TOWN OF NEWINGTON
POLICE OFFICERS' PENSION 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.

Milliman's work is prepared solely for the internal business use of the Town of Newington ("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.

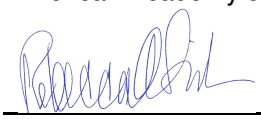
Certification

The 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.



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Section I - Executive Summary
Changes Since the Prior Valuation

Plan Changes

None.

Changes in Actuarial Methods and Assumptions

This valuation reflects the adoption of the PUB-2010 public safety mortality table with generational projection of future improvements in longetivity per the MP Ultimate table. In addition, the interest rate assumption was lowered from 7.00% to 6.875%. These changes increased the Unfunded Accrued Liability by about $3,342,000 and increased the Actuarially Determined Contribution by about $462,000.

The period for amortizing the Unfunded Accrued Liability was lengthened from 10 years to 13 years. This change did not impact the Unfunded Accrued Liability and decreased the Actuarially Determined Contribution by about $1,045,000.

The method for calculating the Actuarially Determined Contribution was revised to include interest to reflect the one-year lag between the valuation date and when the contribution is expected to be paid. This change did not impact the Unfunded Accrued Liability and increased the Actuarially Determined Contribution by about $213,000.

Other Significant Changes

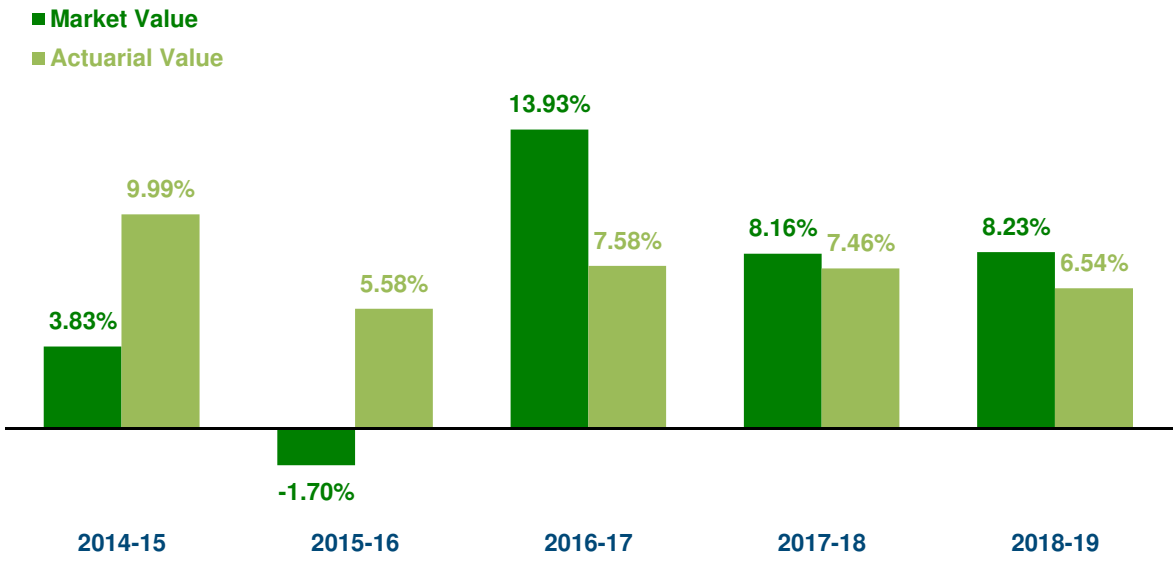
None.

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 asymptotically over five years.

	Market	Actuarial
Value as of July 1, 2018	$45,218,993	$44,992,789
Town and Member Contributions	4,094,153	4,094,153
Investment Income	3,738,595	2,953,748
Benefit Payments and Administrative Expenses	(3,723,958)	(3,723,958)
Value as of July 1, 2019	49,327,783	48,316,732

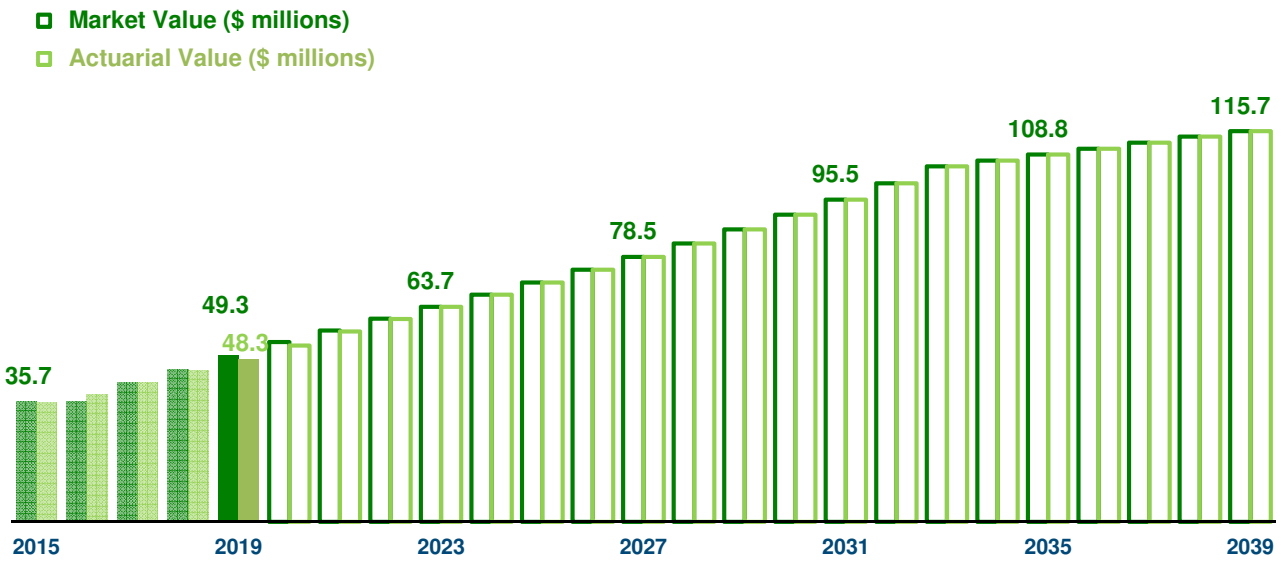
For fiscal year 2018-19, the plan's assets earned 8.23% on a Market Value basis and 6.54% on an Actuarial Value basis. The actuarial assumption for this period was 7.00%; the result is an asset gain of about $558,700 on a Market Value basis and a loss of about $207,800 on an Actuarial Value basis. Historical rates of return are shown in the graph below.



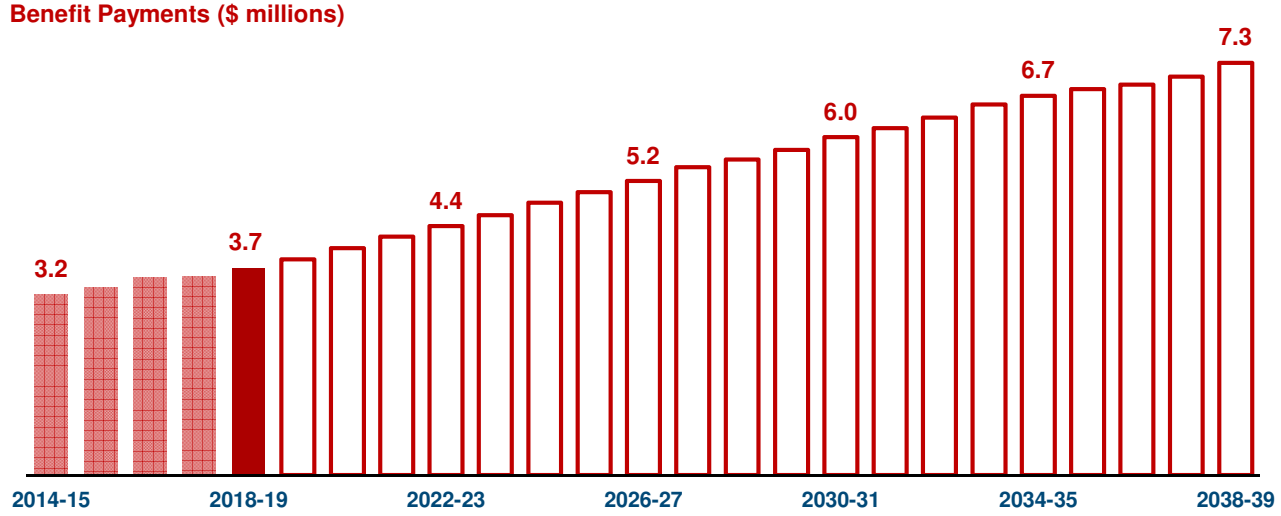
Please note that the Actuarial Value currently is less than the Market Value by $1,011,100. This figure represents investment gains that will be gradually recognized in future years. This process will exert downward pressure on the Town's contribution, unless there are offsetting market losses.

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.

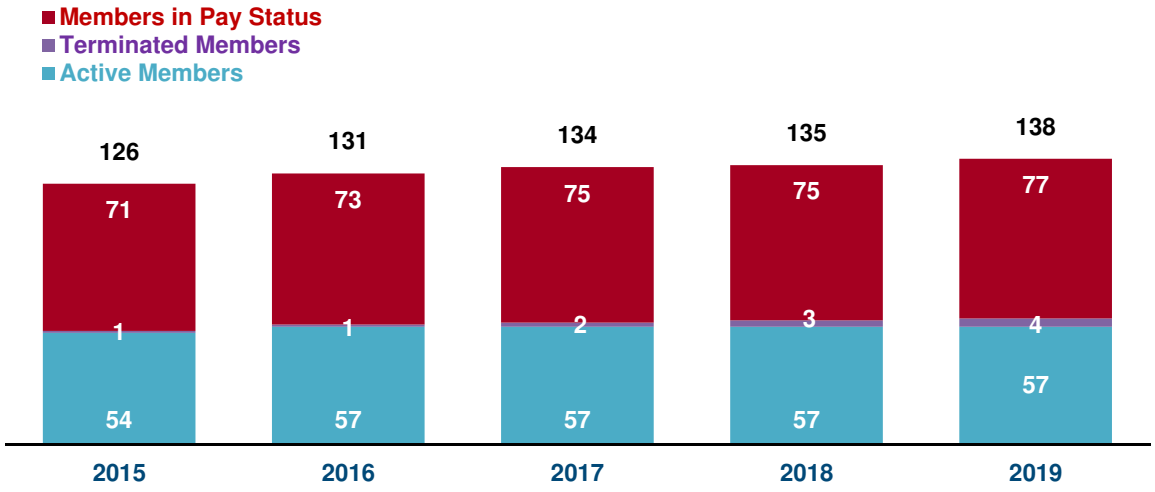


In 2018-19, the plan paid out $3,685,500 in benefits to members. Over the next 20 years, the plan is projected to pay out a total of $113,145,000 in benefits to members.



Section I - Executive Summary
Membership

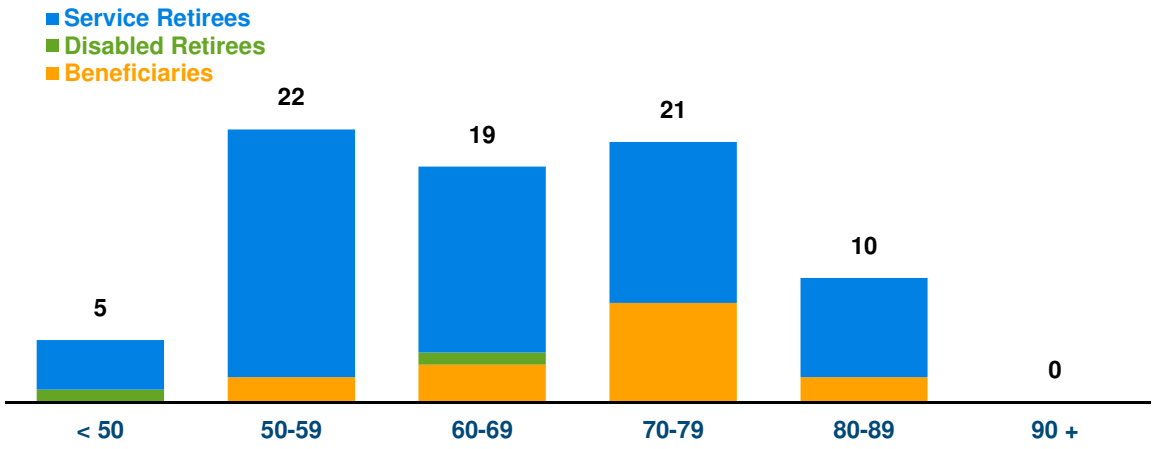
There are three basic categories of plan members included in the valuation: (1) members who are receiving monthly pension benefits, (2) former employees who have a vested right to benefits but have not yet started collecting, and (3) active employees who have met the eligibility requirements for membership.



Members in Pay Status on July 1, 2019

Service Retirees	60	Average Age	65.7
Disabled Retirees	2	Total Annual Benefit	$3,701,467
Beneficiaries	15	Average Annual Benefit	48,071
Total	77		

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	1
Average Age	39.0
Total Annual Benefit	$22,674
Average Annual Benefit	22,674

Nonvested Members Due Refunds on July 1, 2019

Count	3

Active Members on July 1, 2019

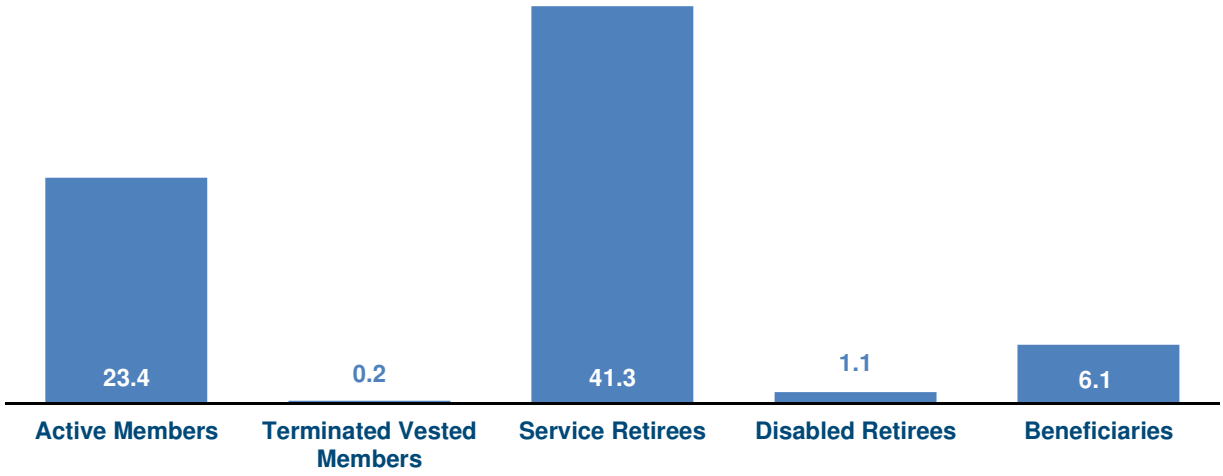
Count	57
Average Age	39.4
Average Service	11.1
Payroll	$6,547,900
Average Payroll	114,875

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

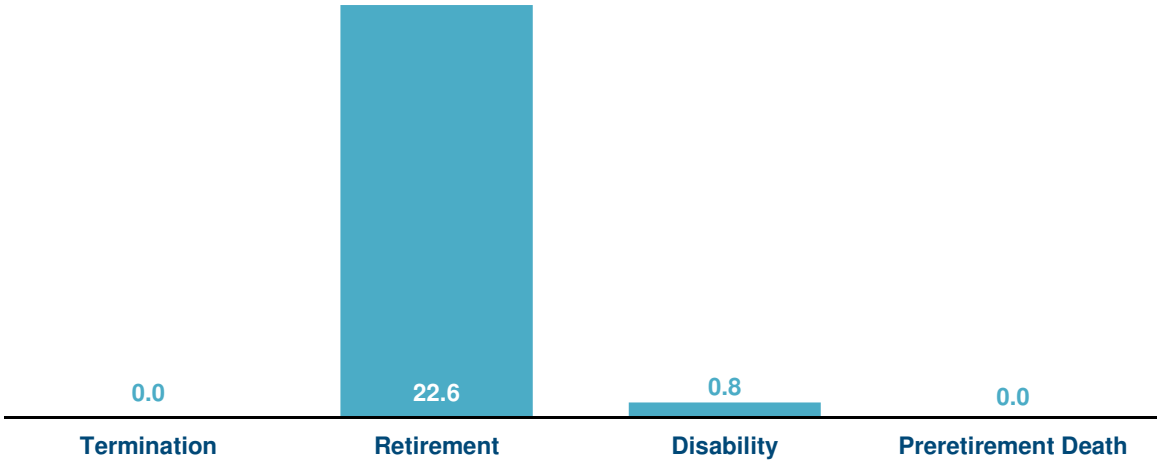
	Years of Service							
Age	**0-4**	**5-9**	**10-14**	**15-19**	**20-24**	**25-29**	**30+**	**Total**
< 25	3							3
25-29	8							8
30-34	3	3	1					7
35-39			7					7
40-44		1	7	5	2			15
45-49	2	1	4	2	1	1		11
50-54			1	1		1		3
55-59			1		1			2
60-64							1	1
65+								0
Total	16	5	21	8	4	2	1	57

Section I - Executive Summary
Accrued Liability

The Accrued Liability as of July 1, 2019 is $72,119,566, which consists of the following pieces (in $ millions):

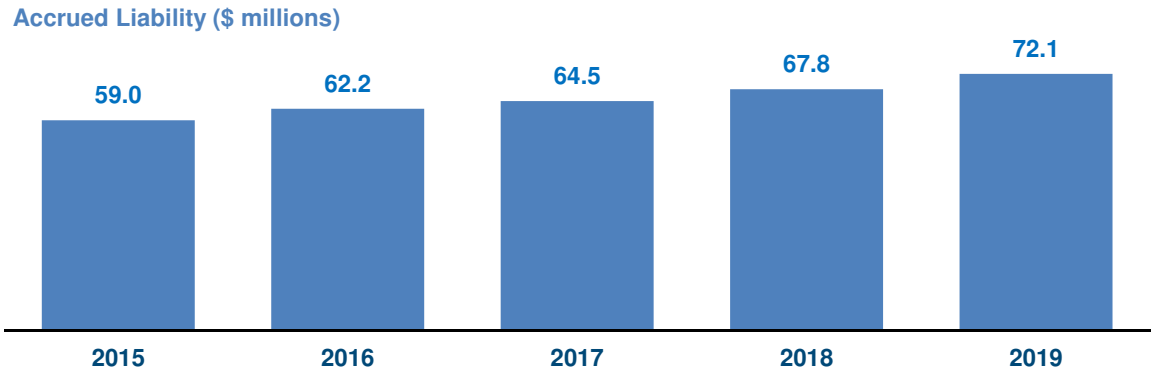


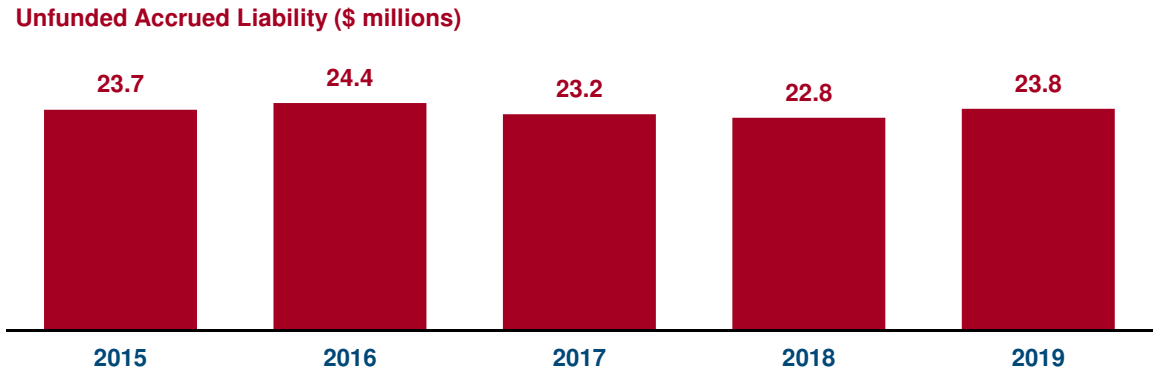
The Accrued Liability for active members can be broken down further by the different types of benefits provided by the plan:

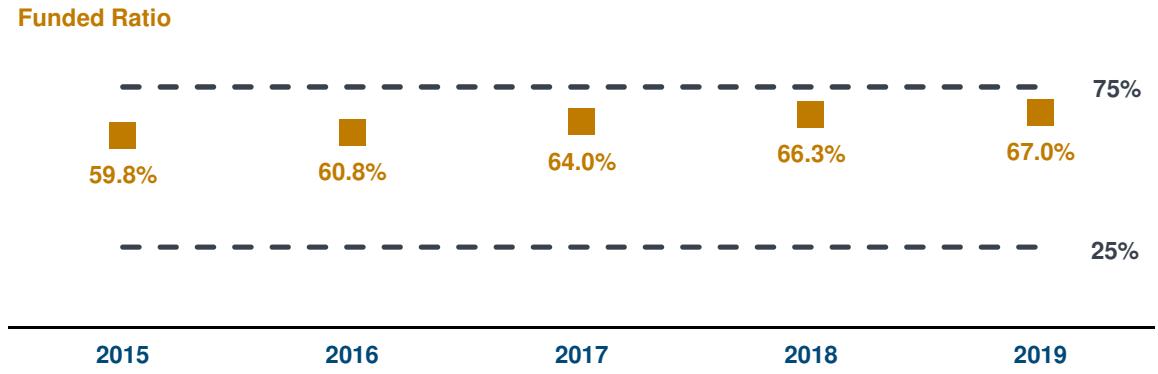


Section I - Executive Summary
Funded Status

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.



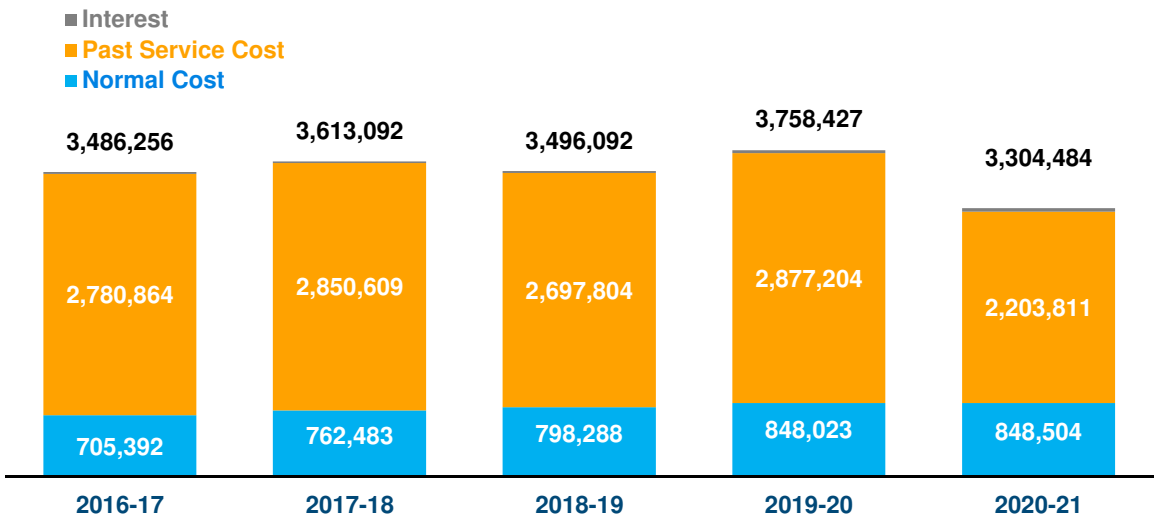




Section I - Executive Summary
Actuarially Determined Contribution

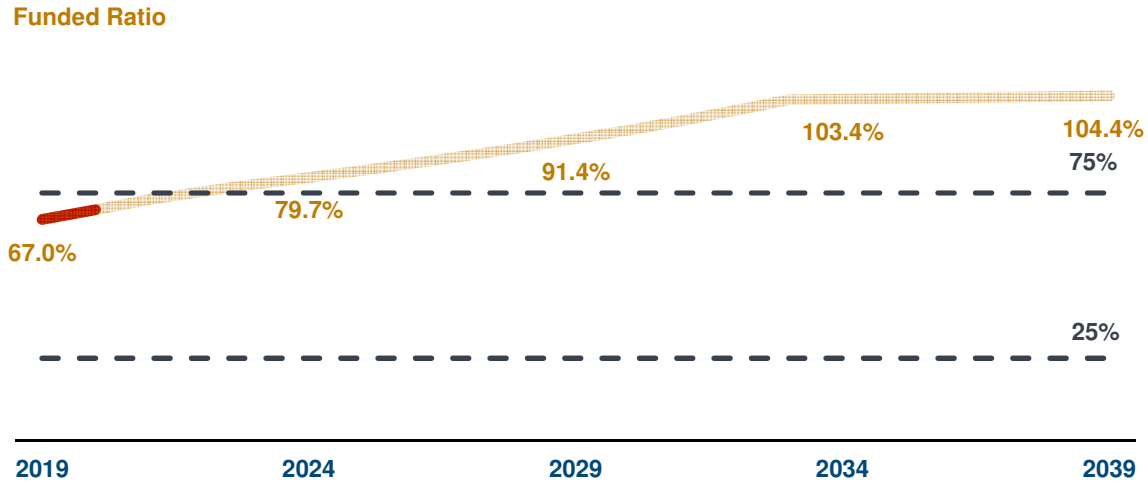
The Actuarially Determined Contribution consists of three pieces: a Normal Cost payment to fund the benefits earned each year, a Past Service Cost to gradually reduce any unfunded or surplus liability, and Interest to reflect the timing of the contribution relative to the valuation date.

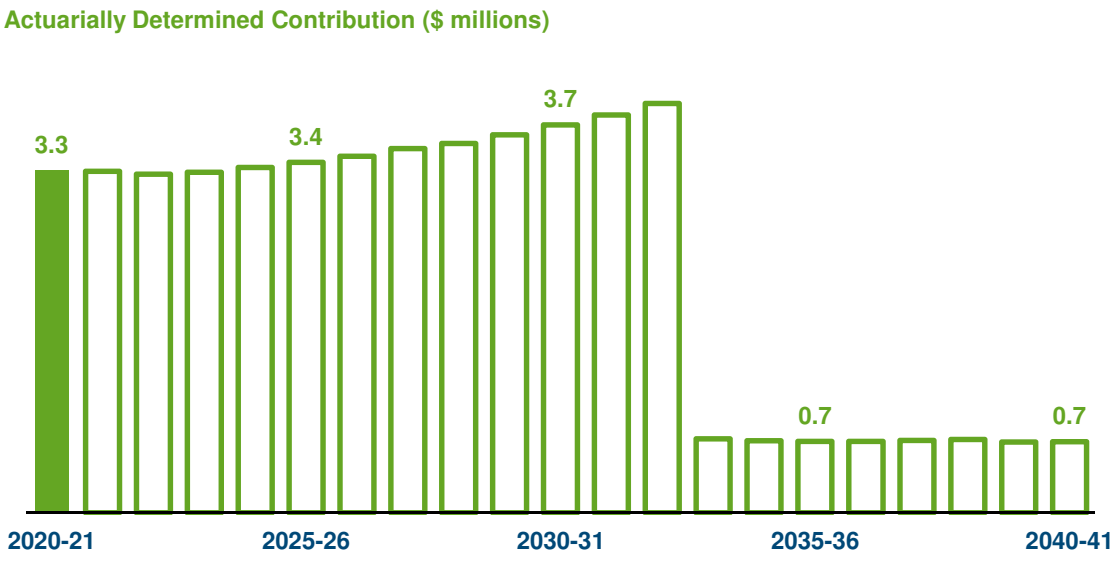
The Actuarially Determined Contribution for fiscal year 2020-21 is shown graphically below, along with the comparable figures for the preceding four fiscal years. Note that the Normal Cost is relatively consistent from year to year, whereas the Past Service Cost tends to be more volatile since it reflects 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:

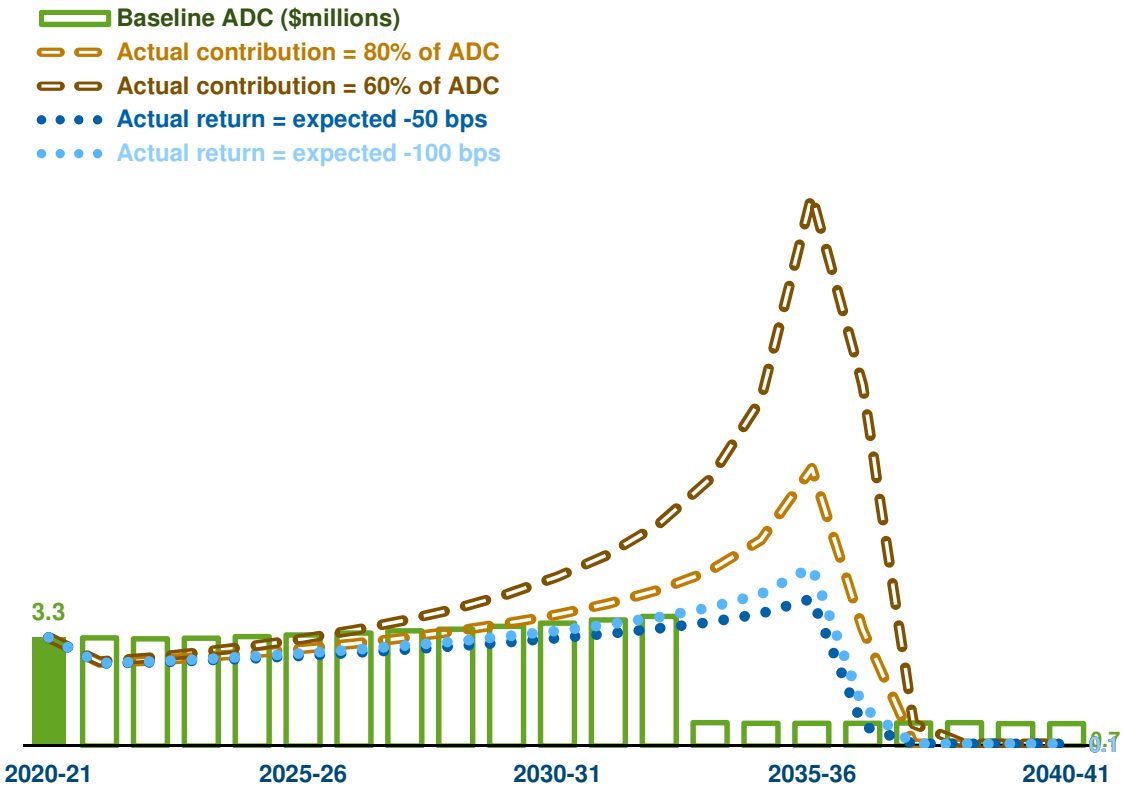




To the extent that there are future investment or liability gains or losses, changes in the actuarial assumptions or methods, or plan changes, the actual valuation results will differ from these forecasts. Please see Section III C for more details of the long range forecast.

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	57	57
Terminated Members	3	4
Members in Pay Status	75	77
Total Count	135	138
Payroll	$6,380,871	$6,547,900

Assets and Liabilities as of	July 1, 2018	July 1, 2019
Market Value of Assets	$45,218,993	$49,327,783
Actuarial Value of Assets	44,992,789	48,316,732
Accrued Liability for Active Members	23,793,597	23,435,553
Accrued Liability for Terminated Members	208,284	244,269
Accrued Liability for Members in Pay Status	43,816,047	48,439,744
Total Accrued Liability	67,817,928	72,119,566
Unfunded Accrued Liability	22,825,139	23,802,834
Funded Ratio	66.3%	67.0%

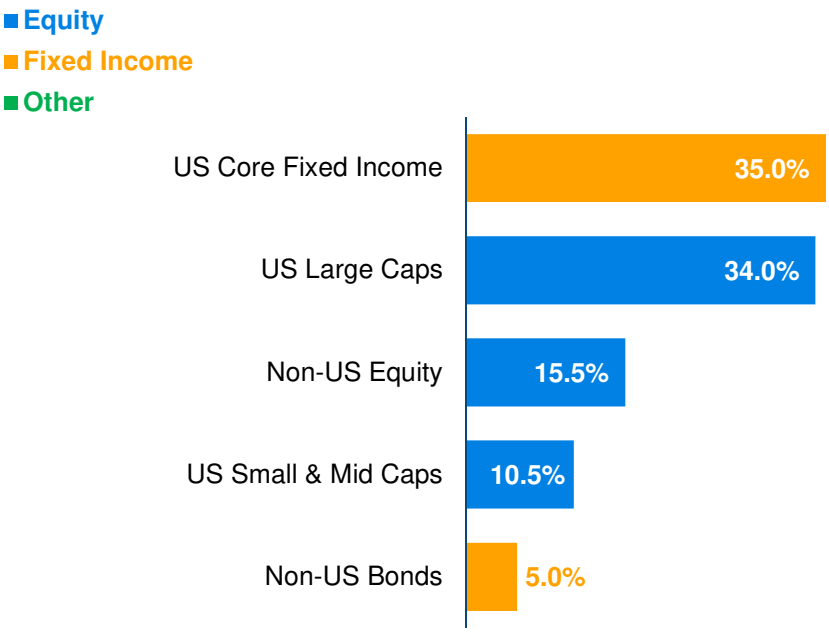
Actuarially Determined Contribution for Fiscal Year	2019-20	2020-21
Normal Cost	$848,023	$848,504
Past Service Cost	2,877,204	2,203,811
Interest	33,200	252,169
Actuarially Determined Contribution	3,758,427	3,304,484

Section II - Plan Assets
A. Summary of Fund Transactions

Market Value as of July 1, 2018	$45,218,993
Town Contributions	3,496,092
Member Contributions	598,061
Net Investment Income	3,738,595
Benefit Payments	(3,685,532)
Administrative Expenses	(38,426)
Market Value as of June 30, 2019	49,327,783
Expected Return on Market Value of Assets	3,179,850
Market Value (Gain)/Loss	(558,745)
Approximate Rate of Return *	8.23%

* 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 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	$45,218,993
	b. Town and Member Contributions	4,094,153
	c. Benefit Payments and Administrative Expenses	(3,723,958)
	d. Expected Earnings Based on 7.00% Interest	3,179,850
	e. Expected Market Value of Assets as of July 1, 2019	48,769,038
2.	Actual Market Value of Assets as of July 1, 2019	49,327,783
3.	Market Value (Gain)/Loss: (1e) - (2)	(558,745)
4.	Delayed Recognition of Market (Gains)/Losses:	

Plan Year End	(Gain)/Loss	Percent Not Recognized	Amount Not Recognized
06/30/2019	($558,745)	80%	($446,996)
06/30/2018	(427,629)	60%	(256,577)
06/30/2017	(2,399,467)	40%	(959,787)
06/30/2016	3,261,544	20%	652,309
			(1,011,051)

5.	Actuarial Value of Assets as of July 1, 2019: (2) + (4)	48,316,732
6.	Approximate Rate of Return on Actuarial Value of Assets	6.54%
7.	Actuarial Value (Gain)/Loss	207,756

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 a closed 13 year period starting July 1, 2019.

		July 1, 2018	July 1, 2019
1.	Accrued Liability		
	Active Members	$23,793,597	$23,435,553
	Terminated Members	208,284	244,269
	Service Retirees	37,193,768	41,265,954
	Disabled Retirees	1,101,439	1,121,648
	Beneficiaries	5,520,840	6,052,142
	Total Accrued Liability	67,817,928	72,119,566
2.	Actuarial Value of Assets (see Section IIB)	44,992,789	48,316,732
3.	Unfunded Accrued Liability: (1) - (2)	22,825,139	23,802,834
4.	Funded Ratio: (2) / (1)	66.3%	67.0%
5.	Amortization Period	10	13
6.	Amortization Growth Rate	3.50%	3.50%
7.	Past Service Cost: (3) amortized over (5)	2,877,204	2,203,811

Section III - Development of Contribution
B. Actuarially Determined Contribution

		2019-20	2020-21
1.	Total Normal Cost	$1,410,424	$1,437,815
2.	Expected Member Contributions	562,401	589,311
3.	Expected Administrative Expenses	33,200	39,600
4.	Town Normal Cost: (1) - (2) + (3)	848,023	848,504
5.	Past Service Cost (see Section IIIA)	2,877,204	2,203,811
6.	Interest on (4) + (5) to beginning of fiscal year	0	212,569
7.	Actuarially Determined Contribution: (4) + (5) + (6)	3,758,427	3,304,484
8.	Actuarially Determined Contribution as a Percent of Payroll	58.9%	50.5%

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.

	Values as of the Valuation Date					Cash Flows Projected to the Following Fiscal Year			
Valuation Date	Accrued Liability	Actuarial Value of Assets	Unfunded Accrued Liability	Funded Ratio	Fiscal Year	Town Contributions	Member Contributions	Benefit Payments	Net Cash Flows
7/1/2019	$72,119,566	$48,316,732	$23,802,834	67.0%	2020-21	$3,304,484	$586,643	($4,031,240)	($140,113)
7/1/2020	74,671,000	52,226,000	22,445,000	69.9%	2021-22	3,291,000	596,000	(4,236,000)	(349,000)
7/1/2021	77,176,000	56,374,000	20,802,000	73.0%	2022-23	3,265,000	599,000	(4,423,000)	(559,000)
7/1/2022	79,625,000	60,064,000	19,561,000	75.4%	2023-24	3,282,000	606,000	(4,621,000)	(733,000)
7/1/2023	82,018,000	63,689,000	18,329,000	77.7%	2024-25	3,328,000	605,000	(4,839,000)	(906,000)
7/1/2024	84,374,000	67,264,000	17,110,000	79.7%	2025-26	3,378,000	609,000	(5,029,000)	(1,042,000)
7/1/2025	86,622,000	70,904,000	15,718,000	81.9%	2026-27	3,438,000	616,000	(5,227,000)	(1,173,000)
7/1/2026	88,796,000	74,651,000	14,145,000	84.1%	2027-28	3,511,000	609,000	(5,473,000)	(1,353,000)
7/1/2027	90,918,000	78,518,000	12,400,000	86.4%	2028-29	3,560,000	621,000	(5,609,000)	(1,428,000)
7/1/2028	92,863,000	82,465,000	10,398,000	88.8%	2029-30	3,643,000	634,000	(5,781,000)	(1,504,000)
7/1/2029	94,790,000	86,605,000	8,185,000	91.4%	2030-31	3,740,000	635,000	(6,004,000)	(1,629,000)
7/1/2030	96,711,000	90,948,000	5,763,000	94.0%	2031-32	3,836,000	647,000	(6,162,000)	(1,679,000)
7/1/2031	98,492,000	95,460,000	3,032,000	96.9%	2032-33	3,945,000	660,000	(6,351,000)	(1,746,000)
7/1/2032	100,237,000	100,227,000	10,000	100.0%	2033-34	713,000	661,000	(6,584,000)	(5,210,000)
7/1/2033	101,940,000	105,251,000	(3,311,000)	103.2%	2034-35	692,000	669,000	(6,740,000)	(5,379,000)
7/1/2034	103,501,000	107,036,000	(3,535,000)	103.4%	2035-36	686,000	682,000	(6,859,000)	(5,491,000)
7/1/2035	104,984,000	108,767,000	(3,783,000)	103.6%	2036-37	687,000	699,000	(6,936,000)	(5,550,000)
7/1/2036	106,456,000	110,500,000	(4,044,000)	103.8%	2037-38	697,000	716,000	(7,082,000)	(5,669,000)
7/1/2037	107,972,000	112,289,000	(4,317,000)	104.0%	2038-39	706,000	709,000	(7,325,000)	(5,910,000)
7/1/2038	109,503,000	114,076,000	(4,573,000)	104.2%	2039-40	680,000	724,000	(7,470,000)	(6,066,000)

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, 2012	$26,840,306	$48,223,073	$21,382,767	55.7%
July 1, 2013	28,505,350	53,455,897	24,950,547	53.3%
July 1, 2014	31,673,813	55,606,605	23,932,792	57.0%
July 1, 2015	35,321,259	59,022,146	23,700,887	59.8%
July 1, 2016	37,835,177	62,249,703	24,414,526	60.8%
July 1, 2017	41,264,222	64,483,784	23,219,562	64.0%
July 1, 2018	44,992,789	67,817,928	22,825,139	66.3%
July 1, 2019	48,316,732	72,119,566	23,802,834	67.0%

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
2013-14	$2,661,462	$2,661,462	$5,561,136	47.9%
2014-15	3,195,093	3,195,093	5,535,655	57.7%
2015-16	3,338,285	3,338,285	5,765,839	57.9%
2016-17	3,486,256	3,515,356	5,827,731	60.3%
2017-18	3,613,092	3,613,092	6,151,253	58.7%
2018-19	3,496,092	3,496,092	6,182,890	56.5%
2019-20	3,758,427	TBD	6,380,871	TBD
2020-21	3,304,484	TBD	6,547,900	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	57	1	2	58	3	14	135
Terminated							
- no benefits due	-	-	-	-	-	-	0
- paid refund	(4)	-	-	-	-	-	(4)
- non-vested benefits d	(1)	-	1	-	-	-	0
Retired	(5)	-	-	5	-	-	0
Died							
- with beneficiary	-	-	-	(1)	-	-	(1)
- no beneficiary	-	-	-	(2)	(1)	-	(3)
Benefits expired	-	-	-	-	-	-	0
New member	10	-	-	-	-	-	10
Rehired	-	-	-	-	-	-	0
New Alternate Payee	-	-	-	-	-	1	1
Correction	-	-	-	-	-	-	0
Count July 1, 2019	57	1	3	60	2	15	138

Section IV - Membership Data
B. Statistics of Active Membership

	As of July 1, 2018	As of July 1, 2019
Number of Active Members	57	57
Average Age	40.7	39.4
Average Service	11.9	11.1
Total Payroll	$6,380,871	$6,547,900
Average Payroll	111,945	114,875

Section IV - Membership Data
C. Statistics of Inactive Membership

	As of July 1, 2018	As of July 1, 2019
Terminated Vested Members		
Number	1	1
Total Annual Benefit	$22,674	$22,674
Average Annual Benefit	22,674	22,674
Average Age	38.0	39.0
Nonvested Members Due Refunds		
Number	2	3
Service Retirees		
Number	58	60
Total Annual Benefit	$2,936,929	$3,068,634
Average Annual Benefit	50,637	51,144
Average Age	65.1	64.6
Disabled Retirees		
Number	3	2
Total Annual Benefit	$93,928	$71,961
Average Annual Benefit	31,309	35,981
Average Age	56.0	52.8
Beneficiaries		
Number	14	15
Total Annual Benefit	$503,806	$560,872
Average Annual Benefit	35,986	37,391
Average Age	70.1	71.8

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

	Age	Number	Annual Benefits
Terminated Vested Members	< 50	4	$22,674
	50 - 59	0	0
	60 - 69	0	0
	70 - 79	0	0
	80 - 89	0	0
	90 +	0	0
	Total	4	22,674
Service Retirees	< 50	4	$260,110
	50 - 59	20	1,166,302
	60 - 69	15	682,735
	70 - 79	13	666,233
	80 - 89	8	293,254
	90 +	0	0
	Total	60	3,068,634
Disabled Retirees	< 50	1	$44,985
	50 - 59	0	0
	60 - 69	1	26,976
	70 - 79	0	0
	80 - 89	0	0
	90 +	0	0
	Total	2	71,961
Beneficiaries	< 50	0	$0
	50 - 59	2	69,380
	60 - 69	3	151,018
	70 - 79	8	319,781
	80 - 89	2	20,693
	90 +	0	0
	Total	15	560,872

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.

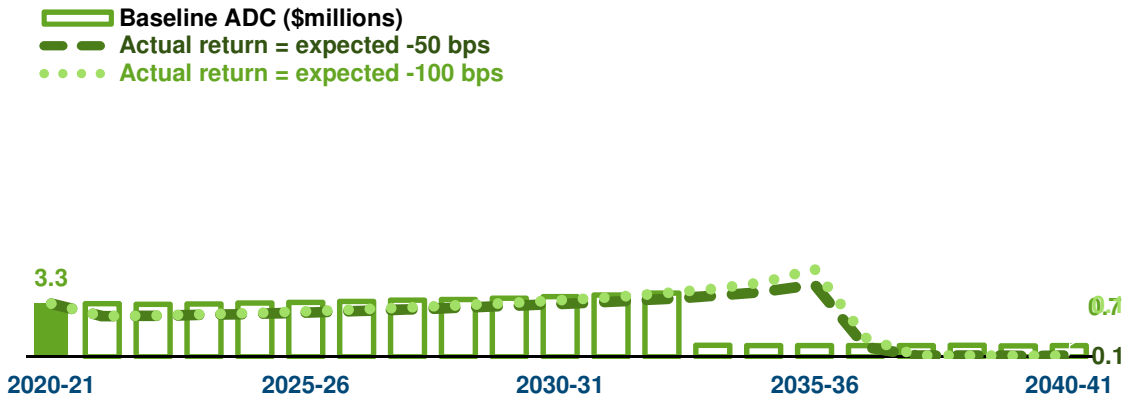
Please see Section III C for more information on the basis for the projected results shown on the following pages.

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.

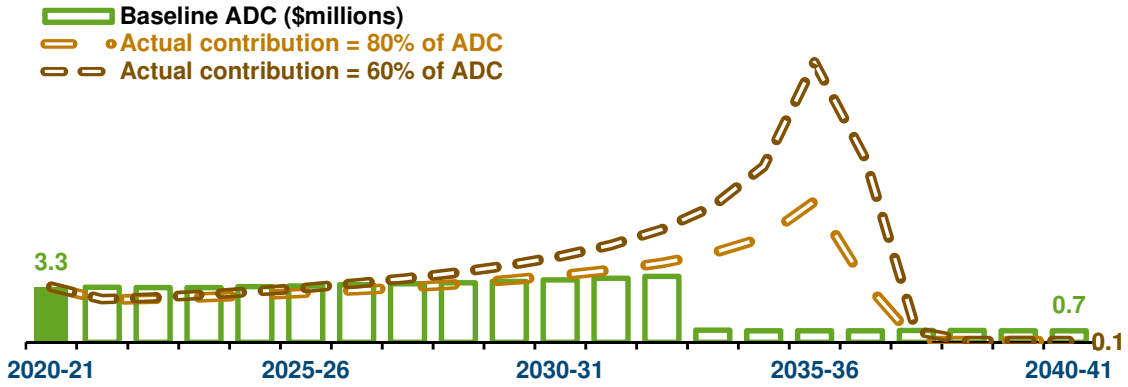
Identification: To the extent that actual investment returns differ from the assumed investment return, the plan's future assets, Actuarially Determined Contributions, and funded status may differ significantly from those presented in this valuation. The consequences of persistent underperformance on 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 6 years, actual contributions have been 100.1% 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.

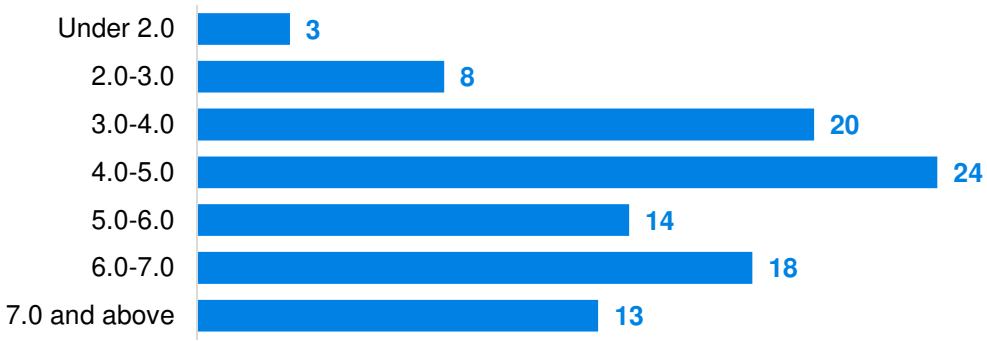
Identification: In 2018-19, the plan had positive cash flow, with town and member contributions to the plan of $4,094,153 compared to $3,723,958 of benefit payments and administrative expenses paid out of the plan. We suggest that you consult with your investment advisors with respect to the liquidity 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 7.5. 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: Members who retire on or before January 1, 2007 receive an annual benefit increase of 1.50%. For this group of members, their pension benefits are insulated against inflation risk. Members who retire after January 1, 2007 do not receive benefit increases after retirement, so these 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.

Pensionable Earnings Risk

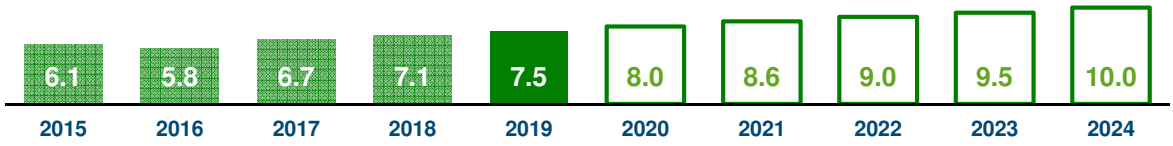
Definition: This is the potential for active members to add items to their pensionable earnings and receive pension benefits that are higher than expected.

Identification: This plan uses gross earnings to determine pension amounts. To the extent that members have years with substantial amounts of overtime pay, this could put upward pressure on subsequent Actuarially Determined Contributions.

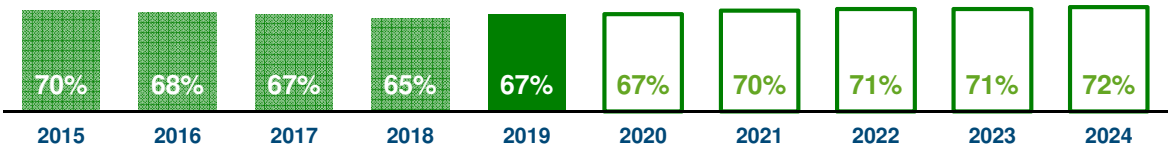
Section V - Analysis of Risk
C. Maturity Measures

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.

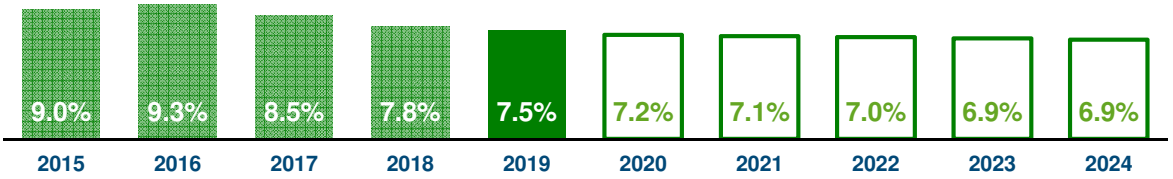
Asset Volatility Ratio: Market Value of Assets compared to Payroll



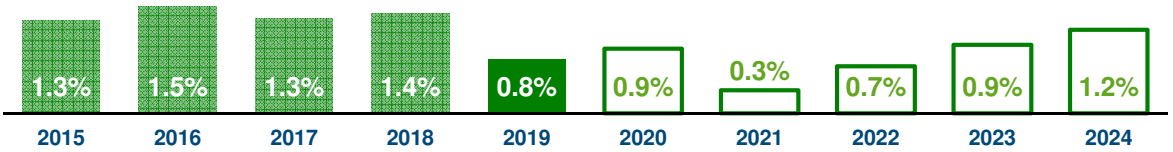
Accrued Liability for members in pay status compared to total Accrued Liability



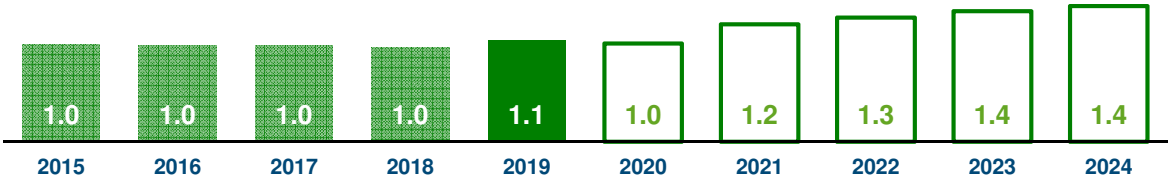
Benefit Payments compared to Market Value of Assets



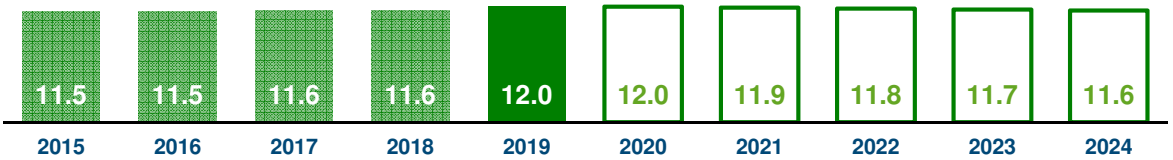
Net Cash Flows compared to Market Value of Assets



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 one-year lag between the valuation date and when the contribution is expected to be paid.

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 a closed period of 13 years starting on July 1, 2019.

The Actuarial Value of Assets is determined by recognizing market gains and losses 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. 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	6.875% (prior: 7.00%)
Amortization Growth Rate	3.50%
Expenses	Administrative expenses paid in the prior year, increased by 3% and rounded to the nearest $100.
Salary Scale	3.50%
Mortality	Current: PubS-2010 Mortality Table for Employees, Healthy Annuitants and Disabled Annuitants with generational projection of future improvements per the MP Ultimate scale. This assumption incorporates the expectation of mortality improvements beyond the valuation date. Prior: RP-2000 Mortality Tables for Employees and Healthy Annuitants with generational improvements per Scale AA.
Turnover	None.
Retirement	50% in the first year eligible for Normal Retirement. 15% in each following year. 100% at age 65. For employees hired after October 1, 2013, no retirements are assumed prior to the completion of 25 years of service.
Disability	11th Railroad Retirement Board Disability Rates.
Marital Status	80% of members are assumed to be married with wives 3 years younger than husbands.
Cost of Living Adjustment	1.50%
Worker's Compensation	10% of Final Average Earnings.

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	Employed for twenty or more hours a week for more than 5 months per calendar year.
Employee Contributions	8% of after tax earnings, 8.5% of after tax earnings effective July 1, 2015 and 9% of after tax earnings effective July 1, 2016. Interest is credited at 4% per annum. Refund of Employee Contributions with interest to date of termination of employment or death, unless the employee is eligible for a deferred retirement income.
Continuous Service	The period of continuous employment with the Police Department beginning with the first of the month following date of employment measured in years and full months.
Final Average Earnings	Highest average gross earnings received in any three full calendar years.
Normal Retirement Date	Hired prior to January 1, 2007: the earlier of age 50 or the completion of 20 years of service. Hired after January 1, 2007 but before October 1, 2013: the later of age 45 and the completion of 20 years of service; in order to be eligible for cost of living adjustments and retiree insurance benefits, the later of age 50 and the completion of 25 years of service. Hired after October 1, 2013: the later of age 45 and the completion of 20 years of service; in order to be eligible for retiree insurance benefits, the later of age 50 and the completion of 25 years of service.
Normal Retirement Benefit	2.5% of Final Average Earnings multiplied by Continuous Service. For employees hired after January 1, 2007 the benefit is capped at the lesser of 70% of base compensation in the year prior to retirement and 62.5% of Final Average Earnings.
Early Retirement Date	Age 45 and 10 years of Continuous Service.
Early Retirement Benefit	Benefit is based on Continuous Service and Final Average Earnings to actual retirement date actuarially reduced for early commencement.

Appendix C - Summary of Plan Provisions

Deferred Retirement Date	Members may continue to work beyond Normal Retirement.
Deferred Retirement Benefit	Benefit based on Continuous Service and Final Average Earnings to actual date of retirement.
Death Benefit Eligibility	Married Member (for at least one year) or with minor children. Age 25 with 1 year of Aggregate Service.
Death Benefit	35% of benefit accrued to date of death.
Disability Retirement	Members not covered under the Long Term Disability Contract.
Disability Retirement Benefit	60% of earnings at the time of disability, less Worker's Compensation.
Termination Benefit Eligibility	Ten years of Continuous Service.
Termination Benefit	Benefit accrued to date of termination with payment commencing on Normal Retirement Date.
Cost of Living Adjustment	One half of active salary increases.

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.