TOWNSHIP OF BLOOMFIELD RETIREMENT INCOME PLAN

Actuarial Valuation as of January 1, 2021
To Determine Funding for Fiscal Year 2022-23

Prepared by

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Table of Contents

Certification

We have performed an actuarial valuation of the Plan as of January 1, 2021 to determine funding for fiscal year 2022-23. 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 Bloomfield Township ("Township"). 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 Township may provide a copy of Milliman's work, in its entirety, to the Township'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 Township; and (b) the Township 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 Township. 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.

The valuation results were developed using models intended for valuations that use standard actuarial techniques. In addition to these models, 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 (ASOP). The models including all input, calculations, and output may not be appropriate for any other purpose.

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.

The signing actuaries are independent of the plan sponsor. We are not aware of any relationship that would impact the objectivity of our work.

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.

Michelle L. Boyles

Michelle L. Boyles, FSA
Consulting Actuary

Section I - Executive Summary
Changes Since the Prior Valuation

Plan Changes

None.

Changes in Actuarial Methods and Assumptions

The Mortality Table was updated from Pub-2010 Mortality Table with generational projection per the modified MP-2018 scale to Pub-2010 Mortality Table with generational projection per the modified MP-2019 scale.

These mortality changes decreased the Accrued Liability by $558,000.

Other Significant Changes

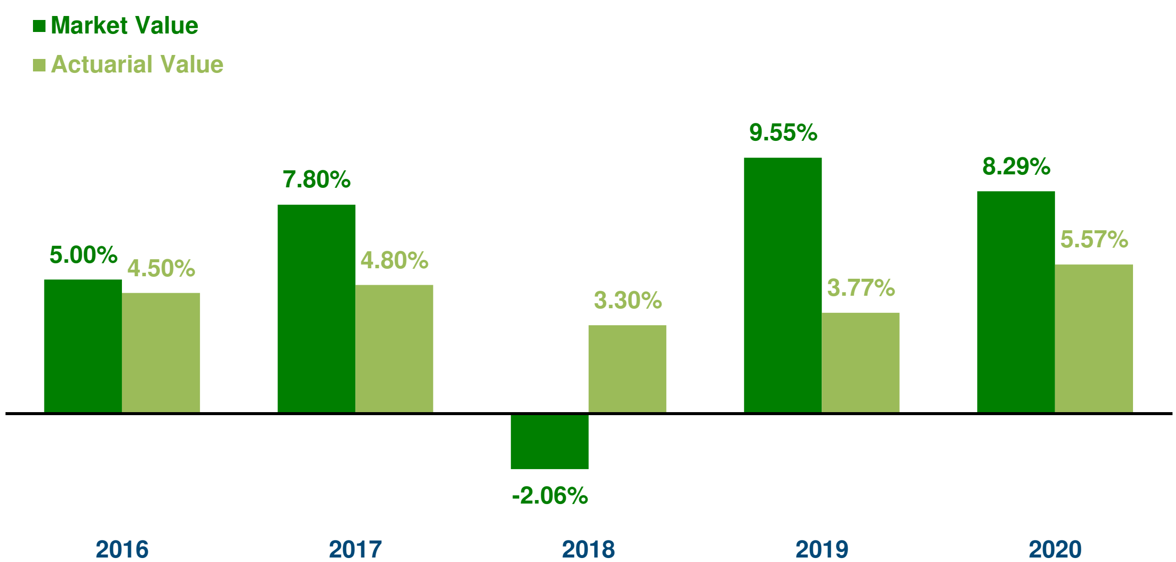
None.

Section I - Executive Summary
Assets

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

	Market	Actuarial
Value as of January 1, 2020	$219,571,303	$223,171,968
Township and Member Contributions	4,860,729	4,860,729
Investment Income	17,869,320	12,204,640
Benefit Payments and Administrative Expenses	(12,746,568)	(12,746,568)
Value as of January 1, 2021	229,554,784	227,490,769

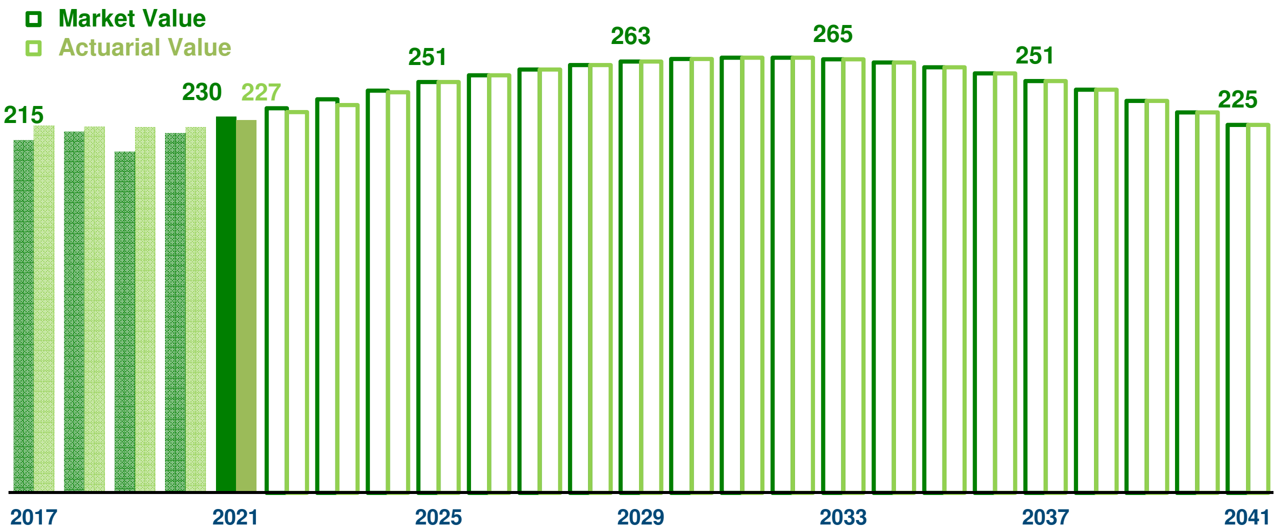
For the period January 1, 2020 to December 31, 2020 the plan's assets earned 8.29% on a Market Value basis and 5.57% on an Actuarial Value basis. The actuarial assumption for this period was 6.00%; the result is an asset gain of about $4.9 million on a Market Value basis and a loss of about $0.9 million on an Actuarial Value basis. Historical rates of return are shown in the graph below.



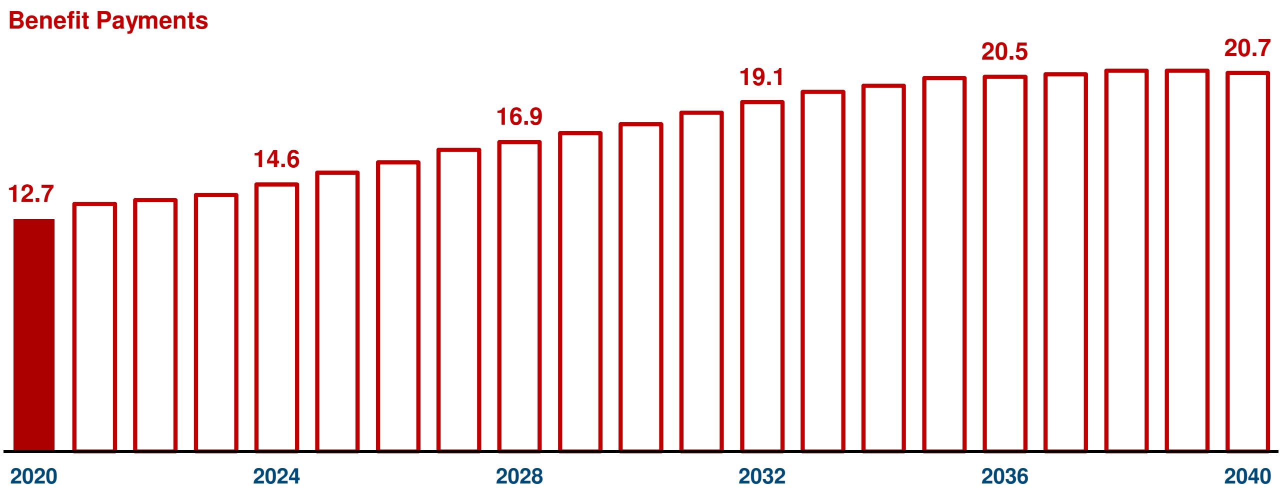
Please note that the Actuarial Value currently is less than the Market Value by $2.1 million. This figure represents investment gains that will be gradually recognized in future years. This process will exert downward pressure on the Township's contribution, unless there are offsetting market losses.

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

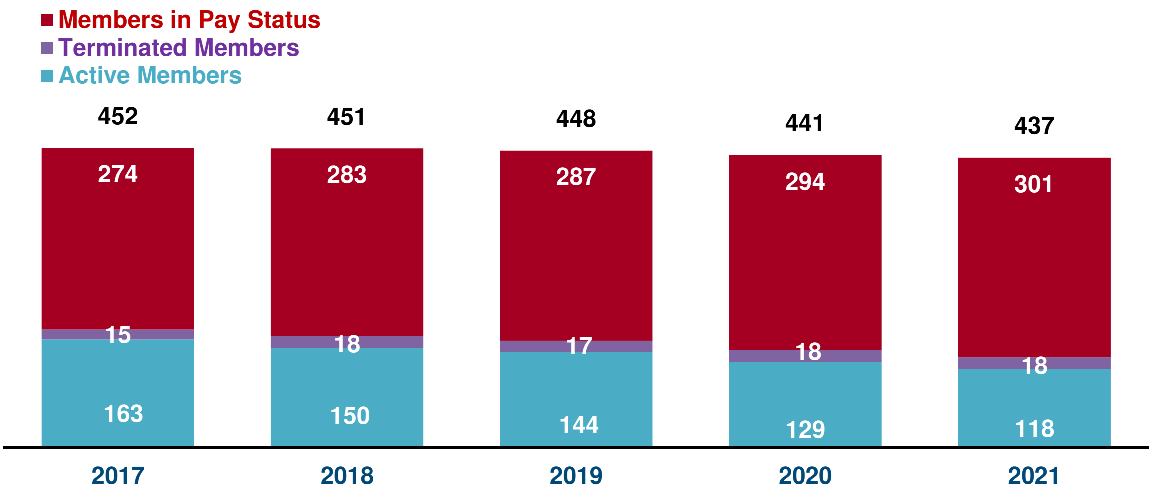


In 2020, the plan paid out $12.7 million in benefits to members. Over the next 20 years, the plan is projected to pay out a total of $357 million in benefits to members.



Section I - Executive Summary
Membership

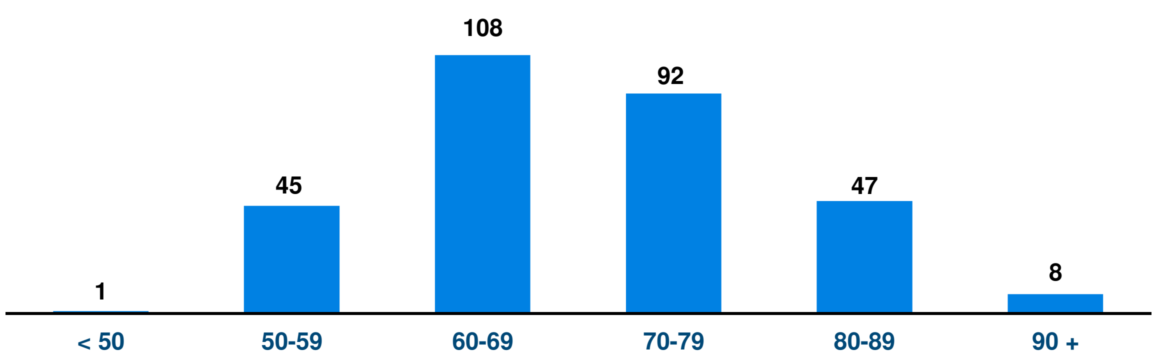
There are three basic categories of plan members included in the valuation: (1) members who are receiving monthly pension benefits, (2) former employees who have a vested right to benefits but have not yet started collecting, and (3) active employees who have met the eligibility requirements for membership.



Members in Pay Status on January 1, 2021

Count	301
Average Age	70.3
Total Annual Benefit	$13,175,616
Average Annual Benefit	43,773

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



Section I - Executive Summary
Membership (continued)

Terminated Vested Members on January 1, 2021

Count	18
Average Age	46.3
Total Annual Benefit	$410,115
Average Annual Benefit	22,784

Active Members on January 1, 2021

	Library Employees	Non-Library Employees	Plan Total
Count	13	105	118
Average Age	54.4	47.5	48.3
Average Service	19.0	20.4	20.3
Payroll	$998,529	$9,602,528	$10,601,057
Average Payroll	76,810	91,453	89,839

The tables below illustrate the age and years of service of the active membership:

Library Employees

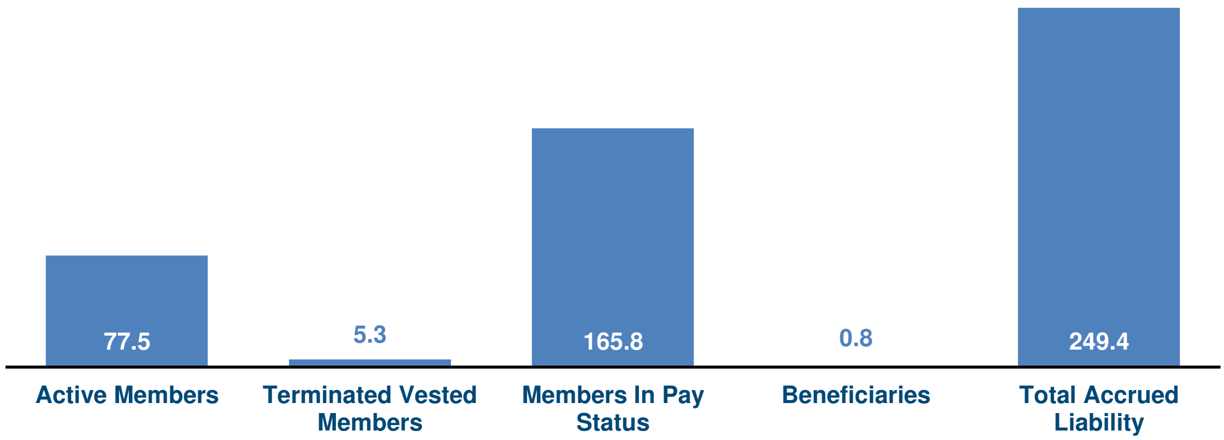
	Years of Service							
Age	**0-4**	**5-9**	**10-14**	**15-19**	**20-24**	**25-29**	**30+**	**Total**
<30								0
30-34								0
35-39			1					1
40-44			1					1
45-49			1	1				2
50-54					1		1	2
55-59			2	2				4
60-64								0
65+			1		1		1	3
Total	0	0	6	3	2	0	2	13

Non-Library Employees

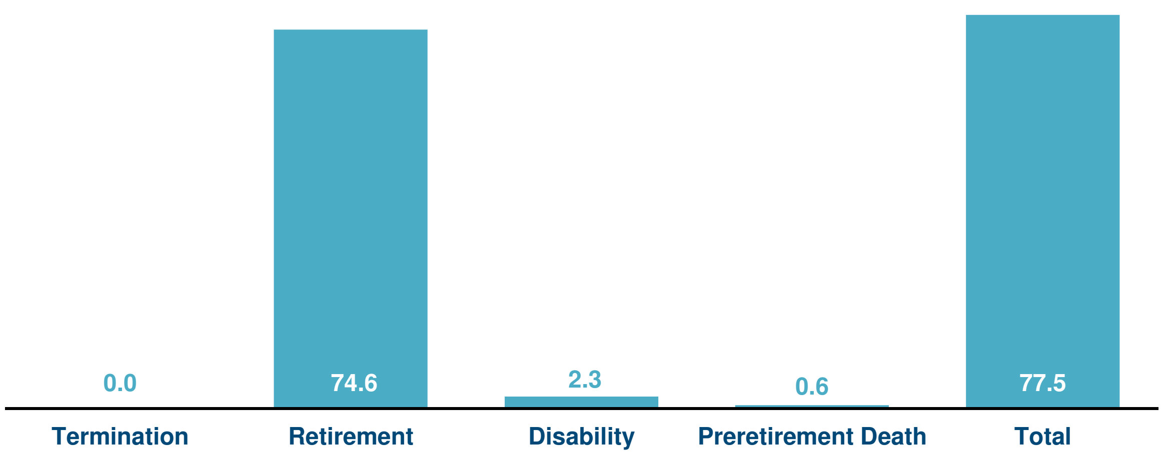
	Years of Service							
Age	**0-4**	**5-9**	**10-14**	**15-19**	**20-24**	**25-29**	**30+**	**Total**
<30								0
30-34								0
35-39				8				8
40-44				30	5			35
45-49				4	23	2		29
50-54				2	5	7		14
55-59				5	10			15
60-64					2			2
65+				1	1			2
Total	0	0	0	50	46	9	0	105

Section I - Executive Summary
Accrued Liability

The Accrued Liability as of January 1, 2021 consists of the following pieces:



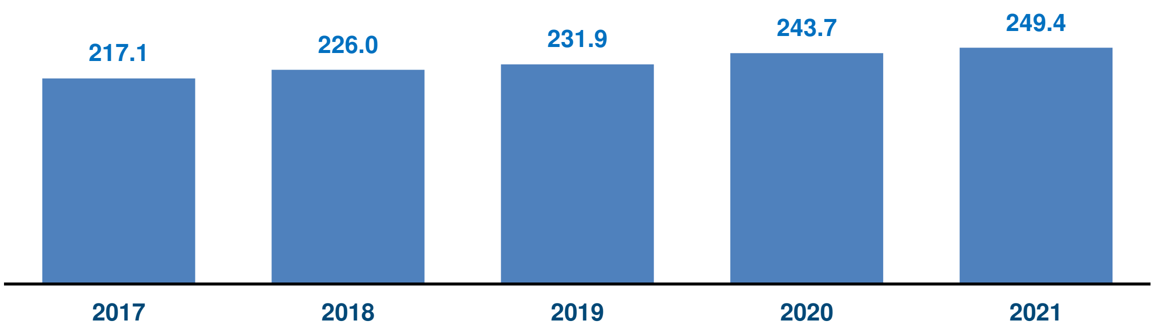
The Accrued Liability for active members can be broken down further by the different types of benefits provided by the plan:



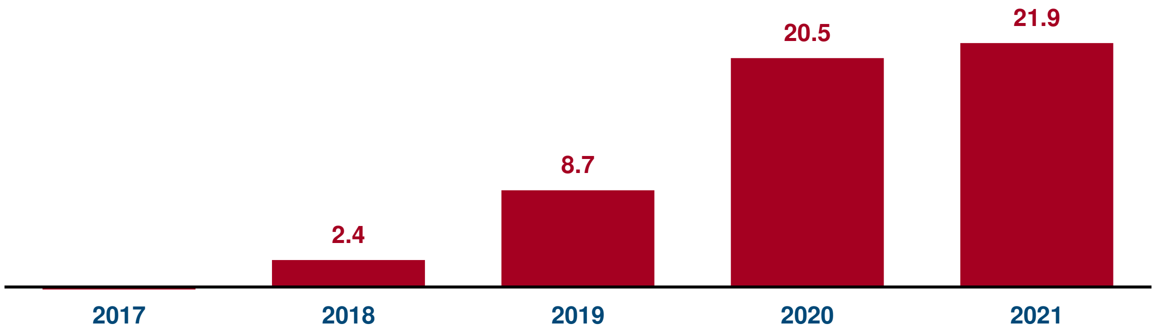
Section I - Executive Summary
Funded Status

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

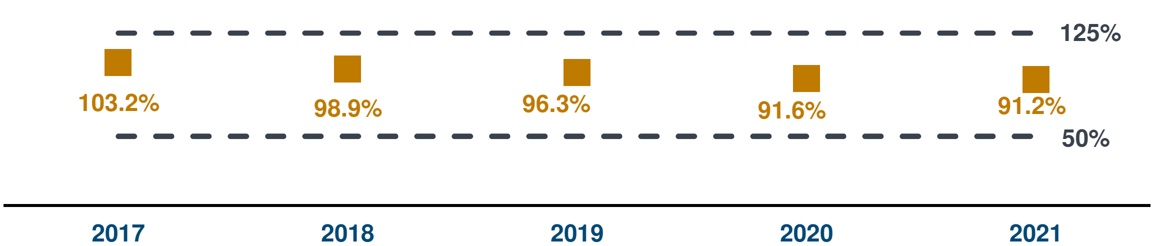
Accrued Liability ($ millions)



Unfunded Accrued Liability ($ millions)



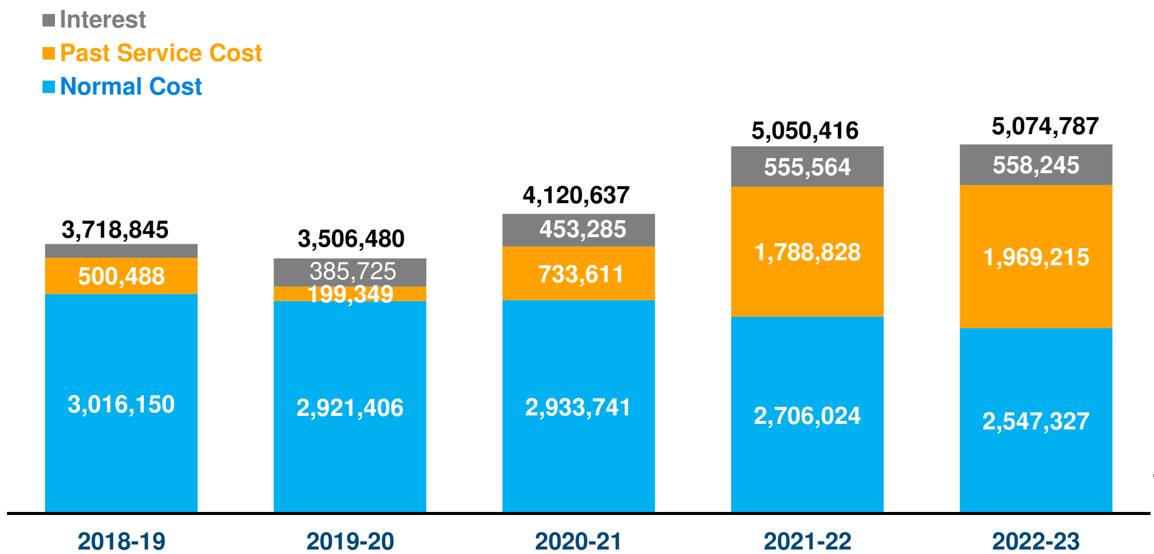
Funded Ratio



Section I - Executive Summary
Actuarially Determined Contribution

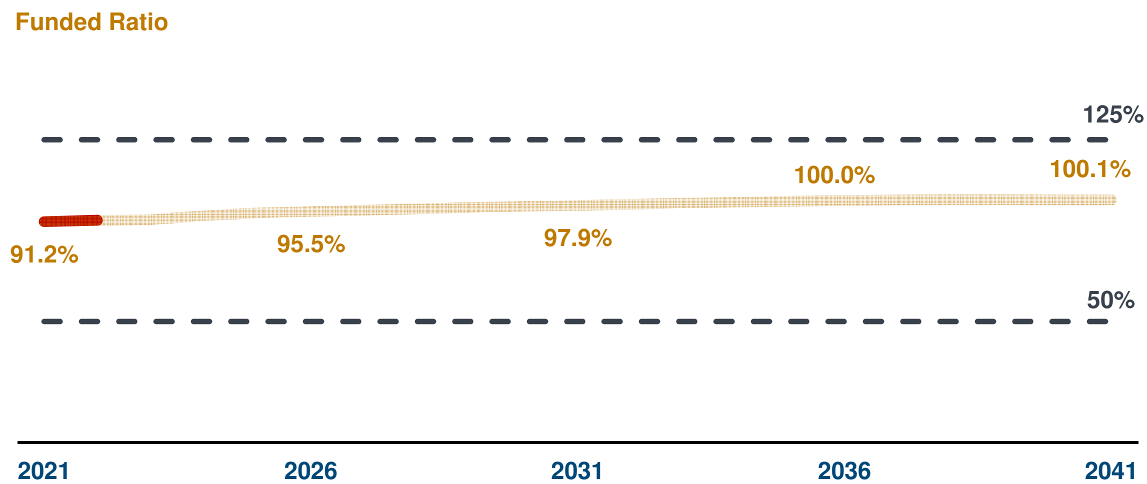
The Actuarially Determined Contribution consists of three pieces: a Normal Cost payment to fund the benefits earned each year, a Past Service Cost to gradually reduce any unfunded or surplus liability, and Interest to reflect the timing of the contribution relative to the valuation date.

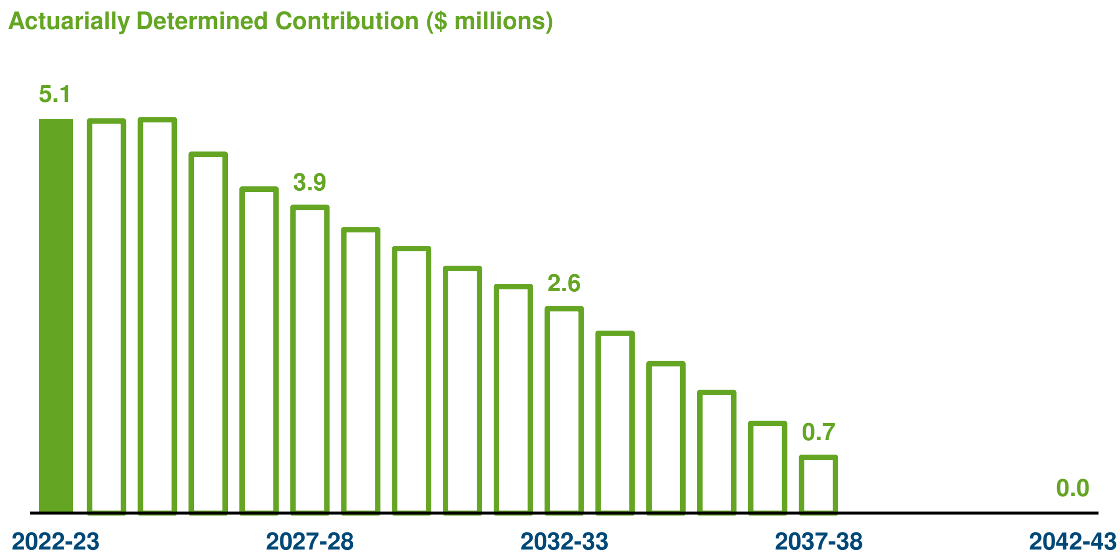
The Actuarially Determined Contribution for fiscal year 2022-23 is shown graphically below, along with the comparable figures for the preceding four fiscal years. Note that in years where a contribution is required, the Normal Cost is relatively consistent from year to year, whereas the Past Service Cost tends to be more volatile since it reflects the impact of asset performance as well as assumption changes.



Section I - Executive Summary
Long-Range Forecast

If the Township 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:

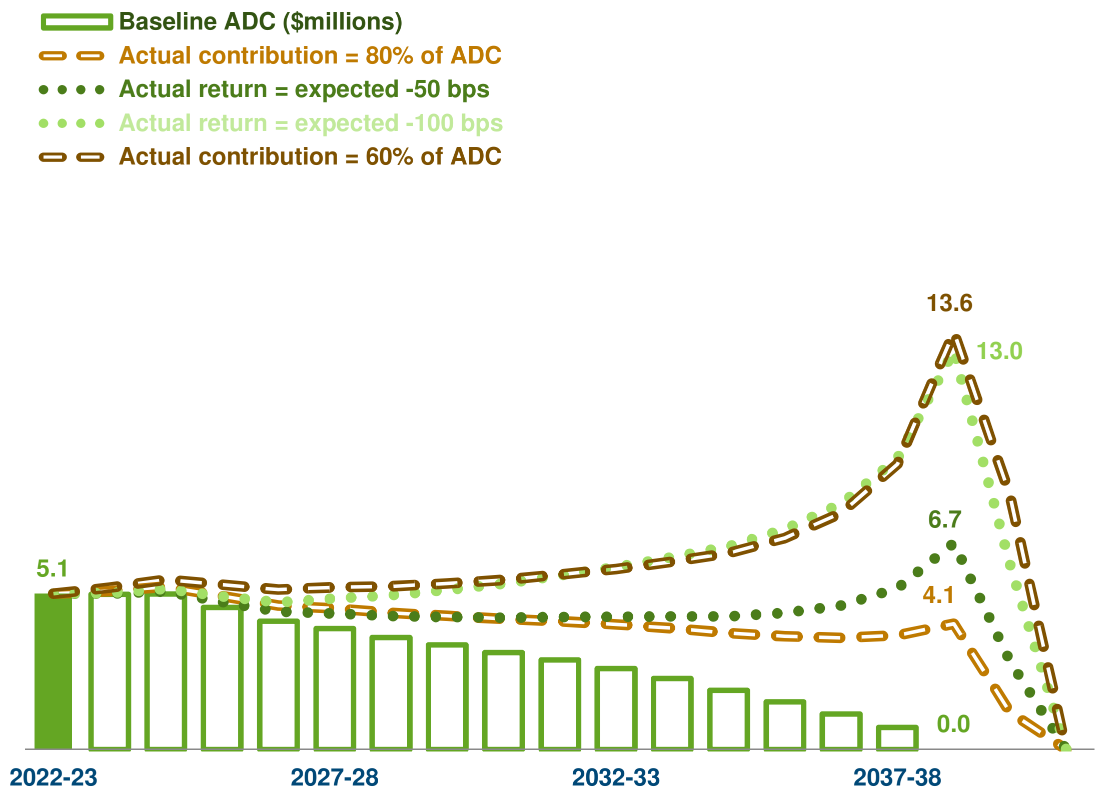




To the extent that there are future investment or liability gains or losses, changes in the actuarial assumptions or methods, or plan changes, the actual valuation results will differ from these forecasts. Please see Section III C for more details of the long range forecast.

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

Pension benefits are paid for through a combination of contributions from the Township and from employees, and from investment income. If the Township 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 Township'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 Township's future contribution levels. Stochastic projections could be prepared that would enable the Township 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	January 1, 2020	January 1, 2021
Active Members	129	118
Terminated Members	18	18
Members in Pay Status	294	301
Total Count	441	437
Payroll	$11,128,632	$10,601,057

Assets and Liabilities as of	January 1, 2020	January 1, 2021
Market Value of Assets	$219,571,303	$229,554,784
Actuarial Value of Assets	223,171,968	227,490,769
Accrued Liability for Active Members	78,647,255	77,534,082
Accrued Liability for Terminated Members	4,956,619	5,248,808
Accrued Liability for Members in Pay Status	160,098,932	166,577,778
Total Accrued Liability	243,702,806	249,360,668
Unfunded Accrued Liability	20,530,838	21,869,899
Funded Ratio	91.6%	91.2%

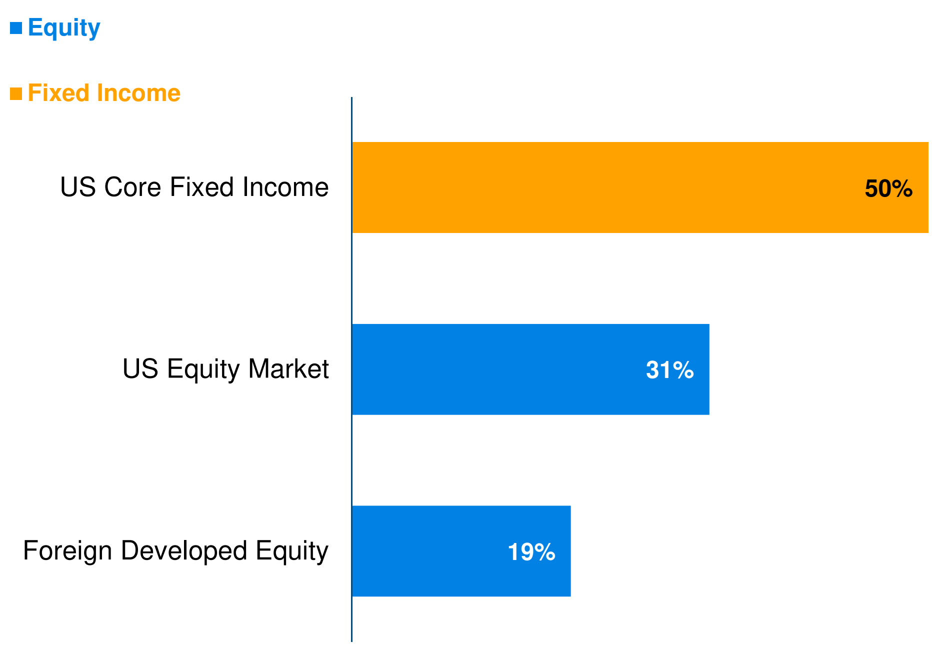
Actuarially Determined Contribution for Fiscal Year	2021-22	2022-23
Normal Cost	$2,706,024	$2,547,327
Past Service Cost	1,788,828	1,969,215
Interest	555,564	558,245
Actuarially Determined Contribution	5,050,416	5,074,787

Section II - Plan Assets
A. Summary of Fund Transactions

Market Value as of January 1, 2020	$219,571,303
Township Contributions	4,620,637
Member Contributions	240,092
Net Investment Income	17,869,320
Benefit Payments	(12,694,359)
Administrative Expenses	(52,209)
Market Value as of December 31, 2020	229,554,784
Market Value (Gain)/Loss	(4,936,157)
Approximate Rate of Return *	8.29%

* 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 December 31, 2020



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 January 1, 2021 is determined below.

1.	Expected Market Value of Assets:	
	a. Market Value of Assets as of January 1, 2020	$219,571,303
	b. Township and Member Contributions	4,860,729
	c. Benefit Payments and Administrative Expenses	(12,746,568)
	d. Expected Earnings Based on 6.00% Interest	12,933,163
	e. Expected Market Value of Assets as of January 1, 2021	224,618,627
2.	Actual Market Value of Assets as of January 1, 2021	229,554,784
3.	Market Value (Gain)/Loss: (1e) - (2)	(4,936,157)
4.	Delayed Recognition of Market (Gains)/Losses:	

Plan Year End	(Gain)/Loss	Percent Not Recognized	Amount Not Recognized	
12/31/2020	($4,936,157)	80%	($3,948,926)	
12/31/2019	(7,246,662)	60%	(4,347,997)	
12/31/2018	17,427,966	40%	6,971,186	
12/31/2017	(3,691,389)	20%	(738,278)	
				(2,064,015)

5.	Actuarial Value of Assets as of January 1, 2021: (2) + (4)	227,490,769
6.	Return on Actuarial Value of Assets:	12,204,640
7.	Approximate Rate of Return on Actuarial Value of Assets	5.57%
8.	Actuarial Value (Gain)/Loss	942,189

Section III - Development of Contribution
A. Past Service Cost

In determining the Past Service Cost, the Unfunded Accrued Liability is amortized as a level dollar over 20 years beginning January 1, 2018.

		January 1, 2020	January 1, 2021
1.	Accrued Liability		
	Active Members	$78,647,255	$77,534,082
	Terminated Members	4,956,619	5,248,808
	Members in Pay Status	160,098,932	166,577,778
	Total Accrued Liability	243,702,806	249,360,668
2.	Actuarial Value of Assets (see Section IIB)	223,171,968	227,490,769
3.	Unfunded Accrued Liability: (1) - (2)	20,530,838	21,869,899
4.	Funded Ratio: (2) / (1)	91.6%	91.2%
5.	Amortization Period	18	17
6.	Amortization Growth Rate	0.00%	0.00%
7.	Past Service Cost: (3) amortized over (5)	1,788,828	1,969,215

Section III - Development of Contribution
B. Actuarially Determined Contribution

		2021-22	2022-23
1.	Total Normal Cost	$2,908,571	$2,753,380
2.	Expected Member Contributions	266,947	259,853
3.	Expected Administrative Expenses	64,400	53,800
4.	Net Normal Cost: (1) - (2) + (3)	2,706,024	2,547,327
5.	Past Service Cost (see Section IIIA)	1,788,828	1,969,215
6.	Interest on (4) + (5) to the start of the fiscal year	555,564	558,245
7.	Actuarially Determined Contribution: (4) + (5) + (6)	5,050,416	5,074,787

Section III - Development of Contribution
C. Allocation of Contribution by Department

Contributions are allocated to each department on the basis of the Accrued Liability for members of the department relative to the total Accrued Liability. These percentages are shown below.

Department	Active Members	Terminated Vested Members	Members in Pay Status	Total
Accounting	0.00%	0.00%	1.20%	1.20%
Assessing	0.69%	0.00%	1.62%	2.31%
Building Inspection	0.32%	0.00%	1.70%	2.02%
Buildings & Grounds	0.74%	0.09%	0.52%	1.35%
Cable Studio	0.42%	0.09%	0.61%	1.12%
Clerk	0.00%	0.09%	0.53%	0.62%
Dispatch	0.50%	0.00%	2.08%	2.58%
Elections	0.00%	0.09%	0.53%	0.62%
Fire	6.54%	0.58%	22.76%	29.88%
Information Technology	1.05%	0.00%	0.00%	1.05%
Library	1.87%	0.06%	1.84%	3.77%
Motor Pool	0.85%	0.00%	2.13%	2.98%
Ordinance	0.00%	0.00%	0.66%	0.66%
Planning	0.18%	0.00%	0.29%	0.47%
Police	14.07%	0.91%	21.99%	36.97%
Road	1.68%	0.04%	3.07%	4.79%
Senior Services	0.24%	0.00%	0.11%	0.35%
Supervisor	0.25%	0.00%	0.84%	1.09%
Treasurer	0.07%	0.00%	0.70%	0.77%
Village Police	0.00%	0.00%	0.10%	0.10%
Water & Sewer	1.63%	0.15%	3.52%	5.30%
Total	31.10%	2.10%	66.80%	100.00%

Section III - Development of Contribution
D. Long Range Forecast

This forecast is based on the results of the January 1, 2021 actuarial valuation and assumes that the Township will pay the Actuarially Determined Contribution each year, the assets will return the assumed interest rate on a market value basis each year, and there are no future changes in the actuarial methods or assumptions or in the plan provisions. Actual results at each point in time will yield different values, reflecting the actual experience of the plan membership and assets.

	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	Township Contributions	Member Contributions	Benefit Payments	Net Cash Flows
01/01/2021	$249,360,668	$227,490,769	$21,869,899	91.2%	2022-23	$5,074,787	$259,628	($13,739,355)	($8,404,940)
01/01/2022	253,278,000	232,445,000	20,833,000	91.8%	2023-24	5,048,000	257,000	(14,019,000)	(8,714,000)
01/01/2023	257,204,000	236,774,000	20,430,000	92.1%	2024-25	5,065,000	248,000	(14,598,000)	(9,285,000)
01/01/2024	261,047,000	244,593,000	16,454,000	93.7%	2025-26	4,620,000	230,000	(15,252,000)	(10,402,000)
01/01/2025	264,423,000	250,695,000	13,728,000	94.8%	2026-27	4,171,000	221,000	(15,799,000)	(11,407,000)
01/01/2026	267,103,000	254,965,000	12,138,000	95.5%	2027-28	3,936,000	200,000	(16,482,000)	(12,346,000)
01/01/2027	269,247,000	258,454,000	10,793,000	96.0%	2028-29	3,647,000	188,000	(16,910,000)	(13,075,000)
01/01/2028	270,598,000	261,185,000	9,413,000	96.5%	2029-30	3,405,000	171,000	(17,399,000)	(13,823,000)
01/01/2029	271,433,000	263,326,000	8,107,000	97.0%	2030-31	3,150,000	161,000	(17,889,000)	(14,578,000)
01/01/2030	271,640,000	264,824,000	6,816,000	97.5%	2031-32	2,916,000	145,000	(18,514,000)	(15,453,000)
01/01/2031	271,214,000	265,632,000	5,582,000	97.9%	2032-33	2,633,000	128,000	(19,095,000)	(16,334,000)
01/01/2032	269,928,000	265,587,000	4,341,000	98.4%	2033-34	2,315,000	108,000	(19,653,000)	(17,230,000)
01/01/2033	267,760,000	264,628,000	3,132,000	98.8%	2034-35	1,927,000	90,000	(20,000,000)	(17,983,000)
01/01/2034	264,635,000	262,686,000	1,949,000	99.3%	2035-36	1,553,000	74,000	(20,416,000)	(18,789,000)
01/01/2035	260,772,000	259,851,000	921,000	99.6%	2036-37	1,153,000	63,000	(20,482,000)	(19,266,000)
01/01/2036	256,069,000	256,015,000	54,000	100.0%	2037-38	717,000	50,000	(20,618,000)	(19,851,000)
01/01/2037	250,904,000	251,454,000	(550,000)	100.2%	2038-39	0	34,000	(20,821,000)	(20,787,000)
01/01/2038	245,148,000	246,015,000	(867,000)	100.4%	2039-40	0	22,000	(20,808,000)	(20,786,000)
01/01/2039	238,667,000	239,283,000	(616,000)	100.3%	2040-41	0	15,000	(20,686,000)	(20,671,000)
01/01/2040	231,696,000	232,145,000	(449,000)	100.2%	2041-42	0	13,000	(20,426,000)	(20,413,000)

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

Valuation Date	Actuarial Value of Assets	Accrued Liability	Unfunded Accrued Liability	Funded Ratio
January 1, 2013	$127,620,304	$207,921,175	$80,300,871	61.4%
January 1, 2014	218,093,625	187,794,369	(30,299,256)	116.1%
January 1, 2015	222,705,325	196,449,788	(26,255,537)	113.4%
January 1, 2016	224,127,478	209,302,751	(14,824,727)	107.1%
January 1, 2017	224,014,077	217,109,347	(6,904,730)	103.2%
January 1, 2018	223,568,307	225,992,017	2,423,710	98.9%
January 1, 2019	223,182,109	231,858,972	8,676,863	96.3%
January 1, 2020	223,171,968	243,702,806	20,530,838	91.6%
January 1, 2021	227,490,769	249,360,668	21,869,899	91.2%

Section III - Development of Contribution
F. History of Township Contributions

Fiscal Year	Actuarially Determined Contribution	Actual Township Contribution	Payroll	Actual Contribution as a Percent of Payroll
2013-14	$10,357,678	$90,657,678	$14,862,788	610.0%
2014-15	0	0	14,159,863	0.0%
2015-16	0	0	13,711,213	0.0%
2016-17	0	0	13,603,792	0.0%
2017-18	0	0	12,575,569	0.0%
2018-19	3,718,845	3,718,845	11,858,422	31.4%
2019-20	3,506,480	3,506,480	12,273,467	28.6%
2020-21	4,120,637	4,620,637	12,138,645	38.1%
2021-22	5,050,416	TBD	11,128,632	TBD
2022-23	5,074,787	TBD	10,601,057	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	Retirees in Pay Status	Beneficiaries In Pay Status	Total
Count January 1, 2020	129	18	276	18	441
Terminated					
- no benefits due	-	-	-	-	0
- paid refund	-	-	-	-	0
- vested benefits due	-	-	-	-	0
Retired	(11)	-	11	-	0
Died					
- with beneficiary	-	-	(1)	1	0
- no beneficiary	-	-	(4)	-	(4)
Benefits expired	-	-	-	-	0
New member	-	-	-	-	0
Rehired	-	-	-	-	0
New Alternate Payee	-	-	-	-	0
Correction	-	-	-	-	0
Count January 1, 2021	118	18	282	19	437

Section IV - Membership Data
B. Statistics of Active Membership

	As of January 1, 2020	As of January 1, 2021
Library		
Number of Active Members	13	13
Average Age	53.4	54.4
Average Service	18.0	19.0
Total Payroll	$955,806	$998,529
Average Payroll	73,524	76,810
Non-Library		
Number of Active Members	116	105
Average Age	47.5	47.5
Average Service	19.8	20.4
Total Payroll	$10,172,826	$9,602,528
Average Payroll	87,697	91,453
Plan Total		
Number of Active Members	129	118
Average Age	48.1	48.3
Average Service	19.6	20.3
Total Payroll	$11,128,632	$10,601,057
Average Payroll	86,268	89,839

Section IV - Membership Data
C. Statistics of Inactive Membership

	As of January 1, 2020	As of January 1, 2021
Terminated Vested Members		
Library		
Number	1	1
Total Annual Benefit	$12,836	$12,836
Average Annual Benefit	12,836	12,836
Average Age	48.0	49.0
Non-Library		
Number	17	17
Total Annual Benefit	$397,279	$397,279
Average Annual Benefit	23,369	23,369
Average Age	45.1	46.1
Plan Total		
Number	18	18
Total Annual Benefit	$410,115	$410,115
Average Annual Benefit	22,784	22,784
Average Age	45.3	46.3
Nonvested Members Due Refunds		
Number	0	0
Participants Receiving Benefits		
Library		
Number	16	14
Total Annual Benefit	$378,090	$356,038
Average Annual Benefit	23,631	25,431
Average Age	76.3	74.9
Non-Library		
Number	278	287
Total Annual Benefit	$12,128,164	$12,819,578
Average Annual Benefit	43,626	44,668
Average Age	69.6	70.1
Plan Total		
Number	294	301
Total Annual Benefit	$12,506,254	$13,175,616
Average Annual Benefit	42,538	43,773
Average Age	69.9	70.3

Section IV - Membership Data
D. Distribution of Inactive Members as of January 1, 2021

Terminated Vested Members

	Library		Non-Library	
Age	Number	Annual Benefits	Number	Annual Benefits
< 50	1	$12,836	12	$293,900
50 - 59	0	0	5	103,379
60 - 69	0	0	0	0
70 - 79	0	0	0	0
80 - 89	0	0	0	0
90 +	0	0	0	0
Total	1	12,836	17	397,279

Participants Receiving Benefits

	Library		Non-Library	
Age	Number	Annual Benefits	Number	Annual Benefits
< 50	0	$0	1	28,344
50 - 59	0	0	45	2,795,776
60 - 69	6	220,303	102	5,044,797
70 - 79	4	76,115	88	3,692,323
80 - 89	2	34,075	45	1,146,594
90 +	2	25,545	6	111,744
Total	14	356,038	287	12,819,578

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.

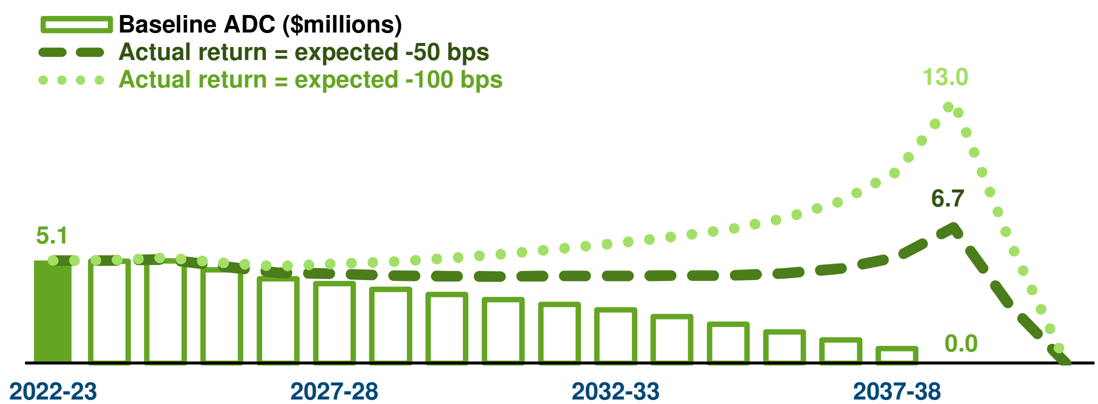
Please see Section III C for more information on the basis for the projected results shown on the following pages.

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.

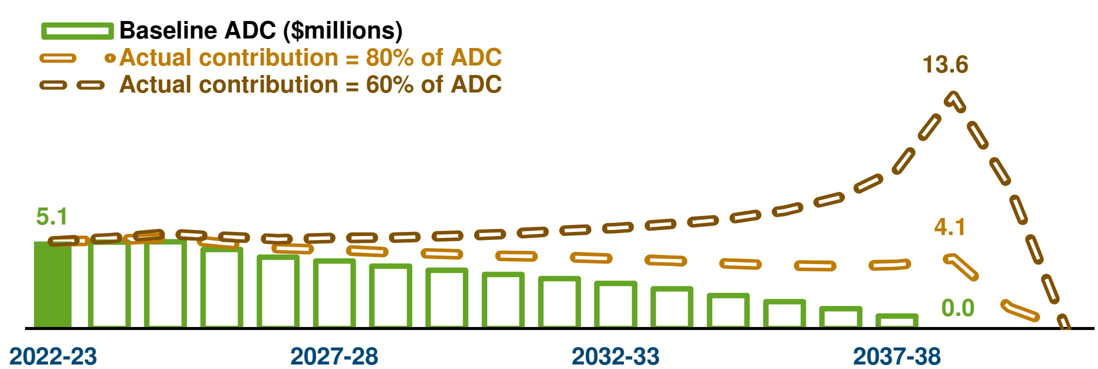
Identification: To the extent that actual investment returns differ from the assumed investment return, the plan's future assets, Actuarially Determined Contributions, and funded status may differ significantly from those presented in this valuation. The consequences of persistent underperformance on 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 several years, actual contributions have been $0 due to full funding. Starting in FY 2018-19, contributions greater than $0 are required, at least 100% of these Actuarially Determined Contributions have been contributed. 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.

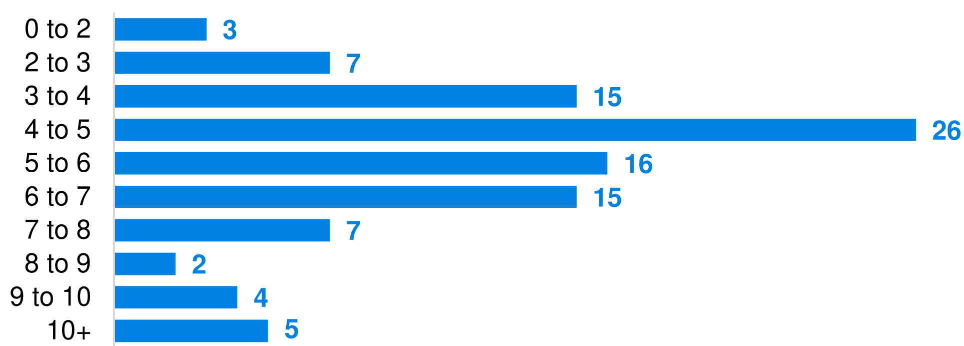
Identification: In 2020-21, the plan had negative cash flow, with town and member contributions to the plan of $4,860,729 compared to $12,746,568 of benefit payments and administrative expenses paid out of the plan. We suggest that you consult with your investment advisors with respect to the liquidity 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 January 1, 2021, the plan's Asset Voliatility Ratio (the ratio of the market value of plan assets to payroll) is 21.7. 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 provides for some postretirement benefit increases, but the increases are not directly tied to each year's rate of actual inflation; this leaves members bearing some inflation risk.

Section V - Analysis of Risk
B. Risk Identification and Assessment

Insolvency Risk

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

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

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

Demographic Risks

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

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

Retirement Risk

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

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

Pensionable Earnings Risk

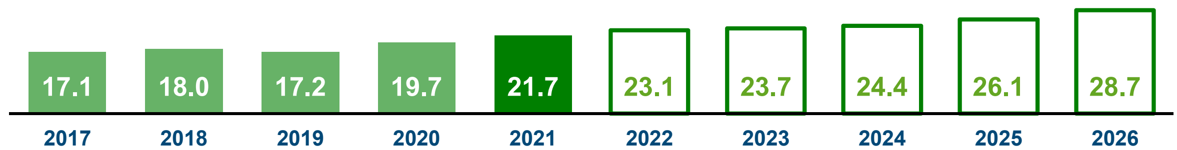
Definition: This is the potential for active members to add items to their pensionable earnings and receive pension benefits that are higher than expected.

Identification: This plan's pensionable earnings includes longetivity adjustments but excludes overtime commisions, bonuses and other compensation.

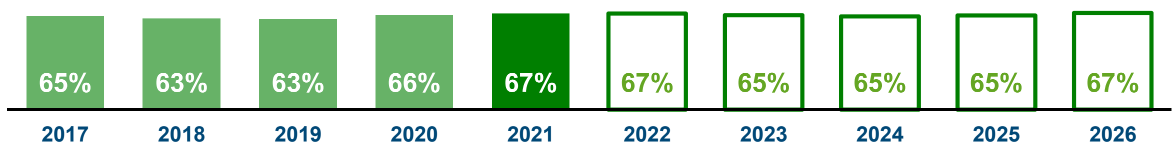
Section V - Analysis of Risk
C. Maturity Measures

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.

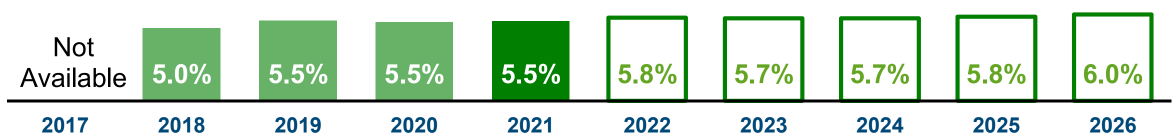
Asset Volatility Ratio: Market Value of Assets compared to Payroll



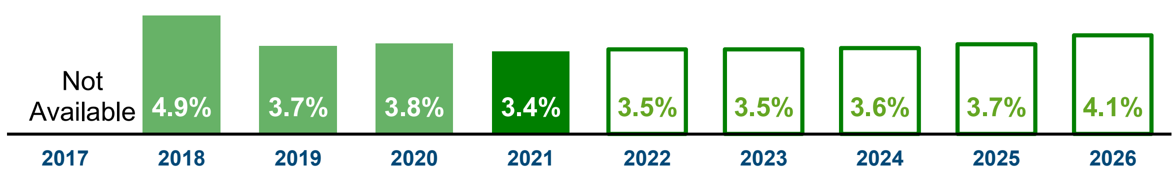
Accrued Liability for members in pay status compared to total Accrued Liability



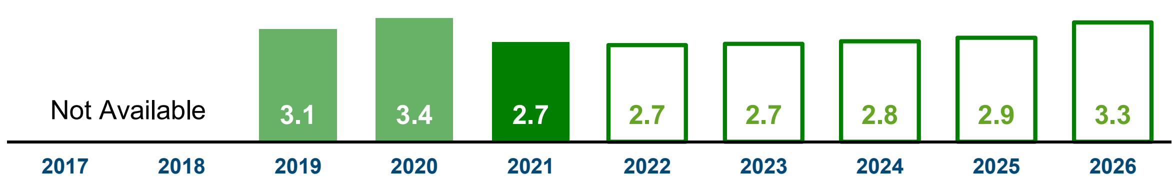
Benefit Payments compared to Market Value of Assets



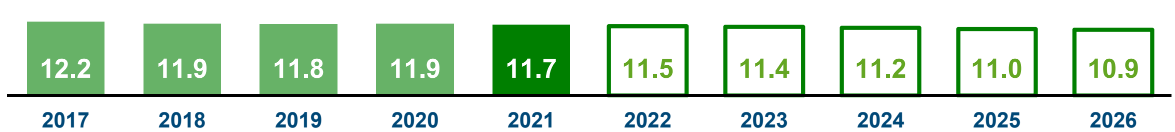
Net Cash Flows compared to Market Value of Assets



Benefit Payments compared to Township 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 dollar over 20 years beginning January 1, 2018.

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

The long-range forecasts included in this report have been developed by assuming that members will terminate, retire, become disabled, and die according to the actuarial assumptions with respect to these causes of decrement, and that pay increases, cost of living adjustments, and so forth will likewise occur according to the actuarial assumptions.

Appendix B - Actuarial Assumptions

Each of the assumptions used in this valuation was set based on industry standard published tables and data, the particular characteristics of the plan, relevant information from the plan sponsor or other sources about future expectations, and our professional judgment regarding future plan experience. We believe the assumptions are reasonable for the contingencies they are measuring, and are not anticipated to produce significant cumulative actuarial gains or losses over the measurement period.

Interest Rate 6.00%

Inflation 2.50%

Amortization Growth Rate 0.00%

Estimated Expenses The prior year's administrative expenses increased by 3.0% and rounded to the nearest $100.

Salary Scale 3.50%

Turnover 50% of Prudential Scale 1/2A

Age	Male	Female
<25	2.500%	3.750%
30	1.875%	2.500%
35	1.250%	1.875%
40	0.750%	1.250%
45	0.375%	0.625%
50+	0.000%	0.000%

Retirement

	Years of Service	
Age	<25 Years	25+ Years
52	10%	25%
53-54	15%	25%
55	20%	30%
56-59	0%	0%
60	20%	100%
61	0%	
62	50%	
63-64	0%	
65	100%	

Marital Status 80% of active participants are assumed to be married. Female spouses are assumed to be 3 years younger than male spouses.

Cost of Living Adjustment 1.0% per year for life.

Appendix B - Actuarial Assumptions

Disability

Table C-4 of the Society of Actuaries Transactions Volume XXXIX, 100% of the 6-month rates

Age	Male	Female
20	0.080%	0.100%
25	0.085%	0.110%
30	0.099%	0.140%
35	0.124%	0.201%
40	0.176%	0.276%
50	0.540%	0.622%
55	0.977%	0.932%
60	1.477%	1.179%
62	1.671%	1.253%

These rates apply to members in Divisions eligible for disability benefits. We assume 25% Non-service and 75% Service Disability.

Mortality

General Administrative Employees, Library Employees and Police Department Civilians: PubG-2010 Mortality Table with Modified Scale MP-2019 (Prior: MP-2018), with employee rates before benefit commencement and healthy or disabled annuitant rates after benefit commencement. This assumption includes a margin for future improvements in longevity.

Fire Department Bargaining Members, Police Department Command Officers, Police Department Bargaining Members and Fire Department Command Officers: PubS-2010 Mortality Table with Modified Scale MP-2019 (Prior: MP-2018), with employee rates before benefit commencement and healthy or disabled annuitant rates after benefit commencement. This assumption includes a margin for future improvements in longevity.

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.

Rate of Earnings

Basic compensation including longevity adjustments but excluding overtime, commisions, bonuses and any other additional compensation.

Final Earnings

General Administrative Employees, Police Department Civilians and Police Department Command Officers: Average Rate of Earnings as of the highest three consecutive May 1's during the last 10 years before Retirement Date.

Fire Department Bargaining Members, Police Department Bargaining Members and Fire Department Command Officers: Average Rate of Earnings as of the highest three consecutive May 1's before Retirement Date.

Library Employees and Bloomfield Village Police: Average Rate of Earnings as of the highest five consecutive May 1's during the last 10 years before Retirement Date.

Credited Service

Whole years and full months of service from date of employment to the earlier of retirement, termination or death.

Form of Annuity

Modified Cash Refund with 50% benefit continuation to the spouse. Members who are not married receive an actuarially increased benefit.

Vesting

Police Department Command Officers and Police Department Bargaining Officers: 100% after 10 years of service or Normal Retirement Date.

All Others: 100% after 8 years of service or Normal Retirement Date.

Cost of Living Adjustment

1% increase each January 1.

Normal Retirement Date

General Administrative Employees and Police Department Civilians: Age 52 with 8 years of service or 30 years of service.

Library Employees: Age 55 with 8 years of service.

Fire Department Bargaining Members and Fire Department Command Officers: Age 52 with 8 years of service.

Bloomfield Village Police: Age 55 with 10 years of service or age 60 with 8 years of service.

Appendix C - Summary of Plan Provisions

Normal Retirement Benefit

Equal to a percentage of Final Earnings multiplied by years of Credited Service with a cap on the overall benefit.

Division	Multiplier	Benefit Cap	Cap Effective
General Administrative Employees	2.85%	90%*	06/01/2005
Library Employees	2.10%	None	
Fire Dpt. Bargaining Members	2.75%	80%	07/08/1996
Police Dpt. Civilians	2.85%	90%*	06/02/2005
Police Dpt. Command Officers	3.00%	90%	04/27/2000
Police Dpt. Bargaining Members	3.00%	85%	04/01/1999
Bloomfield Village Police	2.10%	None	
Fire Dpt. Command Officers	2.75%	80%	12/18/1996

* applies to members with 36 or fewer years of Credited Service on April 1, 1996.

Early Retirement Eligibility

Age 50 with a Vesting Percentage of 100%.

Early Retirement Benefit

Normal Retirement Benefit reduced by 0.5% for each month that Early Retirement Date precedes Normal Retirement Date.

Disability Eligibility

Fire Department Bargaining Members, Police Department Command Officers, Police Department Bargaining Members and Fire Department Command Officers are eligible. These members are eligible immediately.

Non-Service Disability Benefit

2.75% (3.00% for Police Department Command Officers and Police Department Bargaining Members) of Final Earnings multiplied by Credited Service as of the date of disability.

Service Disability Benefit

2.75% (3.00% for Police Department Command Officers and Police Department Bargaining Members) of Final Earnings as of the date of disability, adjusted by increases negotiated by job classification between date of disability and the earlier of the date the participant is no longer disabled or Normal Retirement Date, multiplied by Credited Service calculated from date of employment through the earlier of the date the participant is no longer disabled or Normal Retirement Date.

Preretirement Death Benefit Eligibility

Library Employees and Bloomfield Village Police are not eligible for this benefit. All other active members are eligible once they have met criteria for 100% Vesting.

Preretirement Death Benefit

50% of the benefit accrued to date of death. If eligible for early retirement, 100% of the benefit accrued to date of death.

Preretirement Spouse Benefit Eligibility

Active Library Employees and Bloomfield Village Police that are eligible for Early Retirement and married.

Appendix C - Summary of Plan Provisions

Preretirement Death Benefit

100% of the benefit accrued to date of death.

Employee Contributions

Active members contribute a percentage of earnings based on Division:

Division	% Earnings
General Administrative Employees	2.0%
Library Employees	5.0%
Fire Dpt. Bargaining Members	1.0%
Police Dpt. Civilians	2.0%
Police Dpt. Command Officers	3.5%
Police Dpt. Bargaining Members	3.5%
Bloomfield Village Police	5.0%
Fire Dpt. Command Officers	1.0%

Employee Contributions are credited with interest at a rate of 5.0% per annum.

Death or Termination Refund

Pre-retirement: Refund of Employee Contributions with interest to date of termination or death.

Post-retirement: Refund of the excess of Employee Contributions with interest over annuity payments made to date of death, unless the form of annuity elected is other than the Normal Form.

Eligibility

Any employees hired or rehired after the freeze dates below are not eligible to enter the Plan.

Division	Freeze Date
General Administrative Employees	06/01/2005
Library Employees	12/31/2012
Fire Dpt. Bargaining Members	06/17/2008
Police Dpt. Civilians	06/01/2005
Police Dpt. Command Officers	06/07/2006
Police Dpt. Bargaining Members	06/07/2006
Bloomfield Village Police	12/31/2012
Fire Dpt. Command Officers	06/17/2008

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.