

Fire and Police Pension Association Statewide Death & Disability Plan

Actuarial Valuation Report
for the Year Beginning January 1, 2024





June 30, 2024

Board of Directors
Fire and Police Pension Association
7979 E Tufts Ave, Suite 900
Denver, Colorado 80237

Re: Actuarial Valuation of the FPPA Statewide Death & Disability Plan (the Plan) as of January 1, 2024

Dear Members of the Board:

We are pleased to present our Report on the actuarial valuation of the Statewide Death & Disability Plan for the Fire and Police Pension Association (FPPA) as of January 1, 2024.

We certify that the information included herein and contained in our 2024 Actuarial Valuation Report is accurate and fairly presents the actuarial position of the FPPA Statewide Death & Disability Plan as of January 1, 2024.

Our report presents the results of the January 1, 2024 actuarial valuation of the FPPA Statewide Death & Disability Plan (D&D). The report describes the current actuarial condition of the D&D, determines the appropriateness of the contribution rate for certain members, and analyzes changes since the last valuation. The results presented herein may not be applicable for other purposes.

Valuations are prepared annually, as of January 1st, the first day of the FPPA plan year.

Financing Objectives

Contribution rates are established by law as a percentage of payroll. The contributions are intended to finance the future benefits payable from the Plan using a modified version of the aggregate actuarial cost method.

Progress toward Realization of Financing Objectives

The unfunded actuarial accrued liability and the funded ratio (ratio of the actuarial value of assets to the net present value of benefits) illustrate the progress toward the realization of certain financing objectives. Based on our actuarial valuation as of January 1, 2024, the Plan has current liabilities which are greater than current assets by \$113.4 million assuming no allowance for future discretionary benefit adjustments for non-totally disabled benefit recipients. This does not take into account any increases beyond the current 3.60% contribution level which the Board may adopt in the future.

The Board increased the contribution rates to 3.60% for 2024. Based on smoothed assets, the cost of providing benefits is 4.39%, therefore, the current contribution rates are inadequate to provide any level of future discretionary benefit adjustments, or even to fund base benefits. We recommend that the Board maximize use of the contribution flexibility allowable and increase rates from 3.60% in 2024 to

3.80% in 2025. We recommend that the Board continue these maximum increases at least until the actuarial rate is met.

Projected Actuarial Results

The following table shows the Funded Ratio (FR) and Annual Required Contribution (ARC) projected over the next five years given alternative investment returns on the market value of assets. With the exception of the market value investment returns, the projections beyond 2024 are based on the same assumptions, methods and provisions used for the January 1, 2024 valuation. The projections assume the Board will utilize the maximum 0.2% contribution increase each year until the Annual Required Contribution is met or exceeded.

5-Year Deterministic Projection						
January 1,	Market Value Investment Return					
	3.00%		7.00%		11.00%	
	Funded Ratio	ARC	Funded Ratio	ARC	Funded Ratio	ARC
2024	83.6%	4.39%	83.6%	4.39%	83.6%	4.39%
2025	85.8%	4.45%	86.5%	4.42%	87.3%	4.38%
2026	87.9%	4.55%	89.9%	4.46%	92.1%	4.36%
2027	89.6%	4.66%	93.6%	4.48%	98.2%	4.28%
2028	91.3%	4.78%	98.2%	4.48%	103.4%	4.15%
2029	92.7%	4.92%	100.9%	4.46%	105.0%	3.96%

Due to the limited scope of our assignment, we did not perform an analysis of the potential range of future actuarial measurements other than that shown above.

Benefit provisions

All of the benefit provisions reflected in this valuation are those which were in effect on January 1, 2024. There were no changes in provisions since the prior valuation. The benefit provisions are summarized in Appendix B of our Report.

Data

FPPA supplied data for active and disabled members as of January 1, 2024. We did not audit this data, but we did apply a number of tests to the data, and we have concluded that the data is reasonable and consistent with the prior year's data. FPPA also supplied asset data as of January 1, 2024.

Assumptions and methods

The current actuarial methods and assumptions were selected by the Board of Directors of FPPA based upon the actuary's analysis and recommendations from the 2022 Experience Study, for first use in the actuarial valuation as of January 1, 2023. For information regarding the rationale for the assumptions chosen, please see the experience study report dated June 20, 2022.



The assumptions and methods are detailed in Appendix A of our Report. The Board of Directors has sole authority to determine the actuarial assumptions used for the Plan. The assumptions that are based upon the actuary's recommendations are internally consistent and are reasonably based on the actual past experience of the Plan.

The actuarial assumptions represent estimates of future experience and are not market measures. The results of any actuarial valuation are dependent upon the actuarial assumptions used. Actual results (and future measures) 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 rates and funding periods. The actuarial calculations presented in this report are intended to provide information for rational decision making.

This report was prepared using our proprietary valuation model and related software which in our professional judgement 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

Plan reporting information for GASB Statement No. 74 can be found in the FPPA Annual Comprehensive Financial Report at FPPA's website - FPPAco.org. There will be no employer reporting for GASB Statement No. 75 as all contributions to the FPPA Statewide Death & Disability Plan are made by members or on behalf of members.

Certification

All of our work conforms with generally accepted actuarial principles and practices, and to the Actuarial Standards of Practice issued by the Actuarial Standards Board. In our opinion, our calculations also comply with the requirements of Colorado state law and, where applicable, the Internal Revenue Code, ERISA, and the Statements of the Governmental Accounting Standards Board.

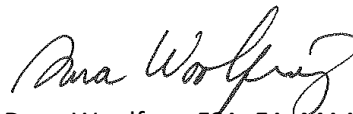
The undersigned are independent actuaries and consultants. All are Members of the American Academy of Actuaries, and meet the Qualification Standards of the American Academy of Actuaries. Joseph Newton, Dana Woolfrey, and Andy Fritz are Enrolled Actuaries. Finally, Joseph Newton and Dana Woolfrey are experienced in performing valuations for large public retirement systems.

Respectfully submitted,

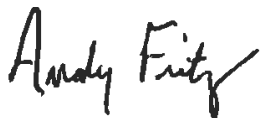
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SECTION I

EXECUTIVE SUMMARY

Executive Summary

Item	January 1, 2024	January 1, 2023
Membership <ul style="list-style-type: none"> • Number of: <ul style="list-style-type: none"> - Active members 14,052 - Total disabled members & beneficiaries 179 - Occupational disabled members & beneficiaries 1,181 - Survivors of deceased active members <u>141</u> - Total 15,553 • Annualized payroll supplied by FPPA \$ 1,386,414 	13,757 176 1,120 <u>140</u> 15,193 \$ 1,292,292	
Contribution rates for members hired on or after January 1, 1997 and members covered by Social Security	3.60%	3.40%
Assets <ul style="list-style-type: none"> • Market value \$ 570,466 • Actuarial value \$ 576,819 • Rate of return on market value 9.6% • Rate of return on actuarial value 6.6% • Contribution for prior year \$ 49,552 • Ratio of actuarial value to market value 101.1% 	\$ 516,545 \$ 537,263 -8.0% 6.0% \$ 43,645 104.0%	
Actuarial Information <ul style="list-style-type: none"> • Unfunded actuarial accrued liability/(surplus) \$ 113,421 • GASB funded ratio (3.6%/3.4% Contributions) 83.6% 	\$ 120,317 81.7%	

Note: Dollar amounts in \$000

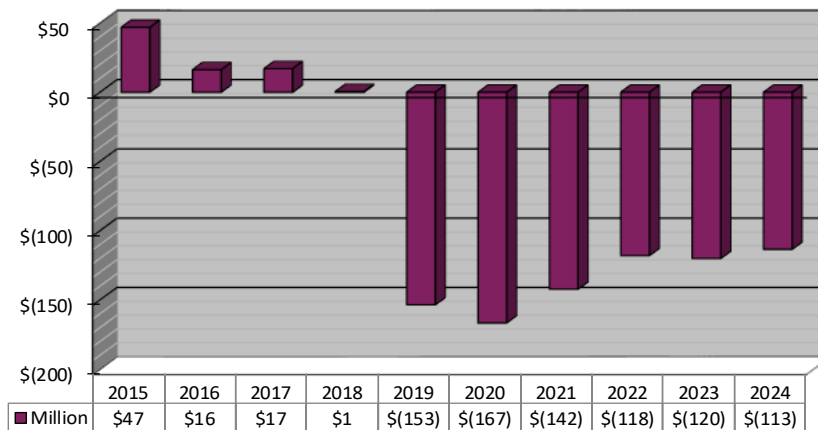


Executive Summary

1. The annual contribution rate for members hired on or after January 1, 1997 and for members covered by Social Security is 3.60% as of January 1, 2024. House Bill 20-1044 allows the Board to increase contributions by up to 0.20% per year. We recommend that the Board maximize use of the contribution flexibility granted by the House Bill and increase rates from 3.60% in 2024 to 3.80% in 2025. We recommend that the Board continue these maximum increases at least until the actuarial rate is met.
2. The number of total members increased from 15,193 in 2023 to 15,553 in 2024, an increase of 2.4%.
3. Current plan benefits provide an automatic annual 3.0% benefit adjustment to totally disabled members and their beneficiaries but assume no future benefit adjustments for other members. Based on actuarial estimations, the current 3.6% contribution rate is inadequate to provide any permanent annual benefit adjustment.
4. The present value of future benefits and expenses at the valuation date is in excess of the plan assets and the present value of future contributions by \$113.4 million. This unfunded position compares to the \$120.3 million unfunded position last year. The Plan is “unfunded” assuming no future discretionary benefit adjustments for non-totally disabled benefit recipients. The primary source of change in unfunded position was the increase in contribution levels from 3.4% to 3.6%.
5. Assets earned 9.64% on a market basis and 6.61% on an actuarial basis in 2024, producing an actuarial loss of \$2.1 million.
6. The funded ratio increased from 81.7% to 83.6% as of January 1, 2024.

The following chart shows the history of the (Unfunded Actuarial Accrued Liability)/Surplus as of past historical valuation dates. The dollar values are in millions.

Historical (UAAL)/Surplus



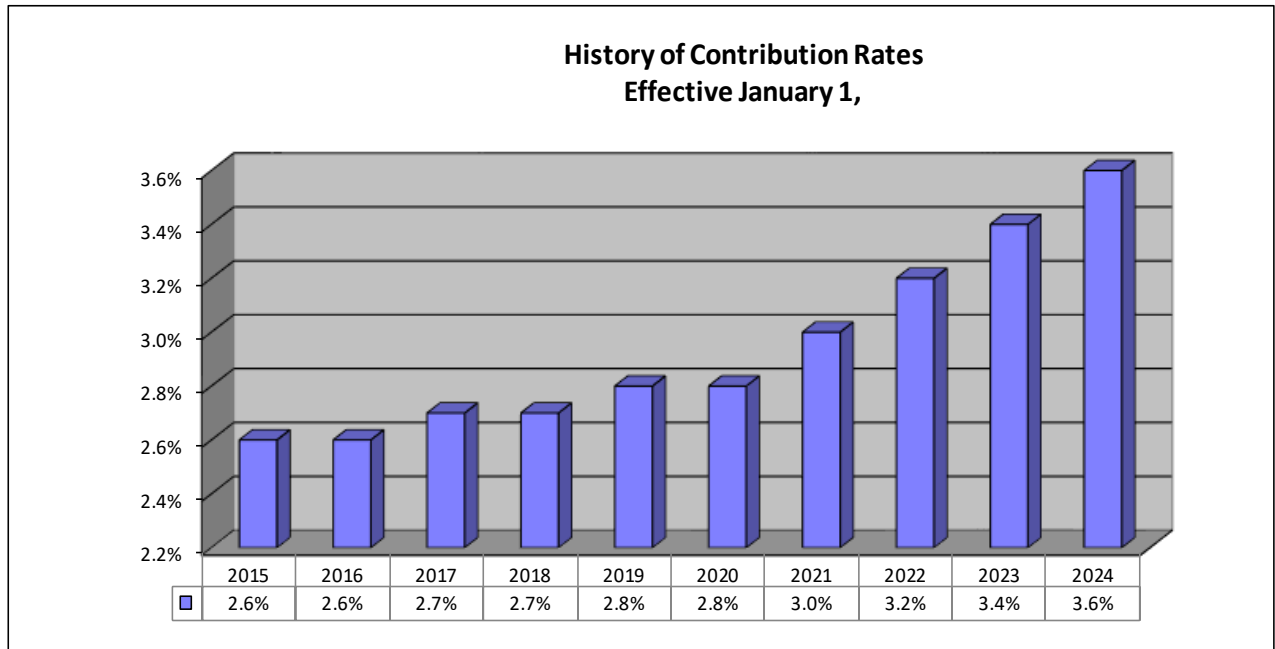
SECTION II

DISCUSSION

Contribution Requirements

The valuation of the Fire and Police Pension Association Statewide Death & Disability Plan (D&D) as of January 1, 2024, reflects a current employee contribution rate of 3.6% for members hired on or after January 1, 1997. House Bill 20-1044 allows the Board to increase the annual contribution rate by as much as 0.2% every year.

The following graph shows the historical contribution rates for employees hired on or after January 1, 1997 and for members covered by Social Security.

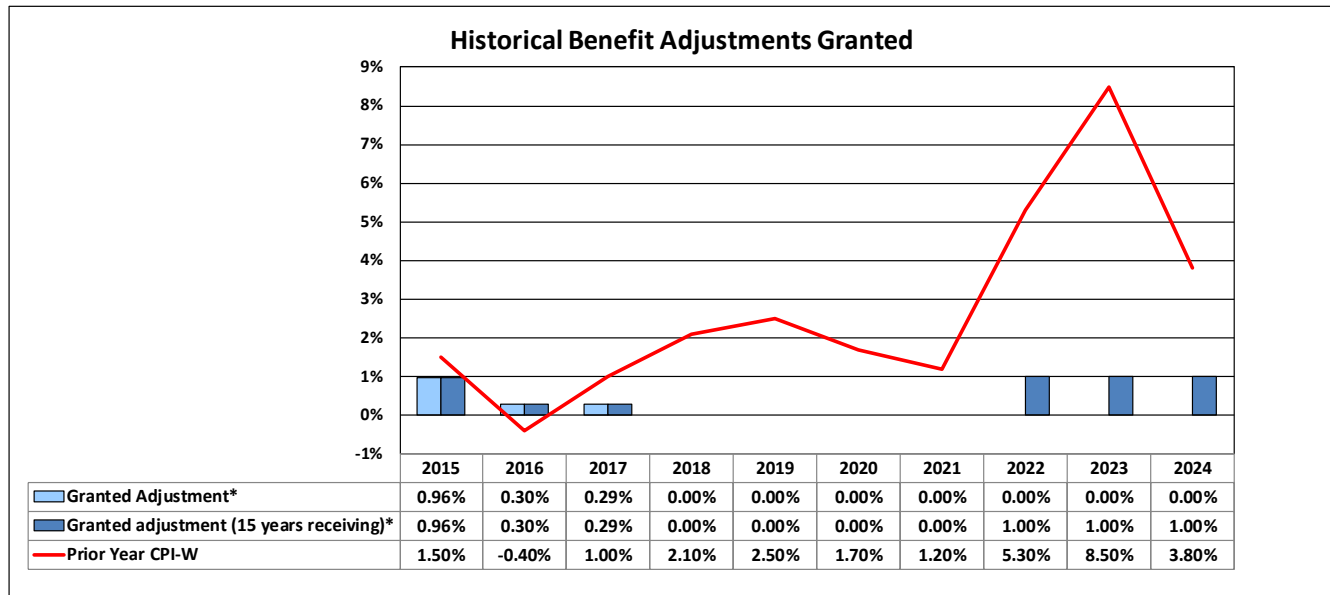


The cost of providing benefits is 4.39% (with no future benefit adjustments for non-totally disabled benefit recipients), therefore, the current 3.6% contribution rate is inadequate to provide any level of future benefit adjustments, or even to fund base benefits. House Bill 20-1044 allows the Board to increase rates by 0.2% per year. We recommend the Board make maximum use of that discretion until the plan's funding outlook is significantly improved.

Discretionary Benefit Adjustments

On October 1st of each year, annuitants may receive a benefit increase at the discretion of the Board of Directors. Totally disabled members and their beneficiaries receive an automatic increase each year of 3%. For other annuitants, the increase may reflect CPI, but in no case may be higher than 3%. Because the increases are purely discretionary, the valuation results in the report are shown assuming no discretionary benefit adjustments are granted to annuitants other than total disability retirees. Based on smoothed assets, the cost of providing base benefits is 4.39%, therefore, the current contribution rates of 3.60% are inadequate to provide any level of future discretionary benefit adjustments, or even to fund base benefits. However, it is expected that the Board will ultimately be able to increase contributions to a level that is able to fund base benefits and some level of discretionary benefit adjustments. In 2021, 2022 and 2023, the Board chose to grant a 1.0% ad hoc benefit adjustment to

occupational disability annuitants and survivors of active members who have been receiving a benefit from the plan for at least 15 years, and included consideration for doing so in the future in their benefits policy. This was done to reflect that the plan had paid minimal COLAs to this group for about 15 years. Although these increases are still discretionary each year, reflecting this 1.0% benefit adjustment on a long-term basis increases the cost of benefits from 4.39% to 4.69% of pay.



* Total disability annuitants and their survivors receive an automatic annual Benefit Adjustment of 3.0%. Amounts for 2024 are not yet finalized.

Financial Data and Experience

This section provides an analysis of the change in Plan Net Assets during the year and an estimate of the yield on mean assets of D&D. FPPA provided GRS with a summary of plan assets as of January 1, 2024. The market value of assets reported was \$570.5 million as of January 1, 2024, as compared to \$516.5 million as of January 1, 2023. Table 6 shows data from some of the tables included in the annual financial statements of the Plan. Table 8 shows the estimated yield on a market value basis and on the actuarial asset valuation method.

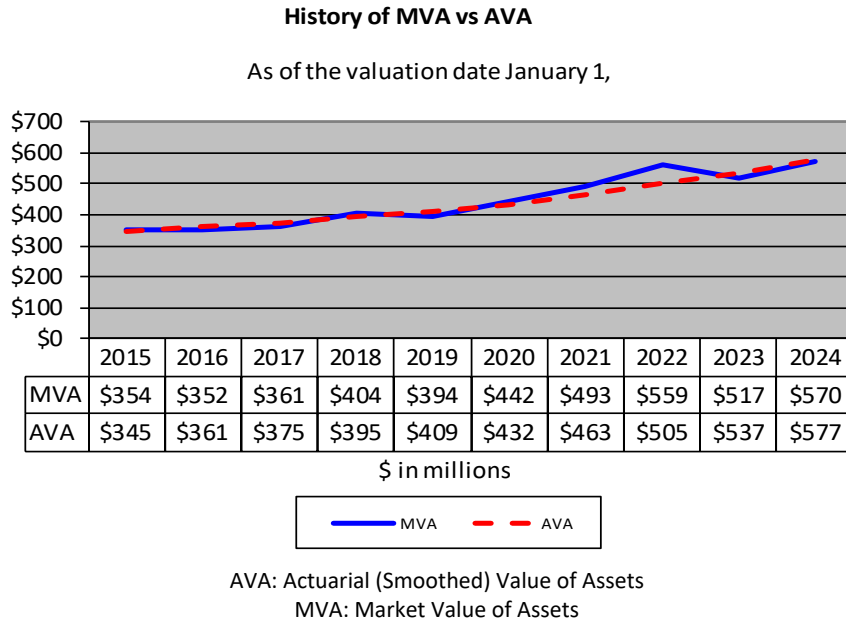
The asset valuation method uses a five-year phase in of the excess/(shortfall) between expected investment return and actual income. Expected earnings used to project the actuarial value are determined using the assumed investment return rate and the beginning of year actuarial value of assets (adjusted for receipts and disbursements during the year). The returns are computed net of administrative and investment expenses.

Table 7 shows the development of the actuarial value of assets. The actuarial value of assets increased from \$537.3 million to \$576.8 million since the prior valuation. This increase was less than expected and produced a loss of approximately \$2.1 million.

As indicated by item 6b of Table 8, the estimated return on mean market value was 9.64% in 2023; higher than the assumed 7.0% return. The actuarial asset value returned 6.61%. This difference in the



estimated return on market value and actuarial value illustrates the smoothing effect of the asset valuation method.



Demographic Experience

During the year, the plan had more disablements than expected (95 actual vs. 71.8 expected) and less active member deaths than expected (2 actual vs. 7.0 expected). The plan had more annuitant deaths than expected (32 actual vs. 19.4 expected). The primary components of the loss shown in Table 3 were the disability experience and newly hired members.

Member Data

FPPA supplied member data as of January 1, 2024. While we did not audit this data, we did perform various tests to ensure that it was internally consistent, consistent with the prior year’s data, and was reasonable overall. Information provided for active members includes: name, member ID, sex, a code indicating whether the member was active or inactive, date of birth, service, salary, accumulated member contribution, and the accumulated stabilization reserve account. For retired members, data includes: name, member ID, sex, date of birth, date of retirement, amount of benefit, a code indicating the option elected and the type of retiree (total disability retirees, occupational disability retirees, beneficiary), and if applicable, the joint pensioner’s date of birth and sex.

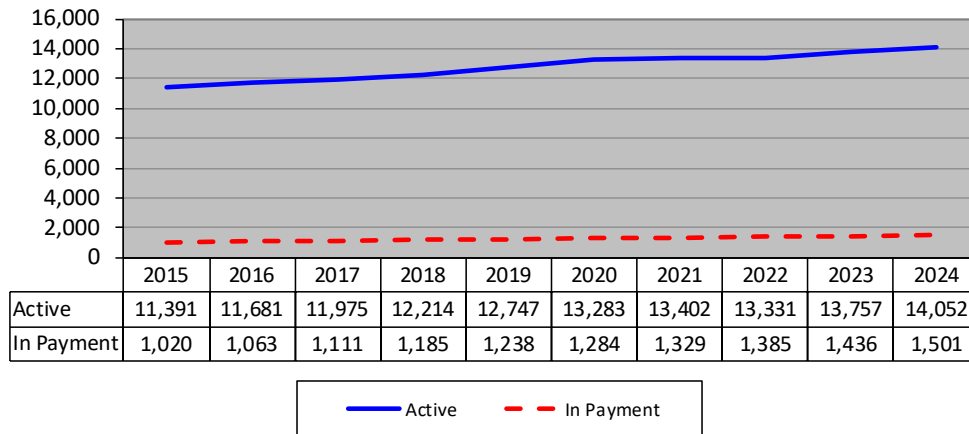
For local Money Purchase members, an array based on service was used to estimate each member’s Money Purchase balance. For missing salary in the data, an array of salaries based on service was used to estimate the salary.

Table 14 shows the number of members by category (active, inactive, retired, etc.). Table 15 shows a historical summary of active member statistics, and Table 16 shows the distribution of active members by age and service.

The total payroll shown on the statistical tables is the amount that was supplied by FPPA. For the cost calculations, the pays were adjusted in accordance with the actuarial assumptions to reflect one year’s salary increase.

History of Counts: Active vs In Payment

As of the valuation date January 1,



Benefit Provisions

Appendix B in Section IV includes a summary of the benefit provisions for FPPA. Highlights include:

- Pre-Retirement Death Benefits:
 - o Off-duty: 40% of the base salary paid to the member prior to death, with an additional 10% of base salary if a surviving spouse has two or more dependent children.
 - o On-duty: 70% of the base salary paid to the member prior to death.
- Disability Benefits:
 - o Total Disability: 70% of the base salary preceding disability.
 - o Permanent Occupational Disability: 50% of the base salary preceding disability.
 - o Temporary Occupational Disability: 40% of the base salary preceding disability for up to 5 years.
- Contributions: Members hired after January 1, 1997 and members covered by Social Security currently contribute 3.6% of pay.
- Benefit adjustments are granted periodically at the discretion of the FPPA Board. Total disability retirees receive an automatic increase of 3%. For other annuitants, the increase may reflect CPI, but in no case may be higher than 3%.

There are no ancillary benefits—e.g., cost of living benefits—that are currently provided by a source independent of FPPA but that might be deemed an FPPA liability if continued beyond the availability of funding by the current funding source.

Actuarial Methods and Assumptions

The valuation was prepared using the Aggregate Method. This is the same funding method that has been used in prior years. The asset valuation method uses a five-year phase in of the excess (shortfall) between expected investment return and actual income. See Appendix A for a complete description of this method.

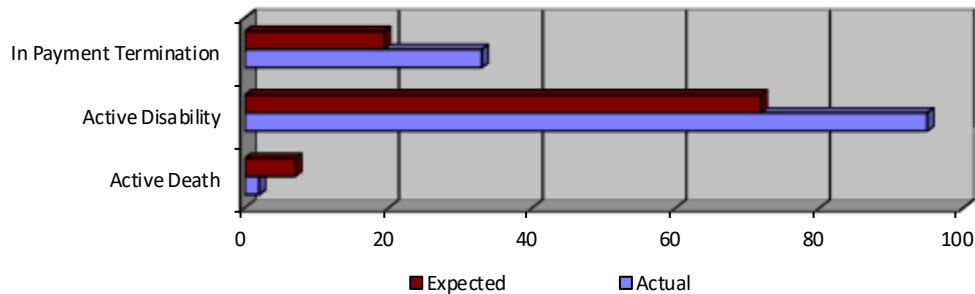
The actuarial value of future benefits from the Plan is based on several economic and non-economic assumptions. These are summarized in Appendix A as well. The economic assumptions include investment return and salary increases. Non-economic assumptions include rates of mortality, disability, and separation.

There were no changes to the assumptions and methods since the prior valuation.

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.

For FY2023, the actual salary increases were 101.5% of expected. The following charts provide a comparison of the actual experience versus the expected experience for selected assumptions.

Demographic Experience - FY2023



The In Payment Terminations above include deaths and benefits that were canceled for other reasons such as recovery.

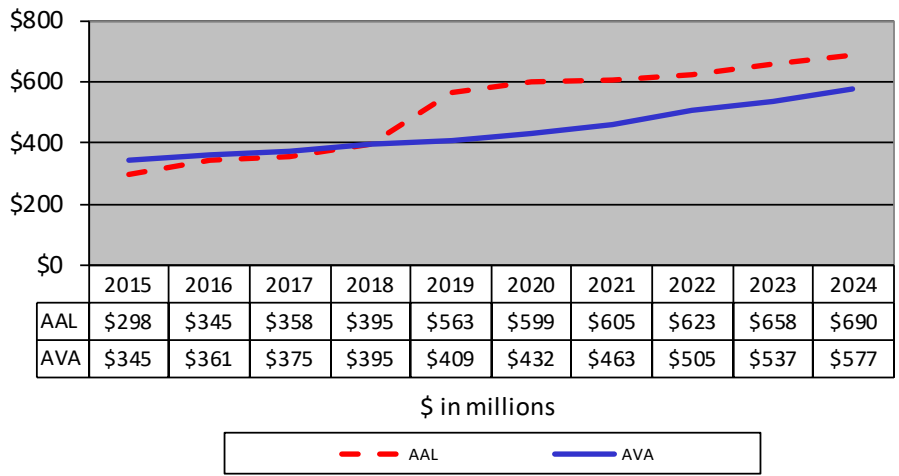
GASB and Funding Progress

Plan reporting information for Governmental Accounting Standards Board (GASB) 74 can be found in the FPPA Annual Comprehensive Financial Report at FPPAco.org. There will be no employer reporting for GASB 75 as all contributions to the FPPA Statewide Death & Disability Plan are made by members or on behalf of members. Although it will no longer be required for financial reporting purpose, we have continued to include Table 11a (shows a historical summary of the funded ratios and other information for FPPA). In addition, we have included a Schedule of Funding Progress in Table 11b based on the Entry Age Normal cost method as required for plans using the Aggregate Cost Method.

For FPPA, the employer Annual Required Contribution for 2023 is 0%. For members hired on or after 1/1/97 and for members covered by Social Security the member contribution rate is 3.6% of pay. The 3.6% became effective January 1, 2024.

History of AAL vs AVA

As of the valuation date January 1,



The AAL referenced in the chart is the Actuarial Accrued Liability as referenced throughout the report.

Significant Factors Affecting Trends in Actuarial Information

With the recognition of significant increases in utilization of the disability benefits of this plan, the funding outlook of the plan notably deteriorated starting with the actuarial valuation as of January 1, 2019. Contribution rate increases have significantly improved the plan’s funding position since then. If the Board maximizes the use of the contribution increases allowed, it is anticipated that the plan will be able to fund at a rate at or above the Actuarially Determined Contribution within the next five years.

Risk Metrics

The Statewide Death and Disability Plan provides death and disability benefits to members covered under the Statewide Retirement Plan, Colorado Springs New Hire Plan, the Statewide Money Purchase Plan and Local Money Purchase and Defined Benefit Plans. The Plan is funded through payroll contributions on active member payroll for members hired on or after January 1, 1997. Benefits for members hired before 1997 were previously funded by the State. The contributions made for this group were considered to fulfill the State’s funding obligation, and no further contributions are anticipated. Accordingly, the Calculated Contribution is calculated as a percentage of contributory (post-1996 hire) payroll. As pre-1997 hires terminate and are replaced by contributory members, the contributory portion of the active population grows. This results in the contributory payroll growing faster than the liabilities and assets. This deleveraging can be observed in the historical data. Although the Plan’s contributory payroll is growing, because the Plan is funded through employee contributions, there is less tolerance for contribution rate volatility. Eventually the active population will become largely contributory and the contributory payroll will not grow at the same rate. At that point (expected to be about 10 years out), the trend will reverse and the Plan will start to become more leveraged.

Valuation Year	AVA as % of Contributory Payroll	AAL (EAN) as % of Contributory Payroll	Calculated Contribution % of Contributory Payroll	Increase in ADC if Assets Decrease 10%	Funded Ratio (EAN)	Change in Funded Ratio if Assets Decrease 10%
2013	58%	52%	2.05%	0.51%	111.5%	-11.1%
2014	58%	52%	1.97%	0.51%	112.3%	-11.2%
2015	58%	52%	1.89%	0.52%	110.8%	-11.1%
2016	55%	53%	2.37%	0.51%	104.0%	-10.4%
2017	54%	53%	2.48%	0.49%	100.7%	-10.1%
2018	50%	52%	2.69%	0.49%	95.8%	-9.6%
2019	47%	56%	4.40%	0.43%	84.2%	-8.4%
2020	43%	51%	4.34%	0.40%	83.9%	-8.4%
2021	41%	48%	4.23%	0.40%	85.7%	-8.6%
2022	41%	47%	4.19%	0.42%	87.7%	-8.8%
2023	46%	55%	4.31%	0.41%	85.2%	-8.5%
2024	46%	55%	4.39%	0.40%	83.6%	-8.4%

Market Value Results

Investment gains or losses are smoothed over five years, and currently, the smoothed or actuarial value of assets is 101.1% of the market value. If the Funded Ratio and Calculated Contribution had been measured using the Market Value of Assets, they would be 82.6% and 4.43% of payroll, respectively.



SECTION III

TABLES

Table 1 - Development of Unfunded Actuarial Accrued Liability

	January 1, 2024	January 1, 2023
1. Covered payroll for upcoming year	\$ 1,405,249,271	\$ 1,305,064,193
2. Present value of future pay		
a. Total	\$ 14,533,658,608	\$ 13,356,680,988
b. Contributory (Hired on or after January 1, 1997)	14,409,884,822	13,206,620,575
3. Present value of benefits for active members		
a. Future occupational disabilities	\$ 484,671,133	\$ 445,319,796
b. Future total disabilities	84,517,982	77,908,623
c. Future active deaths	49,511,731	45,934,082
d. Total for actives	\$ 618,700,846	\$ 569,162,501
4. Total present value of benefits		
a. Current disabled members	\$ 513,327,451	\$ 466,815,809
b. Current beneficiaries of deceased members	42,383,961	41,571,683
c. Active members (Item 3d)	618,700,846	569,162,501
d. Total	\$ 1,174,412,258	\$ 1,077,549,993
5. Unfunded actuarial accrued liability (UAAL)/(surplus)		
a. Present value of benefits	\$ 1,174,412,258	\$ 1,077,549,993
b. Present value of administrative costs	34,583,724	29,054,565
c. Less present value of future contributions (current rate)	(518,755,854)	(449,025,100)
d. Less actuarial value of assets	(576,818,727)	(537,262,675)
e. UAAL/(surplus)	\$ 113,421,401	\$ 120,316,784
6. a. Current Contribution	3.60%	3.40%
b. Calculated Contribution (Aggregate Funding) [(5.a + 5.b + 5.d)/2.b]	4.39%	4.31%
c. Difference (a. - b.)	-0.79%	-0.91%

Table 2 - Actuarial Present Value of Future Benefits

	<u>January 1, 2024</u>	<u>January 1, 2023</u>
1. Active members		
a. Total disability	\$ 84,517,982	\$ 77,908,623
b. Occupational disability	484,671,133	445,319,796
c. Off-duty death	30,337,518	28,357,995
d. On-duty death	<u>19,174,213</u>	<u>17,576,087</u>
e. Total	\$ 618,700,846	\$ 569,162,501
2. Members in pay status		
a. Total disabled	\$ 124,892,223	\$ 117,583,822
b. Occupationally disabled	388,435,228	349,231,987
c. Survivors	<u>42,383,961</u>	<u>41,571,683</u>
d. Total	\$ 555,711,412	\$ 508,387,492
3. Total actuarial present value of future benefits	\$ 1,174,412,258	\$ 1,077,549,993

Table 3 - Actuarial Gain/(Loss) on UAAL

For the year ending December 31,	2023	2022
1. Unfunded actuarial accrued liability (UAAL) as of January 1	\$ 120,316,784	\$ 117,960,080
2. UAAL reflecting changes from experience study as of January 1	N/A	132,688,907
3. Interest on UAAL for one year	8,422,175	9,288,223
4. Expected UAAL as of December 31 (1 + 3 in 2023, 2 + 3 in 2022)	128,738,959	141,977,130
5. Change in Unfunded Liability due to:		
a. Benefit Changes *	1,163,629	937,013
b. Other Provision Changes**	(28,819,770)	(26,413,241)
6. Expected UAAL as of December 31 after changes in assumption, methods and plan provisions	101,082,818	116,500,902
7. Actual UAAL as of December 31	113,421,401	120,316,784
8. Actuarial gain/(loss) for the period (6 - 7)	(12,338,583)	(3,815,882)
<u>SOURCE OF GAINS/(LOSSES)</u>		
9. Asset gain/(loss) (See Table 9)	(2,117,733)	(5,179,310)
10. Salary liability gain/(loss) for the period	(563,034)	(2,662,729)
11. Benefit adjustment granted as of October 1 (0.00% in 2023, 0.00% in 2022)*	0	0
12. Net liability gain/(loss) for the period (8 - 9 - 10 - 11)	(9,657,816)	4,026,157

* Change in the Unfunded Liability due to Benefit Changes reflects ad-hoc 1% COLA granted to occupational disability annuitants and survivors of active members who have been receiving a benefit from the plan for at least 15 years. Benefit adjustments for other annuitants not receiving an automatic benefit adjustment associated with total disability did not receive a benefit adjustment in 2022 or 2023.

** Change in the Unfunded Liability due to Provision or Assumption Changes reflects the change in member contribution rate from 3.4% to 3.6%.



Table 4 - Summary of Historical Valuation Results

As of the Valuation Date January 1,

	<u>2024</u>	<u>2023</u>	<u>2022</u>	<u>2021</u>	<u>2020</u>	<u>2019</u>	<u>2018</u>	<u>2017</u>	<u>2016</u>	<u>2015</u>
1. Number of members										
a. Active	14,052	13,757	13,331	13,402	13,283	12,747	12,214	11,975	11,681	11,391
b. Disabled	1,360	1,296	1,244	1,195	1,149	1,106	1,058	991	944	904
c. Survivor	141	140	141	134	135	132	127	120	119	116
d. Total	<u>15,553</u>	<u>15,193</u>	<u>14,716</u>	<u>14,731</u>	<u>14,567</u>	<u>13,985</u>	<u>13,399</u>	<u>13,086</u>	<u>12,744</u>	<u>12,411</u>
2. Covered payroll (prior year)	\$ 1,386,414	\$ 1,292,292	\$ 1,188,245	\$ 1,168,873	\$ 1,112,893	\$ 1,012,667	\$ 947,520	\$ 917,100	\$ 863,106	\$ 827,633
3. Average compensation	\$ 98,663	\$ 93,937	\$ 89,134	\$ 87,216	\$ 83,783	\$ 79,444	\$ 77,577	\$ 76,585	\$ 73,890	\$ 72,657
4. Covered payroll for upcoming year	\$ 1,405,249	\$ 1,305,064	\$ 1,215,534	\$ 1,175,753	\$ 1,143,563	\$ 1,043,407	\$ 976,603	\$ 942,822	\$ 886,802	\$ 844,536
5. Actuarial value of assets	\$ 576,819	\$ 537,263	\$ 504,999	\$ 463,247	\$ 432,227	\$ 409,327	\$ 395,302	\$ 374,944	\$ 361,070	\$ 345,009
6. Market value of assets	\$ 570,466	\$ 516,545	\$ 559,369	\$ 493,253	\$ 442,442	\$ 394,247	\$ 403,693	\$ 360,747	\$ 351,520	\$ 353,776
7. Present value of benefits										
a. Actives	\$ 618,701	\$ 569,163	\$ 509,799	\$ 495,083	\$ 471,471	\$ 424,784	\$ 246,318	\$ 238,978	\$ 225,012	\$ 201,711
b. Disabled	513,327	466,816	430,033	396,025	371,814	350,578	315,103	287,456	265,786	243,179
c. Survivors	42,384	41,572	40,867	38,263	36,555	34,594	31,490	30,923	30,430	25,703
d. Total	<u>\$ 1,174,412</u>	<u>\$ 1,077,550</u>	<u>\$ 980,699</u>	<u>\$ 929,372</u>	<u>\$ 879,840</u>	<u>\$ 809,956</u>	<u>\$ 592,911</u>	<u>\$ 557,357</u>	<u>\$ 521,228</u>	<u>\$ 470,593</u>
8. Calculated Contribution	4.39%	4.31%	4.19%	4.23%	4.34%	4.40%	2.69%	2.48%	2.37%	1.89%

\$ amounts in '000s



Table 5 - Allocation of Plan Assets at Fair Value

	Actual Allocation January 1, 2024	Target Allocation
1. Global Public Equity	38.6%	38.0%
2. Long/Short Equity	6.8%	6.0%
3. Diversifiers	9.0%	9.0%
4. Private Market	30.8%	31.0%
5. Fixed Income	14.2%	15.0%
6. Cash	<u>0.6%</u>	<u>1.0%</u>
	100.0%	100.0%

Asset Allocation as of January 1, 2024

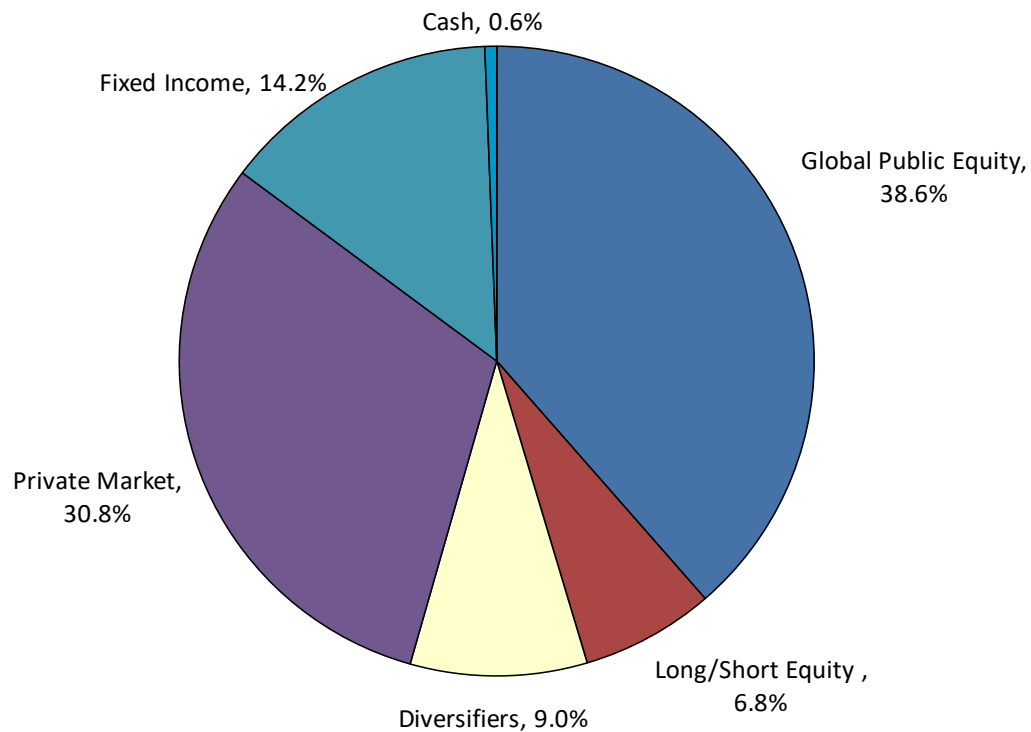


Table 6 - Reconciliation of Plan Net Assets

	Year Ending	
	December 31, 2023	December 31, 2022
1. Market value of assets at January 1	\$ 516,545,434	\$ 559,369,165
2. Revenue for the year		
a. Contributions		
i. Member contributions	\$ 6,774,996	\$ 5,839,585
ii. Employer contributions *	36,127,041	31,155,823
iii. State Funding	6,650,000	6,650,000
b. Net investment income		
i. Interest	\$ 3,595,194	\$ 1,901,470
ii. Dividends	2,684,696	2,631,020
iii. Net change in accrued income	290,966	215,081
iv. Unrealized gain/(loss)	37,602,554	(54,815,844)
v. Realized gain/(loss)	9,800,607	8,024,809
vi. Investment expense	(4,508,370)	(4,137,480)
vii. Other Income	526,528	1,334,864
c. Total revenue	\$ 99,544,212	\$ (1,200,672)
3. Expenditures for the year		
a. Benefit payments and refunds	\$ (42,553,482)	\$ (39,135,248)
b. Administrative expense	(3,070,634)	(2,487,811)
c. Total expenditures	\$ (45,624,116)	\$ (41,623,059)
4. Increase in net assets (Item 2c + Item 3c)	\$ 53,920,096	\$ (42,823,731)
5. Market value of assets at December 31 (Item 1 + Item 4)	\$ 570,465,530	\$ 516,545,434

*All contributions are made by members or on behalf of members



Table 7 - Development of Actuarial Value of Assets

1.	Actuarial value of assets at beginning of year	\$	537,262,675
2.	Net new investments		
	a. Contributions	\$	49,552,037
	b. Benefit payments	\$	(42,553,482)
	c. Administrative expenses	<u>\$</u>	<u>(3,070,634)</u>
	d. Net cash flow	\$	3,927,921
3.	Assumed investment return rate for fiscal year		7.00%
4.	Assumed investment return for fiscal year	\$	37,745,864
5.	Expected Actuarial Value at end of year	\$	578,936,460
6.	Market value of assets at end of year	\$	570,465,530
7.	Excess return/(shortfall) (6-5)	\$	(8,470,930)

8. Development of amounts to be recognized as of December 31, 2023:

Fiscal Year End	Remaining Deferrals of Excess/(Shortfall) of Investment Income	Offsetting of Gains/(Losses)	Net Deferrals Remaining	Years Remaining	Recognized for this valuation	Remaining after this valuation
	(1)	(2)	(3) = (1) + (2)	(4)	(5) = (3) / (4)	(6) = (3) - (5)
2019	\$ 0	\$ 0	\$ 0	1	\$ 0	\$ -
2020	0	0	0	2	0	\$ -
2021	0	0	0	3	0	\$ -
2022	(20,717,241)	12,246,311	(8,470,930)	4	(2,117,733)	\$ (6,353,197)
2023	<u>12,246,311</u>	<u>(12,246,311)</u>	<u>0</u>	5	<u>0</u>	<u>\$ -</u>
Total	(8,470,930)	0	(8,470,930)		(2,117,733)	\$ (6,353,197)

9.	Actuarial value of assets as of December 31, 2023 (Item 6 - Item 8)	\$	576,818,727
10.	Ratio of actuarial value to market value		101.1%

Amounts in column (1) for fiscal years ending 2019 through 2022 are from the prior valuation. The column (1) amount for fiscal year 2023 is developed using item 7 less the total of column (1) for fiscal years ending 2019 through 2022. To the extent possible, the 2023 excess or shortfall is used to reduce prior bases. In this case, the 2022 base was partially offset by the gains in 2023. The fiscal year 2019 through 2021 bases are \$0 because they were previously offset.



Table 8 - Investment Yields

Item	Market Value	Actuarial Value
1. Assets as of January 1, 2023 (A)	\$ 516,545,434	\$ 537,262,675
2. Contributions during FY23	49,552,037	49,552,037
3. Benefit payments and administrative expenses during FY23	(45,624,116)	(45,624,116)
4. Investment return during FY23	<u>49,992,175</u>	<u>35,628,131</u>
5. Assets as of January 1, 2024 (B): (1 + 2 + 3 + 4)	\$ 570,465,530	\$ 576,818,727
6. Approximate rate of return on average invested assets		
a. Net investment income (I)	\$ 49,992,175	\$ 35,628,131
b. Estimated return based on $(2I / (A + B - I))$	9.64%	6.61%

Table 9 - Gain/(Loss) on Actuarial Value of Assets

Item	Valuation as of January 1, 2024	Valuation as of January 1, 2023
1. Actuarial assets, prior valuation	\$ 537,262,675	\$ 504,998,929
2. Total contributions since prior valuation	\$ 49,552,037	\$ 43,645,408
3. Benefit payments and administrative expenses since prior valuation	\$ (45,624,116)	\$ (41,623,059)
4. Assumed net investment income at actuarial rate%		
a. Beginning assets	\$ 37,608,387	\$ 35,349,925
b. Contributions	1,734,321	1,527,589
c. Benefit payments and administrative expenses	<u>(1,596,844)</u>	<u>(1,456,807)</u>
d. Total	\$ 37,745,864	\$ 35,420,707
5. Expected actuarial assets (1 + 2 + 3 + 4d)	\$ 578,936,460	\$ 542,441,985
6. Actual actuarial assets, this valuation	\$ 576,818,727	\$ 537,262,675
7. Asset gain/(loss) since prior valuation (6 - 5)	\$ (2,117,733) Loss	\$ (5,179,310) Loss

Table 10 - History of Investment Return Rates

For Fiscal Year Ending	Market Value	Actuarial Value
December 31, 2014	6.45%	8.41%
December 31, 2015	1.40%	6.80%
December 31, 2016	5.17%	6.34%
December 31, 2017	14.73%	8.07%
December 31, 2018	0.02%	6.03%
December 31, 2019	14.41%	7.63%
December 31, 2020	13.20%	8.90%
December 31, 2021	14.86%	10.54%
December 31, 2022	(8.00%)	5.98%
December 31, 2023	9.64%	6.61%
Average Returns		
Last 5 Years	8.45%	7.92%
Last 10 Years	6.93%	7.52%

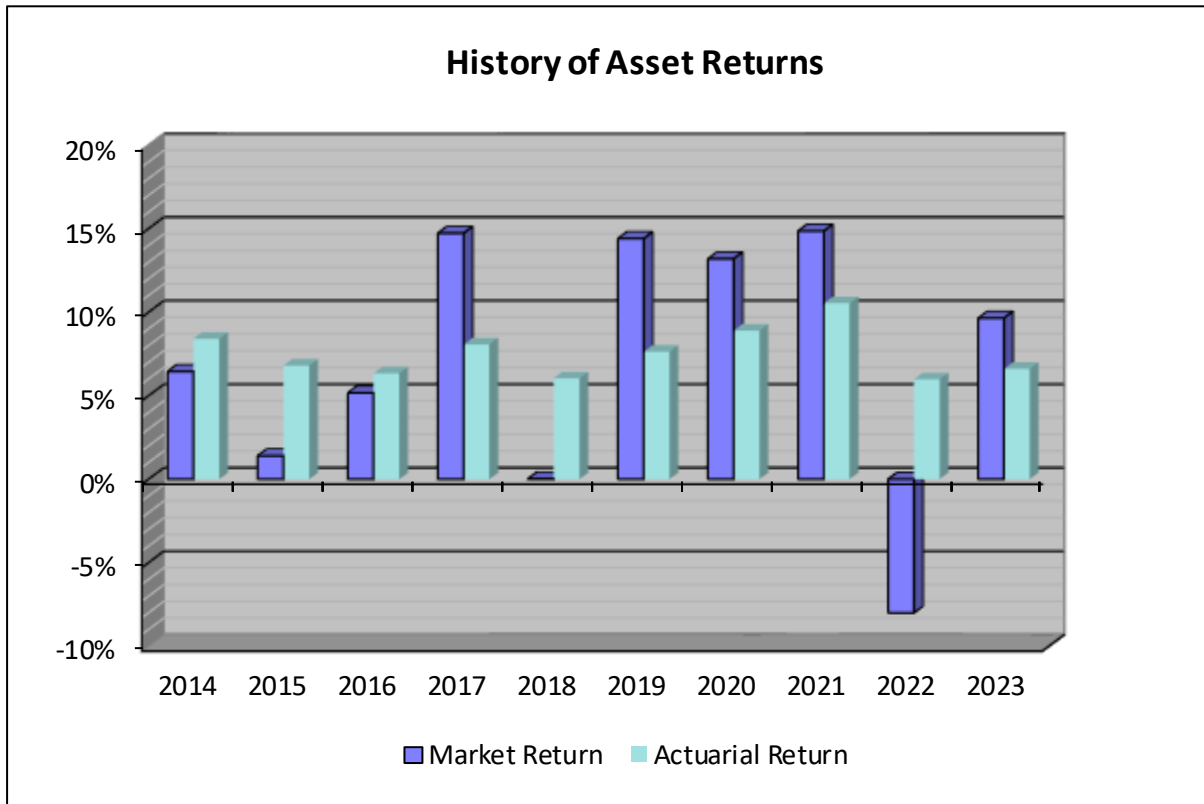


Table 11a - Schedule of Funding Progress
Based on the Aggregate Funding Method

Date	Actuarial Value of Assets (AVA)	Actuarial Accrued Liability (AAL)	Unfunded Actuarial		Annual Payroll	UAAL as % of Payroll (4)/(6)
			Accrued Liability (UAAL) (3) - (2)	Funded Ratio (2)/(3)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
January 1, 2013	\$ 305,454,945	\$ 272,350,253	\$ (33,104,693)	112.2%	\$ 787,009,650	(4.2%)
January 1, 2014	325,180,768	284,820,249	(40,360,519)	114.2%	810,578,220	(5.0%)
January 1, 2015	345,009,408	298,128,930	(46,880,478)	115.7%	827,633,440	(5.7%)
January 1, 2016	361,070,410	344,781,994	(16,288,416)	104.7%	863,105,687	(1.9%)
January 1, 2017	374,943,903	357,915,920	(17,027,983)	104.8%	917,099,955	(1.9%)
January 1, 2018	395,302,474	394,774,736	(527,738)	100.1%	947,520,430	(0.1%)
January 1, 2019	409,326,924	562,823,312	153,496,388	72.7%	1,012,666,543	15.2%
January 1, 2020	432,227,330	598,829,395	166,602,065	72.2%	1,112,892,992	15.0%
January 1, 2021	463,246,684	605,455,223	142,208,539	76.5%	1,168,873,123	12.2%
January 1, 2022	504,998,929	622,959,009	117,960,080	81.1%	1,188,245,471	9.9%
January 1, 2023	537,262,675	657,579,459	120,316,784	81.7%	1,292,292,320	9.3%
January 1, 2024	576,818,727	690,240,128	113,421,401	83.6%	1,386,413,510	8.2%

Limitations of Funded Status Measurements

Unless otherwise indicated, a funded status measurement presented in this report is based upon the actuarial accrued liability and the actuarial value of assets. With regard to any funded status measurements presented in this report:

- (1) The measurement is inappropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations.
- (2) The measurement alone is inappropriate for assessing the need for or the amount of future employer contributions.
- (3) The measurement would produce a different result if the market value of assets were used instead of the actuarial value of assets, unless the market value of assets is used in the measurement.



Table 11b - Schedule of Funding Progress
Based on the Entry Age Normal Funding Method

Date	Actuarial Value of Assets (AVA)	Actuarial Accrued Liability (AAL)	Unfunded Actuarial Accrued Liability (UAAL) (3) - (2)	Funded Ratio (2)/(3)	Annual Payroll	UAAL as % of Payroll (4)/(6)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
January 1, 2015	\$ 345,009,408	\$ 311,334,019	\$ (33,675,389)	110.8%	\$ 827,633,440	(4.1%)
January 1, 2016	361,070,410	347,242,942	(13,827,468)	104.0%	863,105,687	(1.6%)
January 1, 2017	374,943,903	372,201,460	(2,742,443)	100.7%	917,099,955	(0.3%)
January 1, 2018	395,302,474	412,597,445	17,294,972	95.8%	947,520,430	1.8%
January 1, 2019	409,326,924	486,023,181	76,696,257	84.2%	1,012,666,543	7.6%
January 1, 2020	432,227,330	514,918,489	82,691,159	83.9%	1,112,892,992	7.4%
January 1, 2021	463,246,684	540,390,293	77,143,609	85.7%	1,168,873,123	6.6%
January 1, 2022	504,998,929	575,694,455	70,695,526	87.7%	1,188,245,471	5.9%
January 1, 2023	537,262,675	630,328,345	93,065,670	85.2%	1,292,292,320	7.2%
January 1, 2024	576,818,727	689,709,253	112,890,526	83.6%	1,386,413,510	8.1%

Limitations of Funded Status Measurements

Unless otherwise indicated, a funded status measurement presented in this report is based upon the actuarial accrued liability and the actuarial value of assets. With regard to any funded status measurements presented in this report:

- (1) The measurement is inappropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations.
- (2) The measurement alone is inappropriate for assessing the need for or the amount of future employer contributions.
- (3) The measurement would produce a different result if the market value of assets were used instead of the actuarial value of assets, unless the market value of assets is used in the measurement.



Table 12 - Solvency Test

Valuation Date	Aggregated Accrued Liabilities for				Portion of Accrued Liabilities Covered by Reported Assets		
	Active Members Contribution	Retirees	Members (Employer Financed Portion)	Actuarial Value of Assets	(5)/(2)	[(5)-(2)-(3)]/(4)	
		Beneficiaries and Vested Terminations				(7)	(8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
January 1, 2012	\$ 0	\$ 212,239	\$ 43,602	\$ 290,988	100%	100%	100%
January 1, 2013	0	230,546	41,804	305,455	100%	100%	100%
January 1, 2014	0	247,646	37,174	325,181	100%	100%	100%
January 1, 2015	0	268,883	29,246	345,009	100%	100%	100%
January 1, 2016	0	296,216	48,566	361,070	100%	100%	100%
January 1, 2017	0	318,379	39,537	374,944	100%	100%	100%
January 1, 2018	0	346,593	48,182	395,302	100%	100%	100%
January 1, 2019	0	385,173	177,651	409,327	100%	100%	14%
January 1, 2020	0	408,369	190,460	432,227	100%	100%	13%
January 1, 2021	0	434,288	171,167	463,247	100%	100%	17%
January 1, 2022	0	470,900	152,059	504,999	100%	100%	22%
January 1, 2023	0	508,387	149,192	537,263	100%	100%	19%
January 1, 2024	0	555,711	134,529	576,819	100%	100%	16%

\$ amounts in '000s



Table 13 - Cash Flow Analysis

Year Ending December 31,	Contributions for the Year	Expenditures During the Year				External Cash Flow for the Year	Market Value of Assets	External Cash Flow as Percent of Market Value
		Benefit Payments	Refund of Contributions	Expenses	Total			
2012	\$ 13,612	\$ (19,482)	\$ 0	\$ (2,616)	\$ (22,098)	\$ (8,486)	\$ 301,653	(2.8%)
2013	14,570	(21,052)	0	(3,669)	(24,721)	(10,151)	339,347	(3.0%)
2014	15,509	(22,720)	0	(3,791)	(26,511)	(11,003)	353,776	(3.1%)
2015	16,938	(24,097)	0	(4,247)	(28,344)	(11,406)	351,520	(3.2%)
2016	18,216	(26,188)	0	(4,456)	(30,643)	(12,427)	360,747	(3.4%)
2017	20,535	(28,157)	0	(5,604)	(33,761)	(13,226)	403,693	(3.3%)
2018	22,685	(30,273)	0	(5,496)	(35,770)	(13,085)	394,247	(3.3%)
2019	26,150	(32,233)	0	(5,453)	(37,686)	(11,536)	442,442	(2.6%)
2020	29,030	(34,185)	0	(5,472)	(39,656)	(10,626)	493,253	(2.2%)
2021	32,139	(36,569)	0	(6,592)	(43,162)	(11,023)	559,369	(2.0%)
2022	43,645	(39,135)	0	(6,625)	(45,761)	(2,115)	516,545	(0.4%)
2023	49,552	(42,553)	0	(7,579)	(50,132)	(580)	570,466	(0.1%)
2024*	48,256	(45,921)	0	(7,806)	(53,727)	(5,471)	604,735	(0.9%)
2025*	49,782	(49,826)	0	(8,041)	(57,867)	(8,085)	638,698	(1.3%)
2026*	51,354	(53,783)	0	(8,282)	(62,065)	(10,711)	672,322	(1.6%)

Results for 2024, 2025, & 2026 are based on expected contributions, expected benefit payments, and assumed investment return of 7.0%
 Expected contributions are based on applicable employee rate of 3.6% and 3.0% annual payroll growth
 Expected benefit payments are based on the current plan benefits and expected retirements, terminations, and mortality
 Assets are assumed to increase at the annual return of 7.0% with all cash flow occurring in the middle of the year
 \$ amounts in '000s



Table 14 - Membership Data

	<u>January 1, 2024</u>	<u>January 1, 2023</u>	<u>January 1, 2022</u>
1. Active members			
a. Number	14,052	13,757	13,331
b. Total payroll	\$ 1,386,413,510	\$ 1,292,292,320	\$ 1,188,245,471
c. Average annual salary	\$ 98,663	\$ 93,937	\$ 89,134
d. Average age	40.0	40.2	40.5
e. Average service	9.5	9.6	9.9
2. Disabled members and beneficiaries			
a. Number	1,360	1,296	1,244
b. Total annual benefits	\$ 39,785,300	\$ 36,578,956	\$ 33,836,832
c. Average annual benefit	\$ 29,254	\$ 28,225	\$ 27,200
d. Average age	59.2	59.3	59.3
3. Survivors of deceased active members			
a. Number	141	140	141
b. Total annual benefits	\$ 3,800,477	\$ 3,702,936	\$ 3,724,316
c. Average annual benefit	\$ 26,954	\$ 26,450	\$ 26,414
d. Average age	55.8	55.4	55.4

Table 15 - Historical Summary of Active Member Data

<u>Valuation Date</u>	<u>Active Count</u>	<u>Average Age</u>	<u>Average Service</u>	<u>Covered Payroll</u>	<u>Average Annual Salary</u>	<u>Percent Change in Average Salary</u>
January 1, 2012	10,958	41.6	11.5	\$ 755,952,497	68,986	0.22%
January 1, 2013	11,076	41.8	11.7	787,009,650	71,055	3.00%
January 1, 2014	11,341	41.7	11.5	810,578,220	71,473	0.59%
January 1, 2015	11,391	41.8	11.5	827,633,440	72,657	1.66%
January 1, 2016	11,681	41.7	11.3	863,105,687	73,890	1.70%
January 1, 2017	11,975	41.5	11.1	917,099,955	76,585	3.65%
January 1, 2018	12,214	41.4	11.0	947,520,430	77,577	1.30%
January 1, 2019	12,747	41.1	10.6	1,012,666,543	79,444	2.41%
January 1, 2020	13,283	40.9	10.4	1,112,892,992	83,783	5.46%
January 1, 2021	13,402	40.8	10.2	1,168,873,123	87,216	4.10%
January 1, 2022	13,331	40.5	9.9	1,188,245,471	89,134	2.20%
January 1, 2023	13,757	40.2	9.6	1,292,292,320	93,937	5.39%
January 1, 2024	14,052	40.0	9.5	1,386,413,510	98,663	5.03%



Table 16 - Distribution of Active Members by Age and by Years of Service
As of December 31, 2023

Attained Age	Years of Credited Service												Total
	Less than 1	1-2	2-3	3-4	4-5	5-9	10-14	15-19	20-24	25-29	30-34	35 & Over	
	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.
Under 25	293 \$64,594	156 \$69,235	48 \$73,369	7 \$75,170	4 \$71,254								508 \$67,046
25-29	466 \$67,956	433 \$72,989	308 \$77,949	191 \$85,831	178 \$92,625	198 \$95,319							1,774 \$78,373
30-34	413 \$72,258	390 \$75,638	249 \$80,631	228 \$88,492	354 \$95,822	840 \$100,035	72 \$104,441						2,546 \$88,399
35-39	250 \$70,452	247 \$77,338	151 \$80,093	169 \$89,268	236 \$95,493	885 \$102,471	392 \$107,319	92 \$114,939					2,422 \$94,865
40-44	131 \$75,598	133 \$79,396	88 \$83,761	89 \$90,914	112 \$97,829	550 \$103,925	401 \$110,292	520 \$116,752	77 \$123,773				2,101 \$104,003
45-49	74 \$83,934	69 \$87,863	47 \$92,490	46 \$95,730	51 \$97,511	245 \$102,384	227 \$107,963	533 \$116,851	457 \$124,359	54 \$128,132			1,803 \$111,826
50-54	40 \$93,528	39 \$87,364	28 \$101,454	33 \$96,640	26 \$93,184	135 \$107,114	125 \$107,833	344 \$114,357	560 \$119,086	330 \$127,676	18 \$135,505		1,678 \$115,697
55-59	44 \$100,103	18 \$107,982	20 \$106,250	28 \$107,880	12 \$100,772	68 \$109,735	64 \$108,726	165 \$115,499	207 \$117,203	180 \$127,943	69 \$134,625	3 \$173,226	878 \$117,631
60-64	10 \$91,801	10 \$94,065	10 \$99,011	7 \$118,766	6 \$101,995	17 \$109,839	16 \$127,079	34 \$118,870	44 \$124,593	45 \$117,235	36 \$124,278	30 \$140,750	265 \$119,579
65 & Over	5 \$114,947	2 \$68,677	1 \$73,396	6 \$81,309	2 \$70,659	6 \$134,337	3 \$124,084	12 \$124,269	6 \$112,580	7 \$130,084	6 \$129,856	21 \$133,454	77 \$120,154
Total	1,726 \$71,728	1,497 \$76,190	950 \$81,525	804 \$89,809	981 \$95,357	2,944 \$102,048	1,300 \$108,590	1,700 \$116,174	1,351 \$120,999	616 \$127,059	129 \$131,638	54 \$139,717	14,052 \$98,663
	Average:	Age:	40.0					Number of participants:			Males:	12,398	
		Service:	9.5								Females:	1,654	



Table 17 - Schedule of Retirants & Annuitants Added to & Removed from Rolls*

Year Ended	Added to Rolls *		Removed from Rolls		Rolls-End of Year		% Increase in Annual Benefit	Average Annual Benefit
	Number	Annual Benefit	Number	Annual Benefit	Number	Annual Benefit		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
December 31, 2011	46	\$ 1,239,908	18	\$ 414,489	881	\$ 18,431,608	4.69%	\$ 20,921
December 31, 2012	56	1,721,508	9	166,231	928	19,986,885	8.44%	21,538
December 31, 2013	56	1,853,252	16	341,854	968	21,498,284	7.56%	22,209
December 31, 2014	67	2,082,872	15	299,192	1,020	23,281,964	8.30%	22,825
December 31, 2015	52	1,797,136	9	184,015	1,063	24,895,085	6.93%	23,420
December 31, 2016	68	2,098,542	20	413,487	1,111	26,580,140	6.77%	23,925
December 31, 2017	92	2,807,643	18	328,332	1,185	29,059,451	9.33%	24,523
December 31, 2018	76	2,443,624	23	415,991	1,238	31,087,084	6.98%	25,111
December 31, 2019	71	2,483,559	25	584,895	1,284	32,985,748	6.11%	25,690
December 31, 2020	67	2,644,753	22	521,694	1,329	35,108,807	6.44%	26,417
December 31, 2021	91	3,226,542	35	774,202	1,385	37,561,148	6.98%	27,120
December 31, 2022	77	3,412,191	26	691,447	1,436	40,281,892	7.24%	28,051
December 31, 2023	98	4,084,834	33	780,949	1,501	43,585,777	8.20%	29,038

*Includes benefit adjustments



Table 18 - Summary of Members and Adjusted Payroll by Employer

City Code	City Name	Police		Fire		Total	
		No.	Earnings	No.	Earnings	No.	Earnings
550	ADAMS COUNTY FPD	0	\$ 0	108	\$ 11,734,794	108	\$ 11,734,794
3	ALAMOSA	25	1,642,785	0	0	25	1,642,785
7	ARVADA	158	18,030,004	0	0	158	18,030,004
501	ARVADA FPD	0	0	182	18,967,286	182	18,967,286
8	ASPEN	25	2,569,683	0	0	25	2,569,683
711	ASPEN FPD	0	0	18	1,760,270	18	1,760,270
9	AULT	8	518,196	0	0	8	518,196
712	AULT FPD	0	0	9	454,142	9	454,142
10	AURORA	665	70,416,711	430	44,058,868	1,095	114,475,579
11	AVON	18	1,865,742	0	0	18	1,865,742
12	BASALT	11	1,100,313	0	0	11	1,100,313
13	BAYFIELD	8	597,571	0	0	8	597,571
718	BENNETT FPD #7	0	0	37	2,618,229	37	2,618,229
503	BERTHOUD FPD	0	0	33	2,998,331	33	2,998,331
538	BEULAH PROTECTION & AMBULANCE DISTRICT	0	0	2	107,908	2	107,908
7331	BIG SANDY FPD	0	0	2	94,796	2	94,796
580	BLACK FOREST RESCUE	0	0	29	2,202,334	29	2,202,334
723	BLACK HAWK	0	0	21	2,057,837	21	2,057,837
18	BLANCA	3	138,570	0	0	3	138,570
22	BOULDER	176	18,074,161	121	13,387,790	297	31,461,951
726	BOULDER MOUNTAIN FPD	0	0	7	452,654	7	452,654
730	BOULDER RURAL FPD	0	0	20	2,183,942	20	2,183,942
7700	BRIGGS DALE FPD	0	0	1	58,000	1	58,000
326	BRIGHTON	88	8,184,499	0	0	88	8,184,499
26	BRIGHTON (GREATER) FPD	0	0	93	9,720,628	93	9,720,628
504	BROADMOOR FPD	0	0	2	153,221	2	153,221
27	BROOMFIELD	174	18,177,428	0	0	174	18,177,428
28	BRUSH	9	644,401	0	0	9	644,401
29	BUENA VISTA	12	808,839	0	0	12	808,839
735	BYERS FPD #9	0	0	7	434,320	7	434,320



Table 18 (continued) - Summary of Members and Adjusted Payroll by Employer

City Code	City Name	Police		Fire		Total	
		No.	Earnings	No.	Earnings	No.	Earnings
736	CALHAN FPD	0	\$ 0	5	\$ 260,365	5	\$ 260,365
33	CANON CITY	37	2,554,888	0	0	37	2,554,888
533	CANON CITY AREA FPD	0	0	52	3,450,506	52	3,450,506
740	CARBONDALE & RURAL FPD	0	0	27	2,913,762	27	2,913,762
35	CASTLE ROCK	0	0	100	10,780,645	100	10,780,645
37	CENTER	7	338,624	0	0	7	338,624
38	CENTRAL CITY	0	0	1	107,212	1	107,212
1748	CENTRAL ORCHARD MESA FPD	0	0	1	49,999	1	49,999
749	CHAFFEE COUNTY FPD	0	0	8	511,490	8	511,490
40	CHERRY HILLS VILLAGE	24	2,479,824	0	0	24	2,479,824
754	CIMARRON HILLS FPD	0	0	28	2,216,460	28	2,216,460
7125	CLEAR CREEK AUTHORITY	0	0	10	678,584	10	678,584
509	CLIFTON FPD	0	0	19	1,286,278	19	1,286,278
757	COAL CREEK CANYON FPD	0	0	1	96,025	1	96,025
531	COLORADO RIVER FPD	0	0	53	4,880,703	53	4,880,703
45	COLORADO SPRINGS	701	66,323,525	482	48,607,977	1,183	114,931,502
46	COLUMBINE VALLEY	6	507,358	0	0	6	507,358
47	COMMERCE CITY	110	11,243,384	0	0	110	11,243,384
48	CORTEZ	29	1,948,589	0	0	29	1,948,589
765	CORTEZ FPD	0	0	19	951,309	19	951,309
772	CRESTED BUTTE FPD	0	0	22	1,885,800	22	1,885,800
774	CRIPPLE CREEK	0	0	12	890,242	12	890,242
57	DACONO	14	1,496,859	0	0	14	1,496,859
58	DEBEQUE	4	297,821	0	0	4	297,821
779	DEBEQUE FPD	0	0	11	947,433	11	947,433
60	DEL NORTE	4	206,770	0	0	4	206,770
61	DELTA	23	1,728,626	0	0	23	1,728,626
783	DELTA COUNTY FPD #1	0	0	1	58,983	1	58,983
62	DENVER	1,398	147,448,871	1,009	106,203,231	2,407	253,652,102
63	DILLON	12	1,210,064	0	0	12	1,210,064



Table 18 (continued) - Summary of Members and Adjusted Payroll by Employer

City Code	City Name	Police		Fire		Total	
		No.	Earnings	No.	Earnings	No.	Earnings
64	DINOSAUR	3	\$ 171,125	0	\$ 0	3	\$ 171,125
787	DIVIDE FPD	0	0	3	210,739	3	210,739
67	DURANGO	55	4,035,373	0	0	55	4,035,373
567	DURANGO FPD	0	0	80	6,356,285	80	6,356,285
522	EAGLE RIVER FPD	0	0	69	6,880,552	69	6,880,552
507	EAST GRAND FPD #4	0	0	5	455,831	5	455,831
795	EATON FPD	0	0	19	1,554,312	19	1,554,312
73	EDGEWATER	20	1,882,876	0	0	20	1,882,876
74	ELIZABETH	10	781,536	0	0	10	781,536
515	ELIZABETH FPD	0	0	22	1,692,435	22	1,692,435
7102	ELK CREEK FPD	0	0	25	1,678,474	25	1,678,474
75	EMPIRE	2	141,614	0	0	2	141,614
76	ENGLEWOOD	77	8,377,946	0	0	77	8,377,946
77	ERIE	41	4,235,133	0	0	41	4,235,133
523	ESTES VALLEY FPD	0	0	5	477,173	5	477,173
79	EVANS	34	3,437,099	0	0	34	3,437,099
579	EVANS FPD	0	0	19	1,730,895	19	1,730,895
7109	EVERGREEN FPD	0	0	5	444,765	5	444,765
510	FAIRMOUNT FPD	0	0	25	2,163,913	25	2,163,913
80	FAIRPLAY MARSHALLS	4	336,417	0	0	4	336,417
7112	FALCON FPD	0	0	59	4,688,690	59	4,688,690
81	FEDERAL HEIGHTS	22	2,006,611	14	1,162,807	36	3,169,418
810	FEDERAL HEIGHTS	0	0	1	152,796	1	152,796
82	FIRESTONE	30	3,269,904	0	0	30	3,269,904
85	FLORENCE	9	452,056	0	0	9	452,056
7222	FOOTHILLS & RESCUE	0	0	3	254,926	3	254,926
86	FORT COLLINS	257	27,795,559	0	0	257	27,795,559
7122	FORT LEWIS MESA FPD	0	0	1	104,719	1	104,719
87	FORT LUPTON	24	2,208,206	0	0	24	2,208,206
7123	FORT LUPTON FPD	0	0	44	3,647,266	44	3,647,266



Table 18 (continued) - Summary of Members and Adjusted Payroll by Employer

City Code	City Name	Police		Fire		Total	
		No.	Earnings	No.	Earnings	No.	Earnings
88	FORT MORGAN	28	\$ 2,473,236	0	\$ 0	28	\$ 2,473,236
89	FOUNTAIN	61	5,157,542	47	3,781,602	108	8,939,144
7449	FOUR MILE FPD - BOULDER	0	0	4	214,801	4	214,801
7489	FOUR MILE FPD - FLORISSANT	0	0	3	173,999	3	173,999
90	FOWLER	2	105,270	0	0	2	105,270
511	FRANKTOWN FPD	0	0	25	1,823,985	25	1,823,985
292	FREDERICK	14	1,377,507	0	0	14	1,377,507
592	FREDERICKSTONE FPD	0	0	67	6,169,739	67	6,169,739
5920	FREDERICKSTONE FPD	0	0	5	736,192	5	736,192
93	FRISCO	14	1,455,102	0	0	14	1,455,102
7131	FRONT RANGE RESCUE FPD	0	0	34	3,337,265	34	3,337,265
94	FRUITA	18	1,228,917	0	0	18	1,228,917
7132	GALETON FPD	0	0	20	704,349	20	704,349
95	GARDEN CITY	5	415,162	0	0	5	415,162
7135	GATEWAY-UNAWEEP FPD	0	0	4	178,986	4	178,986
7136	GENESEE FPD	0	0	3	247,833	3	247,833
97	GEORGETOWN	3	274,699	0	0	3	274,699
99	GLENDALE	29	2,839,112	0	0	29	2,839,112
100	GLENWOOD SPRINGS	25	2,448,406	28	2,405,317	53	4,853,723
101	GOLDEN	51	5,098,504	21	1,911,488	72	7,009,992
74	GOLDEN GATE FPD	0	0	1	72,560	1	72,560
102	GRANADA	1	55,164	0	0	1	55,164
7147	GRAND FPD #1	0	0	10	725,920	10	725,920
104	GRAND JUNCTION	125	11,384,096	160	13,785,339	285	25,169,435
7149	GRAND LAKE FPD	0	0	11	773,366	11	773,366
7150	GRAND VALLEY FPD	0	0	26	2,015,943	26	2,015,943
7153	GREATER EAGLE FPD	0	0	16	1,360,380	16	1,360,380
107	GREELEY	153	15,149,834	127	12,752,620	280	27,902,454
109	GREENWOOD VILLAGE	66	7,156,576	0	0	66	7,156,576
7156	GYPSUM FPD	0	0	11	921,162	11	921,162



Table 18 (continued) - Summary of Members and Adjusted Payroll by Employer

City Code	City Name	Police		Fire		Total	
		No.	Earnings	No.	Earnings	No.	Earnings
7158	HARTSEL FPD	0	\$ 0	2	\$ 138,212	2	\$ 138,212
115	HAXTUN	2	115,039	0	0	2	115,039
119	HOLYOKE	5	294,571	0	0	5	294,571
7174	HOT SULPHUR SPRINGS/PARSHALL FPD	0	0	1	80,880	1	80,880
7176	HUDSON FPD	0	0	29	2,746,197	29	2,746,197
124	HUGO	3	157,836	0	0	3	157,836
125	IDAHO SPRINGS	9	699,498	0	0	9	699,498
126	IGNACIO	8	582,478	0	0	8	582,478
7187	INTER-CANYON FPD	0	0	5	387,701	5	387,701
7191	JEFFERSON-COMO FPD	0	0	10	569,228	10	569,228
129	JOHNSTOWN	24	2,025,497	0	0	24	2,025,497
131	KEENESBURG POST	6	408,525	0	0	6	408,525
132	KERSEY	6	496,995	0	0	6	496,995
7198	KIOWA FPD	0	0	3	161,809	3	161,809
5136	KREMMLING FPD	0	0	3	202,799	3	202,799
138	LA JARA	2	102,663	0	0	2	102,663
139	LA JUNTA	13	761,375	13	927,121	26	1,688,496
144	LA SALLE	7	553,543	0	0	7	553,543
7211	LA SALLE FPD	0	0	14	1,112,496	14	1,112,496
146	LA VETA	1	60,000	0	0	1	60,000
137	LAFAYETTE	41	4,146,902	39	4,100,217	80	8,247,119
7206	LAKE GEORGE FPD	0	0	1	63,922	1	63,922
263	LAKESIDE	13	1,047,585	0	0	13	1,047,585
143	LAMAR	15	1,004,953	10	644,838	25	1,649,791
141	LARKSPUR FPD	0	0	18	1,392,477	18	1,392,477
147	LEADVILLE	3	204,767	15	979,218	18	1,183,985
574	LEFTHAND FPD	0	0	3	221,887	3	221,887
149	LITTLETON	75	8,609,976	0	0	75	8,609,976
150	LOCHBUIE	11	930,820	0	0	11	930,820
214	LOG LANE VILLAGE	1	43,830	0	0	1	43,830



Table 18 (continued) - Summary of Members and Adjusted Payroll by Employer

City Code	City Name	Police		Fire		Total	
		No.	Earnings	No.	Earnings	No.	Earnings
268	LONE TREE	55	\$ 5,451,045	0	\$ 0	55	\$ 5,451,045
151	LONGMONT	156	15,652,114	97	10,021,704	253	25,673,818
578	LOS PINOS FPD	0	0	24	1,581,025	24	1,581,025
153	LOVELAND	114	12,481,478	0	0	114	12,481,478
2153	LOVELAND FRA	0	0	108	12,365,588	108	12,365,588
7226	LOWER VALLEY FPD	0	0	21	1,540,345	21	1,540,345
7227	LYONS FPD	0	0	8	611,088	8	611,088
155	MANASSA	2	89,114	0	0	2	89,114
157	MANITOU SPRINGS	13	1,067,719	11	906,885	24	1,974,604
160	MEAD	14	1,374,682	0	0	14	1,374,682
163	MILLIKEN	11	973,560	0	0	11	973,560
166	MONTE VISTA	16	869,533	0	0	16	869,533
167	MONTROSE	42	3,030,002	0	0	42	3,030,002
537	MONTROSE FPD	0	0	43	3,538,731	43	3,538,731
168	MONUMENT	27	2,127,119	0	0	27	2,127,119
170	MOUNTAIN VIEW	9	750,369	0	0	9	750,369
516	MOUNTAIN VIEW FPD	0	0	146	16,511,356	146	16,511,356
266	MOUNTAIN VILLAGE	9	750,061	0	0	9	750,061
7246	NEDERLAND FPD	0	0	5	405,410	5	405,410
7251	NORTH FORK FPD	0	0	1	86,493	1	86,493
532	NORTH METRO RESCUE	0	0	159	17,299,800	159	17,299,800
7253	NORTH ROUTH FPD	0	0	6	354,050	6	354,050
7255	NORTHEAST TELLER COUNTY FPD	0	0	15	1,205,043	15	1,205,043
175	NORTHGLENN	74	7,368,331	0	0	74	7,368,331
7259	NORTH-WEST FPD	0	0	20	1,325,145	20	1,325,145
178	NUNN	3	204,913	0	0	3	204,913
179	OAK CREEK	2	131,322	0	0	2	131,322
1790	OAK CREEK CHIEF	1	94,955	0	0	1	94,955
7263	OAK CREEK FPD	0	0	9	658,568	9	658,568
180	OLATHE	4	239,921	0	0	4	239,921



Table 18 (continued) - Summary of Members and Adjusted Payroll by Employer

City Code	City Name	Police		Fire		Total	
		No.	Earnings	No.	Earnings	No.	Earnings
7264	OLATHE FPD	0	\$ 0	10	\$ 553,501	10	\$ 553,501
588	PAGOSA FPD	0	0	17	1,007,043	17	1,007,043
188	PAGOSA SPRINGS	9	664,306	0	0	9	664,306
189	PALISADE	10	705,799	6	401,802	16	1,107,601
190	PALMER LAKE	6	357,388	5	355,391	11	712,779
192	PAONIA	6	352,645	0	0	6	352,645
106	PARACHUTE	6	386,014	0	0	6	386,014
191	PARKER	68	7,302,373	0	0	68	7,302,373
7281	PEYTON FPD	0	0	1	46,957	1	46,957
7481	PLATEAU VALLEY FPD	0	0	4	274,140	4	274,140
7285	PLATTE CANYON FPD	0	0	25	2,028,990	25	2,028,990
7286	PLATTE VALLEY FPD	0	0	18	1,522,718	18	1,522,718
7287	PLATTE VALLEY FPD	0	0	2	233,837	2	233,837
196	PLATTEVILLE	10	721,835	0	0	10	721,835
513	PLATTEVILLE/GILCREST FPD	0	0	42	3,761,302	42	3,761,302
7289	PLEASANT VIEW METRO DISTRICT	0	0	11	1,009,377	11	1,009,377
518	POUDRE AUTHORITY	0	0	212	22,860,549	212	22,860,549
199	PUEBLO	168	142,165,320	136	11,675,669	304	25,892,201
519	PUEBLO RURAL FPD	0	0	30	1,915,733	30	1,915,733
7294	PUEBLO WEST METRO FPD	0	0	35	2,508,293	35	2,508,293
201	RANGELY	6	456,204	0	0	6	456,204
7298	RATTLESNAKE FPD	0	0	12	749,023	12	749,023
521	RED WHITE & BLUE FPD	0	0	58	5,977,637	58	5,977,637
7305	RIDGWAY FPD	0	0	4	211,749	4	211,749
206	RIFLE	19	1,405,550	0	0	19	1,405,550
551	ROARING FORK FRA	0	0	36	3,468,385	36	3,468,385
208	ROCKY FORD	6	308,382	9	436,604	15	744,986
7314	RYE FPD	0	0	4	291,019	4	291,019
542	SABLE ALTURA FPD	0	0	9	540,039	9	540,039
213	SALIDA	19	1,455,377	13	1,053,588	32	2,508,965



Table 18 (continued) - Summary of Members and Adjusted Payroll by Employer

City Code	City Name	Police		Fire		Total	
		No.	Earnings	No.	Earnings	No.	Earnings
215	SANFORD	1	\$ 74,610	0	\$ 0	1	\$ 74,610
543	SECURITY FPD	0	0	50	3,882,453	50	3,882,453
219	SEVERANCE	7	583,017	0	0	7	583,017
220	SHERIDAN	32	3,029,947	0	0	32	3,029,947
222	SILT	7	546,689	0	0	7	546,689
228	SNOWMASS VILLAGE	10	1,093,365	0	0	10	1,093,365
525	SOUTH ADAMS COUNTY FPD	0	0	88	9,281,853	88	9,281,853
7339	SOUTH FORK	2	108,599	0	0	2	108,599
5339	SOUTH FORK FPD	0	0	6	312,599	6	312,599
540	SOUTH METRO RESCUE FPD	0	0	609	69,673,371	609	69,673,371
7340	SOUTHEAST WELD FPD	0	0	25	2,010,183	25	2,010,183
7341	SOUTHEAST WELD FPD	0	0	1	185,499	1	185,499
548	SOUTHERN PARK COUNTY FPD	0	0	2	88,800	2	88,800
552	SOUTHWESTERN HIGHWAY 115 FPD	0	0	1	85,000	1	85,000
229	SPRINGFIELD	4	220,100	0	0	4	220,100
231	STEAMBOAT SPRINGS	27	2,643,418	37	3,579,956	64	6,223,374
232	STERLING	20	1,470,612	22	1,522,764	42	2,993,376
7348	STRASBURG FPD #8	0	0	5	284,069	5	284,069
7349	STRATMOOR HILLS FPD	0	0	6	422,031	6	422,031
593	SUMMIT & EMS FPD	0	0	77	7,441,731	77	7,441,731
237	TELLURIDE	9	992,978	0	0	9	992,978
545	TELLURIDE FPD	0	0	31	2,813,480	31	2,813,480
238	THORNTON	0	0	149	17,555,181	149	17,555,181
338	THORNTON	247	26,322,852	0	0	247	26,322,852
7354	TIMBERLINE FPD	0	0	8	502,283	8	502,283
2557	TRI-LAKES MONUMENT FPD	0	0	74	7,541,191	74	7,541,191
240	TRINIDAD	23	1,455,805	16	1,099,371	39	2,555,176
2400	TRINIDAD	0	0	1	82,992	1	82,992
595	UPPER PINE RIVER FPD	0	0	34	2,105,409	34	2,105,409
242	VAIL	32	3,258,300	39	3,782,155	71	7,040,455



Table 18 (continued) - Summary of Members and Adjusted Payroll by Employer

City Code	City Name	Police		Fire		Total	
		No.	Earnings	No.	Earnings	No.	Earnings
7369	WELLINGTON FPD	0	0	15	1,038,163	15	1,038,163
7373	WEST DOUGLAS COUNTY FPD	0	0	1	94,999	1	94,999
534	WEST METRO FPD	0	0	374	41,348,784	374	41,348,784
5340	WEST METRO FPD	0	0	13	1,998,362	13	1,998,362
7375	WEST ROUTT FPD	0	0	11	545,332	11	545,332
252	WESTMINSTER	0	0	141	15,197,352	141	15,197,352
2520	WESTMINSTER	0	0	2	284,097	2	284,097
253	WHEAT RIDGE	85	8,527,083	0	0	85	8,527,083
254	WIGGINS	3	187,720	0	0	3	187,720
2257	WINDSOR	14	1,120,734	0	0	14	1,120,734
7384	WINDSOR SEVERANCE FPD	0	0	54	5,312,385	54	5,312,385
259	WOODLAND PARK	18	1,370,693	0	0	18	1,370,693
260	WRAY	6	349,088	0	0	6	349,088
262	YUMA	8	450,514	0	0	8	450,514
Totals		6,617	\$ 653,346,308	7,435	\$ 733,067,202	14,052	\$ 1,386,413,510



Table 19 - Summary of Inactive Members

	<u>Count</u>	<u>Average Age</u>	<u>Average Monthly Benefit</u>
Totally Disabled Members*	179	60.3	\$3,919
Occupationally Disabled Members*	1,181	59.0	\$2,213
Beneficiaries of Deceased Active Members	141	55.8	\$2,246

* Including beneficiaries of deceased retirees

SECTION IV

APPENDICES

SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS

I. Valuation Date

The valuation date is January 1st of each plan year. This is the date as of which the actuarial present value of future benefits and the actuarial value of assets are determined.

II. Actuarial Cost Method

The actuarial valuation uses the Aggregate Funding Method. Under this method, the contribution rate is calculated to fully fund the present value of all benefits over the remaining working career of the active employees. The contribution rate is determined as a percentage of increasing payroll.

1. The valuation is prepared on the projected benefit basis. The present value of each participant's expected benefit payable at retirement or termination is determined, based on age, service, sex, compensation, and the interest rate assumed to be earned in the future (7.0%). The calculations take into account the probability of a participant's death or termination of employment prior to becoming eligible for a benefit, as well as the possibility of his terminating with a service benefit. Future salary increases are also anticipated. The present value of the expected benefits payable on account of the active participants is added to the present value of the expected future payments to retired participants and beneficiaries to obtain the present value of all expected benefits payable from the Plan on account of the present group of participants and beneficiaries.
2. The actuarial value of assets is subtracted from the present value of all expected benefits to determine the present value of future normal costs. The future normal costs are spread across the future value of salaries to be paid to the current active population to determine a contribution rate.

III. Actuarial Value of Assets

Effective January 1, 2013, the actuarial value of assets is equal to the market value of assets less a five-year phase in of the excess (shortfall) between expected investment return and actual income. The actual calculation is based on the difference between actual earnings and expected earnings each year, and recognizes the cumulative excess return (or shortfall) over at a minimum rate of 20% per year. The speed of the recognition will increase if the Plan continues to be in the same net deferred position (net gain or net loss) from one year to the next. This is intended to ensure the smoothed value of assets will converge towards the market value in a reasonable amount of time. In addition, a gain or loss that is in the opposite direction of the current net position will be immediately recognized.



Expected earnings are determined using the assumed investment return rate and the beginning of year actuarial value of assets (adjusted for receipts and disbursements during the year). The returns are computed net of administrative and investment expenses.

IV. Actuarial Assumptions

The current assumptions were adopted by the Board in 2022 for first use in the valuation as of January 1, 2023. The rationale for all of the current assumptions is included in that report, dated June 20, 2022.

A. Economic Assumptions

1. Investment return: 7.00% per annum, compounded annually, composed of an assumed 2.50% inflation rate and a 4.50% real rate of return. This rate represents the assumed return, net of investment expenses.
2. Salary increase rate: Inflation rate of 2.50%, plus productivity component of 1.75%, plus step-rate/ promotional component as shown:

Years of Service	Annual Step-rate/ Promotional Rate	Total Annual Rate of Increase Including 2.50% Inflation Component and 1.75% Productivity Component
(1)	(2)	(4)
1	7.50%	11.75%
2	7.50%	11.75%
3	7.00%	11.25%
4	6.50%	10.75%
5	3.75%	8.00%
6	1.75%	6.00%
7	1.75%	6.00%
8	1.25%	5.50%
9	1.25%	5.50%
10	1.00%	5.25%
11	1.00%	5.25%
12	0.75%	5.00%
13	0.75%	5.00%
14	0.50%	4.75%
15	0.00%	4.25%

Salary increases are assumed to occur once a year, on January 1. Therefore the pay used for the period between the valuation date and the first anniversary of the valuation date is equal to the reported pay for the prior year, annualized if necessary, and then increased by the salary increase assumption.



3. Payroll growth rate: In the amortization of the unfunded actuarial accrued liability, payroll is assumed to increase 3.00% per year. This increase rate is primarily due to the effect of inflation on salaries, with no allowance for future membership growth.

B. Demographic Assumptions

1. Mortality rates (members in payment status) –

a. Healthy retirees and beneficiaries: Pub-2010 Safety Healthy Retiree Mortality Tables for males and females, amount-weighted, projected with the ultimate values of the MP-2020 projection scale.

Annual Rate per 1,000 Members					
Attained Age in 2023	Males	Females	Attained Age in 2023 (cont.)	Males	Females
(1)	(2)	(3)	(4)	(5)	(6)
50	1.61	1.25	70	13.33	11.30
55	2.56	2.16	75	24.25	19.69
60	4.26	3.74	80	44.20	34.31
65	7.42	6.49	85	81.54	61.07

The following table provides the life expectancy for an individual age 55 at retirement in a given year based on the assumption with full generational projection:

Gender	Year of Retirement			
	2023	2028	2033	2038
Male	31.2	31.6	32.0	32.4
Female	33.1	33.5	33.9	34.3

b. Occupationally disabled retirees: Healthy retiree tables set forward three years.

Annual Rate per 1,000 Members					
Attained Age in 2023	Males	Females	Attained Age in 2023 (cont.)	Males	Females
(1)	(2)	(3)	(4)	(5)	(6)
50	2.12	1.73	70	18.98	15.68
55	3.45	3.00	75	34.56	27.33
60	5.90	5.18	80	62.87	47.63
65	10.46	9.00	85	113.96	84.76

c. Totally disabled retirees: Pub-2010 Safety Healthy Retiree Mortality Tables for males and females, amount-weighted, set forward five years, projected with the ultimate values of the MP-2020 projection scale, with minimum probability of 3.5% for males and 2.5% for females.

Annual Rate per 1,000 Members					
Attained Age in 2023	Males	Females	Attained Age in 2023 (cont.)	Males	Females
(1)	(2)	(3)	(4)	(5)	(6)
50	35.00	25.00	70	35.00	25.00
55	35.00	25.00	75	43.79	34.00
60	35.00	25.00	80	79.12	59.26
65	35.00	25.00	85	141.57	105.46

2. Mortality rates (active members) – Off-duty mortality: Pub-2010 Safety Employee Mortality Tables for males and females, amount-weighted, 60% multiplier, projected with the ultimate values of the MP-2020 projection scale. On-duty mortality: Flat rate of 0.00015 at all ages without projection for future mortality improvement. Sample rates for off-duty mortality are shown below:

Annual Rate per 1,000 Members					
Attained Age in 2023	Males	Females	Attained Age in 2023 (cont.)	Males	Females
(1)	(2)	(3)	(4)	(5)	(6)
20	0.21	0.08	40	0.30	0.25
25	0.19	0.10	45	0.41	0.34
30	0.21	0.14	50	0.60	0.46
35	0.24	0.18	55	0.88	0.62

3. Disability rates: Sample rates are shown below.

Annual Rate per 1,000 Members				
Age	Occupational Disability Rates (MP)	Occupational Disability Rates (SRP)	Total Disability Rates (MP)	Total Disability Rates (SRP)
(1)	(2)	(3)	(4)	(5)
25	0.25	0.48	0.02	0.02
30	1.18	2.26	0.17	0.17
35	1.60	3.05	0.34	0.34
40	2.35	4.48	0.52	0.52
45	4.09	5.53	0.72	0.72
50	8.86	8.22	0.94	0.94
55	15.53	11.56	1.17	1.17

4. Termination rates (for causes other than death, disability or retirement):
Termination rates are based on service. Termination rates are not applied after a member becomes eligible for a retirement benefit. Rates at selected ages are shown:

Annual Rate per 1,000 Members					
Service	Rates	Service (cont.)	Rates	Service (cont.)	Rates
0	91.9	9	25.8	18	12.3
1	70.4	10	22.9	19	11.7
2	62.2	11	20.6	20	11.2
3	54.9	12	18.6	21	10.6
4	48.3	13	17.0	22	9.8
5	42.5	14	15.6	23	9.0
6	37.4	15	14.5	24	7.9
7	33.0	16	13.7	25	6.6
8	29.1	17	12.9	26	5.1

For police members, these rates are multiplied by 1.25. For fire members, these rates are multiplied by 0.83.

5. Retirement rates: Members are assumed to retire at the time of attaining:
- A. Statewide Retirement Plan Members and other New Hire Plan Members: Age 55 with 22 years of service or current age, if greater.
 - B. Money Purchase Plan Members: The earliest of Age 65 or Age 55 with 25 years of service; or current age, if greater. For members age 55 with less than 25 years of service, service-based rates consistent with the SRP service-based rates.
 - C. All Other Plan members: Age 52 or current age, if greater.

C. Other Assumptions

1. Family status: 100% of employees are assumed to be married or in a civil union. Those assumed to be married or in a civil union are assumed to have two or more dependent children until age 51.
2. Age difference: Male members are assumed to be two years older than their spouses, and female members are assumed to be two years younger than their spouses.
3. Post-retirement benefit adjustments: Totally disabled 3.0%; All others 0.0%.
4. Percent electing annuity on death (when eligible): All of the spouses of vested, married participants are assumed to elect an annuity.
5. There will be no recoveries once disabled.
6. No surviving spouse will remarry.
7. Earned income: It is assumed that there are no offsets for Worker's Compensation or other current income.
8. Dependent children: Dependency status assumed to terminate at age 23.
9. Combined spouse/dependent records: In cases, where an annuitant record includes benefits for both a spouse and a dependent child, the total benefit was assumed to be payable for the life of the spouse.
10. Administrative expenses: Based on actual administrative expenses paid in the prior year, adjusted by wage inflation.
11. Money Purchase Offset: For members where no data is available, the current money purchase balance is estimated using current pay, estimated pay histories, actual plan investment returns, and the current money purchase contribution rate specific by employer. The balance is projected forward using 7.00% investment returns, and the current money purchase contribution rate specific by employer. The money purchase account used for offset is limited based on the specific money purchase contribution rate by employer and the contribution rate requirements for the Statewide Death & Disability Plan. At decrement, the limited account is converted to an annuity using current actuarial equivalence factors.
12. Decrement timing: Decrements of all types are assumed to occur mid-year.
13. 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.
14. Decrement relativity: Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.

15. Incidence of Contributions: Contributions are assumed to be received continuously throughout the year based upon the computed percent of payroll shown in this report, and the actual payroll payable at the time contributions are made.
16. Retirement Processing: In order to reflect the lengthy application period and associated processing lag, a load is included in the Present Value of Future Benefits equal to the liability associated with new retirees in this year's valuation data who had not been included in the previous year's valuation data due to processing.
17. Conversion to Total Disability: Members that initially go out through occupational disability can reapply for, and if approved, convert to total disability within five years. To account for this, a load of 4% on occupational disability benefits in place for five years or less is included in the Present Value of Future Benefits. This load only applies to those already in payment status.

D. Participant Data

Participant data was supplied on electronic files in the form of spreadsheets. There were separate tabs for (i) active and non-vested inactive members, and (ii) members and beneficiaries receiving benefits or vested inactives.

The data for an active members included birthdate, sex, service, salary and employee contribution account balance. For retired members and beneficiaries, the data included date of birth, sex, spouse's date of birth (where applicable), amount of monthly benefit, date of retirement, and a form of payment code.

Salary supplied for the current year was based on the following:

- If the YTD service credit is at least 12, then use the earnings for the year preceding the valuation date
- If the YTD service credit is less than 12, then use the greater of the earnings for the year preceding the valuation date or the annual salary.
- If the YTD service credit is less than 12, greater than 0 and the Member DD Flag is N, then use the annualized earnings for the year preceding the valuation date.
- If both Salary YTD and Annual Salary are zero, an array of salaries based on service will be used to estimate the salary.
- Finally, the prior salaries are used to prevent the valuation salary from decreasing.

Assumptions were made to correct for missing, bad, or inconsistent data. These had no material impact on the results presented.

E. Changes to the assumptions:

There were no changes to assumptions since the prior valuation.

SUMMARY OF BENEFIT PROVISIONS

Plan Description

The Fire & Police Pension Association Statewide Death & Disability Plan (“Plan”) is a cost-sharing multiple-employer defined benefit death and disability plan covering full-time employees of substantially all fire and police departments in Colorado. As of August 5, 2003, the Plan may include part-time police and fire employees. Employers who are covered by Social Security may elect supplementary coverage by the Plan. As of January 1, 2020, Colorado police and sheriff departments who participate in Social Security have the option of affiliating for coverage under the Defined Benefit System and the Statewide Death and Disability Plan. The Plan was established in 1980 pursuant to Colorado Revised Statutes. Plan assets are included in the Fire & Police Members’ Benefit Investment Fund Long-Term Pool.

Contributions to the Plan are used for the payment of death and disability benefits. Plan benefits provide 24-hour coverage, both on- and off-duty and are available for Members not eligible for Normal Retirement under a defined benefit plan, or Members who have not met 25 years of accumulated service and age 55 under a money purchase plan.

In the case of an on-duty death, benefits may be payable to the surviving spouse or dependent children of active Members who were eligible to retire, but were still working. Death and disability benefits are free from state and federal taxes in the event that a Member’s disability is determined to be the result of an on-duty injury or an occupational disease.

Plan Year

A twelve-month period ending December 31.

Members Included

Members included are active, full-time salaried employees of a participating municipality or fire protection district normally serving at least 1,600 hours in a calendar year and whose duties are directly involved with the provision of police or fire protection. As of August 5, 2003, the Plan may include part-time police and fire employees. A department chief who elects to be exempted from the Fire & Police Pension Association Defined Benefit System and covered under Social Security or Colorado Public Employees Retirement Association shall not be covered by the Plan.

Also included are employees of any Employer that covers Members under the federal Social Security Act or any county that chooses to affiliate with the Fire & Police Pension Association and includes all personnel employed by a sheriff expected to work 1,600 hours or more in a calendar year who are directly involved with the provision of law enforcement or fire protection, as certified by the county, except that personnel whose position does not require passage of a fitness for duty test shall not be eligible for participation in the Statewide Death & Disability Plan.



Compensation Considered (Base Salary)

Base Salary, also known as Pensionable Earnings, means the total base rate of pay including Member Contributions to the Statewide Retirement Plan or Statewide Money Purchase Plan (or contributions to any alternate retirement plan) which are “picked up” by the Employer:

- 1) And shall also include longevity pay, sick leave pay taken in the normal course of employment, vacation leave pay taken in the normal course of employment, shift differential, and mandatory overtime that is part of the Member’s fixed, periodic compensation.
- 2) Accumulated vacation leave pay will also be included if a Member completes their service requirement for purposes of Normal Retirement while exhausting accumulated vacation leave.
- 3) In the event an Employer has established or does establish a Deferred Compensation Plan, the amount of the Member's salary that is deferred shall be included in the Member's Base Salary.
- 4) Any amounts voluntarily contributed to an Internal Revenue Code Section 125 “Cafeteria Plan” shall be included in the Member's Base Salary.
- 5) Base Salary shall not include overtime pay (except as noted in 1) above), step-up pay or other pay for temporarily acting in a higher rank (a Member is deemed temporarily acting in a higher rank if the appointment to the rank is anticipated to last less than six months), uniform allowances, accumulated sick leave pay, accumulated vacation leave pay (except as noted in 2) above), and other forms of extra pay (including Member Contributions which are paid by the Employer and not deducted from the Member's salary).
- 6) The Base Salary under the Plan for each Member of the Colorado Springs New Hire Pension Plan shall be the same as the basic salary as defined in the Colorado Springs New Hire Pension Plan.

Contribution Rates

Prior to 1997, the Plan was primarily funded by the State of Colorado, whose contributions were established by Colorado statute. In 1997 the State made a one-time contribution of \$39,000,000 to fund past and future service costs for all firefighters and police officers hired prior to January 1, 1997. As of January 1, 1997, the Board could adjust the annual rate of contribution by 0.1 percent of Base Salary every other year. Effective January 1, 2021, the Board can adjust the annual rate of contribution by 0.2 percent of Base Salary every year.

Members hired on or after January 1, 1997 and Members covered by Social Security, began contributing 2.4 percent of Base Salary to this Plan as of January 1, 1997. The contribution increased to 2.6 percent of Base Salary as of January 1, 2007. The contribution rate increased to 2.7 percent of Base Salary as of January 1, 2017. The contribution rate increased to 2.8 percent of Base Salary as of January 1, 2019. The contribution rate increased to 3.0 percent of Base Salary as of January 1, 2021. The contribution rate increased to 3.2 percent of Base Salary as of January 1, 2022. The contribution rate increased to 3.4 percent of Base Salary as of January 1, 2023. The contribution rate increased to 3.6 percent of Base Salary as of January 1, 2024. This percentage can vary depending on actuarial experience. All contributions are made by Members or on behalf



of Members. The contribution may be paid entirely by the Employer or Member, or it may be split between the Employer and the Member.

Pre-Retirement Death Benefits

If a Member dies prior to Normal Retirement eligibility while off-duty, the surviving spouse shall receive a benefit equal to 40 percent of the monthly Base Salary paid to the Member prior to death. An additional 10 percent of Base Salary is payable if a surviving spouse has two or more dependent children. If there is no surviving spouse, but the Member had one or two dependent children, the benefit payable is 40 percent of the Member's monthly Base Salary. If there is no spouse but three or more dependent children, the benefit equals 50 percent of the Member's monthly Base Salary.

As of October 15, 2002, if a Member dies prior to retirement while on-duty; the surviving spouse shall receive a benefit equal to 70 percent of the Member's monthly Base Salary regardless of the number of dependent children. If there is no spouse but one or more dependent children living in the Member's household the benefit equals 70 percent of the Member's monthly Base Salary. If there are dependent children without a surviving spouse, and they do not live in the household, the benefit is 40 percent for the first child and 15 percent for each additional child, but not greater than 70 percent in total of the Member's monthly Base Salary. Benefits will be paid to the spouse until death and to dependent children until age 23, death, marriage or other termination of dependency. Benefits may be extended for an incapacitated child.

For purposes of this Plan, a spouse includes a partner in a civil union. These benefits are offset by Money Purchase account balances, Stabilization Reserve Accounts ("SRA") and Deferred Retirement Option Plan ("DROP") accounts, converted to annuities.

Disability Benefits

The Plan provides the members with two types of disability: occupational and total.

Occupational Disability means a Member is unable to perform their assigned duties due to a medical condition that is expected to last at least one year. Assigned duties are those specific tasks or job duties that a Member is required to regularly perform. Within the Occupational Disability category, there are two sub-categories: Temporary Occupational Disability and Permanent Occupational Disability.

Temporary Occupational Disability is an occupational disability for which there is prognosis for improvement or recovery through surgical treatment, counseling, medication, therapy or other means.

Permanent Occupational Disability is an occupational disability caused by a condition that is permanent or degenerative and for which there is no prognosis for improvement or recovery through surgical treatment, counseling, medication, therapy or other means.

Total Disability means the Member is unable to engage in any substantial gainful activity due to a medically determined physical or mental impairment that may be expected to result in death or that has lasted or is expected to last at least one year.



A Member who becomes disabled prior to Normal Retirement eligibility shall be eligible for disability benefits.

If the Member is totally disabled, the Member shall receive 70 percent of their Base Salary preceding disability.

If the Member is occupationally disabled and their disability is determined to be a Permanent Occupational Disability, the Member shall receive 50 percent of their Base Salary preceding disability regardless of their family status. If the Member is occupationally disabled and the disability is determined to be a Temporary Occupational Disability, the Member shall receive 40 percent of their Base Salary preceding disability regardless of their family status for up to five years.

Total disability and permanent occupational disability benefits are offset by the Money Purchase and DROP balances, converted to annuities. For Member's who also participate in Social Security, disability benefits are reduced by Social Security disability benefits derived from employment as a Member, if applicable.

Temporary Occupational Disability benefits are payable for a maximum of five years. Permanent Occupational and Total Disability benefits are payable as long as the Member remains disabled.

Offsets for Money Purchase Balances and DROP

Plan benefits are reduced by the actuarially equivalent annuities of the Money Purchase and DROP account balances. The amount of money purchase balance considered in determining the offset is limited for departments whose total money purchase rate is in excess of the total statutory contributions for the Statewide Retirement Plan – Defined Benefit Component. At time of disability, an average contribution rate is determined based on each historical calendar year since the member's hire taking the lesser of the current total money purchase rate and the Statewide Retirement Plan – Defined Benefit Component statutory contribution rate in effect in that year. The money purchase balance is then prorated for purposes of the offset based on this blended, limited average contribution rate compared to the total money purchase rate. Benefits provided by the Plan are also offset by any defined benefit that the Member may have received due to work as a Colorado firefighter or police officer.

Spousal income, IRAs, insurance benefits, legal awards, and other investment incomes are not subject to any offset. Deferred compensation accounts are generally not subject to an offset. However, if a department chief has contributions directed to a deferred compensation plan in lieu of a pension plan, the benefit award is offset based on the amount in the deferred compensation account. The amount of the offset is calculated in the same manner as the money purchase offset.

Actuarial equivalence is based on tables adopted by the Fire & Police Pension Association Board of Directors.

Optional Forms of Payment

The Plan provides four choices for receipt of the Permanent Occupational and Total Disability benefits.

Normal Option – The disabled retiree receives an unreduced benefit, payable for as long as the disability exists and as long as the Member remains eligible. Upon the death of the retiree, the benefit is discontinued.

Option 1 (Joint and 100% Survivor) - The disabled retiree's benefit amount is reduced on an actuarially equivalent basis, payable for as long as the disability exists and as long as the Member remains eligible. Upon the death of the retiree, the designated beneficiary receives 100 percent of the retiree's actuarially equivalent reduced benefit for life.

Option 2 (Joint and 50% Survivor) - The disabled retiree's benefit amount is reduced on an actuarially equivalent basis, payable for as long as the disability exists and as long as the Member remains eligible. Upon the death of the retiree, the designated beneficiary receives 50 percent of the retiree's actuarially equivalent reduced benefit for life.

Option 3 (Family Benefit) - The disabled retiree's benefit amount is reduced on an actuarially equivalent basis, payable for as long as the disability exists and as long as the Member remains eligible. Upon the death of the retiree, the actuarially equivalent reduced benefit amount is paid to the surviving spouse* and dependent children, if any, until the death of the surviving spouse, the death of any incapacitated child, or until the youngest child reaches age 23, whichever is later.

*Per FPPA Rule 1603(9)(c), 'Spouse' for the purposes of Payment Option 3 means the Member's spouse at the time the first benefit payment is negotiated. If the spouse beneficiary is removed by the Member, or dies, the Member is not permitted to add a subsequent spouse.

Actuarial equivalence is based on tables adopted by the Fire & Police Pension Association Board of Directors.

Benefit Adjustments for Benefits in Pay Status

A benefit adjustment of up to 3 percent may be granted to Members and survivors by the Fire & Police Pension Association Board of Directors annually. Totally disabled Members and their beneficiaries receive an automatic benefit adjustment each year of 3 percent. The benefit adjustment is effective October 1. A benefit adjustment may begin after receiving benefits for at least 12 calendar months prior to October 1.

Investment Pool

The Statewide Death & Disability Plan is invested in the Long-Term Pool. The Long-Term Pool is designed primarily for open plans with a longer time horizon, higher risk tolerance, and lower liquidity needs. The investment return assumption is 7.0%.



RISKS ASSOCIATED WITH MEASURING THE ACCRUED LIABILITY AND ACTUARIALLY DETERMINED CONTRIBUTION

The determination of the accrued liability and the actuarially determined contribution 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 and the actuarially determined contribution 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. Salary and Payroll risk – actual salaries and total payroll may differ from expected, resulting in actual future accrued liability and contributions differing from expected;
5. Longevity risk – members may live longer or shorter than expected and receive pensions for a period of time other than assumed;
6. 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.

The computed contribution rates shown in this report may be considered as a minimum contribution rate that complies with the Board's funding policy and state statute. The timely receipt of the actuarially determined contributions is critical to support the financial health of the plan. Users of this report should be aware that contributions made at the actuarially determined rate do not necessarily guarantee benefit security.

With each valuation there is a presentation of the summary of findings to the Board. Included are various discussions and scenarios of potential risks.

Plan Specific Risks

Being a Death and Disability Plan, the Death and Disability benefits matter much more to this Plan than a typical pension plan. Since far less members become disabled or die while in active service than due retire each year, the year to year results can be much more volatility and more difficult to notice a change in trend. Also, with the limited nature of the annual change in contribution, it can take longer for the contribution rates to reach appropriate levels if experience is adverse in comparison to the assumptions.

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:

	2024	2023	2022	2021
Ratio of the market value of assets to total payroll	0.4	0.4	0.5	0.4
Ratio of actuarial accrued liability to payroll	0.5	0.5	0.5	0.5
Ratio of actives to retirees and beneficiaries	9.4	9.6	9.6	10.1
Net cash flow as a percentage of market value of assets	-0.1%	-0.4%	-2.0%	-2.2%
Duration of the actuarial accrued liability	22.2	21.5	20.8	21.8

RATIO OF MARKET VALUE OF ASSETS TO PAYROLL:

The relationship between assets and payroll is a useful indicator of the potential volatility of contributions. For example, if the market value of assets is 0.4 times the payroll, a return on assets 5% different than assumed would equal 2% of payroll. A higher (lower) or increasing (decreasing) level of this maturity measure generally indicates a higher (lower) or increasing (decreasing) volatility in plan sponsor contributions as a percentage of payroll.

RATIO OF ACTUARIAL ACCRUED LIABILITY TO PAYROLL:

The ratio of liability to payroll may also be used as a measure of sensitivity of the liability itself. For example, if the actuarial accrued liability is 0.5 times the payroll, a change in liability 2% other than assumed would equal 1% of payroll. A higher (lower) or increasing (decreasing) level of this maturity measure generally indicates a higher (lower) or increasing (decreasing) volatility in liability (and also plan sponsor contributions) as a percentage of payroll.

The relationship between the actuarial accrued liability and payroll is a useful indicator of the potential longer term asset-related volatility once the current UAAL is fully amortized. A funding policy that targets a funded ratio of 100% is expected to result in the ratio of assets to payroll and the ratio of liability to payroll converging over time.

RATIO OF ACTIVES TO RETIREES AND BENEFICIARIES:

A young plan with many active members and few retirees will have a high ratio of active to retirees. A mature open plan may have close to the same number of actives to retirees resulting in a ratio near 1.0. A super-mature or closed plan may have significantly more retirees than actives resulting in a ratio below 1.0.

NET CASH FLOW AS A PERCENTAGE OF 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 LIABILITIES:

The duration of the present value of future benefits 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 present value of future benefits would increase approximately 10% if the assumed rate of return were lowered 1%. This also is an approximation of the discount-weighted average time horizon of the liability.