



TOWN OF WINDSOR RETIREMENT PLAN

**Actuarial Valuation as of July 1, 2019
To Determine Funding for Fiscal Year 2020-21**

Prepared by

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Certification

We have performed an actuarial valuation of the Plan as of July 1, 2019 to determine funding for fiscal year 2020-21. 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 Town. 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.

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 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

None.

Changes in Actuarial Methods and Assumptions

At the Town's direction, this valuation reflects a 75% phase-in of an update to the mortality assumption from the RP-2000 base table with generational projection of mortality improvements per Scale AA to the PUB-2010 base table with generational projection of mortality improvements per the MP Ultimate Scale. The 2020 valuation will reflect 100% of the updated mortality assumption.

This change caused the Unfunded Accrued Liability to increase by about \$4.7 million and the Actuarially Determined Contribution to increase by about \$395,000. Had the updated mortality assumption been 100% adopted, which is our best estimate of future experience, this would have caused the Unfunded Accrued Liability to increase by about \$6.3 million and the Actuarially Determined Contribution to increase by about \$526,000.

Other Significant Changes

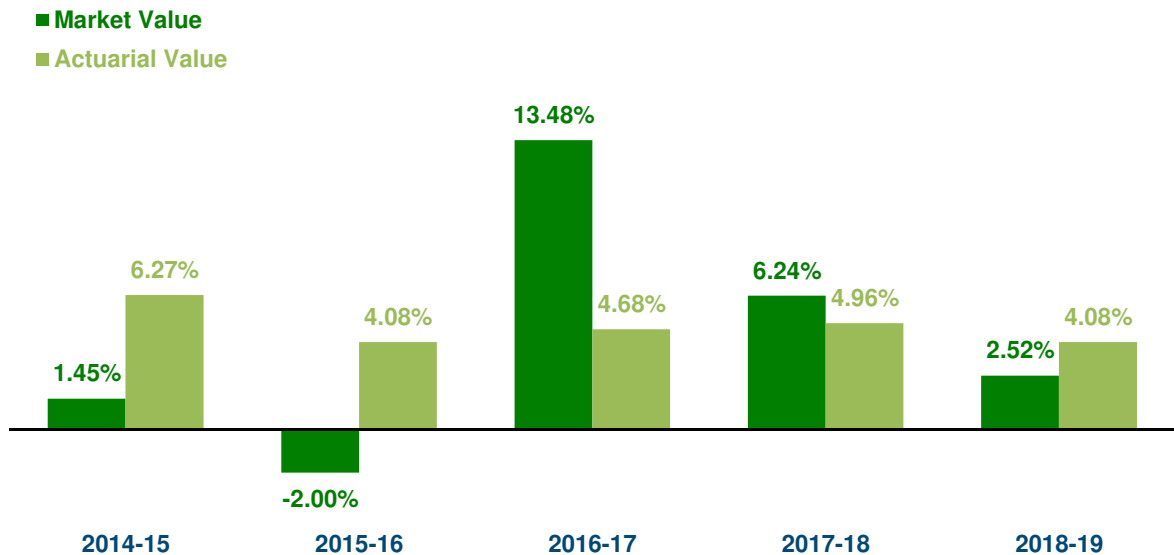
None.

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 non-asymptotically over five years.

	Market	Actuarial
Value as of July 1, 2018	\$69,471,681	\$70,846,138
Town and Member Contributions	1,883,647	1,883,647
Investment Income	1,723,470	2,840,781
Benefit Payments and Administrative Expenses	<u>(4,207,390)</u>	<u>(4,207,390)</u>
Value as of July 1, 2019	68,871,408	71,363,176

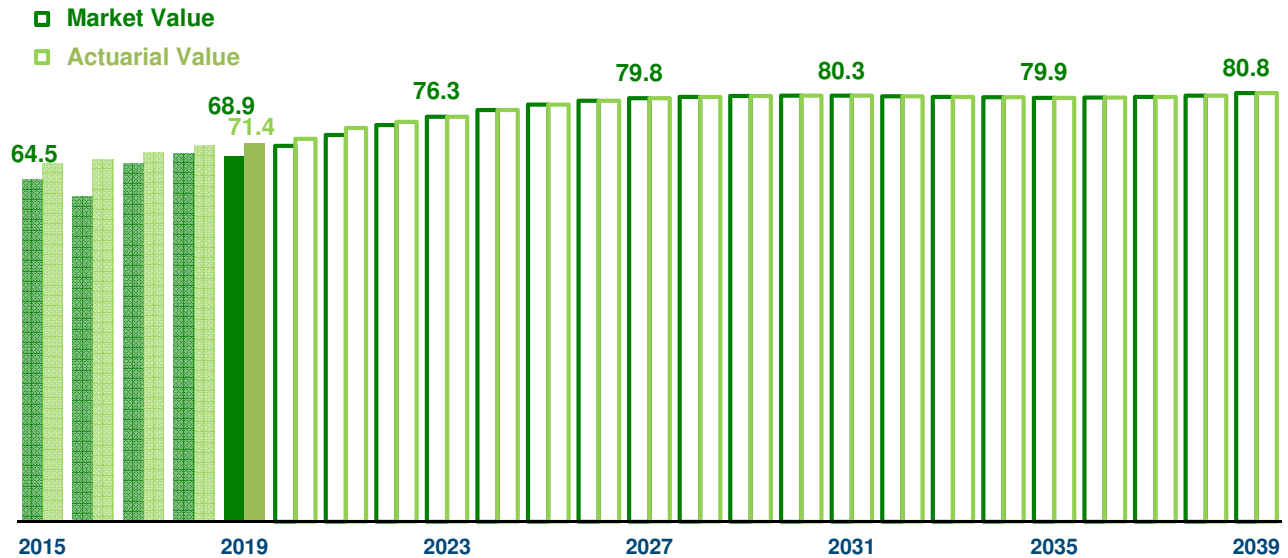
For fiscal year 2018-19, the plan's assets earned 2.52% on a Market Value basis and 4.08% on an Actuarial Value basis. The actuarial assumption for this period was 7.00%; the result is an asset loss of about \$3.1 million on a Market Value basis and a loss of about \$2.0 million on an Actuarial Value basis. Historical rates of return are shown in the graph below.



Please note that the Actuarial Value currently exceeds the Market Value by \$2.5 million. This figure represents investment losses that will be gradually recognized in future years. This process will exert upward pressure on the Town's contribution, unless there are offsetting market gains.

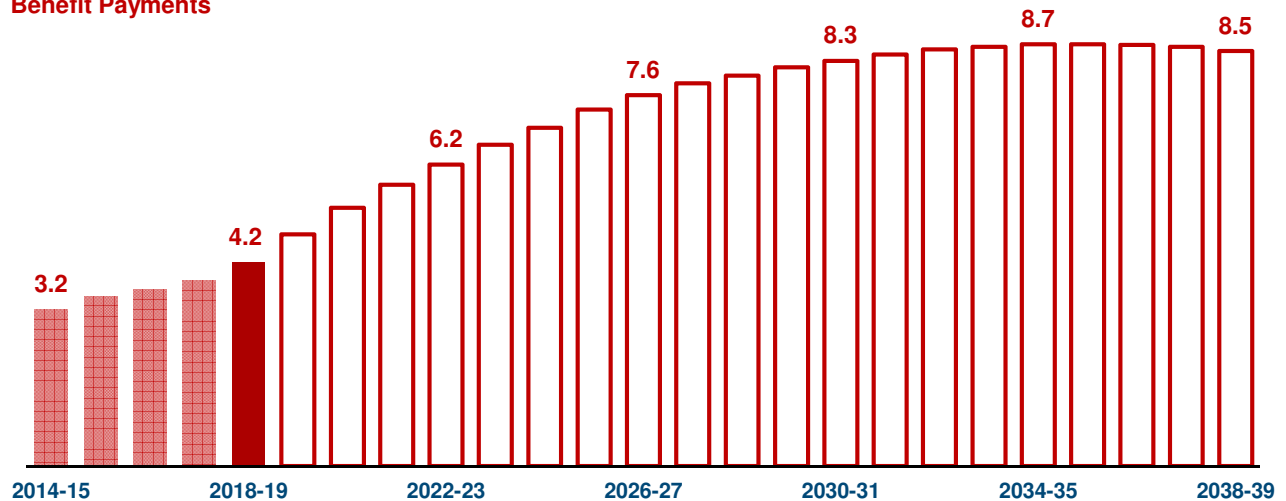
Section I - Executive Summary Assets (continued)

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 Town always contributes the Actuarially Determined Contribution and the investments always earn the assumed interest rate each year.



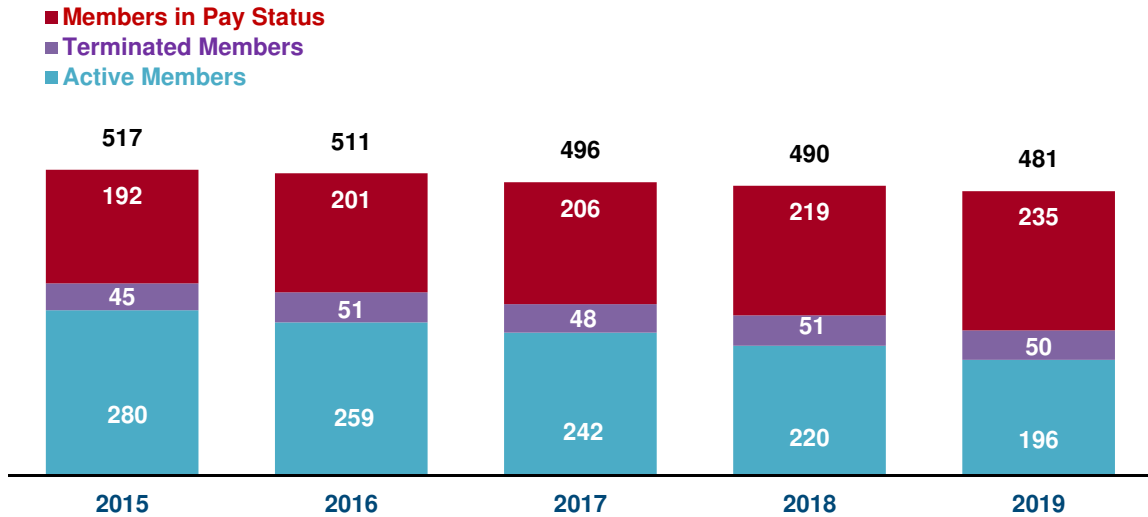
In 2018-19, the plan paid out \$4.2 million in benefits to members. Over the next 20 years, the plan is projected to pay out a total of \$152 million in benefits to members.

Benefit Payments



Section I - Executive Summary Membership

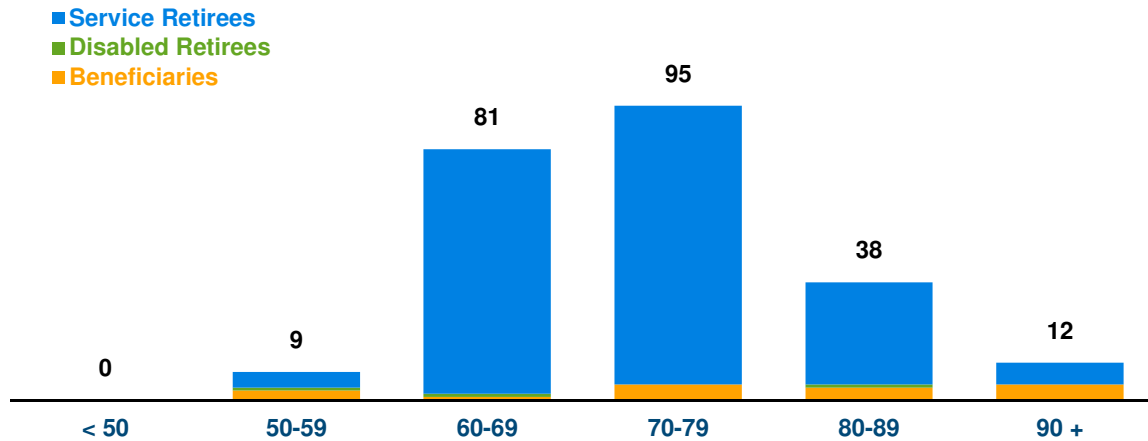
There are three basic categories of plan members included in the valuation: (1) members who are receiving monthly pension benefits, (2) former employees who have a vested right to benefits but have not yet started collecting, and (3) active employees who have met the eligibility requirements for membership.



Members in Pay Status on July 1, 2019

Service Retirees	214	Average Age	73.3
Disabled Retirees	3	Total Annual Benefit	\$4,451,725
Beneficiaries	<u>18</u>	Average Annual Benefit	18,944
Total	235		

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



Section I - Executive Summary Membership (continued)

Terminated Vested Members on July 1, 2019

Count	45
Average Age	50.4
Total Annual Benefit	\$400,747
Average Annual Benefit	8,905

Nonvested Members Due Refunds on July 1, 2019

Count	5
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Active Members on July 1, 2019

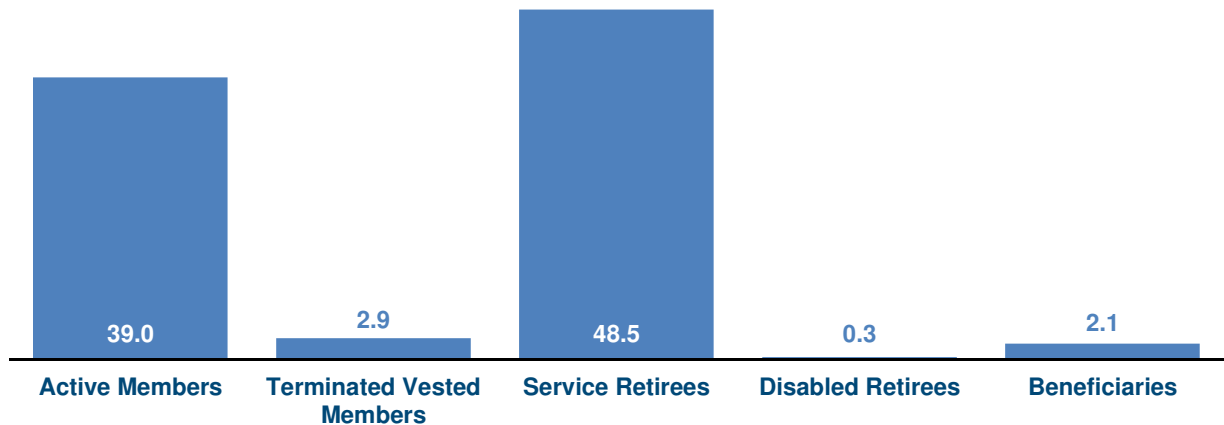
Count	196
Average Age	55.5
Average Service	17.2
Payroll	\$11,383,383
Average Payroll	58,078

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

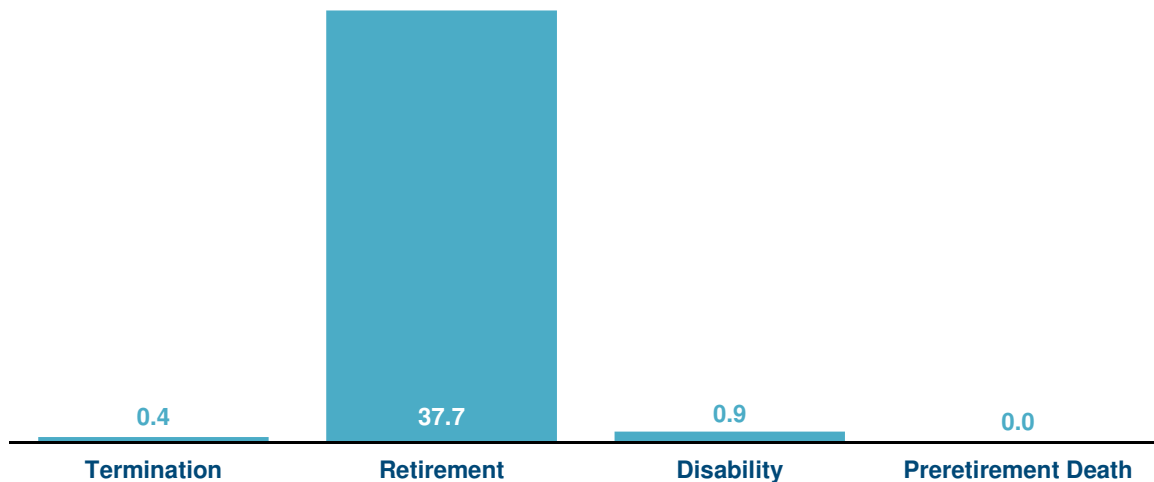
Age	Years of Service							Total
	0-4	5-9	10-14	15-19	20-24	25-29	30+	
< 25								0
25-29								0
30-34		3	2					5
35-39		3	1	2				6
40-44		3	7	4				14
45-49		4	10	1	4			19
50-54		4	8	7	6	1	5	31
55-59		6	9	17	8	3	2	45
60-64		7	7	24	8	2	8	56
65+		2	5	7	3	2	1	20
Total	0	32	49	62	29	8	16	196

Section I - Executive Summary Accrued Liability

The Accrued Liability as of July 1, 2019 is \$92.8 million and consists of the following pieces:



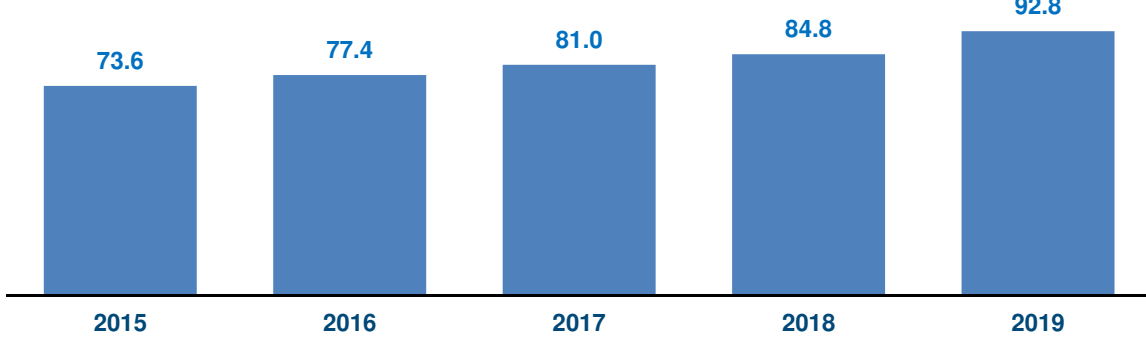
The Accrued Liability for active members can be broken down further by the different types of benefits provided by the plan:



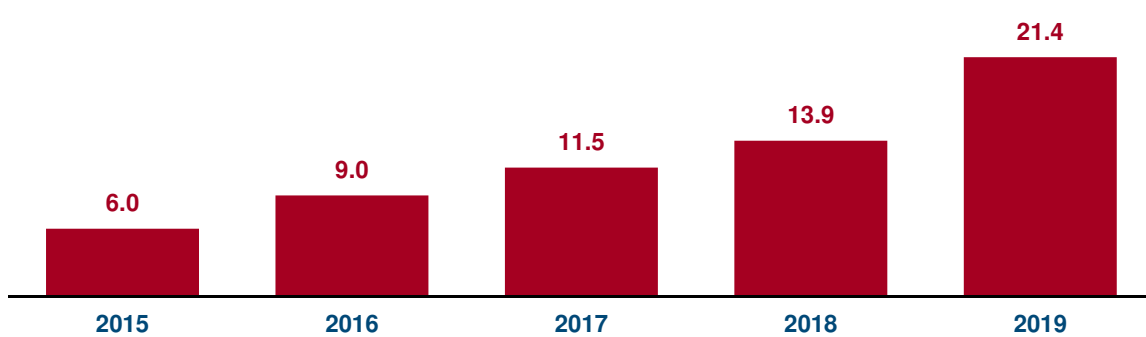
Section I - Executive Summary Funded Status

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.

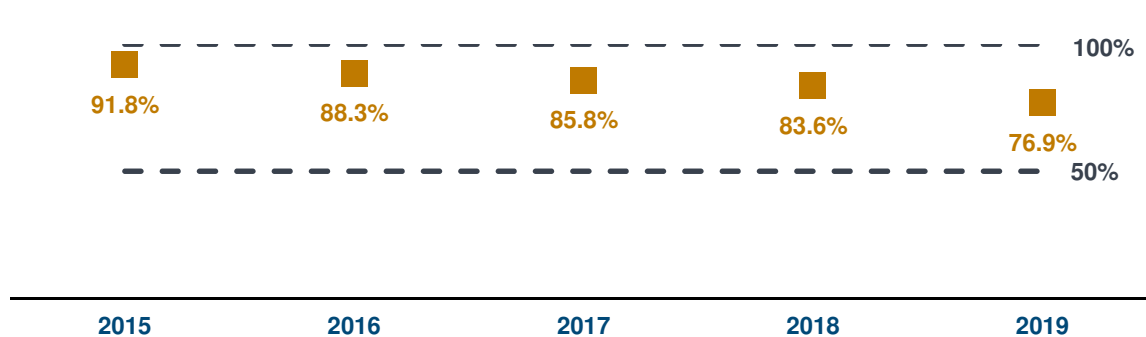
Accrued Liability (\$ millions)



Unfunded Accrued Liability (\$ millions)



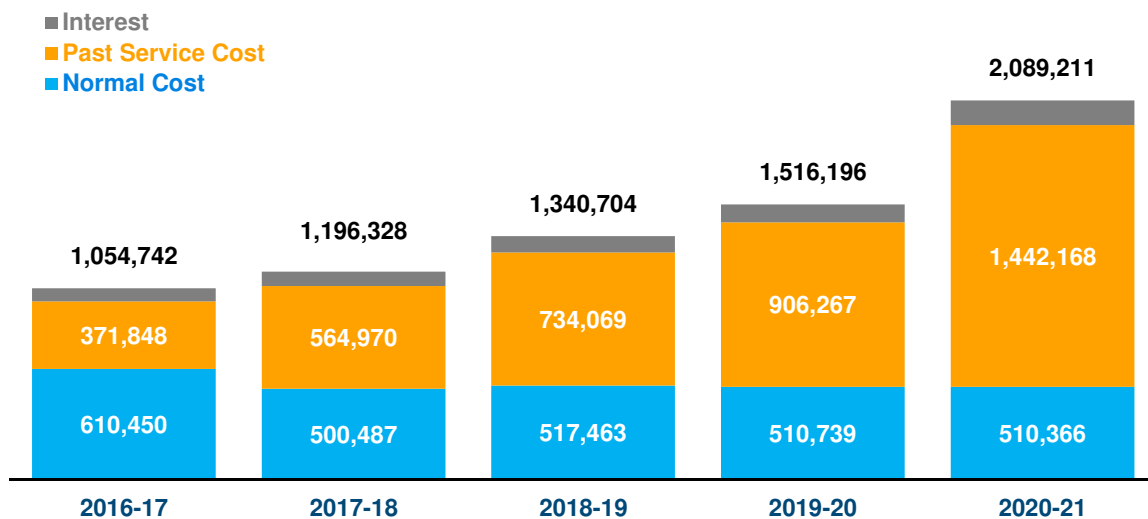
Funded Ratio



Section I - Executive Summary Actuarially Determined Contribution

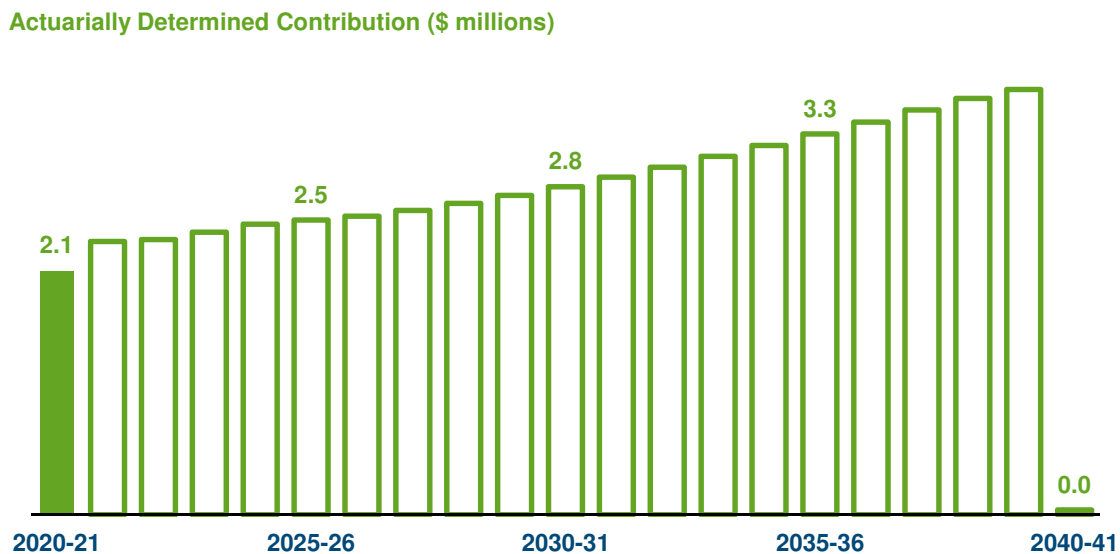
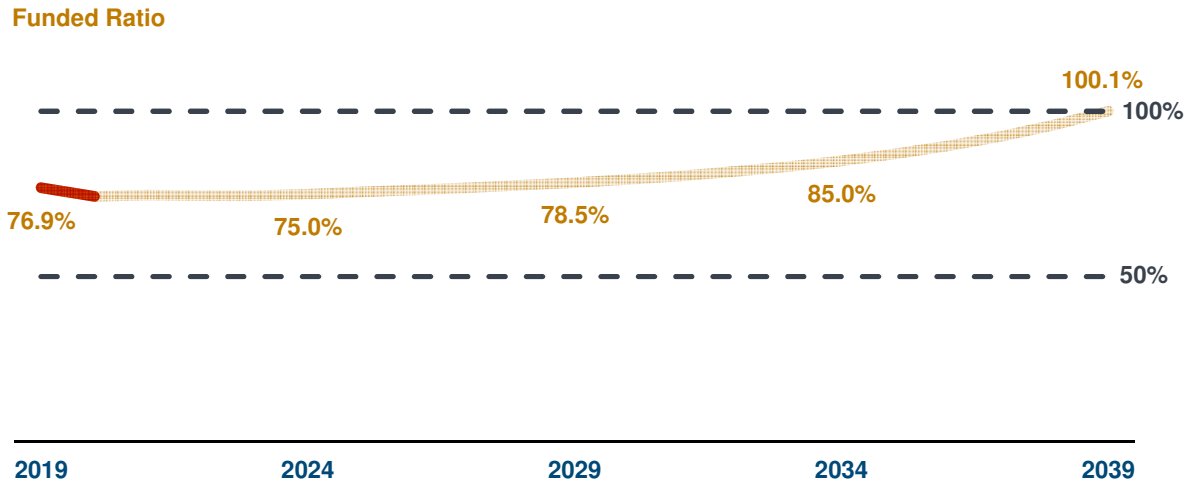
The Actuarially Determined Contribution consists of three pieces: a Normal Cost payment to fund the benefits earned each year, a Past Service Cost to gradually reduce any unfunded or surplus liability, and Interest to reflect the timing of the contribution relative to the valuation date.

The Actuarially Determined Contribution for fiscal year 2020-21 is shown graphically below, along with the comparable figures for the preceding four 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

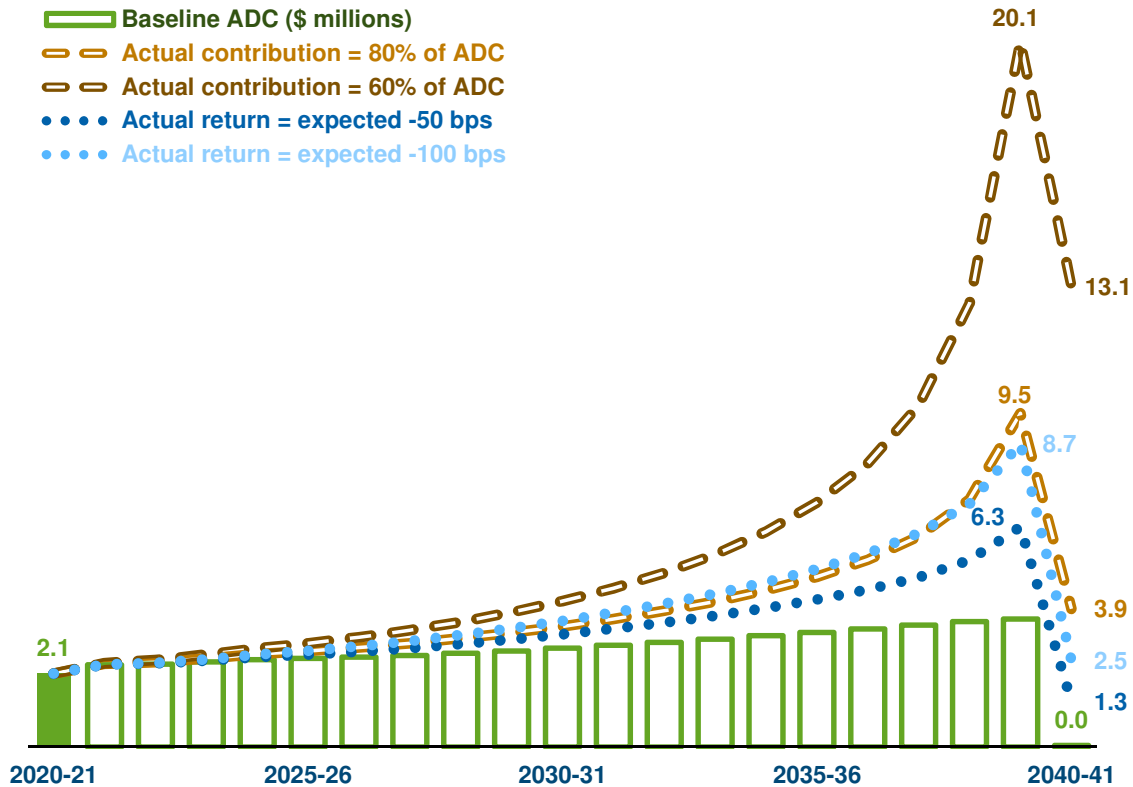
If the Town pays the Actuarially Determined Contribution each year, the investments earn exactly the assumed interest rate each year, and there are no changes in the plan provisions or in the actuarial methods and assumptions, then we project the following changes in the plan's funded status and the 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 Town and from employees, and from investment income. If the Town 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 Town'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 Town's future contribution levels. Stochastic projections could be prepared that would enable the Town 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, 2019
Active Members	220	196
Terminated Members	51	50
Members in Pay Status	<u>219</u>	<u>235</u>
Total Count	490	481
 Payroll	 \$12,192,970	 \$11,383,383
 Assets and Liabilities as of	 July 1, 2018	 July 1, 2019
Market Value of Assets	\$69,471,681	\$68,871,408
Actuarial Value of Assets	70,846,138	71,363,176
 Accrued Liability for Active Members	 39,695,943	 39,042,694
Accrued Liability for Terminated Members	2,607,998	2,859,309
Accrued Liability for Members in Pay Status	<u>42,467,733</u>	<u>50,879,704</u>
Total Accrued Liability	84,771,674	92,781,707
 Unfunded Accrued Liability	 13,925,536	 21,418,531
 Funded Ratio	 83.6%	 76.9%
 Actuarially Determined Contribution for Fiscal Year	 2019-20	 2020-21
Normal Cost	\$510,739	\$510,366
Past Service Cost	906,267	1,442,168
Interest	<u>99,190</u>	<u>136,677</u>
Actuarially Determined Contribution	1,516,196	2,089,211
 Allocation of Actuarially Determined Contribution*		
Allocated to BOE	\$759,998	\$1,058,350
Allocated to Town	<u>756,198</u>	<u>1,030,861</u>
Total	1,516,196	2,089,211

* Allocated on the basis of payroll

Section II - Plan Assets

A. Summary of Fund Transactions

Market Value as of July 1, 2018 \$69,471,681

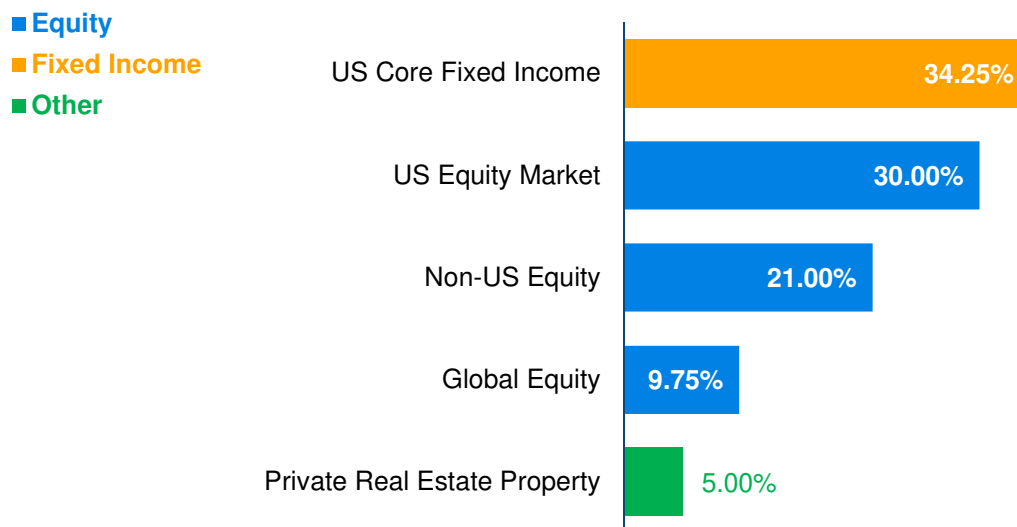
Town Contributions	1,340,704
Member Contributions	542,943
Net Investment Income	1,723,470
Benefit Payments	(4,188,153)
Administrative Expenses	(19,237)

Market Value as of June 30, 2019 68,871,408

Expected Return on Market Value of Assets	4,787,417
Market Value (Gain)/Loss	3,063,947
Approximate Rate of Return *	2.52%

* 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, 2019



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 in equal installments ('non-asymptotically') over a five year period. The Actuarial Value of Assets as of July 1, 2019 is determined below.

1.	Expected Market Value of Assets:		
	a. Market Value of Assets as of July 1, 2018		\$69,471,681
	b. Town and Member Contributions		1,883,647
	c. Benefit Payments and Administrative Expenses		(4,207,390)
	d. Expected Earnings Based on 7.00% Interest		<u>4,787,417</u>
	e. Expected Market Value of Assets as of July 1, 2019		71,935,355
2.	Actual Market Value of Assets as of July 1, 2019		68,871,408
3.	Market Value (Gain)/Loss: (1e) - (2)		3,063,947
4.	Delayed Recognition of Market (Gains)/Losses		
		Percent Not	Amount Not
	Plan Year End	(Gain)/Loss	Recognized
	6/30/2019	\$3,063,947	80%
	6/30/2018	585,934	60%
	6/30/2017	(3,754,634)	40%
	6/30/2016	5,954,521	20%
			<u>1,190,904</u>
			2,491,768
5.	Actuarial Value of Assets as of July 1, 2019: (2) + (4)		71,363,176
6.	Return on Actuarial Value of Assets: (5) - [(1a) + (1b) + (1c)]		2,840,781
7.	Approximate Rate of Return on Actuarial Value of Assets		4.08%
8.	Actuarial Value (Gain)/Loss		2,033,108

Section III - Development of Contribution

A. Past Service Cost

In determining the Past Service Cost, the Unfunded Accrued Liability is amortized as a level percent over 30 years beginning July 1, 2009.

	July 1, 2018	July 1, 2019
1. Accrued Liability		
Active Members	\$39,695,943	\$39,042,694
Terminated Members	2,607,998	2,859,309
Service Retirees	40,263,966	48,480,807
Disabled Retirees	218,457	257,209
Beneficiaries	<u>1,985,310</u>	<u>2,141,688</u>
Total Accrued Liability	84,771,674	92,781,707
2. Actuarial Value of Assets (see Section IIB)	70,846,138	71,363,176
3. Unfunded Accrued Liability: (1) - (2)	13,925,536	21,418,531
4. Funded Ratio: (2) / (1)	83.6%	76.9%
5. Amortization Period	21	20
6. Amortization Growth Rate	3.50%	3.50%
7. Past Service Cost: (3) amortized over (5)	906,267	1,442,168

Section III - Development of Contribution

B. Actuarially Determined Contribution

	2019-20	2020-21
1. Total Normal Cost	\$1,011,200	\$966,801
2. Expected Member Contributions	520,461	476,235
3. Expected Administrative Expenses	20,000	19,800
4. Net Normal Cost: (1) - (2) + (3)	510,739	510,366
5. Past Service Cost (see Section IIIA)	906,267	1,442,168
6. Interest on (4) + (5) to the start of the fiscal year	99,190	136,677
7. Actuarially Determined Contribution: (4) + (5) + (6)	1,516,196	2,089,211
8. Payroll		
Board of Education	6,088,784	5,766,582
Town	<u>6,104,186</u>	<u>5,616,801</u>
Total	12,192,970	11,383,383
9. Allocation of (7) based on (8)		
Board of Education	759,998	\$1,058,350
Town	<u>756,198</u>	<u>1,030,861</u>
Total	1,516,196	2,089,211

Section III - Development of Contribution C. Long Range Forecast

This forecast is based on the results of the July 1, 2019 actuarial valuation and assumes that the Town 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 Town 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		Town Contributions	Member Contributions	Benefit Payments	Net Cash Flows
7/1/2019	\$92,781,707	\$71,363,176	\$21,418,531	76.9%	2020-21	\$2,089,211	\$410,181	(\$5,298,883)	(\$2,799,491)
7/1/2020	97,146,000	72,135,000	25,011,000	74.3%	2021-22	2,342,000	354,000	(5,775,000)	(3,079,000)
7/1/2021	99,411,000	74,194,000	25,217,000	74.6%	2022-23	2,358,000	306,000	(6,186,000)	(3,522,000)
7/1/2022	101,193,000	75,355,000	25,838,000	74.5%	2023-24	2,420,000	264,000	(6,596,000)	(3,912,000)
7/1/2023	102,537,000	76,306,000	26,231,000	74.4%	2024-25	2,491,000	226,000	(6,939,000)	(4,222,000)
7/1/2024	103,440,000	77,577,000	25,863,000	75.0%	2025-26	2,525,000	190,000	(7,316,000)	(4,601,000)
7/1/2025	103,965,000	78,613,000	25,352,000	75.6%	2026-27	2,559,000	161,000	(7,613,000)	(4,893,000)
7/1/2026	104,039,000	79,329,000	24,710,000	76.2%	2027-28	2,607,000	137,000	(7,854,000)	(5,110,000)
7/1/2027	103,744,000	79,793,000	23,951,000	76.9%	2028-29	2,668,000	117,000	(8,014,000)	(5,229,000)
7/1/2028	103,123,000	80,064,000	23,059,000	77.6%	2029-30	2,736,000	100,000	(8,180,000)	(5,344,000)
7/1/2029	102,249,000	80,230,000	22,019,000	78.5%	2030-31	2,812,000	85,000	(8,316,000)	(5,419,000)
7/1/2030	101,105,000	80,287,000	20,818,000	79.4%	2031-32	2,893,000	72,000	(8,444,000)	(5,479,000)
7/1/2031	99,707,000	80,271,000	19,436,000	80.5%	2032-33	2,979,000	61,000	(8,550,000)	(5,510,000)
7/1/2032	98,052,000	80,189,000	17,863,000	81.8%	2033-34	3,070,000	50,000	(8,605,000)	(5,485,000)
7/1/2033	96,150,000	80,069,000	16,081,000	83.3%	2034-35	3,166,000	42,000	(8,651,000)	(5,443,000)
7/1/2034	94,038,000	79,966,000	14,072,000	85.0%	2035-36	3,264,000	35,000	(8,657,000)	(5,358,000)
7/1/2035	91,711,000	79,898,000	11,813,000	87.1%	2036-37	3,366,000	29,000	(8,642,000)	(5,247,000)
7/1/2036	89,202,000	79,914,000	9,288,000	89.6%	2037-38	3,469,000	23,000	(8,604,000)	(5,112,000)
7/1/2037	86,526,000	80,042,000	6,484,000	92.5%	2038-39	3,569,000	19,000	(8,519,000)	(4,931,000)
7/1/2038	83,685,000	80,319,000	3,366,000	96.0%	2039-40	3,645,000	15,000	(8,433,000)	(4,773,000)

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, 2010	\$54,245,354	\$53,427,746	(\$817,608)	101.5%
July 1, 2011	56,804,114	55,428,256	(1,375,858)	102.5%
July 1, 2012	59,251,864	58,623,672	(628,192)	101.1%
July 1, 2013	62,034,394	66,628,676	4,594,282	93.1%
July 1, 2014	65,167,454	69,668,604	4,501,150	93.5%
July 1, 2015	67,591,835	73,630,924	6,039,089	91.8%
July 1, 2016	68,342,306	77,373,867	9,031,561	88.3%
July 1, 2017	69,510,847	81,031,794	11,520,947	85.8%
July 1, 2018	70,846,138	84,771,674	13,925,536	83.6%
July 1, 2019	71,363,176	92,781,707	21,418,531	76.9%

Section III - Development of Contribution

E. History of Town Contributions

Fiscal Year	Actuarially Determined Contribution	Actual Town Contribution	Payroll	Actual Contribution as a Percent of Payroll
2011-12	\$1,334,389	\$1,334,389	\$15,782,256	8.5%
2012-13	1,367,561	1,367,561	15,894,915	8.6%
2013-14	1,311,760	1,311,760	15,947,178	8.2%
2014-15	998,378	998,378	15,744,445	6.3%
2015-16	1,026,539	1,026,539	14,982,909	6.9%
2016-17	1,054,742	1,054,742	14,057,983	7.5%
2017-18	1,196,328	1,196,328	13,489,831	8.9%
2018-19	1,340,704	1,340,704	12,839,197	10.4%
2019-20	1,516,196	TBD	12,192,970	TBD
2020-21	2,089,211	TBD	11,383,383	TBD

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, 2018	220	46	5	199	3	17	490
Terminated							
- no benefits due	-	-	-	-	-	-	0
- paid refund	(3)	(1)	-	-	-	-	(4)
- vested benefits due	(6)	6	-	-	-	-	0
Retired	(15)	(6)	-	21	-	-	0
Died							
- with beneficiary	-	-	-	-	-	-	0
- no beneficiary	-	-	-	(6)	-	-	(6)
Benefits expired	-	-	-	-	-	-	0
New member	-	-	-	-	-	-	0
Rehired	-	-	-	-	-	-	0
New Alternate Payee	-	-	-	-	-	1	1
Correction	-	-	-	-	-	-	0
Count July 1, 2019	196	45	5	214	3	18	481

Section IV - Membership Data

B. Statistics of Active Membership

	As of July 1, 2018	As of July 1, 2019
Board of Education		
Number of Active Members	138	124
Average Age	55.7	56.4
Average Service	15.8	16.4
Total Payroll	\$6,088,784	\$5,766,582
Average Payroll	44,122	46,505
Town		
Number of Active Members	82	72
Average Age	53.4	54.0
Average Service	18.4	18.6
Total Payroll	\$6,104,186	\$5,616,801
Average Payroll	74,441	78,011

Section IV - Membership Data

C. Distribution of Active Members as of July 1, 2019

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		2	1					3
35-39		1	1	1				3
40-44		3	3					6
45-49		4	5	1	3			13
50-54		3	5	5	3		3	19
55-59		4	4	12	6		1	27
60-64		5	6	17	5	1	3	37
65+		2	4	6	3	1		16
Total	0	24	29	42	20	2	7	124

Town

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		1	1					2
35-39		2		1				3
40-44			4	4				8
45-49			5		1			6
50-54		1	3	2	3	1	2	12
55-59		2	5	5	2	3	1	18
60-64		2	1	7	3	1	5	19
65+			1	1		1	1	4
Total	0	8	20	20	9	6	9	72

Section IV - Membership Data

D. Statistics of Inactive Membership

	As of July 1, 2018	As of July 1, 2019
Terminated Vested Members		
Number	46	45
Total Annual Benefit	\$384,507	\$400,747
Average Annual Benefit	8,359	8,905
Average Age	50.6	50.4
Nonvested Members Due Refunds		
Number	5	5
Service Retirees		
Number	199	214
Total Annual Benefit	\$3,655,986	\$4,167,979
Average Annual Benefit	18,372	19,477
Average Age	73.0	72.9
Disabled Retirees		
Number	3	3
Total Annual Benefit	\$28,856	\$29,660
Average Annual Benefit	9,619	9,887
Average Age	66.3	67.3
Beneficiaries		
Number	17	18
Total Annual Benefit	\$246,426	\$254,086
Average Annual Benefit	14,496	14,116
Average Age	85.0	79.6

Section IV - Membership Data
E. Distribution of Inactive Members as of July 1, 2019

	Age	Number	Annual Benefits
Terminated Vested Members	< 50	19	\$130,357
	50 - 59	14	136,540
	60 - 69	12	133,850
	70 - 79	0	0
	80 - 89	0	0
	90 +	<u>0</u>	<u>0</u>
	Total	45	400,747
Service Retirees	< 50	0	\$0
	50 - 59	5	126,553
	60 - 69	79	1,581,741
	70 - 79	90	1,895,143
	80 - 89	33	493,050
	90 +	<u>7</u>	<u>71,492</u>
	Total	214	4,167,979
Disabled Retirees	< 50	0	\$0
	50 - 59	1	8,293
	60 - 69	1	6,020
	70 - 79	0	0
	80 - 89	1	15,346
	90 +	<u>0</u>	<u>0</u>
	Total	3	29,660
Beneficiaries	< 50	0	\$0
	50 - 59	3	39,780
	60 - 69	1	6,108
	70 - 79	5	104,254
	80 - 89	4	31,728
	90 +	<u>5</u>	<u>72,216</u>
	Total	18	254,086

Section V - Analysis of Risk

A. Introduction

The results of this actuarial valuation are based on one set of reasonable assumptions. However, it is almost certain that future experience will not exactly match these assumptions. As an example, the plan's investments may perform better or worse than assumed in any single year and over any longer time horizon. It is therefore important to consider the potential impacts of these likely differences when making decisions that may affect the future financial health of the plan, or of the plan's members.

In addition, as plans mature they accumulate larger pools of assets and liabilities. The increase in size in turn increases the potential magnitude of adverse experience. As an example, the dollar impact of a 10% investment loss on a plan with \$1 billion in assets and liabilities is much greater than the dollar impact for a plan with \$1 million in assets and liabilities. Since pension plans make long-term promises and rely on long-term funding, it is important to consider how mature the plan is today, and how mature it may become in the future.

Actuarial Standard of Practice No. 51 (ASOP 51) directs actuaries to provide pension plan sponsors with information concerning the risks associated with the plan:

- Identify risks that may be significant to the plan.
- Assess the risks identified as significant to the plan. The assessment does not need to include numerical calculations.
- Disclose plan maturity measures and historical information that are significant to understanding the plan's risks.

This section of the report uses the framework of ASOP 51 to communicate important information about significant risks to the plan, the plan's maturity, and relevant historical plan data.

Please see Section III C for more information on the basis for the projected results shown on the following pages.

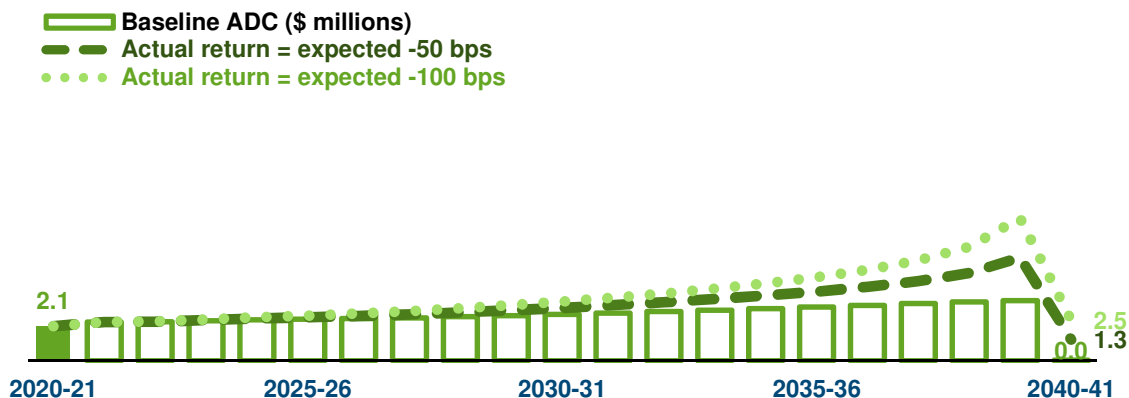
Section V - Analysis of Risk

B. Risk Identification and Assessment

Investment Risk

Definition: This is the potential that investment returns will be different than expected.

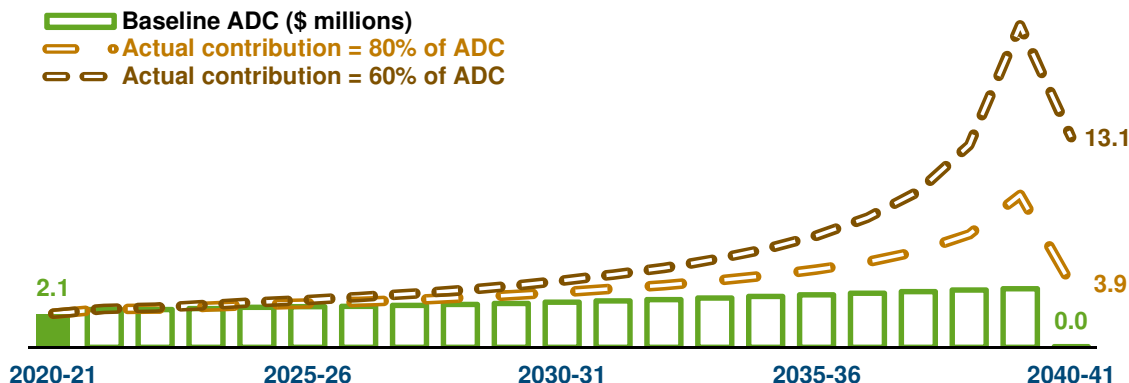
Identification: To the extent that actual investment returns differ from the assumed investment return, the plan's future assets, Actuarially Determined Contributions, and funded status may differ significantly from those presented in this valuation. The consequences of persistent underperformance on future Actuarially Determined Contribution levels are illustrated below:



Contribution Risk

Definition: This is the potential that actual future contributions will be less than the Actuarially Determined Contribution.

Identification: Over the past 8 years, actual contributions have been 100.0% of the Actuarially Determined Contribution in total. The consequences of persistent underfunding on future Actuarially Determined Contribution levels are illustrated below:



Section V - Analysis of Risk

B. Risk Identification and Assessment

Liquidity Risk

Definition: This is the potential that assets must be liquidated at a loss earlier than planned in order to pay for the plan's benefits and operating costs. This risk is heightened for plans with negative cash flows, in which contributions are not sufficient to cover benefit payments plus expenses.

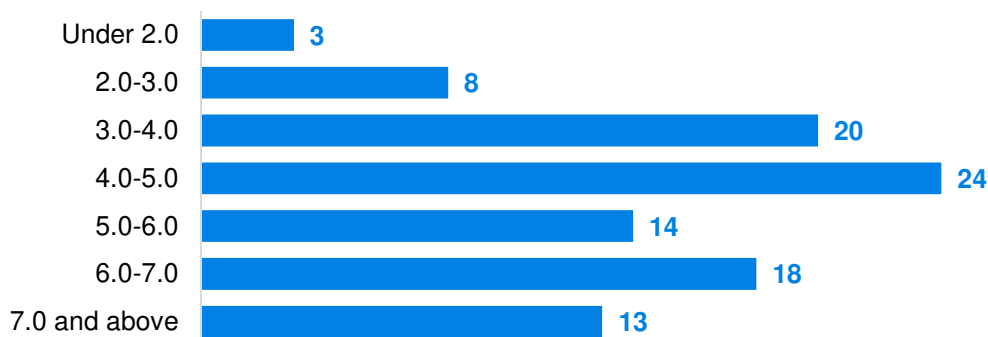
Identification: In 2018-19, the plan had negative cash flow, with town and member contributions to the plan of \$1,883,647 compared to \$4,207,390 of benefit payments and administrative expenses paid out of the plan. We suggest that you consult with your investment advisors with respect to the liquidity characteristics of the plan's investment holdings.

Maturity Risk

Definition: This is the potential for total plan liabilities to become more heavily weighted toward inactive liabilities over time, and for plan assets and/or liabilities to become larger relative to the active member liability.

Identification: The plan is subject to maturity risk because as plan assets and liabilities continue to grow, the dollar impact of any gains or losses on the assets or liabilities also becomes larger.

Assessment: As of July 1, 2019, the plan's Asset Volatility Ratio (the ratio of the market value of plan assets to payroll) is 6.1. According to Milliman's 2018 Public Pension Funding Study, the 100 largest US public pension plans have the following range of Asset Volatility Ratios:



Inflation Risk

Definition: This is the potential for a pension to lose purchasing power over time due to inflation.

Identification: The members of pension plans without fully inflation-indexed benefits are subject to the risk that their purchasing power will be reduced over time due to inflation.

Assessment: This plan provides for automatic postretirement benefit increases, based on changes in CPI; members therefore do not bear inflation risk.

Section V - Analysis of Risk

B. Risk Identification and Assessment

Insolvency Risk

Definition: This is the potential that a plan will become insolvent; that is, assets will be fully depleted.

Identification: If a plan becomes insolvent, contractually required benefits must be paid from the plan sponsor's other remaining assets.

Assessment: Under the GASB 68 depletion date methodology, the plan is not projected to become insolvent. Please see the GASB 68 report for more details on the underlying analysis.

Demographic Risks

Definition: This is the potential that mortality, turnover, retirement, or other demographic experience will be different than expected.

Identification: The pension liabilities reported herein have been calculated by assuming that members will follow patterns of demographic experience as described in Appendix B. If actual demographic experience or future demographic assumptions are different from what is assumed to occur in this valuation, future pension liabilities, Actuarially Determined Contributions, and funded status may differ significantly from those presented in this valuation. Formal Experience Studies performed on a regular basis are helpful in ensuring that the demographic assumptions reflect emerging plan experience.

Retirement Risk

Definition: This is the potential for members to retire and receive subsidized benefits that are more valuable than expected.

Identification: This plan has valuable early retirement benefits. If members retire at earlier ages than are anticipated by the actuarial assumptions, this will put upward pressure on subsequent Actuarially Determined Contributions.

Pensionable Earnings Risk

Definition: This is the potential for active members to add items to their pensionable earnings and receive pension benefits that are higher than expected.

Identification: Pensionable earnings for this plan includes overtime, longevity and payment for up to 30 vacation days.

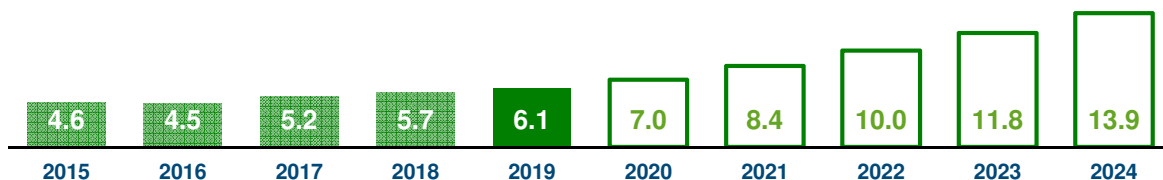
Assessment: If members earn unusual amounts of overtime in years just prior to retirement, this will put upward pressure on subsequent Actuarially Determined Contributions.

Section V - Analysis of Risk

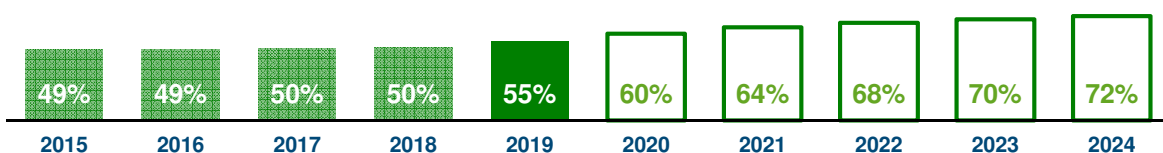
C. Maturity Measures

The metrics presented below are different ways of understanding the plan's maturity level, both in the past and as it is expected to change in the coming years.

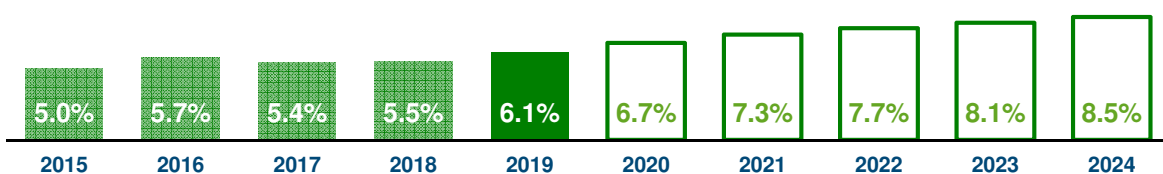
Asset Volatility Ratio: Market Value of Assets compared to Payroll



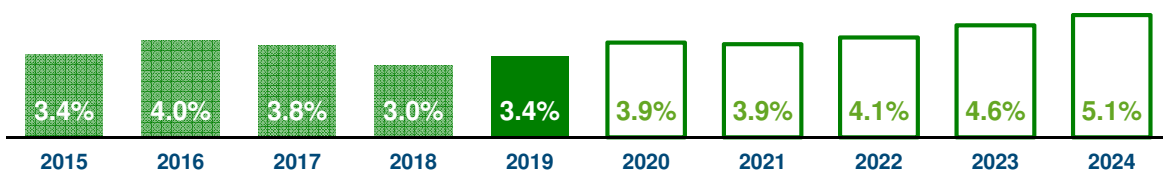
Accrued Liability for members in pay status compared to total Accrued Liability



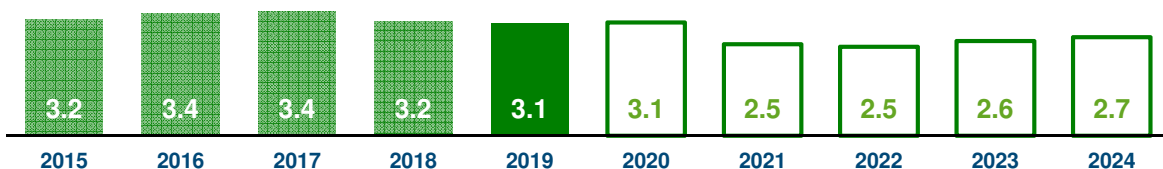
Benefit Payments compared to Market Value of Assets



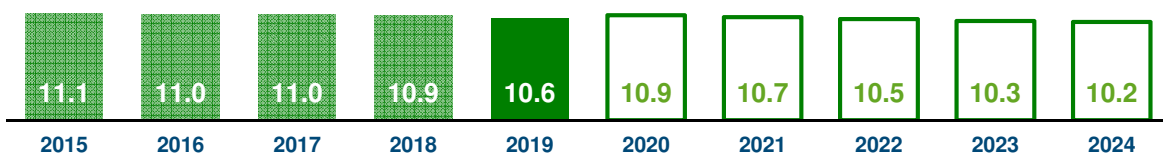
Net Cash Flows compared to Market Value of Assets



Benefit Payments compared to Town Contributions



Duration of Accrued Liability (based on GASB 68 sensitivity disclosures)



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 percent over 30 years beginning July 1, 2009; the amortization period will decrease each year until it reaches 10 years, after which point it will remain at 10 years.

The Actuarial Value of Assets is determined by recognizing market gains and losses non-asymptotically over a five year period.

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.

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	7.00%
Salary Scale	3.50%
Amortization Growth Rate	3.50%
Cost of Living Adjustment	2.25%
Expenses	Prior year's expenses plus 3%, rounded to the nearest \$100.
Mortality	<p>PubG-2010 Mortality Table with generational projection per the MP 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 Disabled Life and Combined Healthy Mortality Tables with generational projection of future mortality improvements per Scale AA.)</p> <p>The change in mortality assumption is 75% phased-in for the 2019 valuation and will be 100% phased-in for the 2020 valuation.</p>

Turnover According to the Crocker-Sarason T9 Table:

Age	Rate
20	17.95%
30	15.85%
40	11.27%
50	5.10%

Retirement 15% at age 55 with 10 years of service.

40% at the earlier of age 55 with 30 years of service or age 65.

At all other ages:

Age	Rate
56-59	10%
60-61	20%
62-69	30%
70	100%

Appendix B - Actuarial Assumptions

Disability

50% of 1985 Pension Class 1 table:

Age	Male	Female
25	0.02%	0.02%
35	0.03%	0.07%
45	0.10%	0.16%
55	0.36%	0.48%
65	0.88%	0.68%

100% of all disabilities are assumed to be non-service connected.

Form of Annuity

3 Year Certain and Life as an approximation to Modified Cash Refund.

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	All employees of the Town who were covered under the Connecticut Municipal Employees' Retirement Fund A on June 30, 1971 are included in the Plan. New employees shall be included on date of hire. The plan is closed to all new employees on or after July 1, 2014.
Employee Contributions	Board of Education Employees: 4.00% of earnings. Dispatchers and Non-Affiliated: 5% of earnings. Teamsters: 4.75%. All other employees: 4.50% of earnings. Employee Contributions will be credited at the rate of 4% per year through December 31, 1978 and 6% per year thereafter. A refund of Employee Contributions with interest to the date of termination of employment or death is paid, unless the employee is eligible for a deferred retirement benefit.
Credited Service	Years and months of continuous service. Food Service employees will not receive service prior to February 19, 1986 and members of the Windsor Paraprofessional Employees Association will not receive service for years prior to September 1, 1990.
Final Average Earnings	Highest average earnings including overtime, longevity pay and any other form of additional compensation received in any 36 consecutive months out of the last 120 months of employment months prior to the earlier of age 65 or termination of employment.
Normal Retirement Date	The earlier of age 65, age 55 with 30 years of Credited Service, or any age with 35 years of Credited Service for employees who were participants on or before December 31, 1979.
Normal Retirement Benefit	1.75% of Final Average Earnings multiplied by Credited Service. For employees who were members as of October 9, 1998, retirement benefits will not be less than the amount determined under the pre-October 9, 1998 formula.
Early Retirement Date	Age 55 and 10 years of Credited Service.
Early Retirement Benefit	Benefit is based on Credited Service and Final Average Earnings to actual retirement date reduced by 6.7% for the first 5 years and 3.3% for each of the next 5 years by which Early Retirement Date precedes Normal Retirement Date.

Appendix C - Summary of Plan Provisions

Deferred Retirement Date	Members may continue to work beyond Normal Retirement.
Deferred Retirement Benefit	Benefit based on Credited Service and Final Average Earnings to Deferred Retirement Date.
Preretirement Death Benefit	Accumulated Employee Contributions in lieu of all benefits.
Disability Retirement Service Connected	Greater of Normal Retirement Benefit calculated using Credited Service and Final Average Earnings through date of disability, or 50% of Monthly Earnings averaged over the 12 months preceding disability.
Disability Retirement Non-Service Connected	If the Member has 10 years of Service, Normal Retirement Benefit calculated using Credited Service and Final Average Earnings through date of disability.
Disability Minimum Benefit	\$300 per month.
Disability Maximum Benefit	75% of Final Average Earnings including non-plan disability earnings from Employer sources.
Vesting	A member is 100% vested after 5 years of Credited Service.
Termination Benefit	Normal Retirement Benefit calculated using Credited Service and Final Average Earnings through date of termination. All benefits are forfeited upon withdrawal of Employee Contributions.
Normal Form of Benefit	Modified Cash Refund.
Cost of Living Adjustment	Benefits will increase annually based on increases in the Cost of Living Adjustment that applies to primary insurance amounts under the federal Social Security Act.

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.