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February 15, 2018

Bloomington Fire Department Relief Association
10 West 95th Street
Bloomington, Minnesota 55420

Re: Actuarial Valuation Report as of January 1, 2018
Bloomington Fire Department Relief Association Pension Fund

Dear Board Members:

As requested, we have performed an actuarial valuation of the Bloomington Fire Department Relief Association Pension Fund ("the Fund") as of January 1, 2018, for the Plan Year ending December 31, 2018. Our findings are set forth in this actuarial valuation report.

The actuarial valuation was performed using information (verbal and written) as of the valuation date, furnished by the Bloomington Fire Department Relief Association and the Fund's accountant. This information includes, but is not limited to, plan documents and statutory provisions, employee data, and financial information. This data was relied upon as submitted. Although we have not performed a detailed audit of the data provided, we have reviewed the data for reasonableness and consistency. Since the results are dependent on the integrity of the data supplied, the results can be expected to differ if the underlying data is incomplete or missing. It should be noted that if any data or other information is inaccurate or incomplete, our calculations may need to be revised.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with our understanding of the requirements of Sections 356.20 through 356.23 and Section 69.77, Minnesota Statutes ("the Statutes"), the Standards for Actuarial Work established by the State of Minnesota Legislative Commission on Pensions and Retirement ("LCPR"), and the generally recognized and accepted actuarial principles and practices which are consistent with the principles prescribed by the Actuarial Standards Board and the Code of Professional Conduct and Qualification Standards for Public Statements of Actuarial Opinion of the American Academy of Actuaries. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein. In addition, Mr. Behar and Mr. Herman meet the requirements of "approved actuary" under Section 356.215, Subdivision 1, Paragraph (c) of Minnesota Statutes.

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The work product was prepared solely for the Board of Trustees for the Bloomington Fire Department Relief Association. It may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. Any distribution of this work should be in its entirety.

All costs, liabilities, rates of interest, and other factors for the Fund have been determined on the basis of actuarial assumptions and methods as described in the Summary of Actuarial Assumptions and Methods in Table 12. Certain actuarial assumptions and methods used in this valuation are prescribed by the Statutes and are noted therein. The remaining actuarial assumptions are individually reasonable (taking into account the experience of the Fund and reasonable expectations); and which, in combination, offer our best estimate of anticipated experience affecting the Fund.

Actuarial computations under the Statutes are for purposes of determining the funded status and the contribution sufficiency for the Fund.

The calculations in the enclosed report have been made on a basis consistent with our understanding of the Statutes and the Standards for Actuarial Work established by the LCPR. Determinations for purposes other than meeting the requirements of the Statutes may be significantly different from the results contained in this report. Accordingly, additional determinations are needed for other purposes, such as judging benefit security at plan termination.

This valuation report is only an estimate of the Fund's financial condition as of a single date. It can neither predict the Fund's future condition nor guarantee future financial soundness. Actuarial valuations do not affect the ultimate cost of benefits, only the timing of contributions. This valuation is based assumptions as described in the Summary of Actuarial Assumptions and Methods. Other assumption sets may also be reasonable and valuation results based on those assumptions would be different. No one set of assumptions is uniquely correct. Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as 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 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 our assignment, we did not perform an analysis of the potential range of future measurements.

Actuarial computations presented in this report are for purposes of determining the recommended funding amounts for the Fund. The calculations in the enclosed report have been made on a basis consistent with our understanding of the Fund's funding requirements and goals. Note that analysis of the impact of GASB Statements No. 67 and No. 68 are outside the scope of this report and provided in a separate report.

Milliman's work is prepared solely for the use and benefit of the Fund. 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 exception(s):

(a) The Fund may provide a copy of Milliman's work, in its entirety, to the Fund'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 Fund. (b) The Fund 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.

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 impair the objectivity of our work.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

We respectfully submit this report, and we look forward to discussing it with you.

Respectfully submitted,

Timothy J. Herman, FSA, MAAA, EA	Robert A. Behar, FSA, MAAA, EA
Principal & Consulting Actuary	Principal & Consulting Actuary

Bloomington Fire Department Relief Association
Table of Contents

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Bloomington Fire Department Relief Association
Report Highlights

	January 1, 2017 Valuation	January 1, 2018 Valuation
A. CONTRIBUTIONS % OF PAYROLL (Table 11)		
1. Relief Association financial requirements - Section 69.77	18.40%	4.25%
2. Minimum City of Bloomington obligation - Section 69.77	13.28%	(1.23%)
B. FUNDING RATIOS		
1. Accrued Benefit Funding Ratio		
a. Current Assets (Table 1)	$155,275,402	$175,842,396
b. Current Benefit Obligations (Table 8)	141,698,640	147,765,500
c. Funding Ratio	109.58%	119.00%
2. Accrued Liability Funding Ratio		
a. Current Assets (Table 1)	$155,275,402	$175,842,396
b. Actuarial Accrued Liability (Table 9)	139,574,319	145,849,298
c. Funding Ratio	111.25%	120.56%
3. Projected Benefit Funding Ratio (Table 8)		
a. Current and Expected Future Assets	$187,170,492	$205,094,120
b. Current and Expected Future Benefit Obligations	171,469,409	175,101,022
c. Funding Ratio	109.16%	117.13%
C. PLAN PARTICIPANTS		
1. Active Members		
a. Number (Table 3A)	125	114
b. Projected Annual Benchmark Earnings	$11,003,580	$10,513,294
c. Average Annual Benchmark Earnings (Actual dollars)	$88,029	$92,222
d. Average Age	38.9	39.6
e. Average Service	10.1	10.6
f. Additional Members on Leave of Absence	-	-
2. Others		
a. Service Retirements (Table 4)	151	164
b. Disability Retirements (Table 5)	17	11
c. Survivors (Table 6)	26	28
d. Deferred Retirements (Table 3B)	14	12
e. Terminated Other Non-Vested (Table 7)	-	-
f. Total	208	215

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Bloomington Fire Department Relief Association
Commentary

Purpose

The purpose of this valuation is to determine the financial status of the Plan. To achieve this purpose, an actuarial valuation is made at the beginning of each fiscal year as required by Section 69.77 of Minnesota Statutes.

Report highlights

The financial status of the Plan can be measured by three different funding ratios:

The *Accrued Benefit Funding Ratio* is a measure of current funding status and, when viewed over a period of years, presents a view of the funding progress. It is based upon benefits that have been earned by service to the valuation date. This year's ratio is 119.00%. The corresponding ratio for the prior year was 109.58%.

The *Accrued Liability Funding Ratio* is also a measure of funding status and funding progress. It is based on the actuarial cost method that has historically been used by the State. For 2018 the ratio is 120.56%, which is an increase from the 2017 value of 111.25%.

The *Projected Benefit Funding Ratio* is a measure of the adequacy or deficiency in the contribution level. This year's ratio of 117.31% shows that the current statutory contributions have a surplus over full funding.

Asset information (Tables 1 and 2)

The actuarial value of assets is determined as the market value of the Special Fund as of December 31, 2017, less liabilities payable as of December 31, 2017. The calculation of the actuarial value of assets is shown in Table 1.

The term “Actuarial Value of Assets” is used to indicate that the value was determined for use in this actuarial valuation. Since Minnesota Statutes refer to this value as “Current Assets”, the latter phrase will be used in some sections of this report.

Actuarial balance sheet (Table 8)

An actuarial balance sheet provides a method for evaluating current and future levels of funding. The current benefit obligation used to measure current funding level is calculated as follows:

For active members – a benchmark salary and service are projected to retirement to determine benefits for each member and the ratio of credited service to total service establishes the portion of the projected benefit to be used in calculating the current funding level.

For non-active members - the discounted value of benefits.

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Actuarial cost method (Table 9)

The approach used by the Bloomington Fire Department Relief Association to determine funding requirements is the “Entry Age Normal” actuarial cost method. The primary characteristic of this method is that it allocates costs as a level of percentage of benchmark payroll.

A comparison of this actuarial method (Table 9) to the actuarial balance sheet (Table 8) illustrates the two techniques for allocating liabilities of active members to past and future. As noted in the prior section, the balance sheet allocates benefits and the corresponding liabilities, on the basis of service. The method used in Table 9 allocates liabilities so that the cost each year will be a constant percentage of payroll. Both approaches, however, calculate the value of all future benefits the same way (see line F of Table 8 and line A5, column 1, of Table 9).

An unfunded actuarial accrued liability, Table 9, line B3, is computed under the entry age normal actuarial cost method by comparing the liabilities allocated to past service (actuarial accrued liability) to the current assets.

For the first plan year in which current assets are less than the actuarial accrued liability, an initial base is established equal to the initial unfunded actuarial accrued liability (UAAL) and is amortized as a level dollar amount over 20 years. For subsequent years in which the UAAL exceeds $0, bases will be established for actuarial losses, assumption changes, and plan amendments to be amortized over 20 years as a level dollar amount from the date of the establishment of the base and will be incorporated into the required contribution development.

If however, current assets exceed the actuarial accrued liability, a supplemental credit equal to 10% of the excess is used to offset the normal cost and expense determination of the required contribution. In addition, all previously unamortized bases that existed at the beginning of the plan year prior to the attainment of current assets exceeding actuarial accrued liabilities shall be considered fully amortized at the end of that prior plan year.

Sources of actuarial gains and losses (Table 10)

The assumptions used in making the calculations using the entry age normal actuarial cost method are based on long-term expectations. Each year, the actual experience will deviate from the long-term expectation. For an analysis of the major components of the actuarial gain or loss refer to Table 10.

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Determination of Minimum Bloomington Obligation (Table 11)

This report determines the Minimum Bloomington Obligation. This amount is the Relief Association's Financial Requirement, less the amounts paid by Member and State of Minnesota contributions.

The required contributions, set forth in Chapter 69, consist of:

A normal cost based on the entry age normal actuarial cost method.

A supplemental contribution for amortizing any unfunded actuarial accrued liability (the Fund is allowed a credit toward required contributions equal to 10% of the unfunded actuarial accrued liability, if it is negative) as of the valuation date.

An allowance for expenses.

Table 11 shows the estimate of the current year minimum obligation of zero for the City of Bloomington assuming the State of Minnesota makes a contribution equal to the prior year's contribution.

Changes in actuarial assumptions

All actuarial assumptions are the same as those used in the prior valuation. Table 12 contains a summary of all actuarial assumptions and methods.

Changes in plan provisions

All plan provisions are the same as those used in the prior valuation. Table 13 contains a summary of current plan benefits.

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Bloomington Fire Department Relief Association
Accounting Balance Sheet

January 1, 2018

	Market Value
A. ASSETS	
1. Cash, Equivalents, Short-Term Securities	$ 46,410
2. Investments	
a. Fixed Income	-
b. Equity	-
c. Real Estate	-
3. Other Assets	176,256,614
B. TOTAL ASSETS	$176,303,024
C. AMOUNTS CURRENTLY PAYABLE	$ (460,628)
D. ASSETS AVAILABLE FOR BENEFITS	
1. Total Assets	$175,842,396
2. Unrestricted Fund Balance	-
3. Total Assets Available for Benefits	$175,842,396
E. TOTAL AMOUNTS CURRENTLY PAYABLE AND ASSETS AVAILABLE FOR BENEFITS	$176,303,024
F. DETERMINATION OF ACTUARIAL VALUE OF ASSETS	
1. Market Value of Assets Available for Benefits (D.3)	$175,842,396
2. Actuarial Value of Assets (F.1)	$175,842,396

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Bloomington Fire Department Relief Association
Change in Assets Available for Benefits

December 31, 2017

	Market Value
A. ASSETS AVAILABLE AT BEGINNING OF PERIOD	$155,275,402
B. OPERATING REVENUES	
1. Member Contributions	$ -
2. State of Minnesota Contributions	576,114
3. City of Bloomington Contributions	1,057,759
4. Investment Income	14,833
5. Investment Expenses	(106,201)
6. Net Gain / (Loss)	24,134,599
7. Other	-
8. Net Change in Unrealized Gain / (Loss)	-
8. Total Operating Revenue	$ 25,677,104
C. OPERATING EXPENSES	
1. Service Retirements	$ (5,476,046)
2. Disability Benefits[1]	-
3. Survivor Benefits[1]	-
4. Refunds	-
5. Administrative Expenses	(94,692)
6. Total Operating Expenses	$ (5,570,738)
D. OTHER CHANGES IN RESERVES	$ 460,628
E. ASSETS AND PAYABLES AT END OF PERIOD	$175,842,396

[1] Included in Item C.1

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Bloomington Fire Department Relief Association

TABLE 3A

Active Members as of December 31, 2017

Participant Count

Age	YEARS OF SERVICE <1	1-4	5-9	10-14	15-19	20-24	25-29	30+	TOTAL
<25	-	1	1	-	-	-	-	-	2
25-29	-	11	2	-	-	-	-	-	13
30-34	-	10	4	5	-	-	-	-	19
35-39	-	7	2	11	4	-	-	-	24
40-44	-	3	4	8	11	-	1	-	27
45-49	-	1	2	1	9	5	2	-	20
50-54	-	-	1	1	5	-	-	-	7
55-59	-	-	-	-	1	-	-	-	1
60-64	-	-	-	-	1	-	-	-	1
65+	-	-	-	-	-	-	-	-	-
All	-	33	16	26	31	5	3	-	114

TABLE 3B

Deferred Vested Members as of December 31, 2017

Participant Count

Age	YEARS OF RETIREMENT <1	1-4	5-9	10-14	15-19	20-24	25-29	30+	TOTAL
<50	12	-	-	-	-	-	-	-	12
50-54	-	-	-	-	-	-	-	-	-
55-59	-	-	-	-	-	-	-	-	-
60-64	-	-	-	-	-	-	-	-	-
65-69	-	-	-	-	-	-	-	-	-
70-74	-	-	-	-	-	-	-	-	-
75-79	-	-	-	-	-	-	-	-	-
80-84	-	-	-	-	-	-	-	-	-
85+	-	-	-	-	-	-	-	-	-
All	12	-	-	-	-	-	-	-	12

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Bloomington Fire Department Relief Association

TABLE 4

Service Retired Members as of December 31, 2017

Participant Count

Age	YEARS OF RETIREMENT ≤1	1-4	5-9	10-14	15-19	20-24	25-29	30+	TOTAL
<50	-	-	-	-	-	-	-	-	-
50-54	7	19	-	2	1	-	-	-	29
55-59	1	3	11	2	2	1	-	-	20
60-64	-	1	5	22	2	2	-	1	33
65-69	-	-	-	6	15	1	-	-	22
70-74	-	-	-	-	6	15	-	-	21
75-79	-	-	-	-	1	1	23	2	27
80-84	-	-	-	-	-	-	-	8	8
85+	-	-	-	-	-	-	-	4	4
All	8	23	16	32	27	20	23	15	164

TABLE 5

Disabled Members as of December 31, 2017

Participant Count

Age	YEARS OF RETIREMENT ≤1	1-4	5-9	10-14	15-19	20-24	25-29	30+	TOTAL
<50	2	4	2	1	-	-	-	-	9
50-54	-	1	-	-	-	-	-	-	1
55-59	-	-	1	-	-	-	-	-	1
60-64	-	-	-	-	-	-	-	-	-
65+	-	-	-	-	-	-	-	-	-
All	2	5	3	1	-	-	-	-	11

TABLE 6

Survivor Members as of December 31, 2017

Participant Count

Age	YEARS OF RETIREMENT ≤1	1-4	5-9	10-14	15-19	20-24	25-29	30+	TOTAL
<50	1	-	-	-	-	-	-	-	1
50-54	-	-	-	-	-	-	-	-	-
55-59	-	-	-	-	-	-	-	-	-
60-64	-	1	-	-	-	-	-	1	2
65-69	-	1	1	-	-	1	-	1	4
70-74	-	-	1	-	-	-	-	2	3
75-79	-	2	-	-	-	-	1	5	8
80-84	-	-	-	1	1	-	-	3	5
85+	-	-	1	-	-	-	-	4	5
All	1	4	3	1	1	1	1	16	28

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Bloomington Fire Department Relief Association
Reconciliation of Members

		Actives	Deferred Retirement
A.	ON JANUARY 1, 2017	125	14
B.	ADDITIONS	-	3
C.	DELETIONS		
1.	Service Retirement	(3)	(5)
2.	Disability	(2)	
3.	Death – Survivor		
4.	Death – Other		
5.	Terminated – Deferred	(3)	
6.	Terminated – Refund		
7.	Terminated – Other Non-Vested	(3)	
8.	Leave of Absence		
9.	Returned as Active		
D.	DATA ADJUSTMENTS		
	Vested	7	12
	Non-Vested	107	-
E.	TOTAL ON DECEMBER 31, 2017	114	12

		Recipients		
		Retirement Annuitants	Disabled	Survivors
A.	ON JANUARY 1, 2017	151	17	26
B.	ADDITIONS	16	2	2
C.	DELETIONS		(8)	
1.	Service Retirement			
2.	Death	(3)		
3.	Annuity Expired			
4.	Returned as Active			
D.	DATA ADJUSTMENTS			
E.	TOTAL ON DECEMBER 31, 2017	164	11	28

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Bloomington Fire Department Relief Association
Actuarial Balance Sheet

January 1, 2018

	Non-Vested	Vested	Total
A. CURRENT ASSETS (Table 1; Line F.2)			$175,842,396
B. EXPECTED FUTURE ASSETS			
1. Present Value of Expected Future Statutory Supplemental Contributions			$ -
2. Present Value of Future Normal Costs			29,251,724
3. Total Expected Future Assets			29,251,724
C. TOTAL CURRENT AND EXPECTED FUTURE ASSETS			$205,094,120
D. CURRENT BENEFIT OBLIGATIONS	Non-Vested	Vested	Total
1. Benefit Recipients			
a. Retirement Annuities		$ 73,903,684	$ 73,903,684
b. Disability Benefits		17,325,637	17,325,637
c. Surviving Spouse and Child Benefits		6,495,571	6,495,571
2. Deferred Retirements		9,432,967	9,432,967
3. Former Members Without Vested Rights		-	-
4. Active Members			
a. Retirement Annuities	$29,519,149	$ 6,154,399	$ 35,673,548
b. Disability Benefits[1]	4,274,120	-	4,274,120
c. Surviving Spouse and Child Benefits	271,786	-	271,786
d. Deferred Retirements[1]	388,187	-	388,187
e. Refund Liability Due to Death or Withdrawal	-	-	-
5. Total Current Benefit Obligations	$34,453,242	$113,312,258	$147,765,500
E. EXPECTED FUTURE BENEFIT OBLIGATIONS			$ 27,335,522
F. TOTAL CURRENT AND EXPECTED FUTURE BENEFIT OBLIGATIONS			$175,101,022
G. CURRENT UNFUNDED ACTUARIAL LIABILITY (D.5 - A)			$ (28,076,896)
H. CURRENT AND FUTURE UNFUNDED ACTUARIAL LIABILITY (F - C)			$ (29,993,098)

[1] Vested benefits for these obligations are included in the vested benefits of Item D.4.a.

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Bloomington Fire Department Relief Association
Determination of Unfunded Actuarial Accrued Liability (UAAL)
and Supplemental Contribution Rate

January 1, 2018

	Actuarial Present Value of Projected Benefits	Actuarial Present Value of Future Normal Costs	Actuarial Accrued Liability
A. DETERMINATION OF ACTUARIAL ACCRUED LIABILITY (AAL)			
1. Active Members			
a. Retirement Benefits	$58,364,025	$23,123,888	$35,240,137
b. Disability Benefits	8,478,353	5,502,826	2,975,527
c. Surviving Spouse and Child Benefits	514,245	382,979	131,266
d. Deferred Retirements	586,540	242,031	344,509
e. Refund Liability Due to Death or Withdrawal	-	-	-
f. Total	$ 67,943,163	$29,251,724	$ 38,691,439
2. Deferred Retirements	$ 9,432,967		$ 9,432,967
3. Former Members Without Vested Rights	-		-
4. Annuitants	97,724,892		97,724,892
5. Total	$175,101,022	$29,251,724	$145,849,298

B. DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)	
1. Actuarial Accrued Liability (A.5)	$145,849,298
2. Current Assets (Table 1; Line F.2)	175,842,396
3. Unfunded Actuarial Accrued Liability (B.1 - B.2)	$(29,993,098)
C. DETERMINATION OF SUPPLEMENTAL CONTRIBUTION RATE	
1. Level Dollar Amortization Factor to December 31, 2038	N/A
2. Supplemental Contribution (B.3 / C.1)	N/A
3. Supplemental Credit for Surplus Assets (10% * B.3)	$ (2,999,310)
4. Projected Annual Payroll for Fiscal Year Beginning on the Valuation Date:	$ 10,513,294
5. Supplemental Contribution Rate (C.3 / C.4)	(28.53%)

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Bloomington Fire Department Relief Association
Changes in Unfunded Actuarial Accrued Liability (UAAL)

December 31, 2017

A. UAAL AT BEGINNING OF YEAR	$(15,701,083)
B. CHANGE DUE TO INTEREST REQUIREMENTS AND CURRENT RATE OF FUNDING	
1. Normal Cost and Expenses	$ 3,482,212
2. Contributions	(1,633,873)
3. Interest	(782,148)
4. Total	$ 1,066,191
C. EXPECTED UAAL AT END OF YEAR (A + B.4)	$(14,634,892)
D. INCREASE / (DECREASE) DUE TO ACTUARIAL LOSSES / (GAINS) BECAUSE OF EXPERIENCE DEVIATIONS FROM EXPECTED	
1. Age and Service Retirements	$ (367)
2. Disability Retirements	(304,269)
3. Death-in-Service Benefits	(14,273)
4. Withdrawal	367,728
5. Benchmark Salary Increases and COLA	-
6. Contribution Income[1]	-
7. Investment Income	(15,305,441)
8. Mortality of Annuitants	(814,102)
9. Other Items	712,518
10. Total	$(15,358,206)
E. UAAL AT END OF YEAR BEFORE PLAN AMENDMENTS AND CHANGES IN ACTUARIAL ASSUMPTIONS (C + D.10)	$(29,993,098)
F. CHANGE IN UAAL DUE TO PLAN AMENDMENTS	-
G. CHANGE IN UAAL DUE TO CHANGES IN ACTUARIAL ASSUMPTIONS	-
H. UAAL AT END OF YEAR (E + F + G)	$(29,993,098)

[1] Included in Item D.7.

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Bloomington Fire Department Relief Association
Determination of Minimum Bloomington Obligation

January 1, 2018

	Percent of Benchmark Payroll	Dollar Amount
A. RELIEF ASSOCIATION FINANCIAL REQUIREMENTS - SECTION 69.77		
1. Normal Cost		
a. Retirement Benefits	25.44%	$ 2,674,973
b. Disability Benefits	5.76%	605,785
c. Surviving Spouse and Child Benefits	0.41%	42,593
d. Deferred Retirements	0.24%	24,941
e. Refund Liability Due to Death or Withdrawal	-	-
f. Total	31.85%	$ 3,348,292
2. Supplemental Contribution Amortization	(28.53%)	(2,999,443)
3. Allowance for Administrative Expenses	0.93%	98,006
4. Total	4.25%	$446,855
B. MINIMUM BLOOMINGTON OBLIGATION - SECTION 69.77		
1. State of Minnesota Contributions	5.48%	576,114
2. City of Bloomington Contributions (A.4 - B.1)	(1.23%)	(129,259)

Projected Annual Payroll for Fiscal Year Beginning on the Valuation Date: $10,513,294

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Bloomington Fire Department Relief Association
Summary of Actuarial Assumptions and Methods

Interest:	6.00% per annum, as mandated by the Statutes
Mortality:	Pre-retirement: RP 2000 non-annuitant table with white collar adjustment, generationally projected using Scale AA, and set back two years for males and females. Post-retirement: RP 2000 annuitant mortality table with white collar adjustment, generationally projected using Scale AA for males and females. Post-disability: RP 2000 non-annuitant mortality table with white collar adjustment, set forward eight years for males and females
Retirement age:	Members are assumed to retire after attaining age 50 and completing 20 years of service.
Separation:	Graded rates shown in the rate table.
Disability:	Graded rates shown in the rate table.
Social Security:	N/A
Index Salary increases (for certain Bloomington Patrol Officers):	4.0% per annum, as mandated by the Statutes.
COLA increases:	Based on increases in Index Salary.
Actuarial cost method:	Entry age normal cost method with normal costs expressed as a level percentage of earnings from each member's date of joining the Association to the member's assumed retirement age, as mandated by the Statutes.
Asset valuation method:	Market value, as mandated by the Statutes. Trusteed funds are reported the Fund's accountant.
Member contributions:	None.
City of Bloomington Contributions:	Relief Association financial requirements less State of Minnesota Contributions. See Table 11 for development.

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Bloomington Fire Department Relief Association
Summary of Actuarial Assumptions and Methods

State of Minnesota contributions:	Prior year State of Minnesota Fire Aid and Supplemental Fire Aid contribution.
Payment on the Unfunded accrued liability:	For the first plan year in which current assets are less than the actuarial accrued liability, an initial base is established equal to the initial unfunded actuarial accrued liability (UAAL) and is amortized as a level dollar amount over 20 years. For subsequent years in which the UAAL exceeds $0, bases will be established for actuarial losses, assumption changes, and plan amendments to be amortized over 20 years as a level dollar amount from the date of the establishment of the base and will be incorporated into the required contribution development. Otherwise, 10% of the excess of current assets over the actuarial accrued liability is treated as a supplemental credit and any amortization bases that existed prior to the plan's current assets exceeding the actuarial accrued liabilities are considered fully amortized.[1]
Administrative expenses:	Prior year administrative expenses (excluding investment expenses) increased by 3.5%, as mandated by the Statutes.
Family composition:	100% of active members are assumed to be married. Female spouses are assumed to be three years younger than male spouses. Duty-related death benefits are increased by 10% for estimated dependent child survivor benefit.
Form of payment:	75% Joint and survivor annuity (fully subsidized), life annuity if single.
Duty assumption:	For purposes of valuing the disability and death benefits an assumption of 75% of the effected population as on-duty and 25% non-duty.

[1] *Per Minnesota Session Laws 1994, Regular Session, Chapter 541, Section 2. It is Milliman's understanding that this Bloomington special law provision remains valid.*

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Bloomington Fire Department Relief Association
Summary of Actuarial Assumptions and Methods

Missing data:	The submitted participant data has been reviewed for reasonableness and consistency with data submitted for prior valuations. We have not audited this data, and the results of this valuation may change based on the accuracy of the underlying data. In cases where submitted data was missing or incomplete, the following assumptions were applied:

Date of birth:	Average age of participant group based on prior year's valuation report.
Date of hire:	Current valuation date minus years of service.
Years of service:	Years of service on last year's valuation plus one year.
Sex:	Male.
Deferred benefit:	Equal to one-third of current year average indexed earnings. Current rate is $2,496.00 per month.

Benchmark salary: Each member is assumed to earn the same salary as Bloomington police patrol officers of the highest grade. For 2018 salary, we assumed an increase of 4.0%.

2018	$7,753 (assumed)
2017	7,455
2016	7,256
2015	7,079

Date of most recent experience study: Unknown

Benefit not valued: $500 lump sum death benefit

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Bloomington Fire Department Relief Association
Summary of Actuarial Assumptions and Methods

Separations Expressed as the Number of Occurrences per 10,000

Age	Withdrawal	Disability
20	300	24
21	290	24
22	280	24
23	270	24
24	260	24
25	250	24
26	240	24
27	230	24
28	220	24
29	210	24
30	200	24
31	190	24
32	180	24
33	170	24
34	160	26
35	150	30
36	140	34
37	130	40
38	120	46
39	110	52
40	100	58
41	90	64
42	80	74
43	70	84
44	60	96
45	50	110
46	40	128
47	30	142
48	20	158
49	10	174
50+	-	-

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Bloomington Fire Department Relief Association
Summary of Actuarial Assumptions and Methods

Rationale for Significant 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. The basis for selection of the significant actuarial assumptions is as follows:

Interest:	The rate is mandated by Minnesota Statutes.
Mortality:	The assumptions set by the actuary for the Minnesota PERA Police and Fire Plan are used for directional guidance. Effective July 1, 2017, the actuary for the system updated the mortality and other assumptions for the system based upon an experience study. We note that the Society of Actuaries is conducting a mortality study for public pension plan members. This study is expected to be finalized in 2018. Under the mortality assumptions used by the Association, there have been mortality gains for the five prior years. Because there has been a consistent pattern of mortality gains, we believe the current assumption is reasonable for the Association. We will continue to monitor both the assumptions for the PERA Police and Fire Plan and the experience study from the Society of Actuaries.
Retirement Age:	Based upon Plan provisions and actual experience.
Index Salary increases:	The rate is mandated by Minnesota Statutes.

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Bloomington Fire Department Relief Association
Summary of Plan Provisions

GENERAL

Eligibility:	Members in good and regular standing of the Bloomington Fire Department Relief Association, and who have actively served as fire fighters in the Bloomington Fire Department for at least one month.
Membership dues:	No membership dues are paid to the Special Fund.
Index salary:	The average of the monthly salary for the preceding three years, including the current year of a patrol officer of the highest grade in the employ of the City of Bloomington.
Basic benefit:	One third of the index salary. All benefits under the plan increase each time a pay increase is granted to the Bloomington Police Department.

RETIREMENT

Normal retirement benefit:

Eligibility:	Age 50 with 20 years of service.
Amount:	Basic benefit.
Form of payment:	Fully subsidized 75% Joint and survivor if married, life annuity if single.

Disability benefit:

Eligibility:	Inability to perform the duties of a firefighter.
Duty related amount:	Basic benefit is payable at time of disability. This benefit is payable during the period of disability. After attainment of age 50 and 20 combined years of service and disability payments, no evidence of disability is required for the benefit to continue.
Non-duty related amount:	The basic benefit is multiplied by 5% for each year of service up to the date of disability (maximum 20 years). This benefit is payable during the period of disability. After attainment of age 50 and 20 combined years of service and disability payments, no evidence of disability is required for the benefit to continue.
Form of payment:	Same as for retirement.

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Bloomington Fire Department Relief Association
Summary of Plan Provisions

DEATH

Spouse's benefit

Duty-related amount:	75% of the basic benefit is payable for his or her remaining lifetime. Benefits cease on remarriage of the surviving spouse.
Non-duty related amount:	75% of the basic benefit multiplied by 5% for each year of service up to the date of death to a maximum of 20 years. This benefit is payable for his or her remaining lifetime. Benefits cease on remarriage of the surviving spouse.

Children's benefit:

Eligibility:	An active or inactive member who dies and leaves surviving minor children.
Amount:	12% of the basic benefit is payable to each surviving child until attainment of age 18 or marriage. If there is no surviving spouse, the minor children are eligible for 100% of the basic benefit. The maximum benefit paid to all family members will not exceed 100% of the basic benefit.
Lump sum death benefit:	$500 is payable on the death of any active or inactive member:

TERMINATION

Eligibility:	20 years of service.
Amount:	The basic benefit is payable at age 50.

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Bloomington Fire Department Relief Association
Schedule of Funding Progress

January 1, 2018

Actuarial Valuation Date	Actuarial Value of Assets (A)	Actuarial Accrued Liability (B)	Unfunded AAL (UAAL) (B)-(A)	Funded Ratio (A)/(B)
01/01/96	66,622,700	56,410,500	(10,212,200)	118.10%
01/01/97	74,763,000	58,807,600	(15,955,400)	127.13%
01/01/98	87,829,787	59,322,179	(28,507,608)	148.06%
01/01/99	98,908,878	64,855,595	(34,053,283)	152.51%
01/01/00	110,084,568	66,819,827	(43,264,741)	164.75%
01/01/01	103,718,180	71,967,391	(31,750,789)	144.12%
01/01/02	93,960,664	76,035,748	(17,924,916)	123.57%
01/01/03	78,447,409	81,361,778	2,914,369	96.42%
01/01/04	91,904,999	83,388,410	(8,516,589)	110.21%
01/01/05	101,341,890	88,034,799	(13,307,091)	115.12%
01/01/06	105,139,140	84,681,811	(20,457,329)	124.16%
01/01/07	116,978,895	87,345,954	(29,632,941)	133.93%
01/01/08	122,158,440	93,293,969	(28,864,471)	130.94%
01/01/09	88,639,493	97,105,335	8,465,842	91.28%
01/01/10	98,707,362	99,697,775	990,413	99.01%
01/01/11	111,072,465	105,372,331	(5,700,134)	105.41%
01/01/12	110,822,777	107,951,877	(2,870,900)	102.66%
01/01/13	122,544,915	124,210,384	1,665,469	98.66%
01/01/14	143,611,691	129,441,911	(14,169,780)	110.95%
01/01/15	152,114,148	133,798,748	(18,315,400)	113.69%
01/01/16	147,828,626	132,836,377	(14,992,249)	111.29%
01/01/17	155,275,402	139,574,319	(15,701,083)	111.25%
01/01/18	175,842,396	145,849,298	(29,993,098)	120.56%

The actuarial value of assets is the fair value of investments, adjusted for receivables and payables.

The above schedule of funding progress presents multi-year trend information about whether the actuarial value of assets is increasing or decreasing over time, relative to the actuarial accrued liability for benefits.

The results do not incorporate any legal or contractual funding limitations.

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