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# **COVENTRY MUNICIPAL EMPLOYEES' RETIREMENT PLAN**

**Actuarial Valuation as of July 1, 2020  
To Determine Funding for Fiscal Year 2021-22**

**Prepared by**

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## Certification

We have performed an actuarial valuation of the Plan as of July 1, 2020 to determine funding for fiscal year 2021-22. 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.

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

In preparing this report, we relied on employee census data and financial information as of the valuation date, furnished by the 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 valuation results were developed using models employing standard actuarial techniques. In addition to the models described previously, Milliman has developed certain models to develop the expected long term rate of return on assets used in this analysis. We have reviewed the models, including their inputs, calculations, and outputs for consistency, reasonableness, and appropriateness to the intended purpose and in compliance with generally accepted actuarial practice and relevant actuarial standards of practice. The models, including all input, calculations, and output, may not be appropriate for any other purpose.

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.

I am a member of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.



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Jennifer M. Castelhana, FSA  
Consulting Actuary

## Section I - Executive Summary Changes Since the Prior Valuation

### Plan Changes

None.

### Changes in Actuarial Methods and Assumptions

None.

### Other Significant Changes

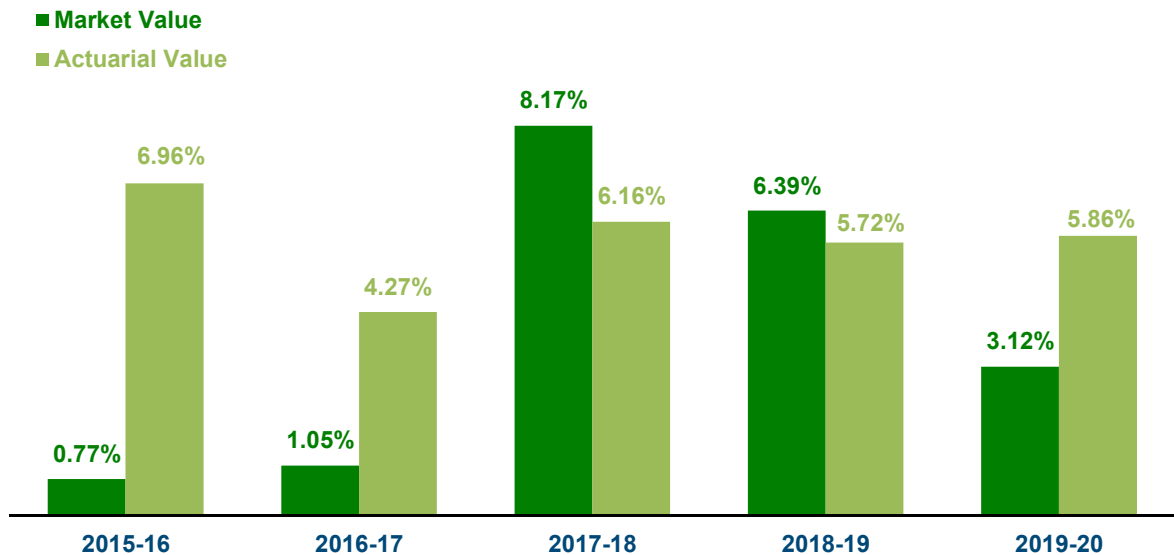
None.

## 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.

	<b>Market</b>	<b>Actuarial</b>
Value as of July 1, 2019	\$11,437,787	\$11,433,016
Town and Member Contributions	1,364,734	1,364,734
Investment Income	359,658	675,184
Benefit Payments and Administrative Expenses	(1,168,899)	(1,168,899)
Value as of July 1, 2020	11,993,280	12,304,035

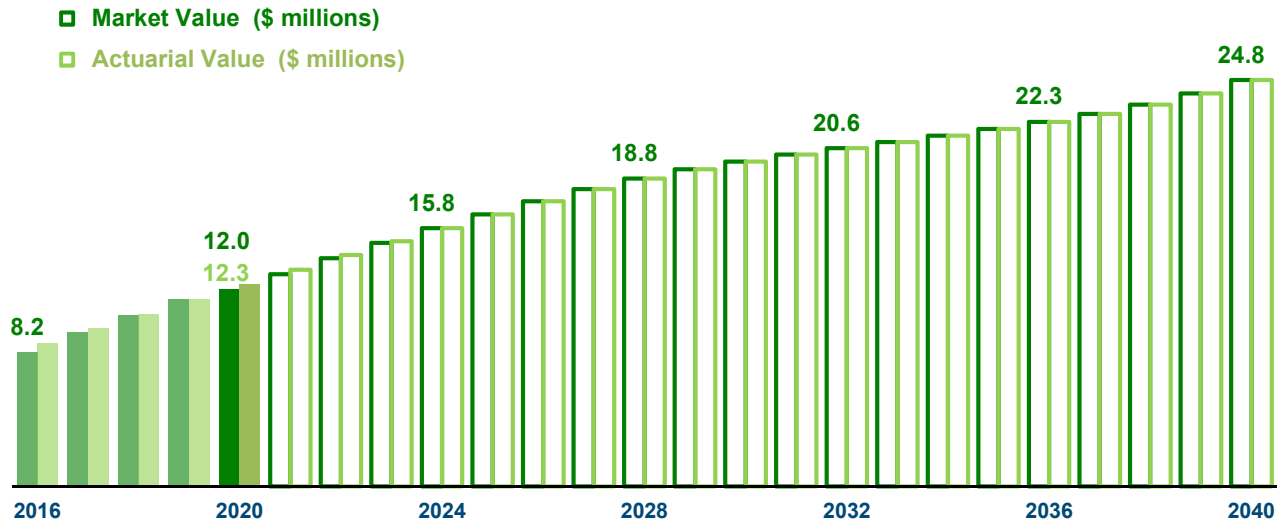
For fiscal year 2019-20, the plan's assets earned 3.12% on a Market Value basis and 5.86% on an Actuarial Value basis. The actuarial assumption for this period was 7.00%; the result is an asset loss of about \$0.4 million on a Market Value basis and a loss of about \$0.1 million on an Actuarial Value basis. Historical rates of return are shown in the graph below.



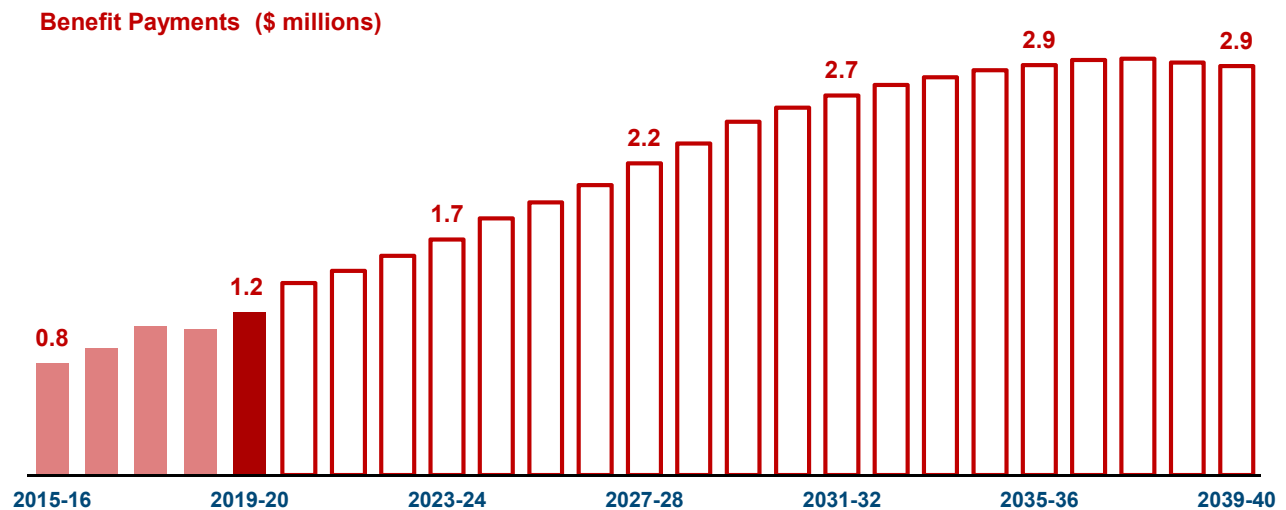
Please note that the Actuarial Value currently exceeds the Market Value by \$0.3 million. This figure represents investment losses that will be gradually recognized in future years. This process will exert upward pressure on the Town's contribution, unless there are offsetting market gains.

## 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.

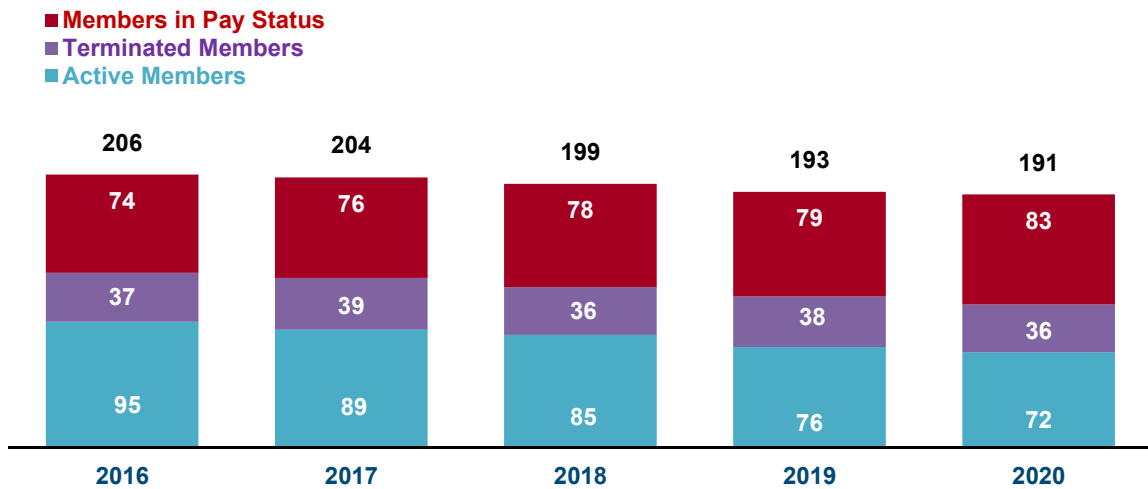


In 2019-20, the plan paid out \$1.2 million in benefits to members. Over the next 20 years, the plan is projected to pay out a total of \$48 million in benefits to members.



## Section I - Executive Summary Membership

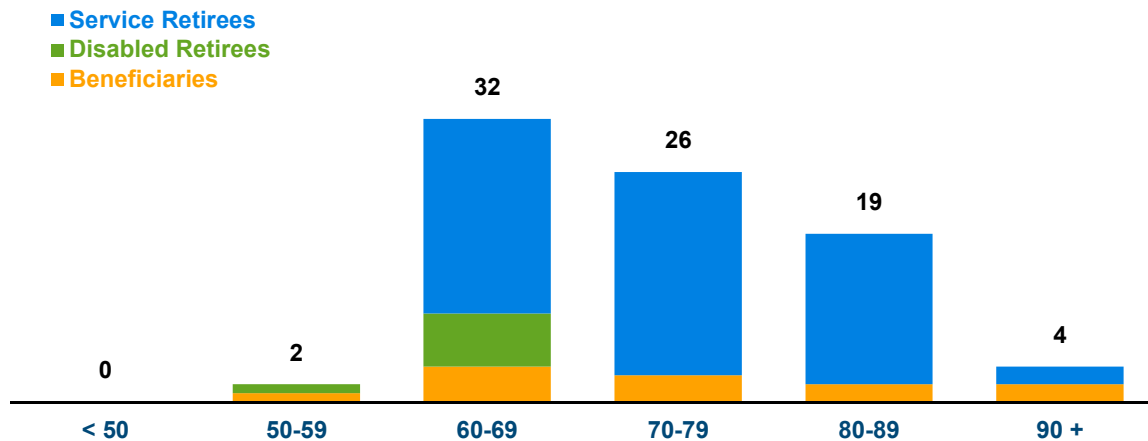
There are three basic categories of plan members included in the valuation: (1) members who are receiving monthly pension benefits, (2) former employees who have a vested right to benefits but have not yet started collecting, and (3) active employees who have met the eligibility requirements for membership.



### Members in Pay Status on July 1, 2020

Service Retirees	64	Average Age	73.1
Disabled Retirees	7	Total Annual Benefit	\$1,280,208
Beneficiaries	<u>12</u>	Average Annual Benefit	15,424
Total	83		

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





## Section I - Executive Summary Membership (continued)

### Terminated Vested Members on July 1, 2020

Count	31
Average Age	55.7
Total Annual Benefit	\$226,678
Average Annual Benefit	7,312

### Nonvested Members Due Refunds on July 1, 2020

Count	5
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### Active Members on July 1, 2020

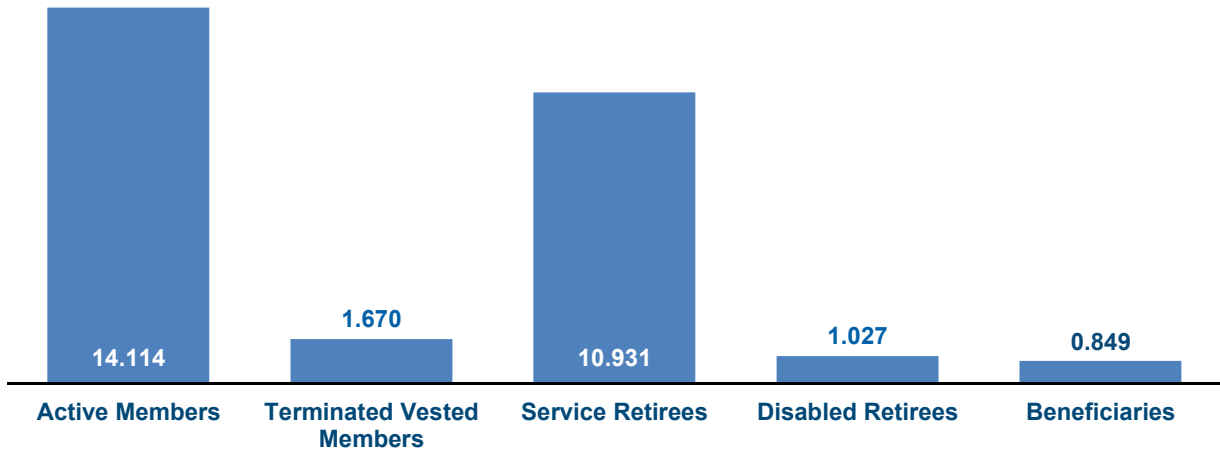
Count	72
Average Age	53.8
Average Service	19.4
Payroll	\$4,338,428
Average Payroll	60,256

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

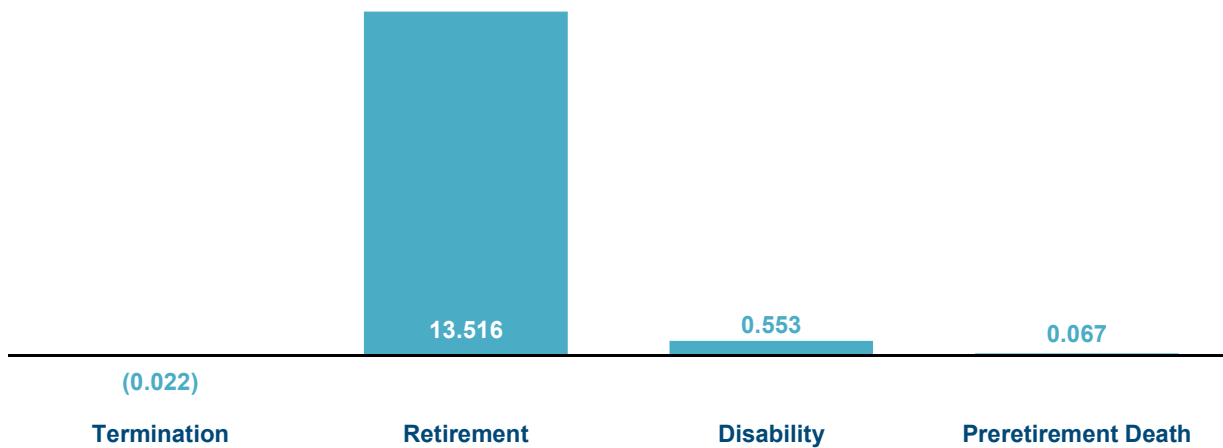
Age	Years of Service							Total
	0-4	5-9	10-14	15-19	20-24	25-29	30+	
< 25								0
25-29								0
30-34		1		1				2
35-39			2	1				3
40-44		1	3		1			5
45-49			4	3	1			8
50-54		2	3	3	3	2	2	15
55-59		1	3	5	6	2	3	20
60-64		1	2	3	2	4	3	15
65+			1	2	1			4
<b>Total</b>	0	6	18	18	14	8	8	72

## Section I - Executive Summary Accrued Liability

The Accrued Liability as of July 1, 2020 equals \$28,590,478, which consists of the following pieces (in \$ millions):



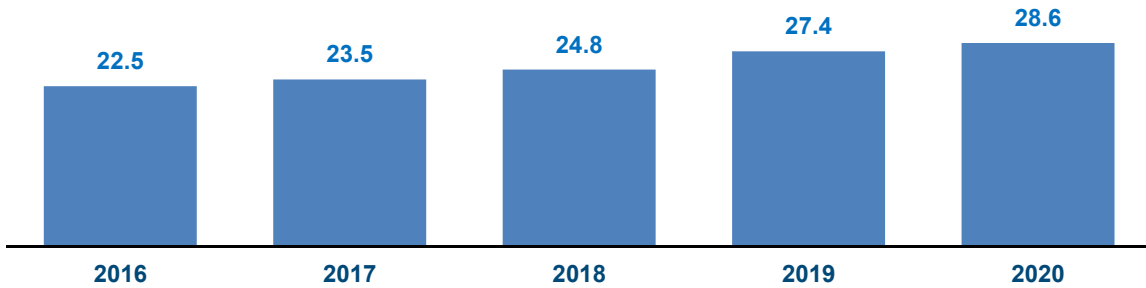
The Accrued Liability for active members can be broken down further by the different types of benefits provided by the plan:



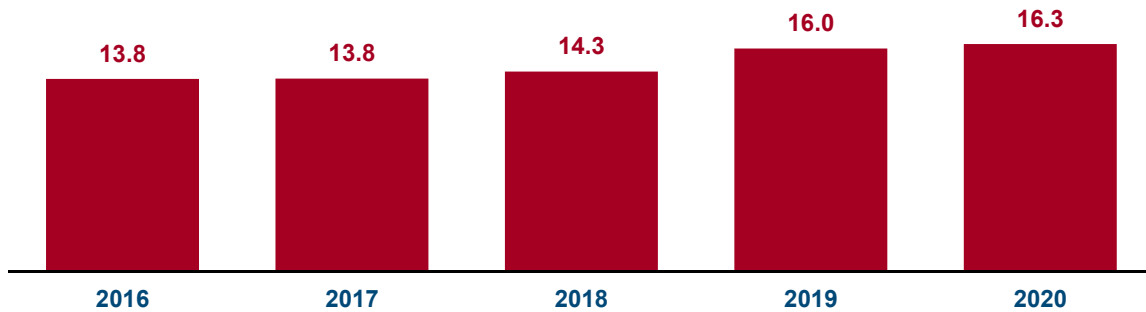
## Section I - Executive Summary Funded Status

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.

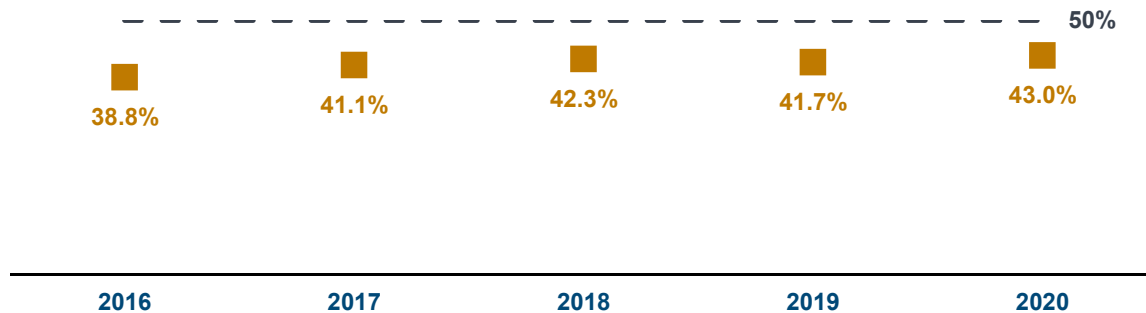
Accrued Liability (\$ millions)



Unfunded Accrued Liability (\$ millions)



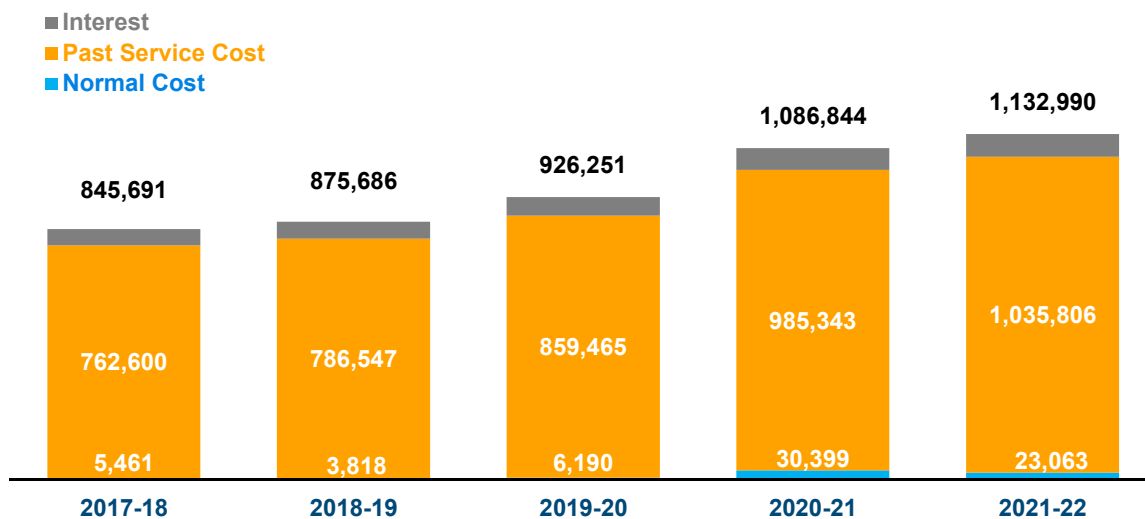
Funded Ratio



## Section I - Executive Summary Actuarially Determined Contribution

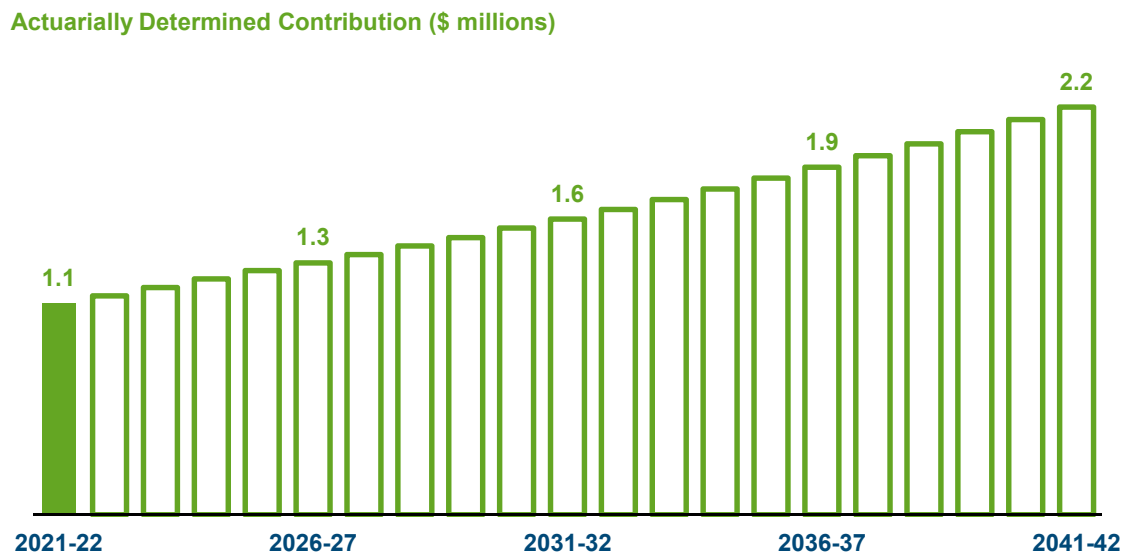
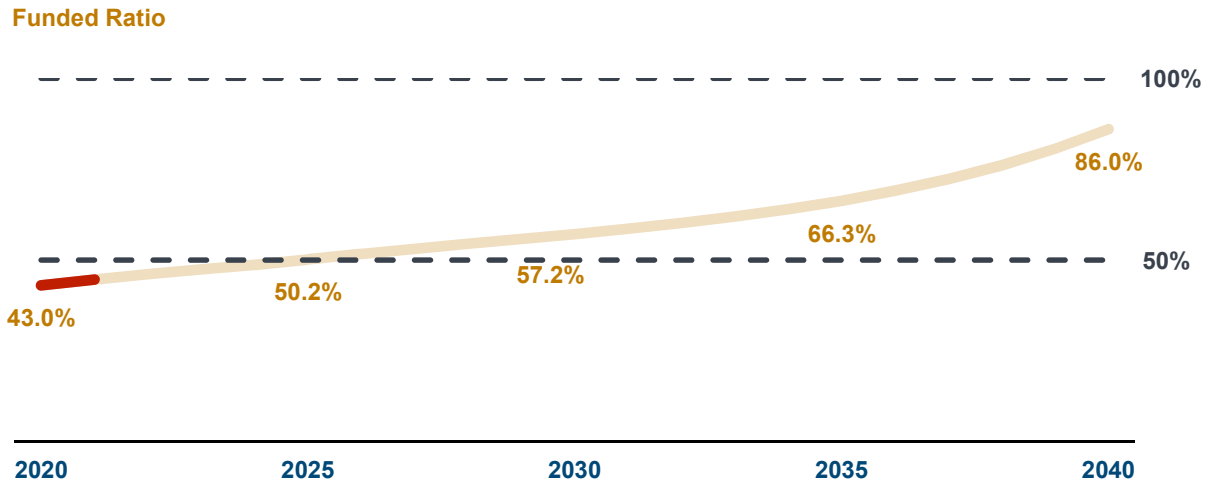
The Actuarially Determined Contribution consists of three pieces: a Normal Cost payment to fund the benefits earned each year, a Past Service Cost to gradually reduce any unfunded or surplus liability, and Interest to reflect the timing of the contribution relative to the valuation date.

The Actuarially Determined Contribution for fiscal year 2021-22 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

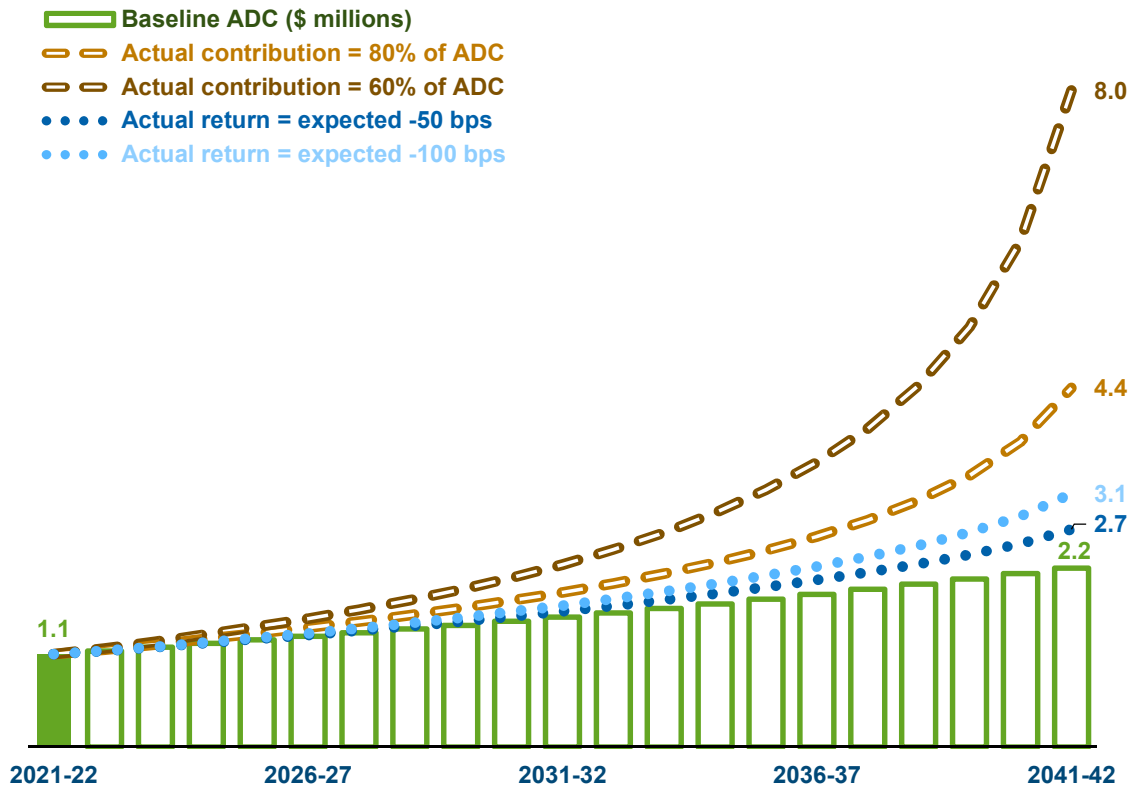
If the Town pays the Actuarially Determined Contribution each year, the investments earn exactly the assumed interest rate each year, and there are no changes in the plan provisions or in the actuarial methods and assumptions, then we project the following changes in the plan's funded status and the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

<b>Membership as of</b>	<b>July 1, 2019</b>	<b>July 1, 2020</b>
Active Members	76	72
Terminated Members	38	36
Members in Pay Status	<u>79</u>	<u>83</u>
Total Count	193	191
 Payroll	 \$4,538,037	 \$4,338,428
 <b>Assets and Liabilities as of</b>	 <b>July 1, 2019</b>	 <b>July 1, 2020</b>
Market Value of Assets	\$11,437,787	\$11,993,280
Actuarial Value of Assets	11,433,016	12,304,035
 Accrued Liability for Active Members	 14,315,267	 14,114,401
Accrued Liability for Terminated Members	1,768,009	1,669,509
Accrued Liability for Members in Pay Status	<u>11,306,806</u>	<u>12,806,568</u>
Total Accrued Liability	27,390,082	28,590,478
 Unfunded Accrued Liability	 15,957,066	 16,286,443
 Funded Ratio	 41.7%	 43.0%
 <b>Actuarially Determined Contribution for Fiscal Year</b>	 <b>2020-21</b>	 <b>2021-22</b>
Normal Cost	\$30,399	\$23,063
Past Service Cost	985,343	1,035,806
Interest	<u>71,102</u>	<u>74,121</u>
Actuarially Determined Contribution	1,086,844	1,132,990

## Section II - Plan Assets

### A. Summary of Fund Transactions

**Market Value as of July 1, 2019** \$11,437,787

Town Contributions	928,292
Member Contributions	436,442
Net Investment Income	359,658
Benefit Payments	(1,167,320)
Administrative Expenses	(1,579)

**Market Value as of June 30, 2020** 11,993,280

Expected Return on Market Value of Assets	806,925
Market Value Gain/(Loss)	447,267
Approximate Rate of Return *	3.12%

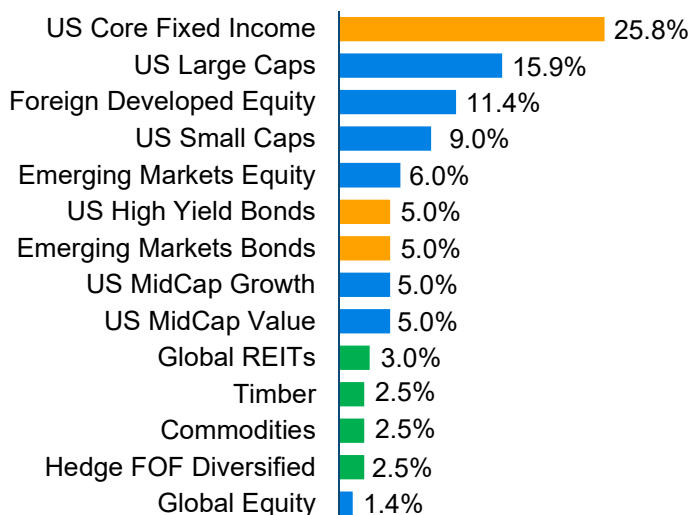
\* The rate shown here is not the dollar or time weighted investment yield rate which measures investment performance. It is an approximate net return assuming all activity occurred on average midway through the fiscal year.

#### Target Asset Allocation as of June 30, 2020

■ Equity

■ Fixed Income

■ Other





## 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, 2020 is determined below.

1.	Expected Market Value of Assets:		
	a. Market Value of Assets as of July 1, 2019		\$11,437,787
	b. Town and Member Contributions		1,364,734
	c. Benefit Payments and Administrative Expenses		(1,168,899)
	d. Expected Earnings Based on 7.00% Interest		<u>806,925</u>
	e. Expected Market Value of Assets as of July 1, 2020		12,440,547
2.	Actual Market Value of Assets as of July 1, 2020		11,993,280
3.	Market Value (Gain)/Loss: (1e) - (2)		447,267
4.	Delayed Recognition of Market (Gains)/Losses		
		<b>Percent Not</b>	<b>Amount Not</b>
	<b>Plan Year End</b>	<b>(Gain)/Loss</b>	<b>Recognized</b>
	06/30/2020	\$447,267	80%
	06/30/2019	64,647	60%
	06/30/2018	(111,622)	40%
	06/30/2017	(205,989)	20%
			<u>(41,198)</u>
			310,755
5.	Actuarial Value of Assets as of July 1, 2020: (2) + (4)		12,304,035
6.	Return on Actuarial Value of Assets: (5) - [(1a) + (1b) + (1c)]		675,184
7.	Approximate Rate of Return on Actuarial Value of Assets		5.86%
8.	Actuarial Value (Gain)/Loss		131,350

## 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 starting on July 1, 2012.

	July 1, 2019	July 1, 2020
1. Accrued Liability		
Active Members	\$14,315,267	\$14,114,401
Terminated Members	1,768,009	1,669,509
Service Retirees	9,401,607	10,930,875
Disabled Retirees	1,014,015	1,026,946
Beneficiaries	<u>891,184</u>	<u>848,747</u>
Total Accrued Liability	27,390,082	28,590,478
2. Actuarial Value of Assets (see Section IIB)	11,433,016	12,304,035
3. Unfunded Accrued Liability: (1) - (2)	15,957,066	16,286,443
4. Funded Ratio: (2) / (1)	41.7%	43.0%
5. Amortization Period	23	22
6. Amortization Growth Rate	3.40%	3.40%
7. Past Service Cost: (3) amortized over (5)	985,343	1,035,806

**Section III - Development of Contribution**  
**B. Actuarially Determined Contribution**

	2020-21	2021-22
1. Total Normal Cost	\$461,681	\$433,309
2. Expected Member Contributions	432,882	411,846
3. Expected Administrative Expenses	1,600	1,600
4. Net Normal Cost: (1) - (2) + (3)	30,399	23,063
5. Past Service Cost (see Section IIIA)	985,343	1,035,806
6. Interest on (4) + (5) to the start of the fiscal year	71,102	74,121
7. Actuarially Determined Contribution: (4) + (5) + (6)	1,086,844	1,132,990
8. Covered Payroll	4,538,037	4,338,428
9. Contribution as a Percent of Covered Payroll: (7) / (8)	23.95%	26.12%

## Section III - Development of Contribution C. Long Range Forecast

This forecast is based on the results of the July 1, 2020 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 1 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
7/1/2020	\$28,590,478	\$12,304,035	\$16,286,443	43.0%	2021-22	\$1,132,990	\$392,315	(\$1,465,980)	\$59,325
7/1/2021	29,622,000	13,227,000	16,395,000	44.7%	2022-23	1,172,000	371,000	(1,575,000)	(32,000)
7/1/2022	30,611,000	14,114,000	16,497,000	46.1%	2023-24	1,216,000	346,000	(1,691,000)	(129,000)
7/1/2023	31,531,000	14,951,000	16,580,000	47.4%	2024-25	1,263,000	321,000	(1,844,000)	(260,000)
7/1/2024	32,365,000	15,767,000	16,598,000	48.7%	2025-26	1,308,000	298,000	(1,958,000)	(352,000)
7/1/2025	33,066,000	16,601,000	16,465,000	50.2%	2026-27	1,349,000	274,000	(2,081,000)	(458,000)
7/1/2026	33,670,000	17,397,000	16,273,000	51.7%	2027-28	1,394,000	248,000	(2,237,000)	(595,000)
7/1/2027	34,162,000	18,139,000	16,023,000	53.1%	2028-29	1,439,000	222,000	(2,382,000)	(721,000)
7/1/2028	34,498,000	18,790,000	15,708,000	54.5%	2029-30	1,485,000	197,000	(2,536,000)	(854,000)
7/1/2029	34,676,000	19,358,000	15,318,000	55.8%	2030-31	1,535,000	174,000	(2,638,000)	(929,000)
7/1/2030	34,680,000	19,827,000	14,853,000	57.2%	2031-32	1,584,000	155,000	(2,725,000)	(986,000)
7/1/2031	34,550,000	20,251,000	14,299,000	58.6%	2032-33	1,634,000	137,000	(2,801,000)	(1,030,000)
7/1/2032	34,296,000	20,644,000	13,652,000	60.2%	2033-34	1,689,000	121,000	(2,857,000)	(1,047,000)
7/1/2033	33,927,000	21,022,000	12,905,000	62.0%	2034-35	1,745,000	107,000	(2,907,000)	(1,055,000)
7/1/2034	33,456,000	21,407,000	12,049,000	64.0%	2035-36	1,803,000	94,000	(2,944,000)	(1,047,000)
7/1/2035	32,884,000	21,811,000	11,073,000	66.3%	2036-37	1,862,000	83,000	(2,981,000)	(1,036,000)
7/1/2036	32,218,000	22,251,000	9,967,000	69.1%	2037-38	1,924,000	72,000	(2,990,000)	(994,000)
7/1/2037	31,455,000	22,733,000	8,722,000	72.3%	2038-39	1,987,000	65,000	(2,963,000)	(911,000)
7/1/2038	30,618,000	23,294,000	7,324,000	76.1%	2039-40	2,051,000	59,000	(2,937,000)	(827,000)
7/1/2039	29,742,000	23,978,000	5,764,000	80.6%	2040-41	2,117,000	53,000	(2,911,000)	(741,000)

## 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, 2011	\$4,385,296	\$17,352,354	\$12,967,058	28.4%
July 1, 2012	4,767,626	18,879,262	14,111,636	25.3%
July 1, 2013	5,393,158	19,828,004	14,434,846	25.3%
July 1, 2014	6,725,129	20,895,296	14,170,167	27.2%
July 1, 2015	7,797,859	21,467,586	13,669,727	36.3%
July 1, 2016	8,717,349	22,493,278	13,775,929	38.8%
July 1, 2017	9,646,588	23,460,945	13,814,357	41.1%
July 1, 2018	10,509,774	24,819,498	14,309,724	42.3%
July 1, 2019	11,433,016	27,390,082	15,957,066	41.7%
July 1, 2020	12,304,035	28,590,478	16,286,443	43.0%

## 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
2012-13	\$1,068,188	\$773,054	\$5,289,322	14.6%
2013-14	991,124	1,080,077	5,469,059	19.7%
2014-15	841,584	829,250	5,382,148	15.4%
2015-16	852,707	864,293	5,412,437	16.0%
2016-17	821,825	835,741	5,239,342	16.0%
2017-18	845,691	845,691	4,850,270	17.4%
2018-19	875,686	875,686	4,699,410	18.6%
2019-20	926,251	928,292	4,706,045	19.7%
2020-21	1,086,844	TBD	4,538,037	TBD
2021-22	1,132,990	TBD	4,338,428	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
<b>Count July 1, 2019</b>	76	33	5	59	7	13	193
Terminated							
- no benefits due	-	-	-	-	-	-	0
- paid refund	-	-	-	-	-	-	0
- vested benefits due	-	-	-	-	-	-	0
Retired	(4)	(2)	-	6	-	-	0
Died							
- with beneficiary	-	-	-	-	-	-	0
- no beneficiary	-	-	-	(1)	-	(1)	(2)
Benefits expired	-	-	-	-	-	-	0
New member	-	-	-	-	-	-	0
Rehired	-	-	-	-	-	-	0
New Alternate Payee	-	-	-	-	-	-	0
Correction	-	-	-	-	-	-	0
<b>Count July 1, 2020</b>	72	31	5	64	7	12	191

**Section IV - Membership Data**  
**B. Statistics of Active Membership**

---

	<b>As of July 1, 2019</b>	<b>As of July 1, 2020</b>
<b>Number of Active Members</b>	76	72
<b>Average Age</b>	53.4	53.8
<b>Average Service</b>	18.8	19.4
<b>Total Payroll</b>	\$4,538,037	\$4,338,428
<b>Average Payroll</b>	59,711	60,256



## Section IV - Membership Data

### D. Statistics of Inactive Membership

	As of July 1, 2019	As of July 1, 2020
<b>Terminated Vested Members</b>		
Number	33	31
Total Annual Benefit	\$249,686	\$226,678
Average Annual Benefit	7,566	7,312
Average Age	55.0	55.7
<b>Nonvested Members Due Refunds</b>		
Number	5	5
<b>Service Retirees</b>		
Number	59	64
Total Annual Benefit	\$961,410	\$1,105,298
Average Annual Benefit	16,295	17,270
Average Age	74.2	74.2
<b>Disabled Retirees</b>		
Number	7	7
Total Annual Benefit	\$78,855	\$78,855
Average Annual Benefit	11,265	11,265
Average Age	60.7	61.7
<b>Beneficiaries</b>		
Number	13	12
Total Annual Benefit	\$101,702	\$96,055
Average Annual Benefit	7,823	8,005
Average Age	74.7	74.2

**Section IV - Membership Data**  
**E. Distribution of Inactive Members as of July 1, 2020**

	Age	Number	Annual Benefits
<b>Terminated Vested Members</b>	< 50	8	\$50,590
(counts include Terminated Nonvested Members Due Refunds)	50 - 59	19	147,813
	60 - 69	4	22,714
	70 - 79	5	5,561
	80 - 89	0	0
	90 +	<u>0</u>	<u>0</u>
	Total	36	226,678
<b>Service Retirees</b>	< 50	0	\$0
	50 - 59	0	0
	60 - 69	22	520,097
	70 - 79	23	379,311
	80 - 89	17	188,774
	90 +	<u>2</u>	<u>17,116</u>
	Total	64	1,105,298
<b>Disabled Retirees</b>	< 50	0	\$0
	50 - 59	1	13,785
	60 - 69	6	65,070
	70 - 79	0	0
	80 - 89	0	0
	90 +	<u>0</u>	<u>0</u>
	Total	7	78,855
<b>Beneficiaries</b>	< 50	0	\$0
	50 - 59	1	16,949
	60 - 69	4	16,312
	70 - 79	3	42,132
	80 - 89	2	11,283
	90 +	<u>2</u>	<u>9,379</u>
	Total	12	96,055

## 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.

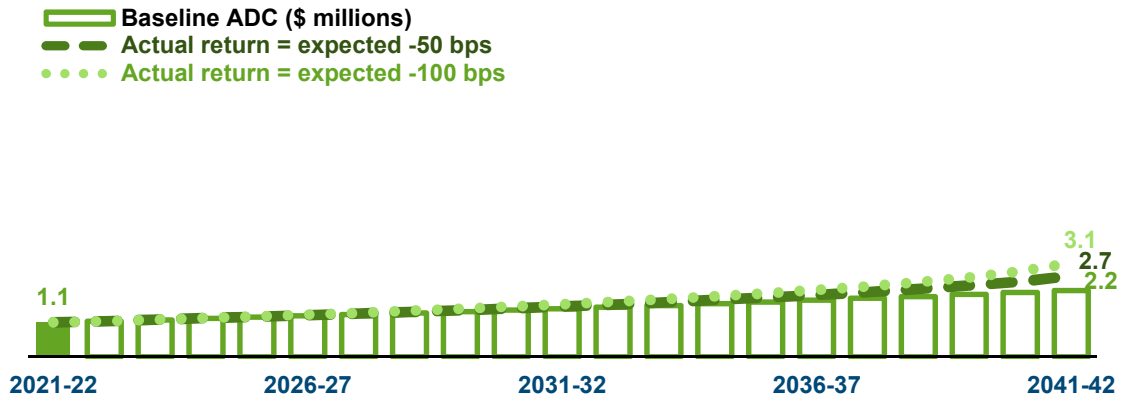
## Section V - Analysis of Risk

### B. Risk Identification and Assessment

#### Investment Risk

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

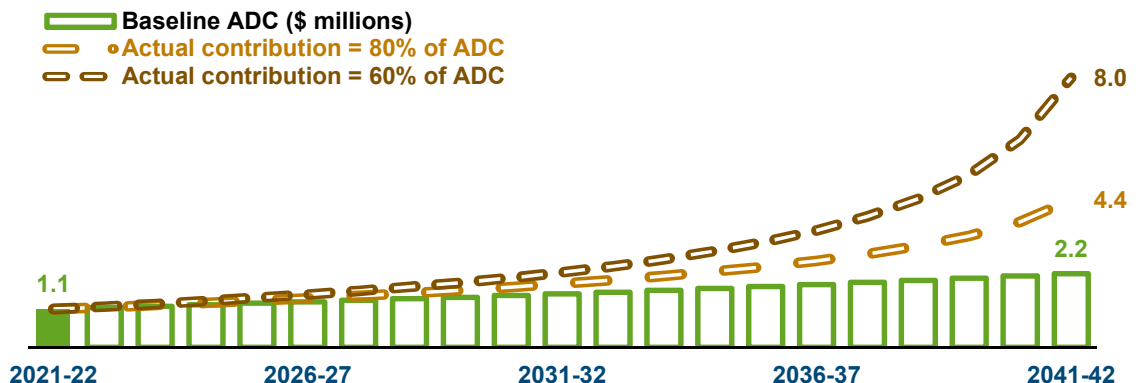
Identification: To the extent that actual investment returns differ from the assumed investment return, the plan's future assets, Actuarially Determined Contributions, and funded status may differ significantly from those presented in this valuation. The consequences of persistent underperformance on 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 97.4% 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.

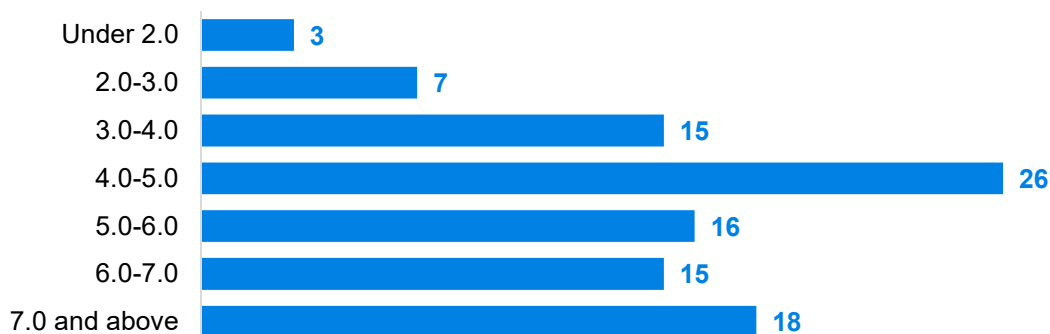
**Identification:** In 2019-20, the plan had positive cash flow, with town and member contributions to the plan of \$1,364,734 compared to \$1,168,899 of benefit payments and administrative expenses paid out of the plan. We suggest that you consult with your investment advisors with respect to the liquidity 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, 2020, the plan's Asset Volatility Ratio (the ratio of the market value of plan assets to payroll) is 2.8. According to Milliman's 2020 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 does not contain a mechanism to regularly increase benefits after retirement, so members bear all of the 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.

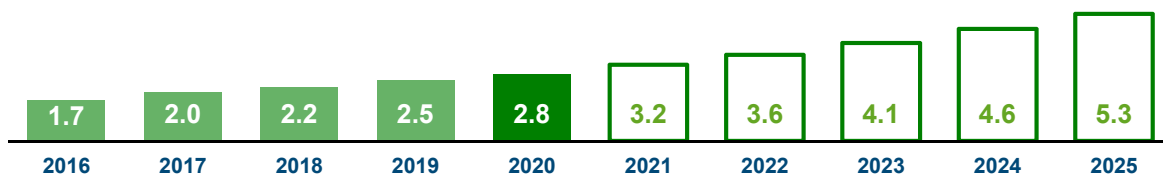
Identification: This plan has moderate early retirement benefits. If members retire at earlier ages than are anticipated by the actuarial assumptions, this will put upward pressure on subsequent Actuarially Determined Contributions.

## Section V - Analysis of Risk

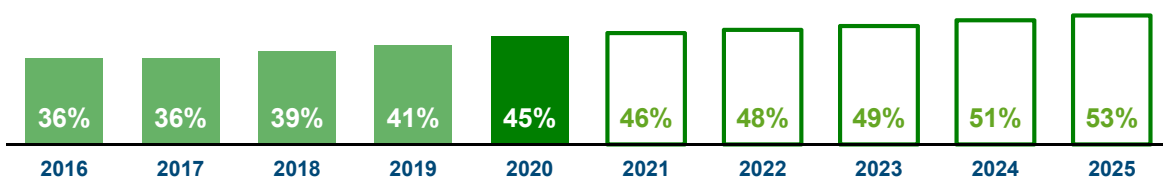
### C. Maturity Measures

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.

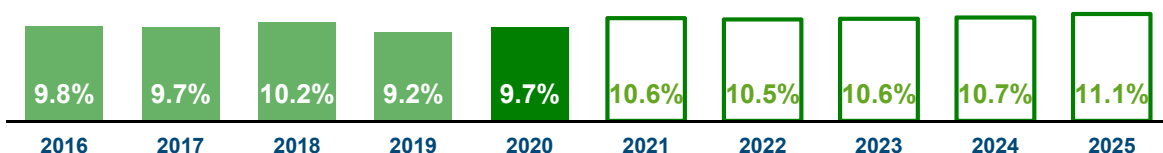
#### Asset Volatility Ratio: Market Value of Assets compared to Payroll



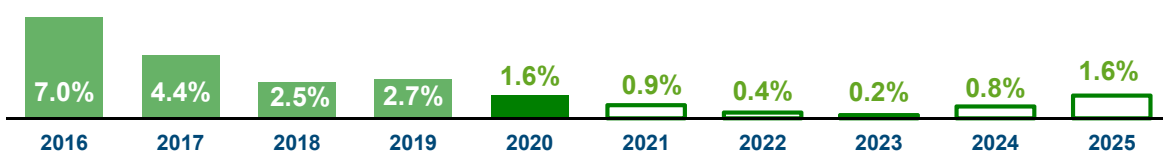
#### Accrued Liability for members in pay status compared to total Accrued Liability



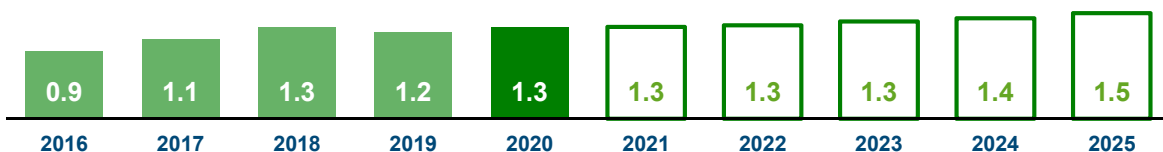
#### Benefit Payments compared to Market Value of Assets



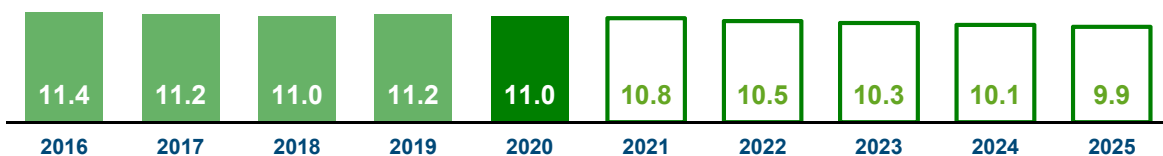
#### Net Cash Flows compared to Market Value of Assets



#### 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 starting on July 1, 2012.

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. For those unions whose new employees are eligible to participate in this plan, members who are projected to leave active employment are assumed to be replaced by new active members with the same age, service, gender, and pay characteristics as those hired in the past few years.



## Appendix B - Actuarial Assumptions

Each of the assumptions used in this valuation 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%

**Inflation** 2.75%

<b>Salary Scale</b>	<b>Service</b>	<b>Rate</b>
	1	6.65%
	2	6.65
	3	3.40
	4	3.40
	5	6.10
	6-9	3.40
	10	5.90
	11-14	3.40
	15	5.80
	16-19	3.40
	20	5.50
	21	3.40
	22	3.40
	23	3.40
	24	3.40
	25	5.20
	26 on	3.40

**Amortization Growth Rate** 3.40%

**Expenses** Prior year's actual administrative expenses increased by 3% and rounded to the nearest \$100.

**Mortality** PubG-2010 Mortality Table with generational projection per the MP-2014 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.

**Percent Married** 75% of active and terminated vested members are assumed to be married.

**Age of Spouse** Females are assumed to be three years younger than their male spouses.

## Appendix B - Actuarial Assumptions

**Turnover**

2003 SOA Small Plan Age Table multiplied by 0.45:

Age	Rate
20	10.94%
25	8.78
30	6.98
35	5.45
40	4.23
45	3.29
50	2.52
55	1.89

**Rate of Retirement**

Active members are assumed to retire as follows.

Age	Rate
55 – 58	3%
59	5
60 – 61	10
62	30
63	15
64	20
65	35
66 – 68	30
69	50
70	100

**Pre-Retirement Disability**

1987 Commissioner’s Group Disability Table, six month elimination period, separately for males and females:

Age	Male	Female
22	0.080%	0.1000%
27	0.089	0.1157
32	0.105	0.1554
37	0.137	0.2315
42	0.202	0.3050
47	0.356	0.4628
52	0.662	0.7282
57	1.187	1.0683
62	1.671	1.2532

## 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.

<b>Eligibility</b>	<p>Municipal employees working in nonuniform classifications.</p> <p>Eligible members participate on the first day of the month following date of hire.</p> <p>All employees hired after November 21, 2013 shall participate in a defined contribution plan, and will not participate in the defined benefit plan.</p>
<b>Employee Contributions</b>	<p>All active participants contribute 10% of compensation (effective July 1, 2015).</p> <p>Interest is credited at 5% per annum.</p>
<b>Final Average Compensation</b>	<p>The average of total pay received for the five consecutive years out of the ten latest years which gives the highest average.</p>
<b>Normal Retirement Date</b>	<p>Age 62.</p>
<b>Normal Retirement Benefit</b>	<p>2% of Average Compensation per year of service.</p>
<b>Early Retirement Date</b>	<p>Age 55 with 10 years of vesting service.</p>
<b>Early Retirement Benefit</b>	<p>Accrued benefit reduced by 6 2/3% for each of the first 5 years and 3 1/3% for each of the next 2 years by which the member's Early Retirement Date precedes their Normal Retirement Date.</p>
<b>Late Retirement Date</b>	<p>Any age beyond 62.</p>
<b>Late Retirement Benefit</b>	<p>The greater of (a) the accrued benefit as of the member's Late Retirement Date or (b) the accrued benefit as of the member's Normal Retirement Date increased actuarially.</p>
<b>Disability Retirement Date</b>	<p>10 years of service.</p>
<b>Disability Retirement Benefit</b>	<p>Immediate benefit equal to 25% of Average Compensation, payable until the member's Normal Retirement Date.</p> <p>Deferred benefit equal to the accrued benefit, starting on the member's Normal Retirement Date.</p>

## Appendix C - Summary of Plan Provisions

<b>Normal Form of Annuity</b>	Life Annuity with Modified Cash Refund. Optional forms of benefit are available on an actuarially equivalent basis.
<b>Vesting</b>	40% after 4 years of service, increasing 5% for each of the next 2 years, then increasing 10% for each of the next 5 years to 100% after 11 years. Members are 100% vested at their Early Retirement Date, Normal Retirement Date, or Disability Retirement Date.
<b>Pre-Retirement Spouse's Death Benefit</b>	If the member is vested and is married at the time of death, the surviving spouse will receive a benefit equal to 50% of the benefit that would have been payable had the member terminated immediately before death, elected to retire at their earliest retirement eligibility or date of death if later, and elected a 50% joint and survivor annuity. The surviving spouse's benefit is payable starting on the date that would have been the member's earliest retirement date.
<b>Pre-Retirement Lump Sum Death Benefit</b>	Refund of Employee Contributions with interest to date of death.
<b>Death Benefits After Retirement</b>	Based on form of benefit elected at retirement.
<b>Termination Benefit Pre-Retirement</b>	Refund of Employee Contributions with interest to date of termination.

## 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.