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PERA
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Volunteer Firefighters Retirement Fund of New Mexico
Annual Actuarial Valuation
as of June 30, 2021

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October 28, 2021

The Retirement Board
Public Employees Retirement Association
Santa Fe, New Mexico

Members of the Board:

We have conducted the annual actuarial valuation of the Volunteer Firefighters Retirement Fund as of June 30, 2021; the results of the valuation are contained in the following report. The annual valuation is used to determine the sufficiency of the statutory contribution rates and, if necessary, the amount required to fund the annual normal cost and fully amortize the unfunded actuarial accrued liability with annual payments over a 25-year period. The results of this valuation apply to the fiscal year beginning July 1, 2021 and ending June 30, 2022 (FY 2022). Information contained in our report for plan years ending prior to June 30, 2010 is based upon valuations performed by the Fund's prior actuary.

In performing the valuation, we relied on data supplied by the Public Employees Retirement Association (PERA) and performed limited tests on the data for consistency and reasonableness. In determining the Fund's liabilities, future events, such as investment returns, deaths, retirements, etc., are anticipated based upon the set of actuarial assumptions as approved by the Board.

Future actuarial results may differ significantly from the current results presented in this report due to such factors as the following: fund experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; and changes in plan provisions or applicable law. Since the potential impact of such factors is outside the scope of a normal annual actuarial valuation, an analysis of the range of results is not presented herein.

This actuarial valuation was performed to determine the adequacy of statutory contributions to fund the plan. The asset values used to determine unfunded liabilities and funded ratios are not market values but less volatile market related values. A smoothing technique is applied to market values to determine the market related values. The unfunded liability amounts and funded ratios using the market value of assets would be different. The interest rate used for determining liabilities is based on the expected return on assets. Therefore, liability amounts in this report cannot be used to assess a settlement of the obligation.

Measuring pension obligations and actuarially determined contributions requires the use of assumptions regarding future economic and demographic experience. Whenever assumptions are made about future events, there is risk that actual experience will differ from expected. Actuarial valuations include the risk that actual future measurements will deviate from expected future measurements due to actual experience that is different than the actuarial assumptions.

The primary areas of risk in this actuarial valuation are:

- Investment Risk – the potential that investment returns will be different than expected.
- Longevity and Other Demographic Risks – the potential that mortality or other demographic experience will be different than expected.
- Contribution Risk – The potential that actual contributions are different than the actuarially determined contributions.

Annual actuarial valuations are performed for PERA which re-measure the assets and liabilities and compute a new actuarially determined contribution. PERA also has experience studies performed every four to five years to analyze the discrepancies between actuarial assumptions and actual experience and determine if the actuarial assumptions need to be changed. Annual actuarial valuations and periodic experience studies are practical ways to monitor and reassess risk.

In order to prepare the results in this report, we have utilized appropriate actuarial models that were developed for this purpose. These models use assumptions about future contingent events along with recognized actuarial approaches to develop the needed results.

We note that as we are preparing this report, the world is in the midst of a pandemic. We have considered available information but do not believe that there is yet sufficient data to warrant the modification of any of our assumptions. We will continue to monitor the situation and advise in the future of any adjustments that we believe would be appropriate.

This is to certify that the undersigned are members of the American Academy of Actuaries and have experience in performing valuations for public retirement systems, that the valuation was prepared in accordance with principles of practice prescribed by the Actuarial Standards Board, and that the actuarial calculations were performed by qualified actuaries in accordance with accepted actuarial procedures, based on the current provisions of the Fund.

Respectfully submitted,

John J. Garrett, ASA, FCA, MAAA
Principal and Consulting Actuary

Bryan Hoge, FSA, EA, FCA, MAAA
Consulting Actuary

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Section I: Board Summary

The table below summarizes the results of the June 30, 2021 actuarial valuation as compared with the prior year.

Table I-1: Comparative Summary of Principal Results

Valuation Date	June 30, 2021	June 30, 2020
Actuarial Accrued Liability (AAL)		
Active Members	$ 17,295,152	$ 17,510,145
Deferred Vested Members	4,599,224	4,821,553
Non-Vested Inactive Members*	244,699	718,655
Retired Members and Survivors	28,011,888	27,289,313
Total	$ 50,150,963	$ 50,339,666
Actuarial Value of Assets (AVA)	$ 78,490,185	$ 73,916,369
Funded Ratio	156.5 %	146.8 %
Unfunded Actuarial Accrued Liability (UAAL) *(AAL - AVA)*	$ (28,339,222)	$ (23,576,703)
Calculation of Required Contribution (Fiscal Year Ending)	June 30, 2022	June 30, 2021
Normal Cost		
Retirement	$ 1,449,121	$ 1,477,389
Termination	406,994	415,597
Pre-Retirement Survivors	33,556	34,252
Disability	-	-
Total Normal Cost	$ 1,889,671	$ 1,927,238
Expected Administrative Expenses	60,000	60,000
UAAL Amortization Amount (25 Years)	(2,402,767)	(1,998,973)
Actuarially Determined Contribution (not less than $0)	$ -	$ -

* Members with at least 5 years of service and a last reported date within the last 5 years who are not valued as active are valued similarly to deferred vested members in order to recognize potential liability these members hold.

Summary of Key Findings

The funding policy for the Fund determines the employer contribution required to fund the annual normal cost plus an amount to fully amortize the unfunded actuarial accrued liability (UAAL) over 25 years. This resulting contribution amount is compared to the expected statutory contribution amount to assess the sufficiency of the statutory contribution. The Fund has maintained a significant surplus of assets over liabilities.

The Fund's normal cost contribution decreased from $1,927,238 to $1,889,671. The annual amount of expected administrative expenses is added to the normal cost in the calculation of the actuarial determined contribution. The surplus of the Fund's actuarial value of assets over the actuarial accrued liability results in a negative UAAL amount which has decreased from $(23,576,703) to $(28,339,222). The funded ratio of the Fund increased from 146.8% to 156.5%. We note the following key findings:

- The Fund experienced an actuarial gain on Fund assets of $1,357,913 as a result of investment return on the actuarial value of assets being more than the assumed rate. This represents a 2.5% increase to the funded ratio. Table III-3 provides the calculation of the investment gain for this year.

- The Fund experienced a net actuarial gain of $2,977,461 on Fund liabilities due to non-investment related experience. This represents a 8.8% increase to the funded ratio.

- The Fund received $777,188 more in contributions than the actuarially determined amount which results in a 1.5% increase to the funded ratio.

Section II of the report provides summarized information on the membership data used in the valuation. Section III covers the Fund's assets and Section IV covers the Fund's liabilities. The results of the valuation are provided in Section V and additional disclosure information is in Section VI. The appendices provide additional information on: A) the Fund members, B) the actuarial assumptions and methods, and C) the summary of the benefit provisions of the Fund. It is important to note that all information contained in this report for periods prior to June 30, 2010 were produced by a prior actuarial consulting firm.

Section II: Membership Data

Data regarding the membership of the Fund for use in the valuation were furnished by PERA. The following table summarizes the membership data as of June 30, 2021 and is compared with that reported for the prior year.

Table II-1: Summary of Membership Data as of June 30, 2021

Group	June 30, 2021	June 30, 2020
Total Active Members	**7,830**	**8,014**
Deferred Vested Members	**296**	**309**
Non-Vested Inactive Members	**19**	**58**
Retirees		
Service*	1,468	1,424
Disabled	0	0
Beneficiaries	122	113
Total Retirees	**1,590**	**1,537**
Total	**9,735**	**9,918**

Table II-2: Deferred Members, Retired Members and Beneficiaries as of June 30, 2021

Group	Number	Total Annual Benefits	Average Annual Benefits	Average Age
Deferred Vested	**296**	**$ 451,500**	**$ 1,525**	**61.48**
Retirees				
Service*	1,468	2,673,000	1,821	69.98
Disability	0	0	N/A	N/A
Survivors	122	123,798	1,015	74.83
Retiree Totals	**1,590**	**$2,796,798**	**$ 1,759**	**70.36**
Total	**1,886**	**$3,248,298**	**$ 1,722**	**68.96**

*Includes 1 co-payee

Section III: Fund Assets

The following tables provide information on the Fund's market value of assets and cash flow.

Table III-1: Market Value Reconciliation

	June 30, 2021	June 30, 2020
Beginning of Year Market Value	$ 68,836,980	$ 71,836,631
Audit Adjustment	-	-
Revised Beginning of Year Market Value	$ 68,836,980	$ 71,836,631
Revenues:		
Member Contributions	-	-
Employer Contributions/Appropriations	750,000	750,000
Purchases of Service	-	-
Investment Income		
Interest, dividends, etc.	1,912,188	1,387,214
Realized/Unrealized gains (losses)	16,437,291	(2,154,175)
Security lending	9,531	14,368
Other Income	125	-
Settlement Award	-	-
Total Revenues	$ 19,109,135	$ (2,593)
Expenditures:		
Benefit Payments	2,757,990	2,625,832
Refunds of Member Contributions	-	-
Investment Expenses	409,123	304,019
Administrative Expenses	60,201	67,207
Total Expenditures	$ 3,227,314	$ 2,997,058
End of Year Market Value	$ 84,718,801	$ 68,836,980

The market value rate of return for the plan year was 26.47%. The Fund's cash flow is (2.69)% as a percentage of average market value.

Section III: Fund Assets

The actuarial value of assets represents a "smoothed" value developed with the purpose of dampening the impact of market volatility on the assets used in determining valuation results. The actuarial value of assets has been calculated by spreading the recognition of unexpected investment income over four years. The amount of unexpected investment income in each year is the difference between expected actuarial value investment income and actual market value investment income. Table III-2 provides the calculation of the amount of the current year excess investment income to be phased-in as well as the amount of deferred investment income from prior years calculated in the development of the actuarial value of assets.

Table III-2: Development of Actuarial Value of Assets as of June 30, 2021

1. Actuarial Value Beginning of Year		$	73,916,369
2. Market Value End of Year			84,718,801
3. Market Value Beginning of Year (with audit adjustment)			68,836,980
4. Cash Flow			
a. Contributions		$	750,000
b. Service Purchases			-
c. Benefit Payments and Refunds			(2,757,990)
d. Administrative Expenses			(60,201)
e. Other			125
f. Net		$	(2,068,066)
5. Investment Income			
a. Market Total (2 - 3 - 4f)		$	17,949,887
b. Assumed Rate			7.25 %
c. Amount for Immediate Recognition			5,283,969
d. Amount for Phased-In Recognition			12,665,918
6. Phased-In Recognition of Investment Income			
a. Current Year: 0.25 * 5d		$	3,166,480
b. First Prior Year (2020)	$ (6,206,995) x 25%		(1,551,749)
c. Second Prior Year (2019)	$ (669,317) x 25%		(167,329)
d. Third Prior Year (2018)	$ (357,957) x 25%		(89,489)
e. Total Recognized Investment Gain		$	1,357,913
7. Audit Adjustment		$	-
8. Actuarial Value End of Year (1 + 4f + 5c + 6e + 7)		**$**	**78,490,185**
9. Difference Between Market & Actuarial Values (2 - 8)		$	6,228,616
10. Rate of Return on Actuarial Value			**9.11 %**
11. Actuarial Value of Assets as a % of Market Value of Assets			**92.6 %**

Section III: Fund Assets

The actuarial valuation assumes the rate of investment return on the assets of the Fund is 7.25% annually. This assumption is based upon the reasonable long-term expected return on the assets. In each year, the Fund will experience actuarial gains and losses due to the actual investment return of the assets. Table III-3 provides the calculation of the gain or loss due to the investment experience on the actuarial value of assets for the year ended June 30, 2021.

Table III-3: Actuarial Investment Gain (Loss) for the Year Ended June 30, 2021

1. Beginning of Year Actuarial Value of Assets (AVA)	$ 73,916,369
2. Employee and Employer Contributions	750,000
3. Benefit Payments	(2,757,990)
4. Administrative Expenses	(60,201)
5. Other	125
6. Interest [1 x 7.25% + (2 + 3 + 4 + 5) x 7.25% x 0.5]	5,283,969
7. Expected End of Year AVA	77,132,272
8. Actual End of Year AVA	78,490,185
9. Actuarial Investment Gain (Loss) (8 - 7)	**$ 1,357,913**

Section IV: Fund Liabilities

The total actuarial present value of benefits is the value as of the valuation date of all future benefits expected to be paid to current members of the Fund. An actuarial cost method allocates each individual's present value of benefits to past and future years of service. The actuarial accrued liability includes the portion of the active member present value of benefits allocated to past service as well as the entire present value of benefits for retirees, beneficiaries and inactive members. The portion of the actuarial present value allocated to the future service of active members is called the present value of future normal costs. Table IV-1 presents the calculation and allocation of the actuarial present value of benefits.

Table IV-1: Allocation of the Actuarial Present Value of Benefits as of June 30, 2021

	Actuarial Accrued Liability	Present Value of Future Normal Cost	Total Actuarial Present Value
Active Members			
Service Retirement	$14,651,699	$ 8,297,796	$22,949,495
Termination Benefits	2,351,115	2,854,099	5,205,214
Disability Retirement	-	-	-
Survivor Benefits	292,338	216,852	509,190
Total for Active Members	$17,295,152	$11,368,747	$28,663,899
Inactive Vested Members and Inactive Holding Liability	$ 4,843,923		$ 4,843,923
Retirees and Beneficiaries			
Service Retirements	$27,024,797		$27,024,797
Disability Retirements	-		-
Beneficiaries	987,091		987,091
Total for Retirees and Beneficiaries	$28,011,888		$28,011,888
Total	**$50,150,963**	**$11,368,747**	**$61,519,710**

Section IV: Fund Liabilities

Under the valuation funding method, an unfunded actuarial accrued liability (UAAL) exists to the extent that the actuarial accrued liability exceeds the actuarial value of assets as presented in Section III. The calculation of the UAAL and Funded Ratio as of the valuation date is shown in Table IV-2.

Table IV-2: Calculation of the Unfunded Actuarial Accrued Liability and Funded Ratio

	June 30, 2021	June 30, 2020
1. Actuarial Accrued Liability	50,150,963	50,339,666
2. Actuarial Value of Assets	78,490,185	73,916,369
3. Unfunded Actuarial Accrued Liability (1 - 2)	(28,339,222)	(23,576,703)
Funded Ratio (2 / 1)	156.5%	146.8%

The funded ratio is the ratio of the actuarial value of assets (Table III-2) to the actuarial accrued liability (Table IV-1) as of the valuation date. As of June 30, 2021, the funded ratio of the Fund is 156.5% as compared to a ratio of 146.8% as of June 30, 2020. The ratio is a commonly used measure of the funding progress and can be useful in reviewing the historical trend of a Fund's funding progress. Such a review should also consider the impact to this measure over the historical period due to changes to Fund benefits, changes to the actuarial assumptions and methods, and the significant impact that investment experience can have on the ratio over short-term periods. We caution that no single "point in time" measure can provide a universal basis for comparing one Fund's funded status to another.

Section IV: Fund Liabilities

The calculation of the Fund's actuarial assets and liabilities requires the use of several assumptions concerning the future experience of the Fund and its members. In each annual valuation, the latest year of actual experience is compared to that expected by the prior valuation. The differences are actuarial gains and losses which decrease or increase the UAAL. Table IV-3 provides the reconciliation of the UAAL.

Table IV-3: Reconciliation of the UAAL

	UAAL	Funded Ratio
1. Beginning of Year	**$ (23,576,703)**	**146.8 %**
2. Normal Cost	1,927,238	
3. Expected Contributions	-	
4. Other Income/Expense	60,076	
5. Interest [1 x 7.25% + (2 + 3 + 4) x 7.25% x 0.5]	(1,637,271)	
6. Expected End of Year	$ (23,226,660)	143.7 %
7. Actuarial Experience (Gain) / Loss		
Additional Contributions (with interest)	$ (777,188)	1.5 %
Investment Experience	(1,357,913)	2.5 %
Liability Experience	(2,977,461)	8.8 %
Total Actuarial Experience (Gain) / Loss	$ (5,112,562)	
8. End of Year Prior to Assumption/Method/Plan Changes (6 + 7)	$ (28,339,222)	156.5 %
9. Assumption/Method Changes	-	0.0 %
10. Plan Changes	-	
11. Actual End of Year (8 + 9 + 10)	**$ (28,339,222)**	**156.5 %**

Section V: Actuarial Funding Calculation

Section IV of this report presented the Fund's actuarial accrued liability as the portion of the present value of benefits allocated to past years of service. The portion of the active members' present value of benefits allocated to future years of service is funded through annual normal cost contributions from the employer. The normal cost amount was developed as of the valuation date and presented in Table V-1.

The minimum contribution to satisfy the funding policy is the dollar amount necessary to fund the annual normal cost and expected administrative expenses of the Fund and fully amortize the UAAL over 25 years in constant dollar amounts. This resulting contribution amount is compared to the expected statutory contribution amount to assess the sufficiency of the statutory contribution. As this Fund is in a significant surplus funded position, the annual amortized amount of the surplus offsets most of the Fund's annual normal cost amount. The calculation of the contribution requirement is provided in Table V-1.

Table V-1: Calculation of Actuarially Determined Contribution for Fiscal Year Ending June 30, 2021

1. Present Value of Future Benefits	$	61,519,710
2. Present Value of Future Normal Costs		11,368,747
3. Actuarial Accrued Liability (1 - 2)	$	50,150,963
4. Actuarial Value of Assets		78,490,185
5. Unfunded Actuarial Accrued Liability (UAAL) (3 - 4)	$	(28,339,222)
6. UAAL Amortization Payment (25 years)		(2,402,767)
7. Total Normal Cost		1,889,671
8. Expected Administrative Expenses		60,000
9. Total Normal Cost and Administrative Expenses		1,949,671
Actuarially Determined Contribution (6 + 9)	**$**	**-**

Section VI: Additional Disclosure Information

The tables provided in this section present information relevant for the annual financial reporting of the Fund. GASB Statement No. 67 required disclosure information will be provided in a separate supplemental report. Additional disclosure information is provided below.

Table VI-1: Schedule of Funding Progress

Actuarial Valuation Date	Actuarial Value of Plan Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (UAAL) (b - a)	Funded Ratio (a / b)
6/30/2021	$ 78,490,185	$ 50,150,963	$ -	156.5 %
6/30/2020	73,916,369	50,339,666	-	146.8 %
6/30/2019	72,011,279	50,518,860	-	142.5 %
6/30/2018	69,674,334	49,235,772	-	141.5 %
6/30/2017	67,985,320	46,388,453	-	146.6 %
6/30/2016	64,899,802	45,256,278	-	143.4 %
6/30/2015	61,575,304	43,916,392	-	140.2 %
6/30/2014	57,997,323	41,516,826	-	139.7 %
6/30/2013	52,179,180	37,766,300	-	138.2 %
6/30/2012	47,382,330	28,219,348	-	167.9 %

Table VI-2: Solvency Test

Aggregate Accrued Liabilities For					Portion of Accrued Liabilities Covered by Actuarial Value of Assets		
Valuation Date	(1) Active Member Contributions	(2) Retirees, Survivors and Inactive Members	(3) Active Members (Employer Financed Portion)	Actuarial Value of Assets	(1)	(2)	(3)
6/30/2021	$ -	$ 32,855,811	$ 17,295,152	$ 78,490,185	N/A	100.00%	100.00%
6/30/2020	-	32,829,521	17,510,145	73,916,369	N/A	100.00	100.00
6/30/2019	-	31,110,078	19,408,782	72,011,279	N/A	100.00	100.00
6/30/2018	-	30,285,764	18,950,008	69,674,334	N/A	100.00	100.00
6/30/2017	-	28,060,938	18,327,515	67,985,320	N/A	100.00	100.00

Table VI-3: Schedule of Retirants Added to and Removed from Rolls

Valuation Date	Added to Rolls		Removed from Rolls		Rolls End of Year		% Increase in Annual Allowances	Average Annual Allowances
	Number Added	Annual Allowances	Number Removed	Annual Allowances	Number	Annual Allowances		
6/30/2021	92	$ 159,999	39	$ 60,700	1,590	$ 2,796,798	3.68%	$ 1,759
6/30/2020	131	229,000	23	40,500	1,537	2,697,499	7.51%	1,755
6/30/2019	103	166,999	28	45,300	1,429	2,508,999	5.10%	1,756
6/30/2018	164	290,000	21	33,100	1,354	2,387,300	12.06%	1,763
6/30/2017	123	231,999	25	41,300	1,211	2,130,400	9.83%	1,759

Table VI-4: Summary of Actuarial Methods and Assumptions

Valuation Date	June 30, 2021
Actuarial cost method	Entry Age, Level Dollar
Amortization method	Level Dollar, Open
Remaining amortization period	25 years
Asset valuation method	4-year Smoothed Market
Actuarial assumptions:	
Administrative Expenses	$60,000 annually
Investment rate of return*	7.25%
* Includes inflation at 2.50%	

Table A-1: Schedule of Active Participant Data as of June 30, 2021

Nearest Age	Completed Years of Service							
	Under 5	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30+	Total
Under 30	2,016	141	5	0	0	0	0	**2,162**
30 to 34	812	202	44	7	0	0	0	**1,065**
35 to 39	601	163	59	24	1	0	0	**848**
40 to 44	508	166	80	33	13	2	0	**802**
45 to 49	336	115	59	33	15	11	0	**569**
50 to 54	309	127	76	37	23	12	5	**589**
55 to 59	269	125	69	34	17	7	4	**525**
60	54	17	15	4	5	2	1	**98**
61	44	20	9	5	1	4	1	**84**
62	43	25	13	5	4	0	0	**90**
63	54	24	4	0	1	2	1	**86**
64	53	19	7	5	4	1	1	**90**
65	45	18	5	2	4	0	0	**74**
66	45	14	8	2	1	2	0	**72**
67	36	24	5	2	1	1	0	**69**
68	51	23	12	4	0	0	0	**90**
69	34	18	3	1	0	0	0	**56**
70	39	11	5	2	2	1	0	**60**
71	37	12	7	1	2	0	0	**59**
72	35	11	3	2	3	1	0	**55**
73	27	18	3	3	0	0	0	**51**
74	23	24	8	1	0	0	0	**56**
75	20	8	3	1	0	0	0	**32**
76	12	11	4	1	1	0	0	**29**
77	14	10	2	0	0	0	0	**26**
78	10	7	3	0	0	0	0	**20**
79	12	5	2	4	0	0	0	**23**
80 & Over	24	19	6	1	0	0	0	**50**
Total	**5,563**	**1,377**	**519**	**214**	**98**	**46**	**13**	**7,830**

Average Age: 42.03
Average Service: 3.71

Table A-2: Number of Annual Retirement Allowances of Benefit Recipients as of June 30, 2021

Type of Pension	Number	Total Annual Benefits	Average Annual Pension
Two Life 66 2/3% Survivor Pension	1,467	2,672,250	1,822
Single Life Pension	123	124,548	1,013
Total Normal Retirement Pensions	**1,590**	**$2,796,798**	**$ 1,759**
Total Pensions Being Paid	**1,590**	**$2,796,798**	**$ 1,759**

Table A-3: Distribution of Participants Receiving Benefits as of June 30, 2021

Attained Age	Retired Member*		Survivor		Totals	
	Number	Annual Pensions	Number	Annual Pensions	Number	Annual Pensions
Under 40						
40 to 44						
45 to 49			0	$ -	0	$ -
50 to 54			2	1,600	2	1,600
55 to 59	113	$ 222,000	1	2,000	114	224,000
60 to 64	295	586,500	11	12,000	306	598,500
65 to 69	330	610,500	18	19,800	348	630,300
70 to 74	320	576,000	24	22,400	344	598,400
75 to 79	228	379,500	34	34,200	262	413,700
80 to 84	121	195,000	19	18,600	140	213,600
85 to 89	51	85,500	9	9,600	60	95,100
90 to 94	8	13,500	2	1,800	10	15,300
95 to 99	2	4,500	2	1,800	4	6,300
100 & Over						
Total	**1,468**	**$2,673,000**	**122**	**$123,798**	**1,590**	**$2,796,798**

* Includes 1 co-payee

Table A-4: Distribution of Retirees by Years of Service at Retirement (not including Disabled Members, Beneficiaries, and Co-Payees)

	Years of Credited Service at Retirement							
	Under 5	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30+	Total
Average Monthly Benefit	$0	$0	$125	$125	$125	$250	$250	$152
Number of Retirees	0	0	833	249	70	265	50	1,467

Table A-5: Distribution of Recent Retiree Ages at Retirement (not including Disabled Members, Beneficiaries, and Co-Payees)

	2016-17 Retirees	2017-18 Retirees	2018-19 Retirees	2019-20 Retirees	2020-21 Retirees	All Current Retirees
Number	112	148	79	114	74	1,467
Average Monthly Benefit at Retirement	$163	$151	$149	$151	$155	$140
Average Attained Age at Retirement	62.23	62.01	62.60	64.85	64.57	61.45

Table A-6: Status Reconciliation

	Active Members	Vested Terminated Members	Non-Vested Inactive Members*	Pension Recipients			Total
				Service Retired**	Disability Retired	All Beneficiaries	
June 30, 2020	**8,014**	**309**	**58**	**1,424**	**0**	**113**	**9,918**
Increase (Decrease) From:							
Service Retirement	(64)	(10)	(1)	75			
Disability Retirement							
Deaths	(30)	(3)		(33)		(6)	(72)
Survivors						15	15
Co-Payee							
Other Pension Terminations							
Vested Terminations	(3)	3					
Non-Vested Terminations	(595)		3				(592)
New Entrants/Rehires	506	(3)	(3)				500
Data Corrections/Changes	2	0	(5)	2			(1)
Released After 5 Years			(33)				(33)
June 30, 2021	**7,830**	**296**	**19**	**1,468**	**0**	**122**	**9,735**

* Members with at least 5 years of service and a last reported date within the last 5 years are valued similarly to deferred vested members in order to recognize potential liability these members hold.

**Includes 1 co-payee

Appendix B: Summary of Actuarial Assumptions and Methods

Actuarial Cost Methods Used for the Valuation

An actuarial cost method is a procedure for allocating the actuarial present value of benefits and expenses to time periods. The method used for this valuation is known as the entry age normal level dollar cost method and has the following characteristics:

i) The total present value of projected benefits of each individual is allocated on a level basis over service from entry age to retirement age. The portion of this present value allocated to the valuation year is the normal cost.

ii) The actuarial liability is the accumulation of past normal costs on the valuation date.

Unfunded actuarial accrued liability, which is the difference between the actuarial accrued liability and the actuarial value of assets, is amortized on a level dollar basis over a 25-year period beginning with the June 30, 2020 valuation (the previous amortization period was 30 years). As of June 30, 2021, actuarial value of assets exceeded accrued liabilities. The excess was amortized over 25 years and applied as a credit to the computed normal cost and expected administrative expenses.

The actuarial value of assets used for funding purposes is derived as follows: prior year actuarial value of assets is increased by contributions and expected investment income and reduced by refunds, benefit payments and expenses. To this amount 25% of the difference between expected and actual investment income for each of the previous four years is added.

Appendix B: Summary of Actuarial Assumptions and Methods

Actuarial Assumptions Used for the Valuation
(based on an experience study for the four-year period ending June 30, 2019)

The rate of investment return: 7.25% per annum net of investment expenses.

The expected administrative expenses: $60,000 which is included in the calculation of the actuarial determined contribution amount.

The rates of separation from active membership were as follows:

Sample Ages	Years of Service	Percent of Active Members Separating Within Next Year
ALL	0	12.0%
	1	11.0
	2	10.0
	3	8.0
	4	6.0
25	5 & Over	4.0
30		4.0
35		4.0
40		4.0
45		4.0
50		5.0
55		5.0
60		6.0

Appendix B: Summary of Actuarial Assumptions and Methods

The rates of retirement from active membership were as follows:

Ages	Percent of Active Members Retiring Within Next Year
55	35.0%
56	30.0
57	25.0
58	20.0
59	20.0
60	20.0
61	20.0
62	25.0
63	25.0
64	25.0
65	25.0
66	25.0
67	25.0
68	25.0
69	25.0
70	100.0

Appendix B: Summary of Actuarial Assumptions and Methods

Mortality Assumption: RPH-2014 Blue Collar mortality table with female ages set forward one year. Future improvement in mortality rates is assumed using 60% of the MP-2017 projection scale generationally.

Sample Mortality Rates (Base Rates)								
Pre-Commencement			Post-Commencement			Post-Commencement		
Age	Male	Female	Age	Male	Female	Age	Male	Female
25	0.000733	0.000244	35	0.001793	0.001169	80	0.053460	0.042932
30	0.000717	0.000317	40	0.002156	0.001611	85	0.088524	0.072752
35	0.000797	0.000417	45	0.003275	0.002671	90	0.146859	0.125111
40	0.000958	0.000598	50	0.005604	0.004235	95	0.223428	0.197901
45	0.001455	0.001013	55	0.007342	0.005165	100	0.313988	0.291040
50	0.002490	0.001685	60	0.009893	0.006890	105	Disabled retirees use the same assumption as healthy lives.	
55	0.004071	0.002510	65	0.014089	0.010092	110		
60	0.006743	0.003606	70	0.021101	0.016038	115		
65	0.011612	0.005456	75	0.032952	0.026199	120		

Miscellaneous and Technical Assumptions

Marriage Assumption:	All members are assumed to be married for purposes of death-in-service benefits. Male spouses are assumed to be three years older than female spouses. At retirement, 90% of members are assumed to be married for purposes of valuing death after retirement benefits.
Pay Increase Timing:	N/A.
Decrement Timing:	Decrements of all types are assumed to occur at the beginning of the year.
Eligibility Testing:	Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.
Decrement Relativity:	Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.
Decrement Operation:	Neither disability nor withdrawal decrements operate during retirement eligibility.
Incidence of Contributions:	Contributions are assumed to be received in the middle of the year.
Normal Form of Benefit:	A 66-2/3% automatic joint and survivor payment is the assumed normal form of benefit for married members. Straight life is the assumed normal form of benefit for single members.
Benefit Service:	Service nearest the whole year is used to determine the amount of benefit payable.
Average Entry Age:	Age 38.31 was assumed in cases where insufficient data was provided. Active members were assumed to accrue 0.65 years of service credit in each future year.
Non-Vested Inactive Members:	Members with at least 5 years of service and a last reported date within the last 5 years are valued similarly to deferred vested members in order to recognize potential liability these members hold.

Appendix B: Summary of Actuarial Assumptions and Methods

Definitions of Technical Terms

Actuarial Accrued Liability. The difference between the actuarial present value of future benefit payments and the actuarial present value of future normal costs.

Actuarial Cost Method. A mathematical budgeting procedure for allocating the dollar amount of the "actuarial present value of future benefit payments" between future normal cost and actuarial accrued liability.

Actuarial Present Value. The amount of funds currently required to provide a payment or series of payments in the future. It is determined by discounting future payments at predetermined rates of interest and by probabilities of payment.

Amortization. Paying off an interest-discounted amount with periodic payments of interest and principal – as opposed to paying off with a lump sum payment.

Experience Gain (Loss). The difference between actual actuarial costs and anticipated actuarial costs – during the period between two valuation dates.

Normal Cost. The actuarial cost allocated to the current year by the actuarial cost method.

Unfunded Actuarial Accrued Liability. The difference between the actuarial accrued liability and the actuarial value of assets. Sometimes referred to as "unfunded accrued liability."

Appendix C: Summary of Fund Provisions

Membership
Includes any active volunteer non-salaried firefighter whose first year of service credit was earned on or after age 16.

Service Credit
A year of service credit may be granted upon required certification for each year the member

(1) attended 50% of all scheduled fire drills,
(2) attended 50% of all scheduled business meetings, and
(3) participated in at least 50% of all emergency response calls which the fire department held him responsible to attend.

Retirement Eligibility
A member may retire (1) with a full retirement annuity at age 55 with 25 or more years of service credit or (2) with a reduced retirement annuity at age 55 with 10 or more years of service credit.

Retirement Annuity
The full retirement annuity is $250 per month. The reduced retirement annuity is $125 per month.

Surviving Spouse Annuity
The surviving spouse of a deceased annuitant receives an annuity equal to 2/3 of the retirement annuity being paid at the time of the member's death. The annuity ceases upon the surviving spouse's marriage or death.

Surviving Dependent Child
If there is no surviving spouse, then a surviving dependent child will receive an annuity equal to 2/3 of the retirement annuity being paid at the time of the member's death. The annuity will cease upon the earlier of the dependent child's 18th birthday or death.

Vested Retirement Annuity
Any member with at least 10 years of service credit who ceases to be a volunteer non-salaried firefighter is eligible for a deferred retirement annuity commencing at age 55. The monthly amount is $250 if the member has at least 25 years of service credit and $125 if the member has between 10 and 25 years of service credit.

Public Payments
$750,000 annually from the State's fire protection fund

Appendix D: Risk Considerations

Actuarial Standards of Practice are issued by the Actuarial Standards Board and are binding on credentialed actuaries practicing in the United States. These standards generally identify what the actuary should consider, document and disclose when performing an actuarial assignment. In September, 2017, Actuarial Standard of Practice Number 51, *Assessment and Disclosure of Risk in Measuring Pension Obligations*, (ASOP 51) was issued as final with application to measurement dates on or after November 1, 2018. This ASOP, which applies to funding valuations, actuarial projections, and actuarial cost studies of proposed plan changes, was first applicable for the June 30, 2019 actuarial valuation.

A typical retirement plan faces many different risks, but the greatest risk is the inability to make benefit payments when due. The term "risk" is most commonly associated with an outcome with undesirable results. However, in the actuarial world, risk can be translated as uncertainty. The actuarial valuation process uses many actuarial assumptions to project how future contributions and investment returns will meet the cash flow needs for future benefit payments. Of course, we know that actual experience will not unfold exactly as anticipated by the assumptions and that uncertainty, whether favorable or unfavorable, creates risk. ASOP 51 defines risk as the potential of actual future measurements to deviate from expected results due to actual experience that is different than the actuarial assumptions.

There are a number of risks inherent in the funding of a defined benefit plan. These include:

- economic risks, such as investment return and price inflation;
- demographic risks such as mortality, payroll growth, aging population including impact of baby boomers, and retirement ages;
- external risks such as the regulatory and political environment.

The various risk factors for a given plan can have a significant impact – positive or negative – on the actuarial projection of liability and contribution rates. The following discussion includes a few exhibits which summarize some historical information to help indicate how certain key risk metrics have changed over time. Many are due to the maturing of the retirement system.

The investment return on assets is the most obvious risk – and usually the primary risk – to funding a pension plan.

HISTORICAL CASH FLOWS

Plans with negative cash flows will experience increased sensitivity to investment return volatility. Cash flows, for this purpose, are measured as contributions less benefit payments. If the System has negative cash flows and then experiences returns below the assumed rate, there are fewer assets to be reinvested to earn the higher returns that typically follow. While any negative cash flow will produce such a result, it is typically a negative cash flow of more than 5% of MVA that may cause significant concerns. This is a metric the investment consultants usually focus on when evaluating the asset allocation. The maturity of the system is the main contributor to the situation.

Actuarial Valuation Date	Market Value of Assets	Contributions	Benefit Payments and Expenses	Net Cash Flow	Net Cash Flow as a Percent of MVA
6/30/2010	$ 38,938,999	750,000	665,211	84,789	0.22%
6/30/2011	$ 47,641,091	750,000	781,845	(31,845)	-0.07%
6/30/2012	$ 47,363,279	750,000	856,453	(106,453)	-0.22%
6/30/2013	$ 53,312,473	750,000	968,742	(218,742)	-0.41%
6/30/2014	$ 61,923,262	750,000	1,463,259	(713,259)	-1.15%
6/30/2015	$ 62,103,236	750,000	1,663,783	(913,783)	-1.47%
6/30/2016	$ 61,049,688	750,000	1,830,833	(1,080,833)	-1.77%
6/30/2017	$ 66,400,768	750,000	2,081,151	(1,331,151)	-2.00%
6/30/2018	$ 69,287,453	750,000	2,375,374	(1,625,374)	-2.35%
6/30/2019	$ 71,836,631	750,000	2,518,776	(1,768,776)	-2.46%
6/30/2020	$ 68,836,980	750,000	2,693,039	(1,943,039)	-2.82%
6/30/2021	$ 84,718,801	750,000	2,818,066	(2,068,066)	-2.44%

Appendix D: Risk Considerations

There is a direct correlation between healthy, well-funded retirement plans and consistent contributions equal to the full actuarial contribution rate each year. Historically, the Fund has been funded with fixed contributions by both employees and the employer. The Fund has maintained a significant surplus of assets over liabilities for the last ten years.

Funding a retirement system with fixed contribution rates creates some unique funding challenges. Given the extreme volatility associated with the underlying investments of the portfolio, wide variations in the actual return on the market value of assets is expected. However, when it occurs it can change the long-term funding outlook from positive to negative or vice versa. By the time a trend has been identified, it is possible for the funded status of the System to have seriously declined, requiring more substantive resources to compensate for the investment losses

A key demographic risk for all retirement systems is improvements in mortality (longevity) greater than anticipated. While the actuarial assumptions reflect small, continuous improvements in mortality experience over time and these assumptions are refined every experience study, the risk arises because there is a possibility of some sudden shift, perhaps from a significant medical breakthrough that could quickly increase liabilities. Likewise, there is some possibility of a significant public health crisis that could result in a significant number of additional deaths in a short time period, as experienced with the COVID-19 pandemic. This type of event is also significant, although more easily absorbed. While either of these events could happen, it represents a small probability and thus represents much less risk than the volatility associated with investment returns.