Fort Lupton Fire Protection District

ANNUAL ACTUARIAL VALUATION
AS OF JANUARY 1, 2023

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July 17, 2023

Ms. Allyson Tkadlec
Fort Lupton Fire Protection District
1121 Denver Avenue
Fort Lupton, CO 80261

Re: Actuarial Valuation Results as of January 1, 2023

Dear Ms. Tkadlec:

The results of the January 1, 2023 Actuarial Valuation of the Fort Lupton Fire Protection District Volunteer Firefighter Pension Fund are presented in this report. This report was prepared at the request of the Board and is intended for use by those designated or approved by the Board. This report may be provided to parties other than the Board only in its entirety and only with the permission of the Board. GRS is not responsible for unauthorized use of this report.

The findings in this report are based on data and other information through January 1, 2023. The valuation was based upon information furnished by the Fort Lupton Fire Protection District concerning retirement benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries. We checked for internal reasonability and year-to-year consistency, but did not audit the data. We are not responsible for the accuracy or completeness of the information provided by the Fort Lupton Fire Protection District.

Financing Objectives

This valuation was prepared to determine if the current annual level dollar contribution of $1,379,204 is adequate for funding the current benefits provided by the department. Contributions into the pension fund can come from two sources: contributions directly from the department and contributions from the State based on assessed property values and other formulas. The "Assumed Contribution" referred to throughout this report is the sum of the contributions from the aforementioned two sources. The total annual required contribution is $195,766, thus the assumed $1,379,204 contribution will be sufficient to fund the plan in accordance with its funding policy.

The calculated contribution shown in Table 3 is the sum of the normal cost, an amount available to amortize the Unfunded Actuarial Accrued Liability (UAAL), and any ongoing administrative and miscellaneous expenses that are paid out of the pension fund. The minimum contribution the department must pay is the calculated contribution, but not less than $0.

The unfunded accrued liability is $1,545,610. The funded ratio (the ratio of assets to liabilities) is 86.1%. The funded ratio may not be appropriate for assessing the need for future contributions. The funded ratio is not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations.

Benefit Provisions

This actuarial valuation reflects the provisions that were applicable to the Fort Lupton Fire Protection District Volunteer Firefighter Pension Fund as of the valuation date. The benefit level has been updated since the prior valuation as of January 1, 2021. The normal retirement benefit was increased from $1,500 per month to $1,700 per month. The details of the actuarial calculations, based on the current benefit provisions, are described in this report. Results are also reported on Table 1 for a "State Match" plan which is a hypothetical benefit level required to determine state matching contributions

This actuarial valuation is based upon coverage data given in the checklist, which was completed by the department and supplied to GRS. Any changes in coverage adopted but not included in the checklist are not reflected in the current results. Once the adopted coverage data is provided, subsequent valuation results will be reflective of the change in coverage.

Actuarial Assumptions and Methods

This actuarial valuation uses the assumptions and methods applicable for volunteer fire plans that were adopted as a result of the 2022 Experience Study as used for the Fire and Police Pension Association of Colorado (FPPA). The mortality tables have been updated since the prior valuation as of January 1, 2021 as a result of the 2022 Experience Study. A summary of those assumptions and methods can be found in Table 8. Based on the allocation of assets, the assumed rate of return on investments is 5.00%. Liabilities in all scenarios were determined under the Entry Age Normal actuarial cost method.

The calculated employer contribution consists of the sum of three pieces: the normal cost, the amortization of the Unfunded Actuarial Accrued Liability (UAAL), and any expenses to be paid out of the pension fund. The calculated contribution is shown in Table 3, Item 9. The normal cost (shown in detail in Table 3, Item 1) can be viewed as the regular, ongoing cost of the plan. The UAAL is the amount by which the actuarial value of assets falls short of, or exceeds, the actuarial accrued liability for this plan. The required payment to amortize the UAAL in 20 years is shown in Table 3, Item 7.

The results of the actuarial valuation are dependent on the actuarial assumptions used. Actual results can and almost certainly will differ, as actual experience deviates from the assumptions. Even seemingly minor changes in the assumptions can materially change the liabilities, calculated contribution and funding periods. The actuarial calculations are intended to provide information for rational decision-making.

This report does not include a detailed assessment of the risks of future experience not meeting the actuarial assumptions. Additional assessment of risks was outside the scope of this assignment. We encourage a review and assessment of investment and other significant risks that may have a material effect on the plan's financial condition.

This report was prepared using our proprietary valuation model and related software which in our professional judgment has the capability to provide results that are consistent with the purposes of the valuation and has no material limitations or known weaknesses. We performed tests to ensure that the model reasonably represents that which is intended to be modeled.

GASB Accounting

The Governmental Accounting Standards Board (GASB) Statement No. 67, Financial Reporting for Pension Plans (Issued 6/2012), replaced the requirements under GASB Statement No. 25, Financial Reporting for Defined Benefit Pension Plans and Note Disclosures for Defined Contribution Plans (Issued 11/1994), effective for financial statements for fiscal years beginning after June 15, 2013. GASB Statement No. 68, Accounting and Financial Reporting for Pensions (Issued 6/2012), replaced GASB Statement No. 27, Accounting for Pensions by State and Local Governmental Employers (Issued 11/1994), effective for fiscal years beginning after June 15, 2014. Information for GASB Statement Nos. 67 and 68 is provided in a separate report.

Tables

This report includes one executive summary, eleven tables, and a glossary.

- The executive summary includes a condensed summary of the demographic, financial, and actuarial data.
- Table 1 is a comparison of the actuarial results of the report based on the current benefit provisions and the state match calculation.
- Table 2 is a summary of the current benefit provisions and the state match benefit provisions.
- Table 3 provides the details of the development of the required contribution.
- Table 4 shows the actuarial present value of future benefits, broken down by membership category and type of benefit.
- Table 5 shows the summary of the financial information.
- Table 6 shows the historical actuarial data for the plan.
- Table 7 shows the demographic data for the district.
- Table 8 shows the actuarial assumptions and methods used to calculate the liabilities.
- Table 9 shows risks associated with measuring the accrued liability.
- Table 10 is a comparison of the actuarial results of the report based on the alternate scenarios requested.
- Table 11 is a summary of the alternate scenarios requested.
- The glossary provides definitions of several terms used throughout the report.

The contribution amount shown in Table 1 may be considered as a minimum contribution amount that complies with the funding policy. Users of this report should be aware that contributions made at that rate do not guarantee benefit security. Given the importance of benefit security to any retirement system, it is suggested that contributions to the Plan in excess of those presented in this report be considered.

Plan Experience

During the two-year period ending January 1, 2023, the plan Unfunded Actuarial Accrued Liability (UAAL) increased from $0.91 million to $1.55 million. Including an increase of $1.29 million due to new benefit provisions, the expected UAAL as of January 1, 2023 was a surplus of $0.23 million, indicating that there was a $1.78 million loss for this period. Asset losses due to investments earning less than the assumed 5.00% totaled $1.57 million and there was a loss of $0.14 million due to assumption changes. Finally, there was a liability loss of $0.07 million due to demographic experience differing from assumptions.

Certification

This report has been prepared by actuaries who have substantial experience valuing public employee retirement systems. To the best of our knowledge the information contained in this report is accurate and fairly presents the actuarial position of the Fort Lupton Fire Protection District Volunteer Firefighter Pension Fund as of the valuation date.

All calculations have been made in conformity with generally accepted actuarial principles and practices, with the Actuarial Standards of Practice issued by the Actuarial Standards Board. In our opinion, the results presented comply with the requirements of the State of Colorado statutes and, where applicable, the Internal Revenue Code, ERISA, and the Statements of the Governmental Accounting Standards Board.

Ms. Woolfrey and Mr. Detweiler are members of the American Academy of Actuaries and are experienced in performing valuations for public retirement systems. These actuaries meet the Academy's Qualification Standards to render the actuarial opinions contained herein. The signing actuaries are independent of the plan sponsor.

Respectfully submitted,

Gabriel, Roeder, Smith & Company

Dana Woolfrey, FSA, FCA, EA, MAAA
Senior Consultant

Bill Detweiler, ASA, FCA, EA, MAAA
Consultant

EXECUTIVE SUMMARY

Item	Valuation as of January 1, 2023	Valuation as of January 1, 2021
Membership		
• Number of		
- Active members	3	4
- Retired members	37	37
- Disabled members	0	0
- Beneficiaries	13	11
- Terminated vested members	10	12
- Total	63	64
Assets		
• Market value	$ 9,565,277	$ 9,048,451
• Employer contribution for prior year	1,026,802	1,435,997
• Employer contribution for prior year minus 1	1,409,912	1,061,845
Actuarial Information		
• Employer normal cost	$ 13,719	$ 16,839
• Normal cost per active member	4,573	4,210
• Actuarial accrued liability	11,110,887	9,960,981
• Unfunded actuarial accrued liability / (Surplus)	1,545,610	912,530
• Calculated annual contribution	195,766	140,341
• Assumed contribution from department	1,321,522	1,403,190
• Assumed contribution from State	57,682	57,682
• Funding period based on assumed contributions	2 years	1 year
• Funded ratio*	86.1%	90.8%
• Is current level of contributions adequate?	Yes	Yes

**The funded status measure may be appropriate for assessing the need for future contributions. The funded status is not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations.*

COMPARISON OF ACTUARIAL RESULTS BASED ON ALTERNATE BENEFIT LEVELS OR ASSUMPTIONS
TABLE 1

		Current Plan	State Match
1.	Normal Retirement Benefit	$ 1,700.00	$ 300.00
2.	Normal Cost	13,719	2,185
3.	Present Value of Future Benefits	11,193,682	1,945,762
4.	Actuarial Accrued Liability	11,110,887	1,933,186
5.	Unfunded Accrued Liability / (Surplus)	1,545,610	(7,632,091)
6.	Total Annual Calculated Contribution	195,766	(534,462)
7.	Assumed Contribution	1,379,204	1,379,204
8.	Funding Period Based on Assumed Contribution	2 years	0 years
9.	Funded Ratio	86.1%	494.8%

ACTUARIAL VALUATION INFORMATION CHECKLIST
TABLE 2

	Current Plan	State Match Calc	Maximum Per State Statute
1. Normal Retirement Benefit (monthly):			
a. Regular	$1,700.00	$300.00	None
b. Extended Service Amount Per Year of Service	$85.00	$0.00	5% of Regular, for 10 Additional years
2. Vested Retirement Benefit (monthly):			
a. With 20 or More Years of Service Not yet age 50, but payable at age 50	$1,700.00	$300.00	None
b. With 10 to 20 Years of Service Amount Per Year of Service per Minimum Vesting Years	$85.00	$15.00	Pro rata Share of Regular
c. Minimum Vesting Years	10	10	20 Years
3. Disability Retirement Benefit (monthly):			
a. Short Term Disability for line of duty injury Amount payable for not more than 1 year	$0.00	$150.00	½ of Regular or $225, whichever is greater
b. Long Term Disability for line of duty injury Lifetime Benefit	$0.00	$300.00	Regular or $450 whichever is greater
4. Survivor Benefits (monthly):			
a. Following Death before Retirement Eligible; Due to death in the line of duty as a volunteer firefighter	$850.00	$150.00	½ of Regular or $225, whichever is greater
b. Following Death after Normal Retirement	$850.00	$150.00	50% of Regular
c. Following Death after Normal Retirement with Extended Service Amount Per Year of Service	$42.50	$0.00	50% of Extended
d. Following Death after Vested Retirement with 20 or More Years of Service Amount Per Year of Service per Minimum Vesting Years	$850.00	$150.00	50% of Vested
e. Following Death after Vested Retirement with 10 to 20 Years of Service Amount Per Year of Service per Minimum Vesting Years	$42.50	$7.50	50% of Vested
f. Following Death after Disability Retirement	$0.00	$0.00	50% of Long Term
g. Optional Survivor Benefits in lieu of 4a-f Following Death before or after Retirement Eligible due to death on or off duty as a volunteer firefighter (Purchase of Life Insurance Required)	$0.00	$0.00	100% of Regular
5. Funeral Benefit (Required Benefit):			
a. Funeral Benefit Lump Sum, one time only	$3,400.00	$100.00	2 times Regular

DEVELOPMENT OF ACTUARIALLY DETERMINED CONTRIBUTION
TABLE 3

	Valuation as of 1/1/2023	Valuation as of 1/1/2021
1. Total Normal Cost	$ 13,719	$ 16,839
2. Actuarial accrued liability for active members		
a. Present value of future benefits for active members	$ 771,397	$ 695,894
b. Less: present value of future normal costs	(82,795)	(117,160)
c. Actuarial accrued liability	$ 688,602	$ 578,734
3. Total actuarial accrued liability for:		
a. Retirees and beneficiaries	$ 8,584,568	$ 7,600,618
b. Inactive members	1,837,717	1,781,629
c. Active members (Item 2c)	688,602	578,734
d. Total	$ 11,110,887	$ 9,960,981
4. Market value of assets	$ 9,565,277	$ 9,048,451
5. Unfunded actuarial accrued liability / (Surplus) (Item 3 - Item 4)	$ 1,545,610	$ 912,530
6. Funded Ratio*	86.1%	90.8%
7. Required Payment to amortize the UAAL over the next 20 years	$ 121,035	$ 71,459
8. Administrative and other ongoing expenses	$ 61,012	$ 52,043
9. Calculated annual contribution (Item 1 + Item 7 + Item 8)	$ 195,766	$ 140,341
10. Assumed Contribution		
a. Budgeted department contribution	$ 1,321,522	$ 1,403,190
b. Expected state funding	57,682	57,682
c. Total assumed contribution	$ 1,379,204	$ 1,460,872
11. Funding period based on assumed contribution	2 years	1 year

**The funded status measure may be appropriate for assessing the need for future contributions. The funded status is not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations.*

ACTUARIAL PRESENT VALUE OF FUTURE BENEFITS
TABLE 4

	Valuation as of 1/1/2023	Valuation as of 1/1/2021
1. Active members		
a. Retirement benefits	$ 699,632	$ 547,244
b. Vested retirement benefits	70,562	146,732
c. Death benefits	1,203	1,918
d. Disability benefits	0	0
e. Total	$ 771,397	$ 695,894
2. Retired members		
a. Service retirements	$ 7,669,496	$ 6,854,674
b. Disability retirements	0	0
c. Beneficiaries	915,072	745,944
d. Total	$ 8,584,568	$ 7,600,618
3. Terminated vested members	$ 1,837,717	$ 1,781,629
4. Total actuarial present value of future benefits	$ 11,193,682	$ 10,078,141

RECONCILIATION OF NET PLAN ASSETS
TABLE 5

	Year Ending 12/31/2022	Year Ending 12/31/2021
1. Market value of assets at beginning of year	$ 10,405,073	$ 9,048,451
2. Revenue for the year		
a) Contributions		
i) Department contributions	$ 1,026,802	$ 1,409,912
ii) State contributions	57,682	57,682
iii) Other Income	0	0
iv) Total	$ 1,084,484	$ 1,467,594
b) Net investment income	$ (1,208,616)	$ 626,488
c) Total revenue (2.a. + 2.b.)	$ (124,132)	$ 2,094,082
3. Expenditures for the year		
a) Benefit payments	$ 658,240	$ 672,860
b) Administrative expenses	57,424	64,600
c) Miscellaneous	0	0
d) Total expenditures	$ 715,664	$ 737,460
4. Change in plan net assets (2.c. - 3.d.)	$ (839,796)	$ 1,356,622
5. Market value of assets at end of year (1. + 4.)	$ 9,565,277	$ 10,405,073

HISTORICAL SUMMARY
TABLE 6

	Valuation as of 1/1/2023	Valuation as of 1/1/2021	Valuation as of 1/1/2019
1. Member Data			
a. Active Members	3	4	7
b. Retired Members	37	37	37
c. Disabled Members	0	0	0
d. Beneficiaries	13	11	12
e. Terminated Vested Members	10	12	11
f. Total Members	63	64	67
g. Average Age – Actives Only	40.6	37.8	40.0
h. Average Service – Actives Only	16.0	12.0	10.3
2. Financial Data			
a. Market Value of Assets	$ 9,565,277	$ 9,048,451	$ 6,275,579
3. Actuarial Data			
a. Accrued Liability	$ 11,110,887	$ 9,960,981	$ 8,194,715
b. Unfunded Accrued Liability / (Surplus)	$ 1,545,610	$ 912,530	$ 1,919,136
c. Normal Cost			
i. Total Amount	$ 13,719	$ 16,839	$ 25,944
ii. Amount per Active Member	4,573	4,210	3,706
d. Amortization Contribution			
i. Total Amount	$ 121,035	$ 71,459	$ 150,285
ii. Amount per Active Member	40,345	17,865	21,469
e. Administrative and Ongoing Expenses			
i. Total Amount	$ 61,012	$ 52,043	$ 41,176
ii. Amount per Active Member	20,337	13,011	5,882
f. Actuarially Determined Contribution			
i. Total Amount	$ 195,766	$ 140,341	$ 217,405
ii. Amount per Active Member	65,255	35,085	31,058

MEMBERSHIP DATA
TABLE 7

		1/1/2023	1/1/2021
1.	Active members		
	a. Number	3	4
	b. Average age	40.6	37.8
	c. Average service	16.0	12.0
2.	Service Retirees		
	a. Number	37	37
	b. Total annual benefits	$ 586,500	$ 531,900
	c. Average annual benefit	15,851	14,376
	d. Average age	65.3	65.8
3.	Disabled Retirees		
	a. Number	0	0
	b. Total annual benefits	$ 0	$ 0
	c. Average annual benefit	N/A	N/A
	d. Average age	N/A	N/A
4.	Beneficiaries and Spouses		
	a. Number	13	11
	b. Total annual benefits	$ 121,380	$ 90,900
	c. Average annual benefit	9,337	8,264
	d. Average age	80.7	78.3
5.	Terminated vested members		
	a. Number	10	12
	b. Average age	44.7	44.8
6.	Total number of members	63	64

SUMMARY OF ACTUARIAL ASSUMPTIONS, METHODS, AND CHANGES
TABLE 8

The calculations set forth in this report are based on the following assumptions:

1. Investment Rate of Return — 5.00% per annum (net of investment expenses), compounded annually

2. Rates of Decrement due to:

   a. Retirement — Age 50 and 20 years of service. 50% probability for ages 50-64, 100% probability at age 65.

   b. Disability

Age in 2023	Annual Rate Per 1,000
20	0.10
25	0.16
30	0.26
35	0.45
40	0.97
45	3.50
50	6.50
55	8.10

   c. Pre-Retirement Mortality — Pub-2010 Public Safety Healthy Employee Mortality Tables for males and females, amount-weighted, projected with the MP-2020 Ultimate projection scale, 60% multiplier.

   Sample rates shown below:

	Annual Rate Per 1,000	
Age in 2023	Male	Female
20	0.206	0.080
25	0.186	0.101
30	0.206	0.136
35	0.236	0.181
40	0.296	0.247
45	0.412	0.337
50	0.604	0.458
55	0.880	0.619

SUMMARY OF ACTUARIAL ASSUMPTIONS, METHODS, AND CHANGES (CONTINUED)

d. Withdrawal (any reason other than retirement, death, or disability)

Service	Annual Rate Per 1,000
0	182.4
5	126.1
10	84.0
15	55.9
20	0.0

20% of members age 50 and eligible for a terminated vested benefit which would commence immediately are assumed to withdraw each year.

3. Post-Retirement Mortality

a. Healthy Retirees and Beneficiaries

Pub-2010 Public Safety Healthy Annuitant Mortality Tables for males and females, amount-weighted, projected with the ultimate values of the MP-2020 projection scales.

Sample rates shown below:

	Annual Rate Per 1,000	
Age in 2023	Male	Female
50	1.609	1.249
55	2.564	2.162
60	4.257	3.738
65	7.422	6.487
70	13.332	11.300
75	24.251	19.694
80	44.195	34.314

SUMMARY OF ACTUARIAL ASSUMPTIONS, METHODS, AND CHANGES (CONTINUED)

b. Disabled Retirees

Pub-2010 Safety Healthy Annuitant Mortality Tables for males and females, amount-weighted, set forward five years projected with the MP-2020 Ultimate projection scale, with a minimum rate of 3.5% for males and 2.5% for females.

Sample rates shown below:

	Annual Rate Per 1,000	
Age in 2023	Male	Female
50	35.000	25.000
55	35.000	25.000
60	35.000	25.000
65	35.000	25.000
70	35.000	25.000
75	43.791	33.999
80	79.115	59.256

4. Marital Status

90% of members assumed married

5. Administrative Expenses

An explicit administrative expense equal to the average of the actual expenses for the two prior years.

6. Asset Valuation Method

Market Value

7. Changes in Actuarial Assumptions

Mortality assumptions have been updated since the prior valuation. The assumptions are similar to the assumption set used to value volunteer fire districts in Colorado that are associated with Fire and Police Pension Association of Colorado.

SUMMARY OF ACTUARIAL ASSUMPTIONS, METHODS, AND CHANGES (CONTINUED)

8. Actuarial Cost Method

Under the entry age normal actuarial cost method, the Normal Cost is computed as the level dollar amount which, if paid from the earliest time each member would have been eligible to join the plan if it then existed (thus, entry age) until his retirement or termination, would accumulate with interest at the rate assumed in the valuation to a fund sufficient to pay all benefits under the plan. The normal cost for the plan is determined by summing the normal cost of all members.

The Actuarial Accrued Liability under this method at any point in time is the theoretical amount of the fund that should have been accumulated had annual contributions been made in prior years equaling to the normal cost. The Unfunded Actuarial Accrued Liability/(Surplus) is the excess of the actuarial accrued liability over the actuarial value of the plan assets as of the valuation date.

Under this method, experience gains and losses (i.e. decreases or increases in accrued liabilities), attributable to deviations in experience from the actuarial assumptions, adjust the unfunded actuarial accrued liability.

RISKS ASSOCIATED WITH MEASURING THE ACCRUED LIABILITY
TABLE 9

The determination of the accrued liability requires the use of assumptions regarding future economic and demographic experience. Risk measures, as illustrated in this report, are intended to aid in the understanding of the effects of future experience differing from the assumptions used in the course of the actuarial valuation. Risk measures may also help with illustrating the potential volatility in the accrued liability that results from the differences between actual experience and the actuarial assumptions.

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 due to changing conditions; 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. The scope of an actuarial valuation does not include an analysis of the potential range of such future measurements.

Examples of risk that may reasonably be anticipated to significantly affect the plan's future financial condition include:

1. Investment risk – actual investment returns may differ from the expected returns;
2. Asset/Liability mismatch – changes in asset values may not match changes in liabilities, thereby altering the gap between the accrued liability and assets and consequently altering the funded status and contribution requirements;
3. Contribution risk – actual contributions may differ from expected future contributions. For example, actual contributions may not be made in accordance with the plan's funding policy or material changes may occur in the anticipated number of covered employees, covered payroll, or other relevant contribution base;
4. Longevity risk – members may live longer or shorter than expected and receive pensions for a period of time other than assumed;
5. Other demographic risks – members may terminate, retire or become disabled at times or with benefits other than assumed resulting in actual future accrued liability and contributions differing from expected.

The effects of certain trends in experience can generally be anticipated. For example, if the investment return since the most recent actuarial valuation is less (or more) than the assumed rate, the cost of the plan can be expected to increase (or decrease). Likewise, if longevity is improving (or worsening), increases (or decreases) in cost can be anticipated.

RISKS ASSOCIATED WITH MEASURING THE ACCRUED LIABILITY (CONTINUED)

Plan Maturity Measures

Risks facing a pension plan evolve over time. A young plan with virtually no investments and paying few benefits may experience little investment risk. An older plan with a large number of members in pay status and a significant trust may be much more exposed to investment risk. Generally accepted plan maturity measures include the following:

	January 1, 2023	January 1, 2021
Ratio of actives to retirees and beneficiaries	0.1	0.1
Ratio of net cash flows to market value of assets	4%	9%
Duration of the actuarial accrued liability	12.8	13.2

Ratio of Net Cash Flow to Market Value of Assets

A positive net cash flow means contributions exceed benefits and expenses. A negative cash flow means existing funds are being used to make payments. A certain amount of negative net cash flow is generally expected to occur when benefits are prefunded through a qualified trust. Large negative net cash flows as a percent of assets may indicate a super-mature plan or a need for additional contributions.

Duration of Actuarial Accrued Liability

The duration of the actuarial accrued liability may be used to approximate the sensitivity to a 1% change in the assumed rate of return. For example, duration of 10 indicates that the liability would increase approximately 10% if the assumed rate of return were lowered 1%.

Additional Risk Assessment

Additional risk assessment is outside the scope of the annual actuarial valuation. Additional assessment may include scenario tests, sensitivity tests, stochastic modeling, stress tests, and a comparison of the present value of accrued benefits at low-risk discount rates with the actuarial accrued liability.

COMPARISON OF ACTUARIAL RESULTS BASED ON ALTERNATE BENEFIT LEVELS OR ASSUMPTIONS
TABLE 10

		Current Plan	Study A	Study B
1.	Normal Retirement Benefit	$ 1,700.00	$ 1,800.00	$ 1,900.00
2.	Normal Cost	13,719	14,526	15,333
3.	Present Value of Future Benefits	11,193,682	11,852,133	12,510,587
4.	Actuarial Accrued Liability	11,110,887	11,764,464	12,418,052
5.	Unfunded Accrued Liability / (Surplus)	1,545,610	2,199,187	2,852,775
6.	Total Annual Calculated Contribution	195,766	247,754	299,742
7.	Assumed Contribution	1,379,204	1,379,204	1,379,204
8.	Funding Period Based on Assumed Contribution	2 years	2 years	3 years
9.	Funded Ratio	86.1%	81.3%	77.0%

ACTUARIAL VALUATION INFORMATION CHECKLIST
SUMMARY OF ALTERNATE SCENARIOS REQUESTED
TABLE 11

	Current Plan	Study A	Study B	Maximum Per State Statute
1. Normal Retirement Benefit (monthly):				
a. Regular	$1,700.00	$1,800.00	$1,900.00	None
b. Extended Service Amount Per Year of Service	$85.00	$90.00	$95.00	5% of Regular, for 10 Additional years
2. Vested Retirement Benefit (monthly):				
a. With 20 or More Years of Service Not yet age 50, but payable at age 50	$1,700.00	$1,800.00	$1,900.00	None
b. With 10 to 20 Years of Service Amount Per Year of Service per Minimum Vesting Years	$85.00	$90.00	$95.00	Pro rata Share of Regular
c. Minimum Vesting Years	10	10	10	20 Years
3. Disability Retirement Benefit (monthly):				
a. Short Term Disability for line of duty injury Amount payable for not more than 1 year	$0.00	$0.00	$0.00	½ of Regular or $225, whichever is greater
b. Long Term Disability for line of duty injury Lifetime Benefit	$0.00	$0.00	$0.00	Regular or $450 whichever is greater
4. Survivor Benefits (monthly):				
a. Following Death before Retirement Eligible; Due to death in the line of duty as a volunteer firefighter	$850.00	$900.00	$950.00	½ of Regular or $225, whichever is greater
b. Following Death after Normal Retirement	$850.00	$900.00	$950.00	50% of Regular
c. Following Death after Normal Retirement with Extended Service Amount Per Year of Service	$42.50	$45.00	$47.50	50% of Extended
d. Following Death after Vested Retirement with 20 or More Years of Service Amount Per Year of Service per Minimum Vesting Years	$850.00	$900.00	$950.00	50% of Vested
e. Following Death after Vested Retirement with 10 to 20 Years of Service Amount Per Year of Service per Minimum Vesting Years	$42.50	$45.00	$47.50	50% of Vested
f. Following Death after Disability Retirement	$0.00	$0.00	$0.00	50% of Long Term
g. Optional Survivor Benefits in lieu of 4a-f Following Death before or after Retirement Eligible due to death on or off duty as a volunteer firefighter (Purchase of Life Insurance Required)	$0.00	$0.00	$0.00	100% of Regular
5. Funeral Benefit (Required Benefit):				
a. Funeral Benefit Lump Sum, one time only	$3,400.00	$3,600.00	$3,800.00	2 times Regular

Glossary of Terms

Actuarial Accrued Liability	Computed differently under different actuarial cost methods. Generally actuarial accrued liability represents the value of the portion of the participant's anticipated retirement, termination, and/or death and disability benefits accrued as of the valuation date.
Actuarial Cost Method	A method for determining the actuarial present value of future benefits and allocating such value to time periods in the form of a normal cost and an actuarial accrued liability.
Actuarial Gain or Loss	From one valuation to the next, if the experience of the plan differs from that anticipated by the actuarial assumptions, an actuarial gain or loss occurs. For example, an actuarial gain would occur if the assets in the trust had a yield of 12% based on actuarial value, while the assumed yield on the actuarial value of assets was 7.5%.
Actuarial Value of Assets	The value of cash, investments, and other property belonging to the Plan, as valued by the actuary for purposes of the actuarial valuation.
Entry Age Actuarial Cost Method	A method under which a participant's actuarial present value of future benefits is allocated on a level basis over the earnings of the participant between his/her entry into the Plan and his/her assumed exit.
Normal Cost	Computed differently under different actuarial cost methods, the normal cost generally represents the value of the portion of the participant's anticipated retirement, termination, and/or death and disability benefits accrued during a year.
Present Value of Future Benefits	This is computed by projecting the total future benefit cash flow from the Plan, using actuarial assumptions, and then discounting the cash flow to the valuation date.
Unfunded Actuarial Accrued Liability	The difference between total actuarial present value of future benefits over the sum of the tangible assets of the Plan and the actuarial present value of the members' future normal costs. The Plan is underfunded if the difference is positive and overfunded if the difference is negative.