused sick/vacation time for additional pension credit was changed from 50% to 100%. These changes decreased the Accrued Liability by about \$3.0 million.

Other Significant Changes

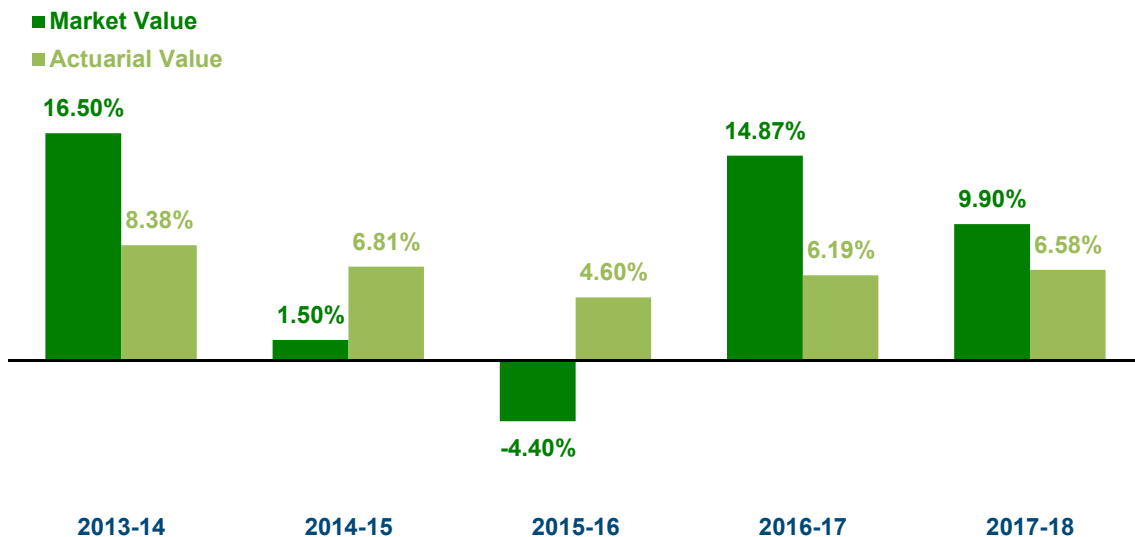
None.

Section I - Executive Summary Assets

There are two different measures of the plan's assets that are used throughout this report. The Market Value is a snapshot of the plan's investments as of the valuation date. The Actuarial Value is a smoothed asset value designed to temper the volatile fluctuations in the market by recognizing investment gains or losses asymptotically over five years.

	Market	Actuarial
Value as of July 1, 2017	\$210,354,348	\$221,592,260
City and Member Contributions	8,418,555	8,418,555
Investment Income	20,438,341	14,571,095
Benefit Payments and Administrative Expenses	(16,146,773)	(16,146,773)
Value as of July 1, 2018	223,064,471	228,435,137

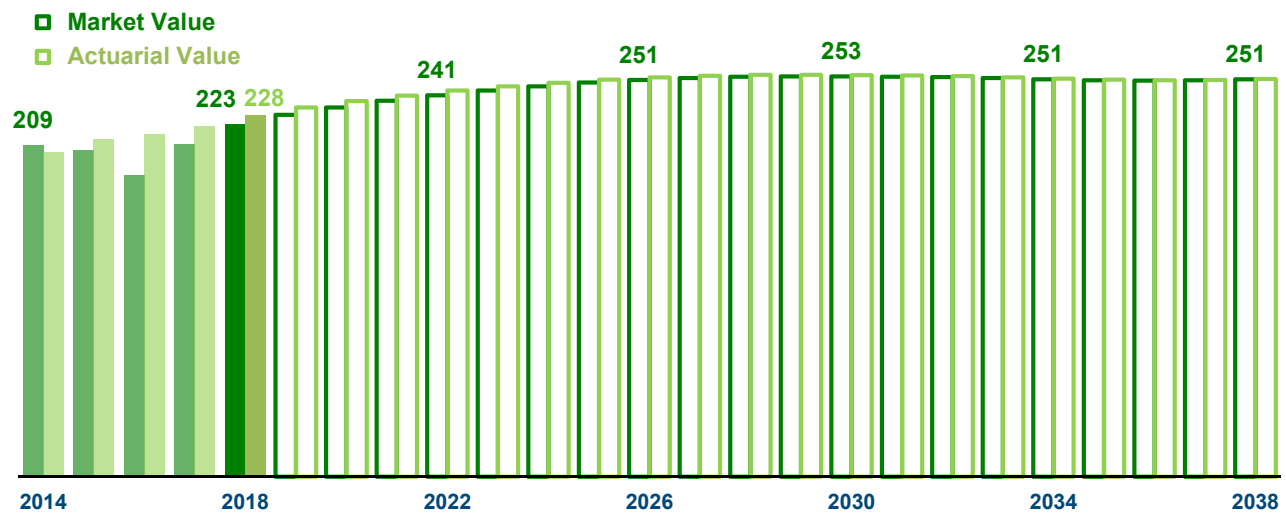
For fiscal year 2017-18, the plan's assets earned 9.90% on a Market Value basis and 6.58% on an Actuarial Value basis. The actuarial assumption for this period was 7.20%; the result is an asset gain of about \$5.6 million on a Market Value basis and a loss of about \$1.3 million on an Actuarial Value basis. Historical rates of return are shown in the graph below.



Please note that the Actuarial Value currently exceeds the Market Value by \$5.4 million. This figure represents investment losses that will be gradually recognized in future years. This process will exert upward pressure on the City's contribution, unless there are offsetting market gains.

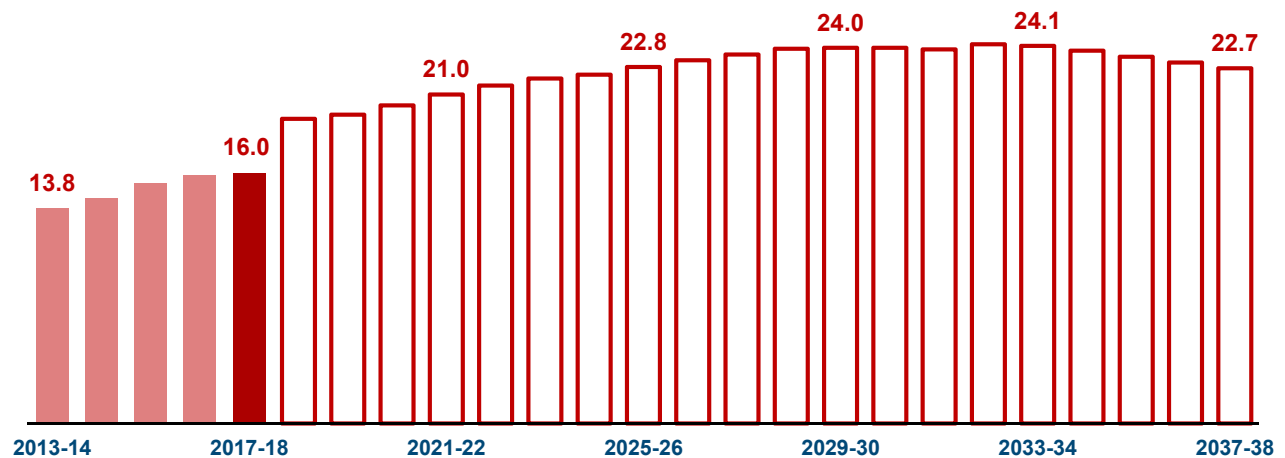
Section I - Executive Summary Assets (continued)

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.



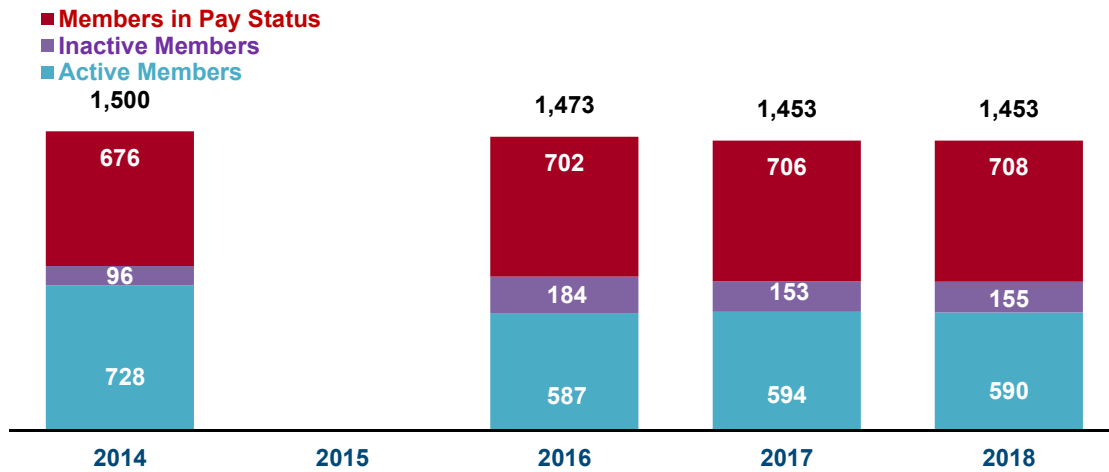
In 2017-18, the plan paid out \$16.0 million in benefits to members. Over the next 20 years, the plan is projected to pay out a total of \$454 million in benefits to members.

Benefit Payments



Section I - Executive Summary Membership

There are three basic categories of plan members included in the valuation: (1) members who are receiving monthly pension benefits, (2) former employees who have a vested right to benefits but have not yet started collecting, and (3) active employees who have met the eligibility requirements for membership. Prior to 2016, full valuations were only performed in even-numbered years, so membership information is not available for all past years.

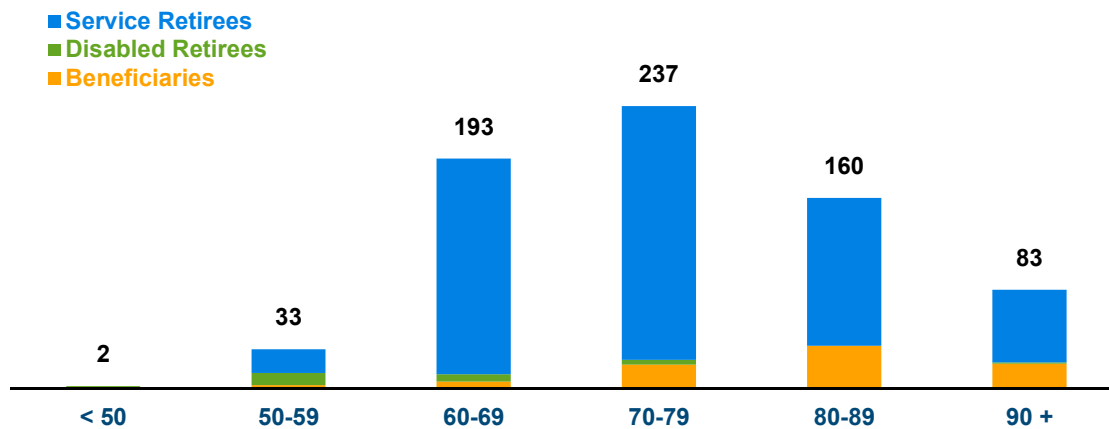


Members in Pay Status on July 1, 2018

Board of Education	86	Average Age	75.8
City	600	Total Annual Benefit	\$15,281,713
WPCA	22	Average Annual Benefit	21,584
Total	708		

As of July 1, 2018, there were 599 Service Retirees, 22 Disabled Retirees, and 87 Beneficiaries.

The total members in pay status fall across a wide distribution of ages:



Section I - Executive Summary Membership (continued)

Terminated Vested Members on July 1, 2018

Board of Education	9	Average Age	52.3
City	129	Total Annual Benefit	\$1,917,818
WPCA	3	Average Annual Benefit	13,602
Total	141		

Nonvested Members Due Refunds on July 1, 2018

Board of Education	0
City	12
WPCA	2
Total	14

Active Members on July 1, 2018

Board of Education	84	Average Age	52.1
City	478	Average Service	15.0
WPCA	28	Payroll	\$42,277,750
Total	590	Average Payroll	71,657

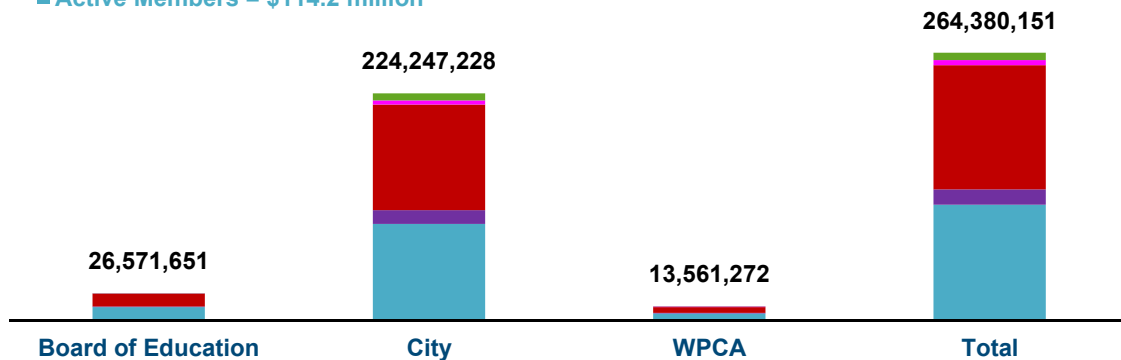
The table below illustrates the age and years of service of the active membership:

Age	Years of Service							Total
	0-4	5-9	10-14	15-19	20-24	25-29	30+	
< 25	6							6
25-29	21	4						25
30-34	16	10	5					31
35-39	21	10	12					43
40-44	10	10	11	15	1			47
45-49	21	8	12	17	11	1		70
50-54	15	17	10	29	15	8	10	104
55-59	9	9	13	33	14	9	20	107
60-64	9	10	17	16	11	5	16	84
65+	4	5	9	13	18	1	23	73
Total	132	83	89	123	70	24	69	590

Section I - Executive Summary Accrued Liability

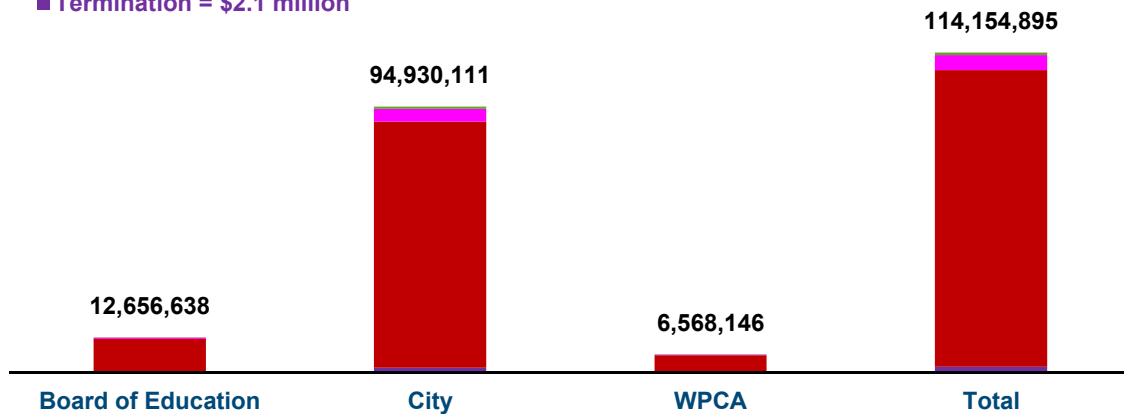
The Accrued Liability as of July 1, 2018 (in \$ millions) consists of the following pieces:

- **Beneficiaries = \$7.3 million**
- **Disabled Retirees = \$5.2 million**
- **Service Retirees = \$122.7 million**
- **Terminated Vested Members = \$15.0 million**
- **Active Members = \$114.2 million**



The Accrued Liability for active members can be broken down further by the different types of benefits provided by the plan:

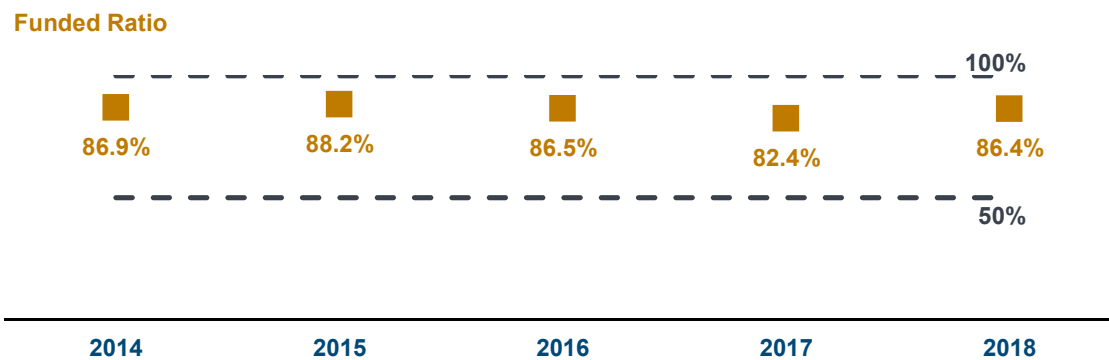
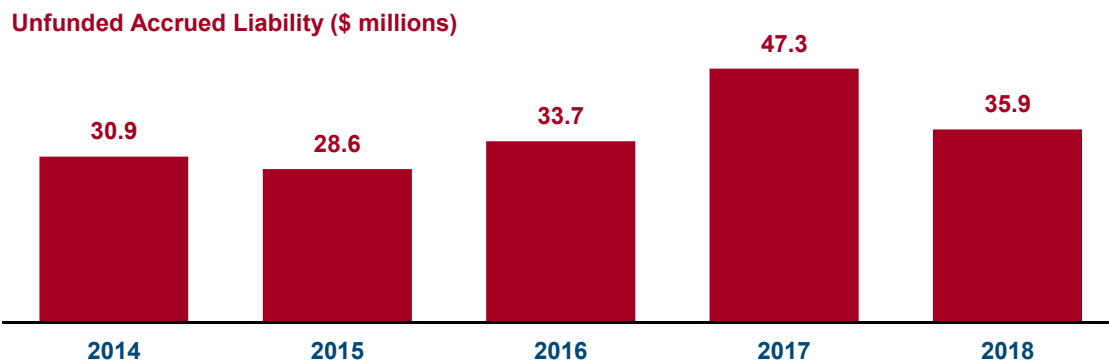
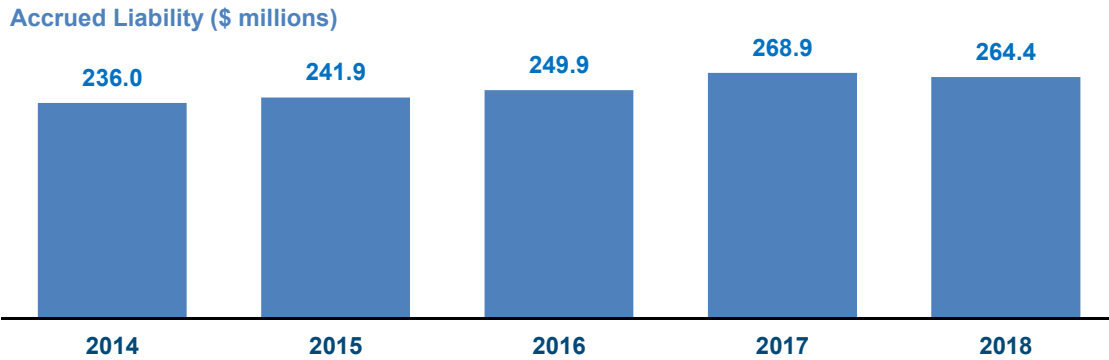
- **Preretirement Death = \$0.9 million**
- **Disability = \$5.3 million**
- **Retirement = \$105.8 million**
- **Termination = \$2.1 million**



For purposes of determining the City's contribution, the Accrued Liability is measured using the Projected Unit Credit actuarial cost method. A different actuarial cost method, Entry Age Normal, is required to be used to measure liability for financial reporting purposes per GASB 67/68. As of July 1, 2018, the Entry Age Normal Accrued Liability is \$271,241,566.

Section I - Executive Summary Funded Status

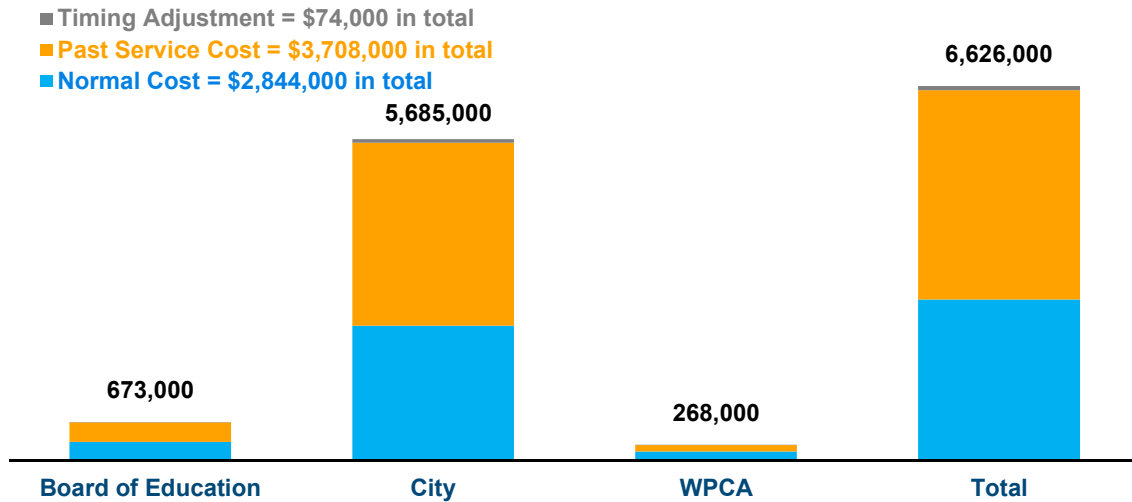
The Accrued Liability grows over time as active members earn additional benefits, and goes down over time as members receive benefits; it may also change when there are changes to the plan provisions or changes in the actuarial assumptions. The Unfunded Accrued Liability is the dollar difference between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



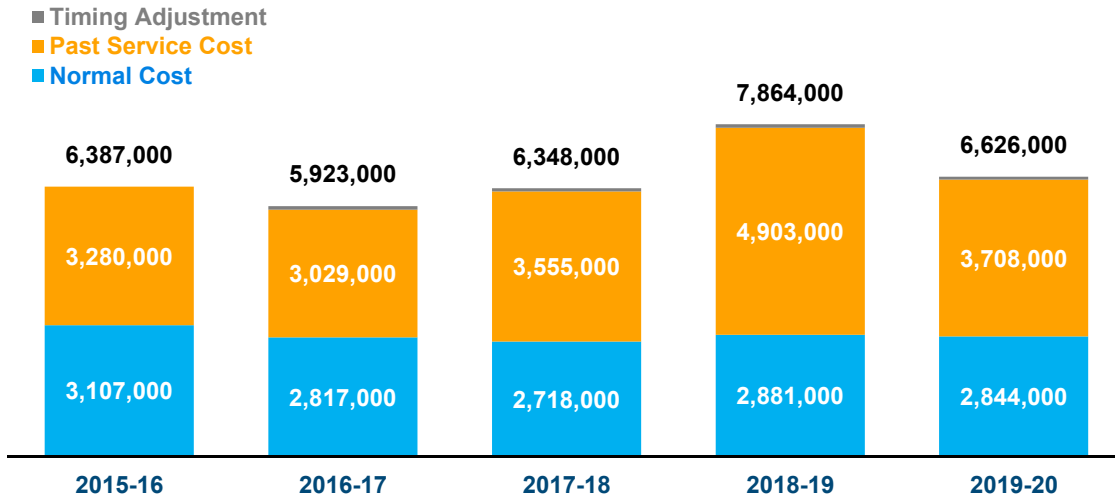
Section I - Executive Summary Actuarially Determined Contribution

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 a Timing Adjustment to reflect the timing of the contribution relative to the valuation date.

The Actuarially Determined Contribution for fiscal year 2019-20 is shown graphically below.

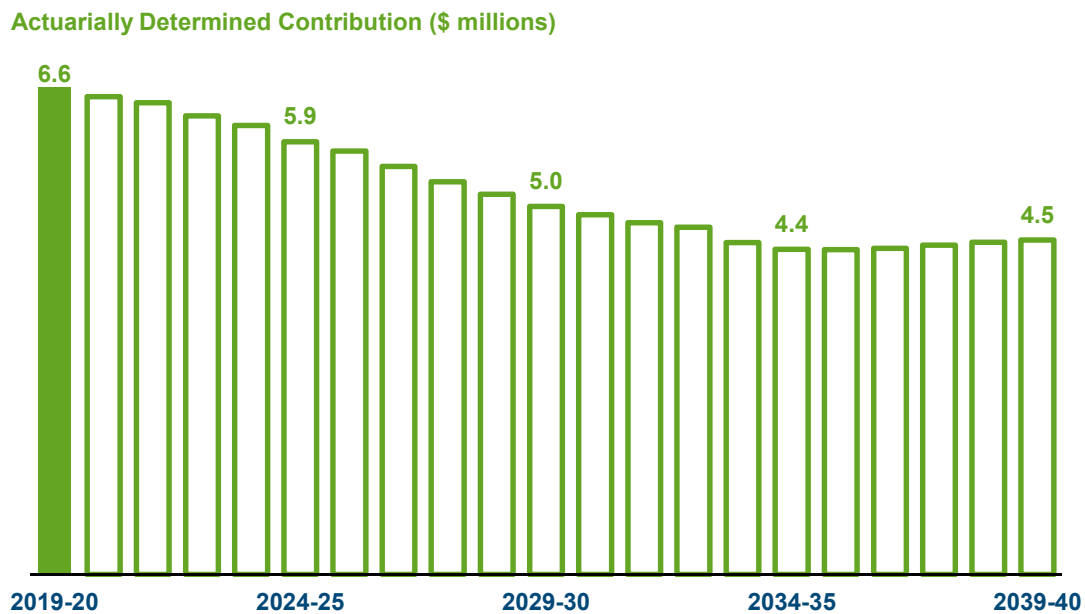
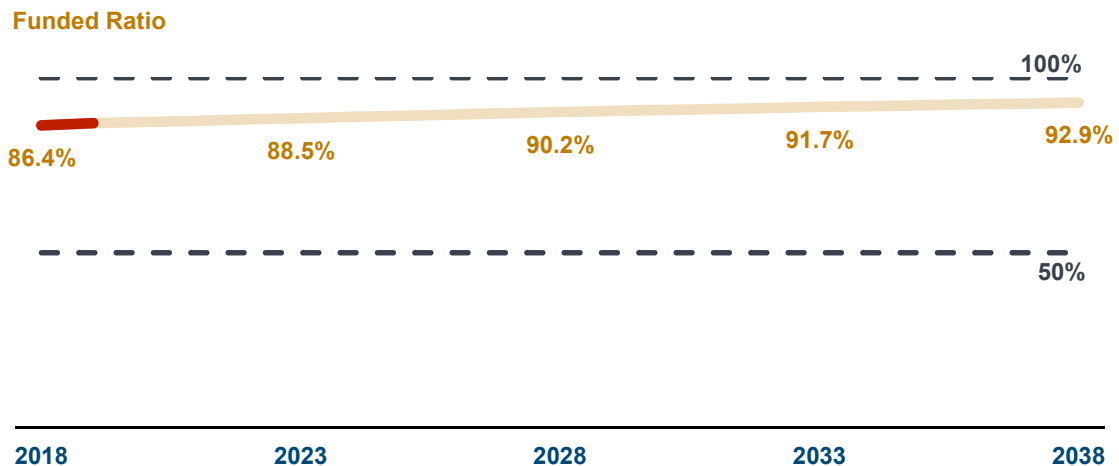


The chart below shows the Actuarially Determined Contribution for the past five fiscal years. Note that the Normal Cost is relatively consistent from year to year, whereas the Past Service Cost tends to be more volatile since it reflects the impact of asset performance.



Section I - Executive Summary Long-Range Forecast

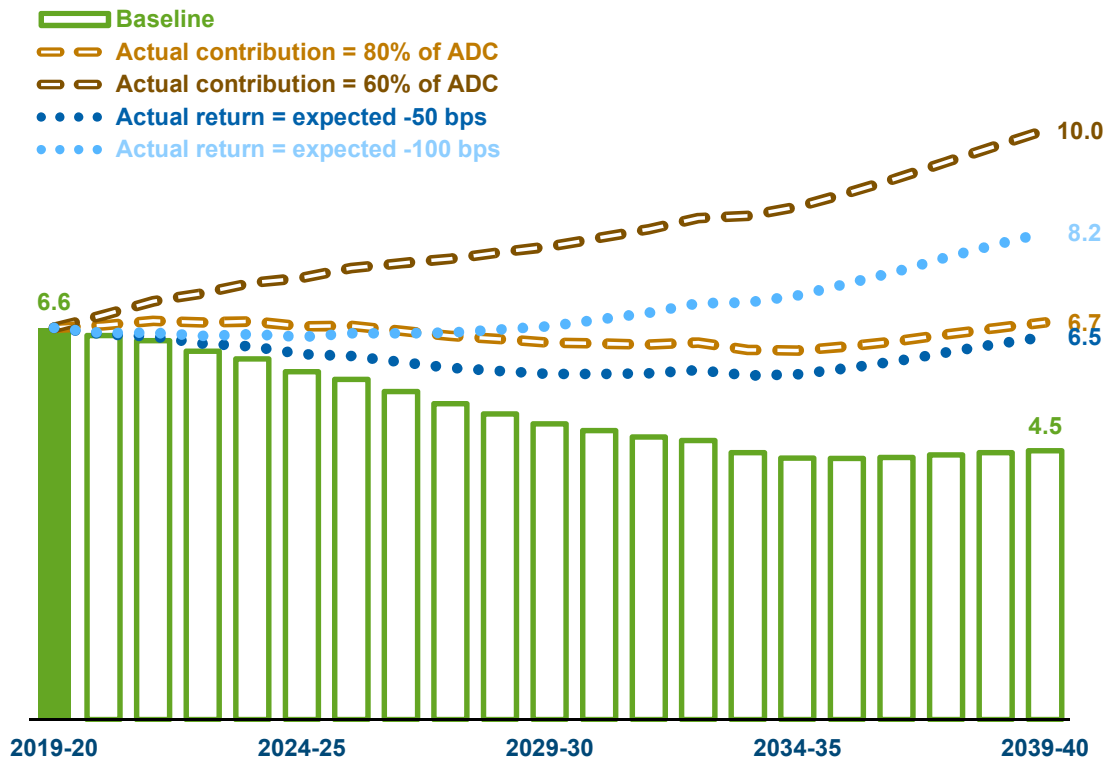
If the City pays the Actuarially Determined Contribution each year, the investments earn exactly the assumed interest rate each year, and there are no changes in the plan provisions or in the actuarial methods and assumptions, then we project the following changes in the plan's funded status and the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



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)

Pension 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, 2018	July 1, 2017
Active Members	590	594
Inactive Members	155	153
Members in Pay Status	708	706
Total Count	1,453	1,453
 Payroll	 \$42,277,750	 \$41,463,538
 Assets and Liabilities as of	 July 1, 2018	 July 1, 2017
Market Value of Assets	\$223,064,471	\$210,354,348
Actuarial Value of Assets	228,435,137	221,592,260
 Accrued Liability for Active Members	 114,154,895	 117,789,246
Accrued Liability for Inactive Members	15,030,129	14,082,103
Accrued Liability for Members in Pay Status	135,195,127	136,993,433
Total Accrued Liability	264,380,151	268,864,782
 Unfunded Accrued Liability	 35,945,014	 47,272,522
 Funded Ratio	 86.4%	 82.4%
 Actuarially Determined Contribution for Fiscal Year	 2019-20	 2018-19
Normal Cost	\$2,844,000	\$2,881,000
Past Service Cost	3,708,000	4,903,000
Timing Adjustment	74,000	80,000
Actuarially Determined Contribution	6,626,000	7,864,000
 Allocated to Board of Education	 673,000	 866,000
Allocated to City	5,685,000	6,582,000
Allocated to WPCA	268,000	416,000
Total	6,626,000	7,864,000

Section II - Plan Assets

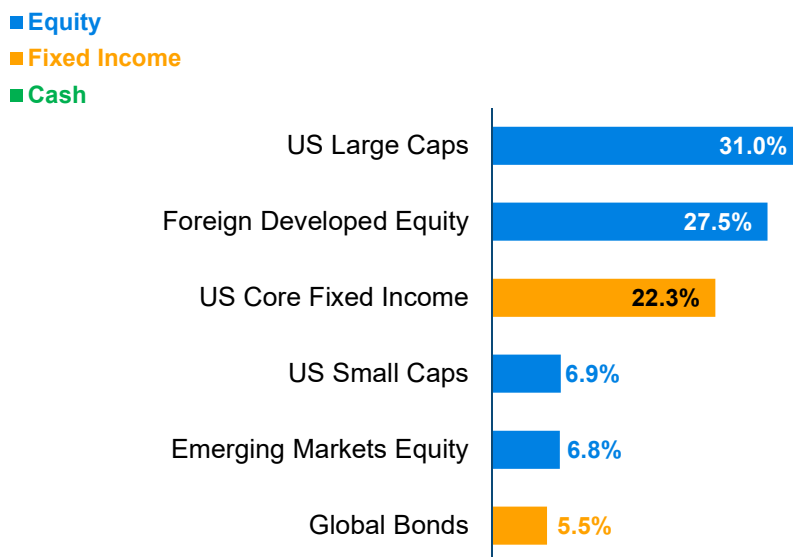
A. Summary of Fund Transactions

Assets are allocated directly to WPCA based on the WPCA cash flows and a prorata share of the net investment income; the remaining non-WPCA market value is allocated to the Board of Education and the City in proportion to their respective total Accrued Liability.

	Board of Education	City	WPCA	Total
Market Value as of July 1, 2017	N/A	N/A	\$11,215,597	\$210,354,348
City Contributions			358,000	6,348,000
Member Contributions			128,388	2,070,555
Net Investment Income			1,105,767	20,438,341
Benefit Payments			(648,152)	(16,026,612)
Administrative Expenses			(6,501)	(120,161)
Market Value as of June 30, 2018	22,653,940	188,257,432	12,153,099	223,064,471
Expected Return on Market Value of Assets				14,864,248
Market Value (Gain)/Loss				(5,574,093)
Approximate Rate of Return *				9.90%

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

Target Asset Allocation as of June 30, 2018



Section II - Plan Assets

B. Development of Actuarial Value of Assets

In order to minimize the impact of market fluctuations on the contribution level, we use an Actuarial Value of Assets that recognizes gains and losses asymptotically over a five year period. The Actuarial Value of Assets as of July 1, 2018 is determined below.

1.	Expected Actuarial Value of Assets:	
	a. Actuarial Value of Assets as of July 1, 2017	\$221,592,260
	b. City and Member Contributions	8,418,555
	c. Benefit Payments and Administrative Expenses	(16,146,773)
	d. Expected Earnings Based on 7.20% Interest	15,913,762
	e. Expected Actuarial Value of Assets as of July 1, 2018	229,777,804
2.	Market Value of Assets as of July 1, 2018	223,064,471
3.	Unrecognized Gains/(Losses): (2) - (1e)	(6,713,333)
4.	Amount Recognized as of July 1, 2018: 20% of (3)	(1,342,667)
5.	Preliminary Actuarial Value of Assets as of July 1, 2018: (1e) + (4)	228,435,137
6.	Preliminary Actuarial Value of Assets as a % of Market Value: (5) / (2)	102.4%
7.	Actuarial Value of Assets as of July 1, 2018: (5), within +/- 20% of (2)	228,435,137
8.	Actual Earnings on Actuarial Value of Assets: (7) - [(1a) + (1b) + (1c)]	14,571,095
9.	Approximate Rate of Return on Actuarial Value of Assets	6.58%
10.	Actuarial Value (Gain)/Loss: (1d) - (8)	1,342,667
11.	Actuarial Value of Assets as of July 1, 2018 allocated in proportion to Market Value:	

	Market Value	Actuarial Value
Board of Education	\$22,653,940	\$23,199,373
City	188,257,432	192,790,058
WPCA	12,153,099	12,445,706
Total	223,064,471	228,435,137

Section III - Development of Contribution

A. Past Service Cost

In determining the Past Service Cost, the Unfunded Accrued Liability is amortized as a level dollar amount over 15 years.

	Board of Education	City	WPCA	Total
1. Accrued Liability				
Active Members	\$12,656,638	\$94,930,111	\$6,568,146	\$114,154,895
Inactive Members	763,999	13,713,340	552,790	15,030,129
Service Retirees	12,663,350	104,326,069	5,745,206	122,734,625
Disabled Retirees	178,409	4,370,344	629,675	5,178,428
Beneficiaries	309,255	6,907,364	65,455	7,282,074
Total Accrued Liability	26,571,651	224,247,228	13,561,272	264,380,151
2. Actuarial Value of Assets (see Section IIB)	23,199,373	192,790,058	12,445,706	228,435,137
3. Unfunded Accrued Liability: (1) - (2)	3,372,278	31,457,170	1,115,566	35,945,014
4. Funded Ratio: (2) / (1)	87.3%	86.0%	91.8%	86.4%
5. Amortization Period	15	15	15	15
6. Amortization Growth Rate	0.00%	0.00%	0.00%	0.00%
7. Past Service Cost: (3) amortized over (5)	347,899	3,245,261	115,087	3,708,247

Section III - Development of Contribution

B. Actuarially Determined Contribution

	Board of Education	City	WPCA	Total
1. Total Normal Cost	\$501,157	\$3,691,067	\$226,007	\$4,418,231
2. Expected Member Contributions	196,183	1,406,000	82,668	1,684,851
3. Expected Administrative Expenses	12,540	92,358	5,655	110,553
4. Net Normal Cost: (1) - (2) + (3)	317,514	2,377,425	148,994	2,843,933
5. Past Service Cost (see Section IIIA)	347,899	3,245,261	115,087	3,708,247
6. Preliminary City Contribution: (4) + (5), rounded to \$1,000	665,000	5,623,000	264,000	6,552,000
7. Inflation Assumption	2.60%	2.60%	2.60%	2.60%
8. Timing Adjustment: (4) x (7)	8,000	62,000	4,000	74,000
9. Actuarially Determined Contribution: (6) + (8)	673,000	5,685,000	268,000	6,626,000

Section III - Development of Contribution

C. Long Range Forecast

This forecast is based on the results of the July 1, 2018 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. 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
7/1/2018	\$264,380,151	\$228,435,137	\$35,945,014	86.4%	2019-20	\$6,626,000	\$1,780,083	(\$19,744,816)	(\$11,338,733)
7/1/2019	268,094,000	233,393,000	34,701,000	87.1%	2020-21	6,494,000	1,751,000	(20,335,000)	(12,090,000)
7/1/2020	271,605,000	237,352,000	34,253,000	87.4%	2021-22	6,411,000	1,687,000	(21,036,000)	(12,938,000)
7/1/2021	274,659,000	240,946,000	33,713,000	87.7%	2022-23	6,233,000	1,669,000	(21,608,000)	(13,706,000)
7/1/2022	276,975,000	244,031,000	32,944,000	88.1%	2023-24	6,103,000	1,639,000	(22,056,000)	(14,314,000)
7/1/2023	278,807,000	246,634,000	32,173,000	88.5%	2024-25	5,883,000	1,650,000	(22,303,000)	(14,770,000)
7/1/2024	280,144,000	248,872,000	31,272,000	88.8%	2025-26	5,754,000	1,634,000	(22,786,000)	(15,398,000)
7/1/2025	281,283,000	250,860,000	30,423,000	89.2%	2026-27	5,547,000	1,622,000	(23,223,000)	(16,054,000)
7/1/2026	281,861,000	252,397,000	29,464,000	89.5%	2027-28	5,340,000	1,634,000	(23,595,000)	(16,621,000)
7/1/2027	281,915,000	253,407,000	28,508,000	89.9%	2028-29	5,170,000	1,616,000	(23,961,000)	(17,175,000)
7/1/2028	281,463,000	253,937,000	27,526,000	90.2%	2029-30	5,004,000	1,609,000	(24,016,000)	(17,403,000)
7/1/2029	280,524,000	253,962,000	26,562,000	90.5%	2030-31	4,890,000	1,621,000	(24,019,000)	(17,508,000)
7/1/2030	279,430,000	253,776,000	25,654,000	90.8%	2031-32	4,781,000	1,624,000	(23,912,000)	(17,507,000)
7/1/2031	278,242,000	253,488,000	24,754,000	91.1%	2032-33	4,721,000	1,591,000	(24,245,000)	(17,933,000)
7/1/2032	277,100,000	253,199,000	23,901,000	91.4%	2033-34	4,513,000	1,619,000	(24,137,000)	(18,005,000)
7/1/2033	275,377,000	252,462,000	22,915,000	91.7%	2034-35	4,422,000	1,639,000	(23,826,000)	(17,765,000)
7/1/2034	273,646,000	251,604,000	22,042,000	91.9%	2035-36	4,417,000	1,667,000	(23,456,000)	(17,372,000)
7/1/2035	272,218,000	250,940,000	21,278,000	92.2%	2036-37	4,432,000	1,702,000	(23,074,000)	(16,940,000)
7/1/2036	271,200,000	250,643,000	20,557,000	92.4%	2037-38	4,477,000	1,726,000	(22,707,000)	(16,504,000)
7/1/2037	270,649,000	250,778,000	19,871,000	92.7%	2038-39	4,514,000	1,735,000	(22,473,000)	(16,224,000)

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, 2018	\$228,435,137	\$264,380,151	\$35,945,014	86.4%
July 1, 2017	221,592,260	268,864,782	47,272,522	82.4%
July 1, 2016	216,205,953	249,941,161	33,735,208	86.5%
July 1, 2015	213,353,135	241,905,000	28,551,865	88.2%
July 1, 2014	205,056,151	235,975,000	30,918,849	86.9%
July 1, 2013	194,421,794	227,311,000	32,889,206	85.5%
July 1, 2012	188,447,106	219,465,000	31,017,894	85.9%
July 1, 2011	185,098,968	202,613,000	17,514,032	91.4%
July 1, 2010	180,544,359	194,670,000	14,125,641	92.7%

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

Fiscal Year	Actuarially Determined Contribution	Actual City Contribution	Payroll	Actual Contribution as a Percent of Payroll
2019-20	\$6,626,000	TBD	\$42,277,750	TBD
2018-19	7,864,000	TBD	41,463,538	TBD
2017-18	6,348,000	\$6,348,000	42,603,785	14.9%
2016-17	5,923,000	5,923,000	40,776,678	14.5%
2015-16	6,387,000	6,348,000	39,506,337	16.1%
2014-15	6,799,000	6,799,000	44,213,643	15.4%
2013-14	6,504,000	6,504,000	44,997,000	14.5%
2012-13	5,902,000	5,897,100	43,686,085	13.5%
2011-12	5,362,000	5,390,000	48,396,000	11.1%
2010-11	4,175,000	4,175,000	46,311,671	9.0%

Section IV - Membership Data

A. Reconciliation of Membership from Prior Valuation

Details of the changes in the Plan membership since the last valuation are shown below. Additional details on the Plan membership are provided in the remainder of Section IV.

	Active Members	Terminated Vested Members	Nonvested Members Due Refunds	Service Retirees	Disabled Retirees	Beneficiaries	Total
Count July 1, 2017	594	141	12	601	22	83	1,453
Terminated							
- due refund	(6)	-	6	-	-	-	0
- paid refund	(6)	(2)	(6)	-	-	-	(14)
- vested benefits due	(8)	8	-	-	-	-	0
Retired	(23)	(5)	-	27	1	-	0
Died							
- with beneficiary	-	-	-	(21)	-	-	(21)
- no beneficiary	-	-	-	(8)	(1)	(3)	(12)
Benefits expired	-	-	-	-	-	-	0
New member	38	-	-	-	-	-	38
Rehired	1	(1)	-	-	-	-	0
New Alternate Payee	-	-	-	-	-	7	7
Correction	-	-	2	-	-	-	2
Count July 1, 2018	590	141	14	599	22	87	1,453
Breakdown July 1, 2018							
Board of Education	84	9	0	80	1	5	179
City	478	129	12	500	19	81	1,219
WPCA	<u>28</u>	<u>3</u>	<u>2</u>	<u>19</u>	<u>2</u>	<u>1</u>	<u>55</u>
Total	590	141	14	599	22	87	1,453

Section IV - Membership Data

B. Statistics of Active Membership

		As of July 1, 2018	As of July 1, 2017
Number of Active Members*	Board of Education	84	
	City	478	
	WPCA	28	
	Total	590	594
Average Age*	Board of Education	53.3	
	City	51.7	
	WPCA	56.1	
	Total	52.1	52.2
Average Service*	Board of Education	14.0	
	City	15.1	
	WPCA	16.7	
	Total	15.0	15.2
Total Payroll*	Board of Education	\$5,315,077	
	City	34,672,568	
	WPCA	2,290,105	
	Total	42,277,750	41,463,538
Average Payroll*	Board of Education	\$63,275	
	City	72,537	
	WPCA	81,789	
	Total	71,657	69,804

**Individual breakdown not available for July 1, 2017*

Section IV - Membership Data

C. Distribution of Active Members as of July 1, 2018

Board of Education

Age	Years of Service							Total
	0-4	5-9	10-14	15-19	20-24	25-29	30+	
< 25								0
25-29								0
30-34	4	2						6
35-39	10		2					12
40-44		2		2				4
45-49	4	1	1	3				9
50-54	6	2		5		1		14
55-59	3	2		3	4	3	1	16
60-64		1	3	3			1	8
65+		1	2	4	3		5	15
Total	27	11	8	20	7	4	7	84

City

Age	Years of Service							Total
	0-4	5-9	10-14	15-19	20-24	25-29	30+	
< 25	6							6
25-29	21	3						24
30-34	12	8	5					25
35-39	11	10	7					28
40-44	10	8	11	13	1			43
45-49	17	7	10	14	11	1		60
50-54	8	11	10	24	15	6	10	84
55-59	6	6	12	27	9	5	19	84
60-64	7	8	14	13	11	4	15	72
65+	4	3	7	9	14	1	14	52
Total	102	64	76	100	61	17	58	478

WPCA

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								0
35-39			3					3
40-44								0
45-49			1					1
50-54	1	4				1		6
55-59		1	1	3	1	1		7
60-64	2	1				1		4
65+		1			1		4	6
Total	3	8	5	3	2	3	4	28

Section IV - Membership Data

D. Statistics of Inactive Membership

	As of July 1, 2018	As of July 1, 2017
Terminated Vested Members		
Number	141	141
Total Annual Benefit	\$1,917,818	\$1,885,432
Average Annual Benefit	13,602	13,372
Average Age	52.3	52.0
Nonvested Members Due Refunds		
Number	14	12
Service Retirees		
Number	599	601
Total Annual Benefit*	\$13,639,341	\$15,682,472
Average Annual Benefit*	22,770	22,213
Average Age*	75.3	75.7
Disabled Retirees		
Number	22	22
Total Annual Benefit	\$477,122	
Average Annual Benefit	21,687	
Average Age	63.3	
Beneficiaries		
Number	87	83
Total Annual Benefit	\$1,165,250	
Average Annual Benefit	13,394	
Average Age	82.3	

**Individual breakdown not available for July 1, 2017- values shown are for all retirees/beneficiaries combined*

Section IV - Membership Data
E. Distribution of Inactive Members as of July 1, 2018

	Age	Number	Annual Benefits
Terminated Vested Members	< 50	45	\$566,520
	50 - 59	82	1,181,744
	60 - 69	14	169,555
	70 - 79	0	0
	80 - 89	0	0
	90 +	0	0
	Total	141	1,917,819
Service Retirees	< 50	0	\$0
	50 - 59	20	709,585
	60 - 69	181	4,697,016
	70 - 79	213	5,151,097
	80 - 89	124	2,219,949
	90 +	61	861,695
	Total	599	13,639,341
Disabled Retirees	< 50	1	\$22,524
	50 - 59	10	242,547
	60 - 69	6	124,796
	70 - 79	4	74,438
	80 - 89	0	0
	90 +	1	12,818
	Total	22	477,122
Beneficiaries	< 50	1	\$31,147
	50 - 59	3	51,593
	60 - 69	6	85,415
	70 - 79	20	319,548
	80 - 89	36	431,788
	90 +	21	245,759
	Total	87	1,165,250

Appendix A - Actuarial Funding Method

The actuarial funding method used in the valuation of this Plan is known as the Projected Unit Credit Cost 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 a Timing Adjustment to reflect the timing of the contribution relative to the valuation date.

Under this cost method a projected retirement benefit at assumed retirement age is computed for each member. The Normal Cost for each member is computed as the present value of the pro-rata portion of the member's projected benefit which is accrued or earned during the plan year being valued. The normal cost of the plan is the total of the individually computed normal costs for all members. The Accrued Liability at any point in time for an active member is the present value of that portion of the projected benefit which has been accrued up to the valuation date. For members receiving benefits or entitled to a deferred benefit, the accrued liability is equal to the present value of their future benefit payments. The accrued liability for the plan is the total of individually computed accrued liability amounts for all members.

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 an open period of 15 years.

The Actuarial Value of Assets is determined by recognizing market gains and losses asymptotically over a five year period; the result is constrained to within +/- 30% of the market value of assets as of the valuation date.

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, as well as incorporating the characteristics of the current active employees as a whole.

Appendix B - Actuarial Assumptions

Each of the assumptions used in this valuation was set based on 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.

Interest Rate 7.10% (prior: 7.20%)

Inflation Rate 2.60% (prior: 2.75%)

Rate of Increase for Part B Reimbursements N/A (prior: 2.75%)

Expenses The average of the prior year two year's administrative expenses, rounded to the nearest \$1.

Salary Scale	Age	Current Rate	Prior Rate
	20	6.10%	6.25%
	25	6.10%	6.25%
	30	5.45%	5.60%
	35	4.80%	4.95%
	40	4.15%	4.30%
	45	3.50%	3.65%
	50	2.85%	3.00%
	55+	2.60%	2.75%

Turnover	Age	Rate
	20	10.6%
	25	7.9%
	30	5.8%
	35	4.2%
	40	3.1%
	45	2.1%
	50	1.3%
	55	0.5%
	60	0.5%

Appendix B - Actuarial Assumptions

Retirement	Age	Rate
	50-61	5%
	62-65	100%

Retirements are assumed to occur after the earliest of 1) age 50 with 25 years of service, 2) age 55 with 15 years of service, or 3) age 60 with 10 years of service.

Disability	Age	Rate
	20	0.05%
	25	0.05%
	30	0.05%
	35	0.06%
	40	0.09%
	45	0.18%
	50	0.40%
	55	0.85%
	60	0.85%

All disabilities are assumed to be non-service related.

Mortality 50/50 blend of the RP-2000 No Collar Combined Healthy Table and the RP-2000 Blue Collar Combined Table, with separate tables for males and females and generational projection per Scale BB. This assumption includes a margin for future improvements in longevity.

All preretirement deaths are assumed to be non-service related.

Marital Status 80% of active participants are assumed to be married. Female spouses are assumed to be 4 years younger than male spouses.

Pension Service Exchange and Payout Bank 100% (prior: 50%) of retiring members are assumed to elect the maximum exchange (based on their current bank) and to elect a lump sum payout.

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 Members of the UAW are eligible to participate upon hire. Members of the other unions hired after a certain date (varies by union) are not eligible to participate in the Plan.

Pension Earnings UAW and TEA: the average of the highest 3 out of the last 10 years of salary.
All others: salary in the final year of employment.

Normal Retirement Eligibility Generally: age 58 with 15 years of service, or age 60 with 10 years of service.
MAA: also any age with 25 years of service.
UE hired or or after 7/1/2012: age 58 with 15 years does not apply.
UAW: age 58 with 15 years only applies to those with 25 years of service on 1/1/2015.
TEA: age 58 with 15 years does not apply.

Normal Retirement Benefit Equal to a percentage of Pension Earnings multiplied by years of service with a cap on years of service and/or a cap on the overall benefit.

Group	Multiplier	Service Cap	Benefit Cap
Generally	2.00%	33	66%
UE hired or or after 7/1/2012		30	
UAW			70%
UAW with <25 years on 1/1/2015	1.75%*		
UAW hired or or after 1/1/2015	1.50%		
TEA			66%
TEA with <20 years on 1/1/2015	1.75%*		
TEA hired on or after 1/1/2015	1.50%		

* applies only to service after 1/1/2015

Appendix C - Summary of Plan Provisions

Normal Retirement Benefit (continued)	<p>For members promoted to MAA after 6/16/2018, the multiplier immediately prior to promotion will be used for service after promotion. These members also have three options regarding what pay will be used for their pension calculation (their new pay, their new pay with phase in, or the salary for their pre-promotion position).</p> <p>Minimum benefit with 25 years of service is \$1,000.</p>
Early Retirement Eligibility	Age 50 with 25 years of service.
Early Retirement Benefit	Accrued retirement benefit reduced .25% for each of the first 36 months prior to age 58 and .55% for each month in excess of 36; no reduction for MAA with 25+ years of service.
Non-Service Disability Eligibility	<p>UAW, Nurses, and Dental: 15 years of service.</p> <p>All others: 10 years of service.</p>
Non-Service Disability Benefit	<p>TEA: 50% of Pension Earnings if less than 20 years of service; accrued retirement benefit if more than 20 years of service.</p> <p>All others: 50% of Pension Earnings if less than 25 years of service; accrued retirement benefit if more than 25 years of service.</p>
Service Disability Eligibility	No service requirement.
Service Disability Benefit	50% of Pension Earnings.
Non-Service Preretirement Death Eligibility	No service requirement.
Non-Service Preretirement Death Benefit	<p>Less than 15 years of service: refund of contributions.</p> <p>15+ years of service but not eligible for retirement: \$166.67 per month less Social Security benefit.</p> <p>Eligible to retire: retirement benefit payable as a 100% Joint & Survivor annuity.</p>
Service Preretirement Death Eligibility	No service requirement.
Service Preretirement Death Benefit	50% of Pension Earnings less Worker's Compensation payments, minimum \$83.33 per month.

Appendix C - Summary of Plan Provisions

Postretirement Death Benefit	Lump sum equal to the excess, if any, of accumulated contributions over the total benefits paid to the member or survivors.
Postretirement Life Insurance	UAW: none. All others: \$6,000 lump sum.
Vesting	TEA and UE: 100% after 10 years of service. All others: 100% after 5 years of service.
Termination Benefit	If the member is vested, the accrued benefit is payable at age 60, or at age 58 if the member has 15+ years of vesting services and is eligible for Normal Retirement at age 58 with 15 years of service. If the member is not vested, the member is paid a refund of their accumulated contributions.
Employee Contributions	Active members contribute a percentage of salary: 1199: 3.00% UE, MAA, NUR, NSH and NHE: 6.00% UAW with multiplier < 2.00%: 4.50% All others: 5.00% No member contributions are made by: UAAW with 33+ years of service on 8/5/2013. MAA, Nurses, Teamsters, IE, and Dental hygienists with 33+ years of service on 7/1/2012. All others: have reached maximum pension benefit.

Appendix C - Summary of Plan Provisions

Vacation / Sick Leave Banks

Union	Payout Bank Source	Additional Pension Credits Available		Eligibility Cutoff Date For	
		Vacation	Sick	Vacation	Sick
1199	Operating Budget	Yes-payout only	Yes-payout only	--	07/01/1998
Dental	CERF	No	Yes	--	07/01/1997
Law	Operating Budget	Yes-payout only	Yes-payout only	--	--
MAA	CERF	Yes	Yes	--	07/01/1997
Nurses	CERF	Yes	Yes	--	07/01/1997
Teamsters	CERF	Yes	Yes	--	07/01/1997
UAW	CERF	Yes	Yes	01/01/2015	07/01/1988
UE	CERF	Yes	Yes	07/01/2012	07/01/2012

UE hired on or after 7/1/2012: not eligible for exchange.

UAW and TEA hired on or after 1/1/2015: not eligible for exchange.

The amount of the exchange/payout bank is equal to 50% of sick days subject to a 75 day maximum, plus vacation days. Employees can trade in up to 100 days of eligible time for additional pension credit. Each 25 days grants an additional 1% of salary up to a maximum of 4%. The remainder of the bank is paid out in a lump sum.

Additional Provisions

MAA, UAW, and Dental Hygenists: can pay 3% of 2011-2012 base salary for one additional year of service credit. The additional benefit is paid at age 65+. Such payment must be made by 6/30/2013 or 6/30/2014, depending on the union.

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 68) 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.