

Fire and Police Pension Association Statewide Death & Disability Plan

Actuarial Valuation Report
for the Year Beginning January 1, 2022





June 30, 2022

Board of Directors
Fire and Police Pension Association
5290 DTC Parkway, Suite 100
Greenwood Village, Colorado 80111

Re: Actuarial Valuation of the FPPA Statewide Death & Disability Plan (the Plan) as of January 1, 2022

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, 2022.

We certify that the information included herein and contained in our 2022 Actuarial Valuation Report is accurate and fairly presents the actuarial position of the FPPA Statewide Death & Disability Plan as of January 1, 2022.

Our report presents the results of the January 1, 2022 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, 2022, the Plan has current liabilities which are greater than current assets by \$118.0 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 3.2% contribution level which the Board may adopt in the future.

The Board increased the contribution rates to 3.2% for 2022. Based on smoothed assets, the cost of providing benefits is 4.19%, 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 3.20% in 2022 to

3.40% in 2023. 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 2022 are based on the same assumptions, methods and provisions used for the January 1, 2022 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
2022	84.5%	4.19%	84.5%	4.19%	84.5%	4.19%
2023	89.4%	4.13%	90.7%	4.07%	91.4%	4.03%
2024	93.6%	4.14%	97.4%	3.96%	99.7%	3.85%
2025	97.4%	4.17%	104.4%	3.85%	109.3%	3.63%
2026	101.0%	4.22%	108.8%	3.76%	109.4%	3.38%
2027	104.5%	4.28%	107.0%	3.72%	108.5%	3.19%

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, 2022. 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, 2022. 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, 2022.

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 2018 Experience Study, for first use in the actuarial valuation as of January 1, 2019. For information regarding the rationale for the assumptions chosen, please see the experience study report dated September 21, 2018.



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 Comprehensive Annual 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. Joseph Newton and Dana Woolfrey are Enrolled Actuaries and all are Members of the American Academy of Actuaries, and meet the Qualification Standards of the American Academy of Actuaries. Finally, all of the undersigned are experienced in performing valuations for large public retirement systems.

Respectfully submitted,
Gabriel, Roeder, Smith & Company



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SECTION I

EXECUTIVE SUMMARY

Executive Summary

Item	January 1, 2022	January 1, 2021
Membership <ul style="list-style-type: none"> • Number of: <ul style="list-style-type: none"> - Active members 13,331 - Total disabled members & beneficiaries 172 - Occupational disabled members & beneficiaries 1,072 - Survivors of deceased active members <u>141</u> - Total 14,716 • Annualized payroll supplied by FPPA \$ 1,188,245 		13,402 167 1,028 <u>134</u> 14,731 \$ 1,168,873
Contribution rates for members hired on or after January 1, 1997 and members covered by Social Security	3.20%	3.00%
Assets <ul style="list-style-type: none"> • Market value \$ 559,369 • Actuarial value \$ 504,999 • Rate of return on market value 14.9% • Rate of return on actuarial value 10.5% • Contribution for prior year \$ 32,139 • Ratio of actuarial value to market value 90.3% 		\$ 493,253 \$ 463,247 13.2% 8.9% \$ 29,030 93.9%
Actuarial Information <ul style="list-style-type: none"> • Unfunded actuarial accrued liability/(surplus) \$ 117,960 • GASB funded ratio (3.2%/3.0% Contributions) 81.1% 		\$ 142,209 76.5%

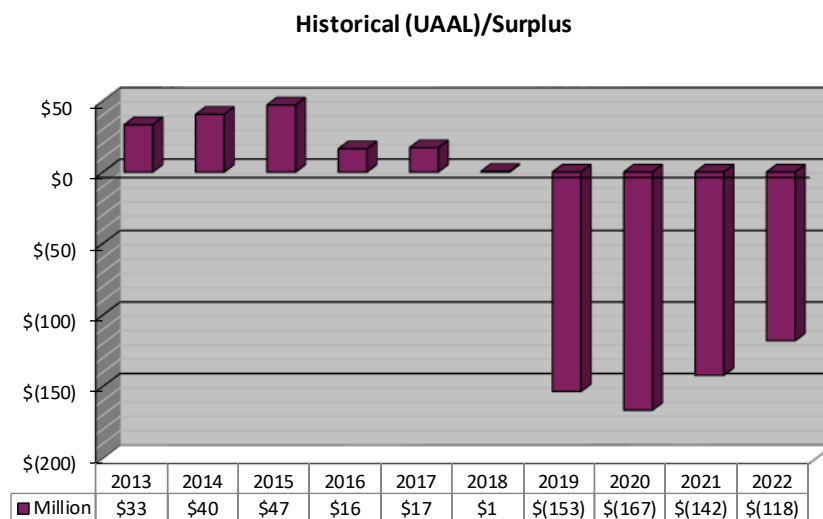
Note: Dollar amounts in \$000



Executive Summary

1. The annual contribution rate for members hired on or after January 1, 1997 and for members covered by Social Security is 3.2% as of January 1, 2022. 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 3.20% in 2022 to 3.40% in 2023. We recommend that the Board continue these maximum increases at least until the actuarial rate is met.
2. The number of total members decreased from 14,731 in 2021 to 14,716 in 2022, a decrease of 0.10%.
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 3.2% 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 \$118.0 million. This unfunded position compares to the \$142.2 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 3.0% to 3.2%.
5. Assets earned 14.9% on a market basis and 10.5% on an actuarial basis in 2021, producing an actuarial gain of \$16.3 million.
6. The funded ratio increased from 76.5% to 81.1% as of January 1, 2022.

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.



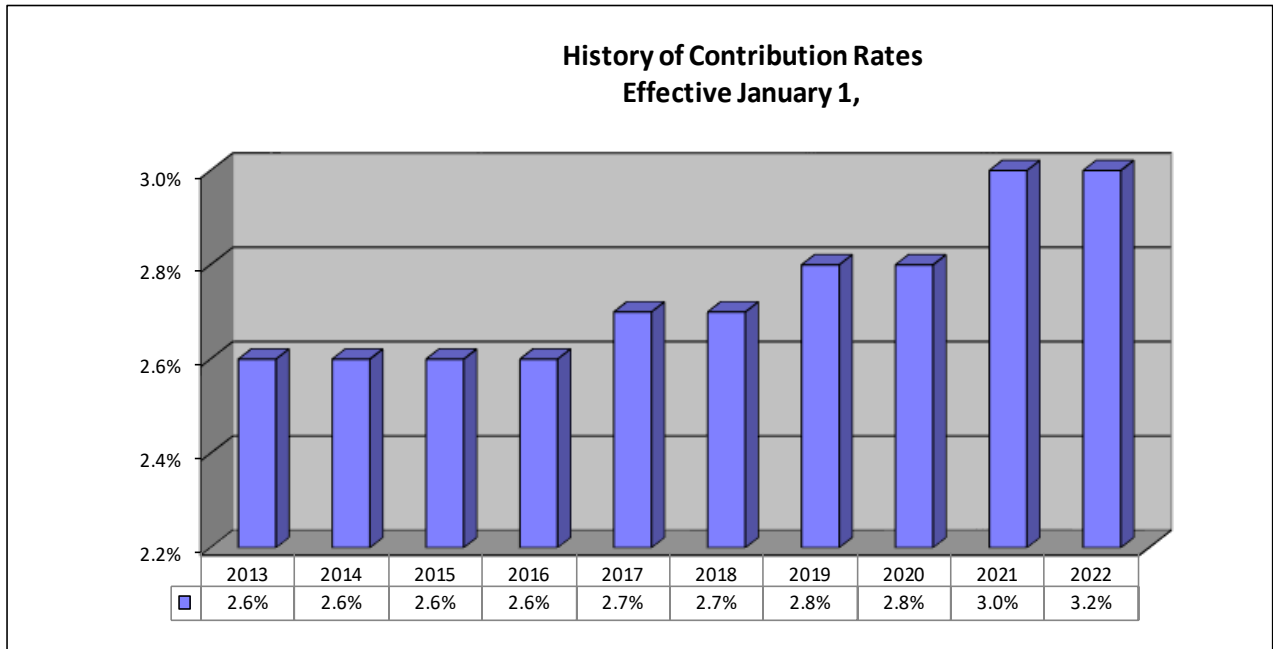
SECTION II

DISCUSSION

Contribution Requirements

The valuation of the Fire and Police Pension Association Statewide Death & Disability Plan (D&D) as of January 1, 2022, reflects a current employee contribution rate of 3.2% 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.

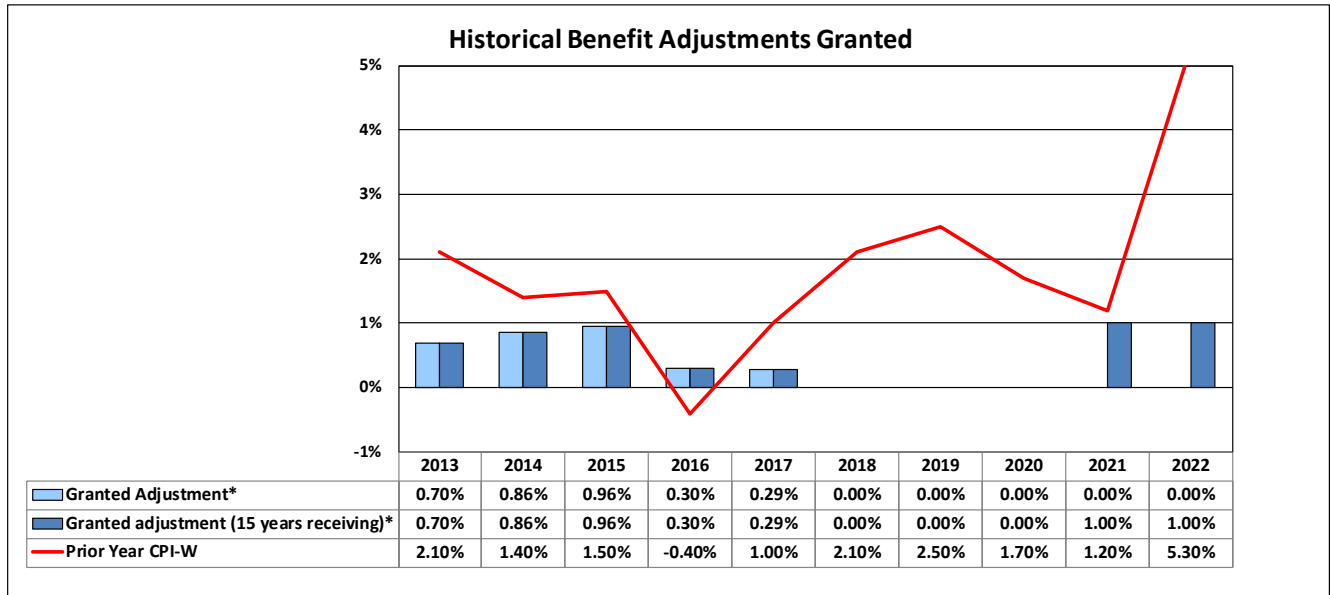


The cost of providing benefits is 4.19% (with no future benefit adjustments for non-totally disabled benefit recipients), therefore, the current 3.2% contribution rate is inadequate to provide any level of future benefit adjustments, or even to fund base benefits. House Bill 20-1044 allows the Board 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 4.19%, therefore, the current contribution rates of 3.20% 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, 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 4.19% to 4.48% of pay.



**Total disability annuitants and their survivors receive an automatic annual Benefit Adjustment of 3.0%.*

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, 2022. The market value of assets reported was \$559.4 million as of January 1, 2022, as compared to \$493.3 million as of January 1, 2021. 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.

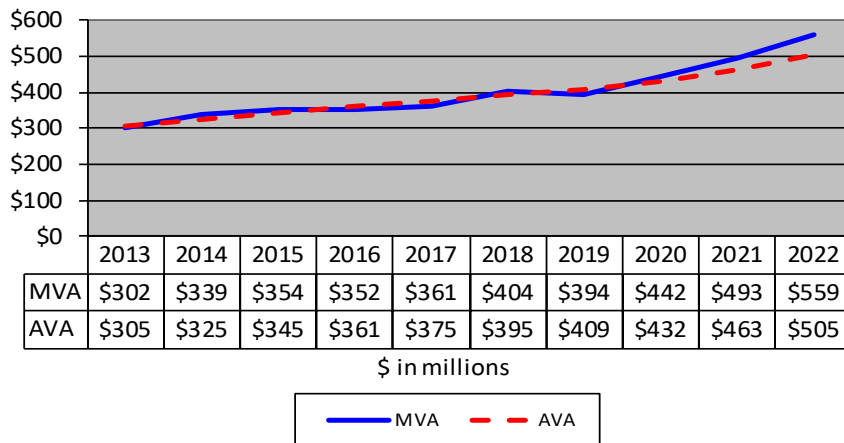
The asset valuation method uses a five-year phase in of the excess/(shortfall) between expected investment return and actual income. Expected earnings used to project the actuarial value are determined using the assumed investment return rate and the beginning of year actuarial value of assets (adjusted 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 \$463.2 million to \$505.0 million since the prior valuation. This increase was more than expected and produced a gain of approximately \$16.3 million.

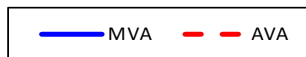
As indicated by item 6b of Table 8, the estimated return on mean market value was 14.86% in 2021; higher than the assumed 7.0% return. The actuarial asset value returned 10.54%. This difference in the estimated return on market value and actuarial value illustrates the smoothing effect of the asset valuation method.

History of MVA vs AVA

As of the valuation date January 1,



\$ in millions



AVA: Actuarial (Smoothed) Value of Assets
MVA: Market Value of Assets

Demographic Experience

During the year, the plan had more disablements than expected (75 actual vs. 70.0 expected) and less active member deaths than expected (8 actual vs. 8.5 expected). The plan had more annuitant deaths than expected (35 actual vs. 19.7 expected). The primary components of the loss shown in Table 3 are the disability experience and newly hired members.

Member Data

FPPA supplied member data as of January 1, 2022. 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.

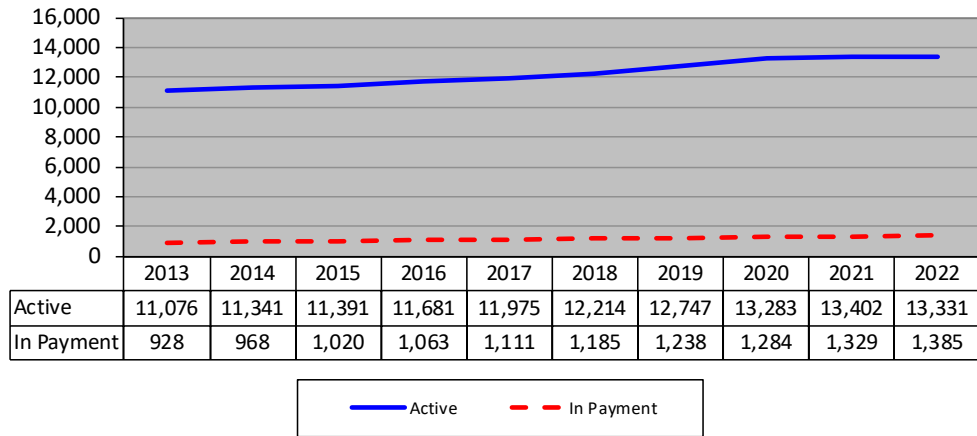
For local Money Purchase members, an array based on service was used to estimate each member's Money Purchase balance. For missing salary in the data, an array of salaries based on service was used to estimate the salary.

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 3.2% 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

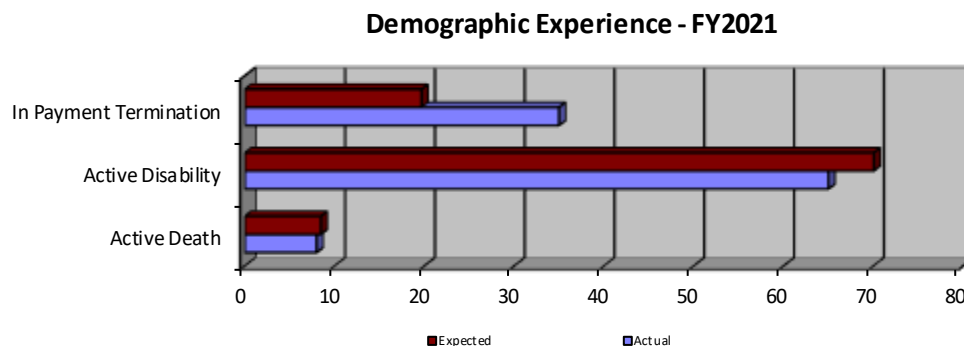
The valuation was prepared using the Aggregate Method. This is the same funding method that has been used in prior years. The asset valuation method uses a five-year phase in of the excess (shortfall) between expected investment return and actual income. See Appendix A for a complete description of this 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 FY2021, the actual salary increases were 99.2% of expected. The following charts provide a comparison of the actual experience versus the expected experience for selected assumptions.



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

GASB and Funding Progress

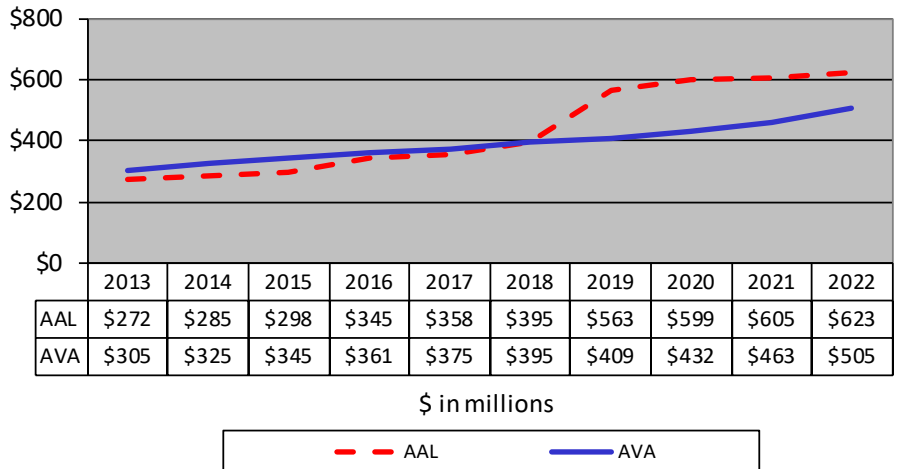
The governmental Accounting Standards Board (GASB) Statement No.74, *Financial Reporting for Postemployment Benefit Plans Other Than Pension Plans (GASB 74)*, has replaced the requirements under GASB Statement No. 43, *Financial Reporting for Postemployment Benefit Plans Other Than Pension Plans (GASB 43)*, effective for financial statements for fiscal years beginning after June 15, 2016. The governmental Accounting Standards Board (GASB) Statement No.75, *Financial Reporting for Postemployment Benefit Plans Other Than Pension Plans (GASB 75)*, has replaced the requirements under GASB Statement No. 45, *Financial Reporting for Postemployment Benefit Plans Other Than Pension Plans (GASB 45)*, effective for financial statements for fiscal years beginning after June 15, 2017.

Plan reporting information for GASB 74 can be found in the FPPA Comprehensive Annual 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 2021 is 0%. For members hired on or after 1/1/97 and for members covered by Social Security the member contribution rate is 3.2% of pay. The 3.2% became effective January 1, 2022.

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. Strong investment returns from 2019 to 2021, coupled with positive demographic experience in 2021 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 Defined Benefit Plan, Statewide Hybrid Plan, Colorado Springs New Hire Plans, 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%
2011	60%	49%	2.23%	0.48%	122.4%	-12.2%
2012	59%	52%	1.98%	0.50%	114.6%	-11.5%
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%

Market Value Results

Investment gains or losses are smoothed over five years, and currently, the smoothed or actuarial value of assets is 90.28% of the market value. If the Funded Ratio and Calculated Contribution had been measured using the Market Value of Assets, they would be 89.8% and 3.73% of payroll, respectively.

SECTION III

TABLES

Table 1 - Development of Unfunded Actuarial Accrued Liability

	<u>January 1, 2022</u>	<u>January 1, 2021</u>
1. Covered payroll for upcoming year	\$ 1,215,533,736	\$ 1,175,753,278
2. Present value of future pay		
a. Total	\$ 12,229,143,470	\$ 11,860,770,043
b. Contributory (Hired on or after January 1, 1997)	11,964,535,589	11,527,273,547
3. Present value of benefits for active members		
a. Future occupational disabilities	\$ 390,034,873	\$ 378,730,893
b. Future total disabilities	69,839,535	67,578,476
c. Future active deaths	49,924,140	48,774,002
d. Total for actives	\$ 509,798,548	\$ 495,083,371
4. Total present value of benefits		
a. Current disabled members	\$ 430,033,053	\$ 396,024,904
b. Current beneficiaries of deceased members	40,867,022	38,263,335
c. Active members (Item 3d)	509,798,548	495,083,371
d. Total	\$ 980,698,623	\$ 929,371,610
5. Unfunded actuarial accrued liability (UAAL)/(surplus)		
a. Present value of benefits	\$ 980,698,623	\$ 929,371,610
b. Present value of administrative costs	25,125,525	21,901,820
c. Less present value of future contributions (current rate)	(382,865,139)	(345,818,206)
d. Less actuarial value of assets	(504,998,929)	(463,246,684)
e. UAAL/(surplus)	\$ 117,960,080	\$ 142,208,539
6. a. Current Contribution	3.20%	3.00%
b. Calculated Contribution (Aggregate Funding) $[(5.a + 5.b + 5.d)/2.b]$	4.19%	4.23%
c. Difference (a. - b.)	-0.99%	-1.23%

Table 2 - Actuarial Present Value of Future Benefits

	<u>January 1, 2022</u>	<u>January 1, 2021</u>
1. Active members		
a. Total disability	\$ 69,839,535	\$ 67,578,476
b. Occupational disability	390,034,873	378,730,893
c. Off-duty death	34,279,543	33,627,579
d. On-duty death	<u>15,644,597</u>	<u>15,146,423</u>
e. Total	\$ 509,798,548	\$ 495,083,371
2. Members in pay status		
a. Total disabled	\$ 113,807,753	\$ 106,003,590
b. Occupationally disabled	316,225,300	290,021,314
c. Survivors	<u>40,867,022</u>	<u>38,263,335</u>
d. Total	\$ 470,900,075	\$ 434,288,239
3. Total actuarial present value of future benefits	\$ 980,698,623	\$ 929,371,610

Table 3 - Actuarial Gain/(Loss) on UAAL

For the year ending December 31,	2021	2020
1. Unfunded actuarial accrued liability (UAAL) as of January 1	\$ 142,208,540	\$ 166,602,066
2. Interest on UAAL for one year	9,954,598	11,662,145
3. Expected UAAL as of December 31 (1 + 2)	152,163,138	178,264,211
4. Change in Unfunded Liability due to:		
a. Benefit Changes *	911,462	(2,577,185)
b. Provision or Assumption Changes**	(23,929,071)	(23,054,547)
5. Expected UAAL as of December 31 after changes in assumption, methods and plan provisions	129,145,529	152,632,479
6. Actual UAAL as of December 31	117,960,080	142,208,540
7. Actuarial gain/(loss) for the period (5 - 6)	11,185,449	10,423,939
 <u>SOURCE OF GAINS/(LOSSES)</u>		
8. Asset gain/(loss) (See Table 9)	16,265,926	8,139,885
9. Salary liability gain/(loss) for the period	2,775,222	(1,520,469)
10. Benefit adjustment granted as of October 1 (0.00% in 2021, 0.00% in 2020)*	0	0
11. Net liability gain/(loss) for the period (7- 8 - 9 - 10)	(7,855,699)	3,804,523

* 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 2021.

** Change in the Unfunded Liability due to Provision or Assumption Changes reflects the change in member contribution rate from 3.0% to 3.2%.



Table 4 - Summary of Historical Valuation Results

As of the Valuation Date January 1,

	<u>2022</u>	<u>2021</u>	<u>2020</u>	<u>2019</u>	<u>2018</u>	<u>2017</u>	<u>2016</u>	<u>2015</u>	<u>2014</u>	<u>2013</u>
1. Number of members										
a. Active	13,331	13,402	13,283	12,747	12,214	11,975	11,681	11,391	11,341	11,076
b. Disabled	1,244	1,195	1,149	1,106	1,058	991	944	904	851	814
c. Survivor	141	134	135	132	127	120	119	116	117	114
d. Total	<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>	<u>12,309</u>	<u>12,004</u>
2. Covered payroll (prior year)	\$ 1,188,245	\$ 1,168,873	\$ 1,112,893	\$ 1,012,667	\$ 947,520	\$ 917,100	\$ 863,106	\$ 827,633	\$ 810,578	\$ 787,010
3. Average compensation	\$ 89,134	\$ 87,216	\$ 83,783	\$ 79,444	\$ 77,577	\$ 76,585	\$ 73,890	\$ 72,657	\$ 71,473	\$ 71,055
4. Covered payroll for upcoming year	\$ 1,215,534	\$ 1,175,753	\$ 1,143,563	\$ 1,043,407	\$ 976,603	\$ 942,822	\$ 886,802	\$ 844,536	\$ 834,268	\$ 833,177
5. Actuarial value of assets	\$ 504,999	\$ 463,247	\$ 432,227	\$ 409,327	\$ 395,302	\$ 374,944	\$ 361,070	\$ 345,009	\$ 325,181	\$ 305,455
6. Market value of assets	\$ 559,369	\$ 493,253	\$ 442,442	\$ 394,247	\$ 403,693	\$ 360,747	\$ 351,520	\$ 353,776	\$ 339,347	\$ 301,653
7. Present value of benefits										
a. Actives	\$ 509,799	\$ 495,083	\$ 471,471	\$ 424,784	\$ 246,318	\$ 238,978	\$ 225,012	\$ 201,711	\$ 203,254	\$ 198,232
b. Disabled	430,033	396,025	371,814	350,578	315,103	287,456	265,786	243,179	221,357	204,847
c. Survivors	40,867	38,263	36,555	34,594	31,490	30,923	30,430	25,703	26,290	25,700
d. Total	<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>	<u>\$ 450,900</u>	<u>\$ 428,778</u>
8. Calculated Contribution	4.19%	4.23%	4.34%	4.40%	2.69%	2.48%	2.37%	1.89%	1.97%	2.05%

\$ amounts in '000s



Table 5 - Allocation of Plan Assets at Fair Value

	<u>Actual Allocation</u> <u>January 1, 2022</u>	<u>Target</u> <u>Allocation</u>
1. Global Equity	41.6%	39.0%
2. Equity Long/Short	7.6%	8.0%
3. Absolute Return	9.1%	10.0%
4. Private Market	28.0%	26.0%
5. Fixed Income	14.4%	15.0%
6. Cash	<u>-0.7%</u>	<u>2.0%</u>
	100.0%	100.0%

Asset Allocation as of January 1, 2022

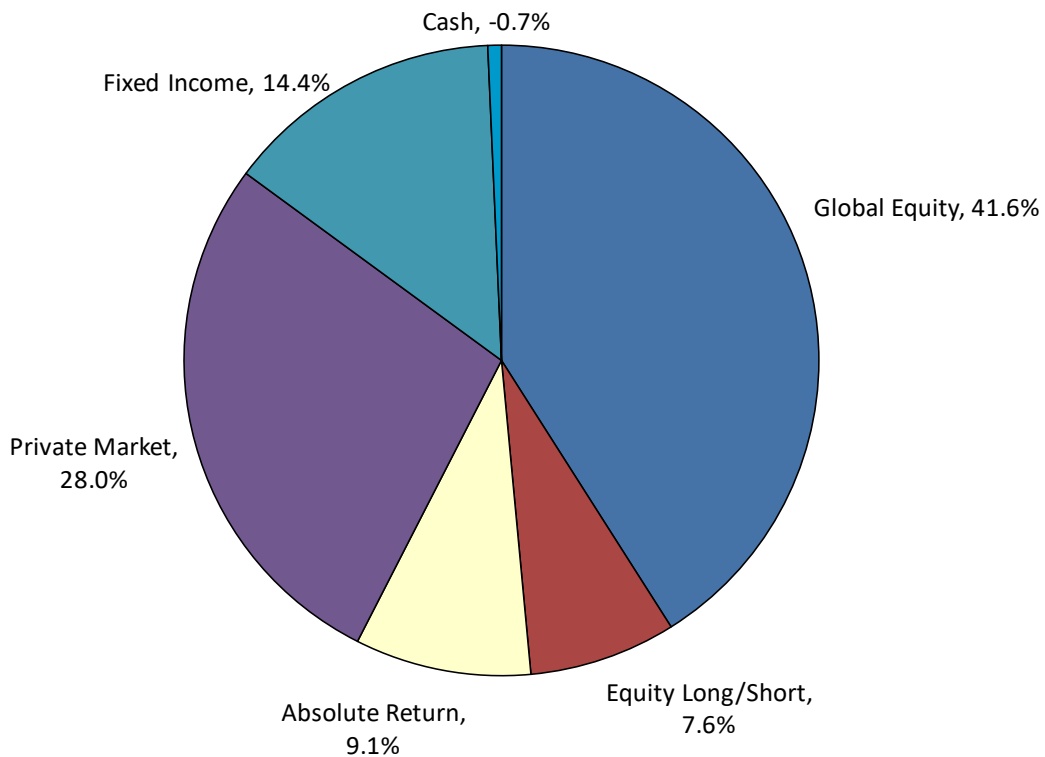


Table 6 - Reconciliation of Plan Net Assets

	Year Ending	
	December 31, 2021	December 31, 2020
1. Market value of assets at January 1	\$ 493,252,642	\$ 442,441,653
2. Revenue for the year		
a. Contributions		
i. Member contributions	\$ 4,972,475	\$ 4,463,916
ii. Employer contributions *	27,166,075	24,566,291
iii. Contributions from the SWDD Plan	0	0
b. Net investment income		
i. Interest	\$ 1,425,337	\$ 1,452,471
ii. Dividends	2,538,094	2,243,927
iii. Net change in accrued income	(14,619)	(141,444)
iv. Unrealized gain/(loss)	30,509,425	37,139,707
v. Realized gain/(loss)	41,077,755	19,003,922
vi. Investment expense	(4,316,859)	(3,499,225)
vii. Other Income	1,603,621	1,738,630
c. Total revenue	\$ 104,961,304	\$ 86,968,195
3. Expenditures for the year		
a. Benefit payments and refunds	\$ (36,569,229)	\$ (34,184,523)
b. Administrative expense	(2,275,552)	(1,972,683)
c. Total expenditures	\$ (38,844,781)	\$ (36,157,206)
4. Increase in net assets (Item 2c + Item 3c)	\$ 66,116,523	\$ 50,810,989
5. Market value of assets at December 31 (Item 1 + Item 4)	\$ 559,369,165	\$ 493,252,642

*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	\$	463,246,684
2. Net new investments		
a. Contributions	\$	32,138,550
b. Benefit payments	\$	(36,569,229)
c. Administrative expenses	\$	<u>(2,275,552)</u>
d. Net cash flow	\$	(6,706,231)
3. Assumed investment return rate for fiscal year		7.00%
4. Assumed investment return for fiscal year	\$	32,192,550
5. Expected Actuarial Value at end of year	\$	488,733,003
6. Market value of assets at end of year	\$	559,369,165
7. Excess return (6-5)	\$	70,636,162
8. Development of amounts to be recognized as of December 31, 2021:		

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)
2017	\$ 0	\$ 0	\$ 0	1	\$ 0	\$ -
2018	0	0	0	2	0	\$ -
2019	7,660,742	0	7,660,742	3	2,553,581	\$ 5,107,161
2020	22,345,216	0	22,345,216	4	5,586,304	\$ 16,758,912
2021	<u>40,630,204</u>	<u>0</u>	<u>40,630,204</u>	5	<u>8,126,041</u>	<u>\$ 32,504,163</u>
Total	70,636,162	0	70,636,162		16,265,926	\$ 54,370,236

9. Actuarial value of assets as of December 31, 2021 (Item 6 - Item 8)	\$	504,998,929
10. Ratio of actuarial value to market value		90.3%

Amounts in column (1) for fiscal years ending 2017 through 2020 are from the prior valuation. The column (1) amount for fiscal year 2021 is developed using item 7 less the total of column (1) for fiscal years ending 2017 through 2020. To the extent possible, the 2021 excess or shortfall is used to reduce prior bases. In this case, there were no offsetting gains or losses to reduce any of the prior bases. The fiscal year 2017 and 2018 bases are \$0 because they were previously offset.



Table 8 - Investment Yields

Item	Market Value	Actuarial Value
1. Assets as of January 1, 2021 (A)	\$ 493,252,642	\$ 463,246,684
2. Contributions during FY21	32,138,550	32,138,550
3. Benefit payments and administrative expenses during FY21	(38,844,781)	(38,844,781)
4. Investment return during FY21	<u>72,822,754</u>	<u>48,458,476</u>
5. Assets as of January 1, 2022 (B): (1 + 2 + 3 + 4)	\$ 559,369,165	\$ 504,998,929
6. Approximate rate of return on average invested assets		
a. Net investment income (I)	\$ 72,822,754	\$ 48,458,476
b. Estimated return based on $(2I / (A + B - I))$	14.86%	10.54%

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

Item	Valuation as of January 1, 2022	Valuation as of January 1, 2021
1. Actuarial assets, prior valuation	\$ 463,246,684	\$ 432,227,330
2. Total contributions since prior valuation	\$ 32,138,550	\$ 29,030,207
3. Benefit payments and administrative expenses since prior valuation	\$ (38,844,781)	\$ (36,157,206)
4. Assumed net investment income at actuarial rate%		
a. Beginning assets	\$ 32,427,268	\$ 30,255,913
b. Contributions	1,124,849	1,016,057
c. Benefit payments and administrative expenses	(1,359,567)	(1,265,502)
d. Total	\$ 32,192,550	\$ 30,006,468
5. Expected actuarial assets (1 + 2 + 3 + 4d)	\$ 488,733,003	\$ 455,106,799
6. Actual actuarial assets, this valuation	\$ 504,998,929	\$ 463,246,684
7. Asset gain/(loss) since prior valuation (6 - 5)	\$ 16,265,926	\$ 8,139,885
	Gain	Gain

Table 10 - History of Investment Return Rates

For Fiscal Year Ending	Market Value	Actuarial Value
December 31, 2012	11.60%	7.06%
December 31, 2013	14.80%	8.67%
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%
Average Returns		
Last 5 Years	11.29%	8.22%
Last 10 Years	9.52%	7.84%

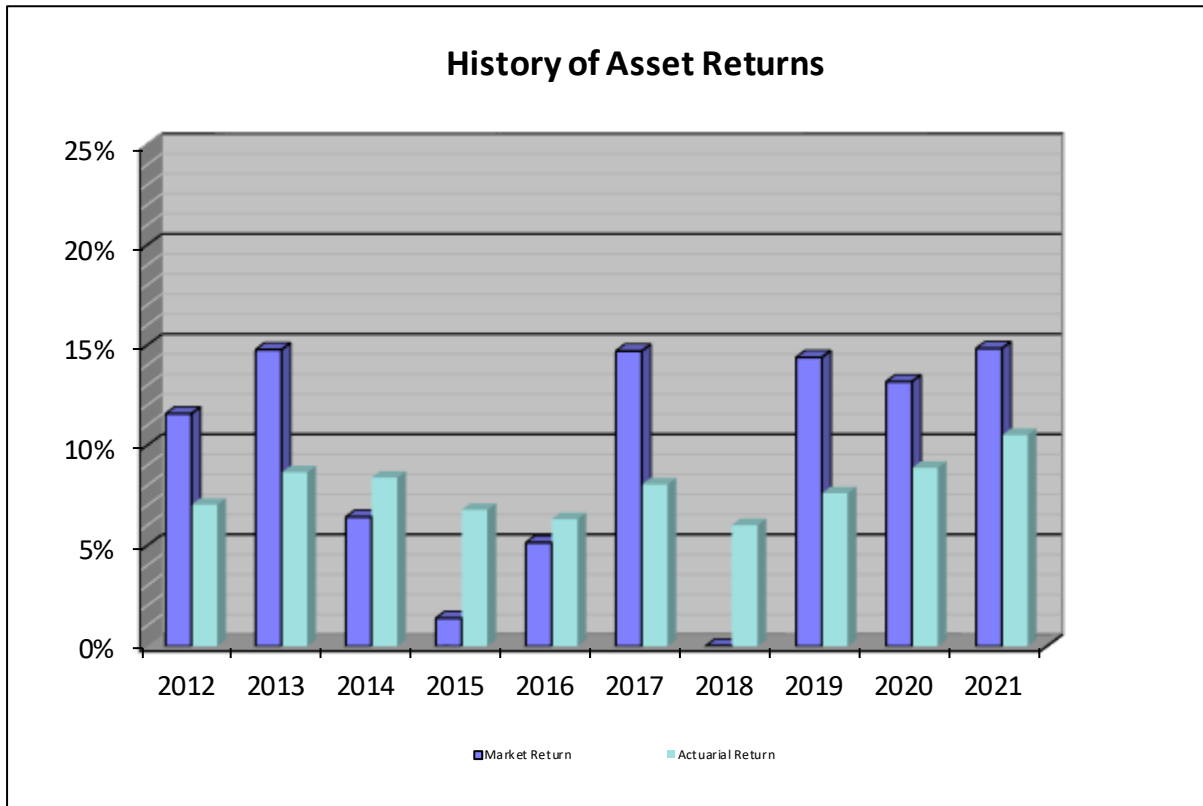


Table 11a - Schedule of Funding Progress
Based on the Aggregate Funding Method

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, 2011	\$ 281,577,454	\$ 260,688,472	\$ (20,888,983)	108.0%	\$ 750,497,200	(2.8%)
January 1, 2012	290,988,339	255,841,269	(35,147,071)	113.7%	755,952,497	(4.6%)
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%

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, 2013	\$ 305,454,945	\$ 274,068,253	\$ (31,386,692)	111.5%	\$ 787,009,650	(4.0%)
January 1, 2014	325,180,768	289,577,412	(35,603,356)	112.3%	810,578,220	(4.4%)
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%

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)]/	
		Beneficiaries and Vested Terminations				(4)	(7)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
January 1, 2010	\$ 0	\$ 178,039	\$ 72,671	\$ 266,478	100%	100%	100%
January 1, 2011	0	191,243	69,445	281,577	100%	100%	100%
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%

\$ 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			
2010	\$ 12,259	\$ (17,435)	\$ 0	\$ (1,963)	\$ (19,398)	\$ (7,139)	\$ 279,882	(2.6%)
2011	12,813	(18,265)	0	(2,175)	(20,439)	(7,627)	275,873	(2.8%)
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*	36,199	(39,211)	0	(6,823)	(46,034)	(9,834)	588,347	(1.7%)
2023*	40,303	(42,552)	0	(7,062)	(49,614)	(9,311)	619,894	(1.5%)
2024*	41,818	(45,935)	0	(7,309)	(53,244)	(11,426)	651,462	(1.8%)

Results for 2022, 2023, & 2024 are based on expected contributions, expected benefit payments, and assumed investment return of 7.0%
 Expected contributions are based on applicable employee rate of 3.2% and 3.5% 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, 2022</u>	<u>January 1, 2021</u>	<u>January 1, 2020</u>
1. Active members			
a. Number	13,331	13,402	13,283
b. Total payroll	\$ 1,188,245,471	\$ 1,168,873,123	\$ 1,112,892,992
c. Average annual salary	\$ 89,134	\$ 87,216	\$ 83,783
d. Average age	40.5	40.8	40.9
e. Average service	9.9	10.2	10.4
2. Disabled members and beneficiaries			
a. Number	1,244	1,195	1,149
b. Total annual benefits	\$ 33,836,832	\$ 31,610,223	\$ 29,576,339
c. Average annual benefit	\$ 27,200	\$ 26,452	\$ 25,741
d. Average age	59.3	59.2	58.8
3. Survivors of deceased active members			
a. Number	141	134	135
b. Total annual benefits	\$ 3,724,316	\$ 3,498,584	\$ 3,409,409
c. Average annual benefit	\$ 26,414	\$ 26,109	\$ 25,255
d. Average age	55.4	55.8	54.2

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, 2010	11,077	40.8	10.9	\$ 751,781,464	\$67,869	3.77%
January 1, 2011	10,903	41.4	11.3	750,497,200	68,834	1.42%
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%



Table 16 - Distribution of Active Members by Age and by Years of Service
As of December 31, 2021

Attained Age	Years of Credited Service												Total Count & Avg. Comp.
	Less than 1 Count & Avg. Comp.	1-2 Count & Avg. Comp.	2-3 Count & Avg. Comp.	3-4 Count & Avg. Comp.	4-5 Count & Avg. Comp.	5-9 Count & Avg. Comp.	10-14 Count & Avg. Comp.	15-19 Count & Avg. Comp.	20-24 Count & Avg. Comp.	25-29 Count & Avg. Comp.	30-34 Count & Avg. Comp.	35 & Over Count & Avg. Comp.	
Under 25	233 \$53,377	91 \$62,028	38 \$63,862	5 \$64,548									367 \$56,906
25-29	467 \$57,384	269 \$63,801	348 \$69,131	261 \$76,443	165 \$81,821	159 \$85,607							1,669 \$68,953
30-34	330 \$59,704	276 \$68,654	377 \$74,156	272 \$77,448	273 \$84,990	701 \$89,493	47 \$89,944						2,276 \$78,136
35-39	183 \$62,246	167 \$70,081	219 \$75,316	190 \$77,077	200 \$86,582	802 \$92,062	416 \$96,995	113 \$104,043					2,290 \$86,240
40-44	108 \$64,722	82 \$74,090	93 \$77,312	95 \$80,424	92 \$86,929	457 \$93,237	432 \$99,019	509 \$105,982	92 \$114,866				1,960 \$94,791
45-49	56 \$68,391	55 \$76,297	63 \$78,927	38 \$75,195	37 \$91,866	238 \$91,741	236 \$99,620	517 \$103,503	484 \$109,385	49 \$112,443			1,773 \$99,584
50-54	43 \$76,084	34 \$80,521	36 \$74,617	27 \$93,607	14 \$97,426	161 \$93,621	172 \$97,478	408 \$103,196	608 \$107,960	293 \$120,647	20 \$112,012		1,816 \$104,493
55-59	39 \$80,034	36 \$98,827	19 \$103,932	13 \$97,086	8 \$96,773	64 \$93,107	64 \$97,523	138 \$104,978	182 \$105,161	147 \$113,404	94 \$122,173	9 \$139,816	813 \$105,695
60-64	14 \$89,696	14 \$88,216	10 \$99,062	7 \$85,908	7 \$104,751	15 \$110,404	26 \$109,759	33 \$98,585	49 \$102,288	26 \$108,096	43 \$118,848	40 \$120,626	284 \$106,821
65 & Over	4 \$68,563	4 \$74,323	2 \$88,708	4 \$106,290	1 \$61,455	10 \$102,545	6 \$88,373	14 \$101,167	10 \$102,074	3 \$125,135	10 \$124,717	15 \$118,224	83 \$103,907
Total	1,477 \$60,306	1,028 \$69,609	1,205 \$73,798	912 \$78,178	797 \$85,757	2,607 \$91,422	1,399 \$98,110	1,732 \$104,199	1,425 \$108,296	518 \$117,212	167 \$120,252	64 \$122,762	13,331 \$89,134
	Average:	Age:	40.5					Number of participants:				Males:	11,848
		Service:	9.9									Females:	1,483



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, 2009	54	\$ 1,537,193	14	\$ 312,334	812	\$ 16,425,790	8.06%	\$ 20,229
December 31, 2010	50	1,366,173	9	185,774	853	17,606,189	7.19%	20,640
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

*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	105	\$ 10,389,825	105	\$ 10,389,825
3	ALAMOSA	23	1,312,837	0	0	23	1,312,837
4	ALMA	1	57,750	0	0	1	57,750
5	ANTONITO	1	35,359	0	0	1	35,359
7	ARVADA	166	16,482,388	0	0	166	16,482,388
501	ARVADA FPD	0	0	173	17,247,822	173	17,247,822
8	ASPEN	24	1,946,764	0	0	24	1,946,764
711	ASPEN FPD	0	0	12	1,073,070	12	1,073,070
9	AULT	8	423,627	0	0	8	423,627
712	AULT FPD	0	0	7	315,175	7	315,175
10	AURORA	711	66,555,939	425	37,374,661	1,136	103,930,600
11	AVON	17	1,517,941	0	0	17	1,517,941
12	BASALT	10	931,088	0	0	10	931,088
13	BAYFIELD	8	501,781	0	0	8	501,781
718	BENNETT FPD #7	0	0	28	1,726,090	28	1,726,090
503	BERTHOUD FPD	0	0	35	2,806,640	35	2,806,640
538	BEULAH FIRE PROTECTION & AMBULANCE DISTRICT	0	0	2	96,047	2	96,047
7331	BIG SANDY FPD	0	0	1	43,626	1	43,626
580	BLACK FOREST FIRE RESCUE	0	0	26	1,608,835	26	1,608,835
723	BLACK HAWK	0	0	19	1,855,375	19	1,855,375
18	BLANCA	3	120,183	0	0	3	120,183
22	BOULDER	167	15,575,200	112	11,443,564	279	27,018,764
726	BOULDER MOUNTAIN FPD	0	0	5	312,677	5	312,677
730	BOULDER RURAL FPD	0	0	21	2,105,241	21	2,105,241
7700	BRIGGSDALE FPD	0	0	1	54,000	1	54,000
3260	BRIGHTON	1	144,074	0	0	1	144,074
326	BRIGHTON	73	6,413,720	0	0	73	6,413,720
26	BRIGHTON (GREATER) FPD	0	0	77	7,153,073	77	7,153,073
504	BROADMOOR FPD	0	0	4	339,641	4	339,641
27	BROOMFIELD	170	15,613,369	0	0	170	15,613,369



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

City Code	City Name	Police		Fire		Total	
		No.	Earnings	No.	Earnings	No.	Earnings
28	BRUSH	9	\$ 542,449	0	\$ 0	9	\$ 542,449
29	BUENA VISTA	12	702,575	0	0	12	702,575
292	BUENA VISTA FIRE	4	306,410	0	0	4	306,410
735	BYERS FPD #9	0	0	4	217,937	4	217,937
736	CALHAN FPD	0	0	3	113,118	3	113,118
33	CANON CITY	36	2,103,162	0	0	36	2,103,162
533	CANON CITY AREA FPD	0	0	36	2,708,900	36	2,708,900
740	CARBONDALE & RURAL FPD	0	0	22	1,905,133	22	1,905,133
35	CASTLE ROCK	0	0	97	8,861,744	97	8,861,744
37	CENTER	5	222,656	0	0	5	222,656
38	CENTRAL CITY	0	0	1	99,687	1	99,687
749	CHAFFEE COUNTY FPD	0	0	6	338,145	6	338,145
40	CHERRY HILLS VILLAGE	22	2,218,781	0	0	22	2,218,781
754	CIMARRON HILLS FPD	0	0	22	1,576,834	22	1,576,834
7125	CLEAR CREEK FIRE AUTHORITY	0	0	11	693,249	11	693,249
509	CLIFTON FPD	0	0	20	1,380,054	20	1,380,054
757	COAL CREEK CANYON FPD	0	0	1	79,999	1	79,999
44	COLLBRAN MARSHALS	2	104,353	0	0	2	104,353
531	COLORADO RIVER FPD	0	0	49	3,564,337	49	3,564,337
45	COLORADO SPRINGS	708	62,053,091	435	41,359,272	1,143	103,412,363
46	COLUMBINE VALLEY	6	408,693	0	0	6	408,693
47	COMMERCE CITY	96	9,288,323	0	0	96	9,288,323
48	CORTEZ	30	1,679,371	0	0	30	1,679,371
765	CORTEZ FPD	0	0	19	827,150	19	827,150
772	CRESTED BUTTE FPD	0	0	19	1,381,754	19	1,381,754
774	CRIPPLE CREEK	0	0	12	725,031	12	725,031
57	DACONO	13	1,152,603	0	0	13	1,152,603
58	DEBEQUE	5	330,412	0	0	5	330,412
779	DEBEQUE FPD	0	0	7	573,295	7	573,295
60	DEL NORTE	4	171,549	0	0	4	171,549



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

City Code	City Name	Police		Fire		Total	
		No.	Earnings	No.	Earnings	No.	Earnings
61	DELTA	20	\$ 1,385,437	0	\$ 0	20	\$ 1,385,437
783	DELTA COUNTY FPD #1	0	0	2	89,640	2	89,640
62	DENVER	1,377	133,753,702	941	93,193,766	2,318	226,947,468
63	DILLON	10	789,461	0	0	10	789,461
64	DINOSAUR	3	160,000	0	0	3	160,000
566	DONALD WESCOTT FPD	0	0	21	1,622,191	21	1,622,191
67	DURANGO	54	3,966,427	0	0	54	3,966,427
567	DURANGO FPD	0	0	78	5,881,376	78	5,881,376
522	EAGLE RIVER FPD	0	0	69	5,751,188	69	5,751,188
507	EAST GRAND FPD #4	0	0	5	339,249	5	339,249
795	EATON FPD	0	0	23	1,214,631	23	1,214,631
73	EDGEWATER	18	1,340,811	0	0	18	1,340,811
74	ELIZABETH	8	494,029	0	0	8	494,029
515	ELIZABETH FPD	0	0	25	1,679,206	25	1,679,206
7102	ELK CREEK FPD	0	0	19	1,192,302	19	1,192,302
75	EMPIRE	3	140,039	0	0	3	140,039
76	ENGLEWOOD	70	6,634,359	0	0	70	6,634,359
77	ERIE	42	3,614,231	0	0	42	3,614,231
523	ESTES VALLEY FPD	0	0	5	380,670	5	380,670
79	EVANS	36	3,019,711	0	0	36	3,019,711
579	EVANS FPD	0	0	19	1,297,085	19	1,297,085
7109	EVERGREEN FPD	0	0	6	487,574	6	487,574
510	FAIRMOUNT FPD	0	0	27	2,075,788	27	2,075,788
80	FAIRPLAY MARSHALLS	4	232,410	0	0	4	232,410
7112	FALCON FPD	0	0	55	3,826,667	55	3,826,667
81	FEDERAL HEIGHTS	18	1,343,835	14	1,057,082	32	2,400,917
810	FEDERAL HEIGHTS FIRE	0	0	1	119,951	1	119,951
82	FIRESTONE	28	2,584,338	0	0	28	2,584,338
85	FLORENCE	12	596,132	0	0	12	596,132
7222	FOOTHILLS FIRE & RESCUE	0	0	5	378,498	5	378,498



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

City Code	City Name	Police		Fire		Total	
		No.	Earnings	No.	Earnings	No.	Earnings
86	FORT COLLINS	259	\$ 24,524,554	0	\$ 0	259	\$ 24,524,554
7122	FORT LEWIS MESA FPD	0	0	2	131,999	2	131,999
87	FORT LUPTON	21	1,771,505	0	0	21	1,771,505
7123	FORT LUPTON FPD	0	0	42	3,152,041	42	3,152,041
88	FORT MORGAN	30	2,125,480	0	0	30	2,125,480
89	FOUNTAIN	60	4,519,217	36	2,605,641	96	7,124,858
7449	FOUR MILE FPD - BOULDER	0	0	4	208,568	4	208,568
7489	FOUR MILE FPD - FLORISSANT	0	0	2	55,299	2	55,299
90	FOWLER POLICE	3	106,414	0	0	3	106,414
511	FRANKTOWN FPD	0	0	21	1,453,154	21	1,453,154
592	FREDERICK FIRESTONE FPD	0	0	55	4,546,812	55	4,546,812
5920	FREDERICK FIRESTONE FPD	0	0	6	716,090	6	716,090
93	FRISCO	11	815,266	0	0	11	815,266
7131	FRONT RANGE FIRE RESCUE FPD	0	0	30	2,594,672	30	2,594,672
94	FRUITA	18	1,117,936	0	0	18	1,117,936
7132	GALETON FPD	0	0	13	372,397	13	372,397
95	GARDEN CITY	4	254,703	0	0	4	254,703
7135	GATEWAY-UNAWEEP FPD	0	0	6	219,158	6	219,158
7136	GENESEE FPD	0	0	3	247,375	3	247,375
97	GEORGETOWN	3	190,493	0	0	3	190,493
99	GLENDALE	28	2,562,440	0	0	28	2,562,440
100	GLENWOOD SPRINGS	20	1,950,799	27	2,232,038	47	4,182,837
101	GOLDEN	53	4,612,264	12	940,281	65	5,552,545
102	GRANADA	1	45,396	0	0	1	45,396
7147	GRAND FPD #1	0	0	4	243,411	4	243,411
104	GRAND JUNCTION	120	9,459,683	135	10,223,226	255	19,682,909
7149	GRAND LAKE FPD	0	0	12	792,147	12	792,147
7150	GRAND VALLEY FPD	0	0	21	1,681,836	21	1,681,836
7153	GREATER EAGLE FPD	0	0	17	1,184,874	17	1,184,874
107	GREELEY	149	14,065,736	121	10,665,182	270	24,730,918



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

City Code	City Name	Police		Fire		Total	
		No.	Earnings	No.	Earnings	No.	Earnings
512	GREEN MOUNTAIN FALLS-CHIPITA PARK FPD	0	\$ 0	1	\$ 58,083	1	\$ 58,083
109	GREENWOOD VILLAGE	63	5,724,414	0	0	63	5,724,414
7156	GYP SUM FPD	0	0	8	513,362	8	513,362
7158	HARTSEL FPD	0	0	1	75,675	1	75,675
115	HAXTUN	2	112,883	0	0	2	112,883
119	HOLYOKE	4	179,350	0	0	4	179,350
7174	HOT SULPHUR SPRINGS/PARSHALL FPD	0	0	1	69,999	1	69,999
7176	HUDSON FPD	0	0	27	2,226,248	27	2,226,248
124	HUGO	2	99,840	0	0	2	99,840
125	IDAHO SPRINGS	6	401,620	0	0	6	401,620
126	IGNACIO	9	641,844	0	0	9	641,844
7187	INTER-CANYON FPD	0	0	4	277,148	4	277,148
7191	JEFFERSON-COMO FPD	0	0	8	424,576	8	424,576
129	JOHNSTOWN	24	1,828,704	0	0	24	1,828,704
132	KERSEY	3	162,635	0	0	3	162,635
7198	KIOWA FPD	0	0	2	129,559	2	129,559
5136	KREMMLING FPD	0	0	2	125,043	2	125,043
138	LA JARA	3	178,129	0	0	3	178,129
139	LA JUNTA	12	606,072	13	578,496	25	1,184,568
144	LA SALLE	8	496,526	0	0	8	496,526
7211	LA SALLE FPD	0	0	13	905,083	13	905,083
146	LA VETA	1	46,201	0	0	1	46,201
137	LAFAYETTE	35	3,175,271	35	3,220,537	70	6,395,808
593	LAKE DILLON FPD	0	0	66	5,158,766	66	5,158,766
7206	LAKE GEORGE FPD	0	0	1	58,000	1	58,000
263	LAKESIDE	6	341,588	0	0	6	341,588
143	LAMAR	15	817,293	10	492,862	25	1,310,155
141	LARKSPUR FPD	0	0	18	1,227,420	18	1,227,420
147	LEADVILLE	4	232,627	12	671,099	16	903,726
574	LEFTHAND FPD	0	0	3	211,250	3	211,250



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

City Code	City Name	Police		Fire		Total	
		No.	Earnings	No.	Earnings	No.	Earnings
149	LITTLETON	77	\$ 7,858,500	0	\$ 0	77	\$ 7,858,500
150	LOCHBUIE	10	724,730	0	0	10	724,730
214	LOG LANE VILLAGE	2	92,998	0	0	2	92,998
268	LONE TREE	48	4,424,802	0	0	48	4,424,802
151	LONGMONT	153	13,695,334	93	8,101,052	246	21,796,386
578	LOS PINOS FPD	0	0	23	1,391,893	23	1,391,893
153	LOVELAND	108	10,563,648	0	0	108	10,563,648
2153	LOVELAND FRA	0	0	99	10,044,329	99	10,044,329
7226	LOWER VALLEY FPD	0	0	21	1,430,444	21	1,430,444
7227	LYONS FPD	0	0	4	321,567	4	321,567
157	MANITOU SPRINGS	14	932,101	5	378,455	19	1,310,556
160	MEAD	9	724,249	0	0	9	724,249
163	MILLIKEN	12	826,188	0	0	12	826,188
166	MONTE VISTA	12	589,393	0	0	12	589,393
167	MONTROSE	39	2,467,601	0	0	39	2,467,601
537	MONTROSE FPD	0	0	37	2,834,058	37	2,834,058
168	MONUMENT	22	1,436,270	0	0	22	1,436,270
170	MOUNTAIN VIEW	9	583,599	0	0	9	583,599
516	MOUNTAIN VIEW FPD	0	0	136	14,075,942	136	14,075,942
266	MOUNTAIN VILLAGE	7	208,289	0	0	7	208,289
7246	NEDERLAND FPD	0	0	5	438,058	5	438,058
7251	NORTH FORK FPD	0	0	1	72,249	1	72,249
532	NORTH METRO FIRE RESCUE	0	0	140	14,179,312	140	14,179,312
7253	NORTH ROUTH FPD	0	0	5	219,047	5	219,047
7255	NORTHEAST TELLER COUNTY FPD	0	0	15	1,064,820	15	1,064,820
175	NORTHGLENN	66	5,776,901	0	0	66	5,776,901
7259	NORTH-WEST FPD	0	0	15	786,967	15	786,967
178	NUNN	1	70,000	0	0	1	70,000
179	OAK CREEK	2	118,342	0	0	2	118,342
7263	OAK CREEK FPD	0	0	7	413,467	7	413,467



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

City Code	City Name	Police		Fire		Total	
		No.	Earnings	No.	Earnings	No.	Earnings
1790	OAK CREEK POLICE	1	\$ 84,086	0	\$ 0	1	\$ 84,086
180	OLATHE	5	272,153	0	0	5	272,153
7264	OLATHE FPD	0	0	9	512,115	9	512,115
588	PAGOSA FPD	0	0	18	887,426	18	887,426
188	PAGOSA SPRINGS	6	348,470	0	0	6	348,470
189	PALISADE	9	515,490	3	169,449	12	684,939
190	PALMER LAKE	4	221,580	4	264,970	8	486,550
192	PAONIA	4	178,460	0	0	4	178,460
106	PARACHUTE	5	288,563	0	0	5	288,563
191	PARKER	68	6,860,094	0	0	68	6,860,094
7281	PEYTON FPD	0	0	1	45,000	1	45,000
7481	PLATEAU VALLEY FPD	0	0	6	464,454	6	464,454
7285	PLATTE CANYON FPD	0	0	19	1,288,175	19	1,288,175
7286	PLATTE VALLEY FPD	0	0	17	1,349,505	17	1,349,505
7287	PLATTE VALLEY FPD	0	0	3	332,883	3	332,883
196	PLATTEVILLE	11	674,989	0	0	11	674,989
513	PLATTEVILLE/GILCREST FPD	0	0	34	2,842,534	34	2,842,534
7289	PLEASANT VIEW METRO FIRE DISTRICT	0	0	7	385,304	7	385,304
518	POUDRE FIRE AUTHORITY	0	0	185	18,564,472	185	18,564,472
199	PUEBLO	209	15,085,669	127	9,765,858	336	24,851,527
519	PUEBLO RURAL FPD	0	0	28	1,573,441	28	1,573,441
7294	PUEBLO WEST METRO FPD	0	0	28	1,795,311	28	1,795,311
201	RANGELY	5	330,502	0	0	5	330,502
7298	RATTLESNAKE FPD	0	0	13	725,269	13	725,269
521	RED WHITE & BLUE FPD	0	0	56	5,114,128	56	5,114,128
206	RIFLE	18	1,239,420	0	0	18	1,239,420
551	ROARING FORK FRA	0	0	33	3,042,067	33	3,042,067
208	ROCKY FORD	6	255,944	5	212,160	11	468,104
7314	RYE FPD	0	0	5	261,369	5	261,369
542	SABLE-ALTURA FPD	0	0	9	463,057	9	463,057



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

City Code	City Name	Police		Fire		Total	
		No.	Earnings	No.	Earnings	No.	Earnings
213	SALIDA	19	\$ 1,271,527	13	\$ 893,008	32	\$ 2,164,535
543	SECURITY FPD	0	0	41	2,217,059	41	2,217,059
219	SEVERANCE POLICE	10	683,565	0	0	10	683,565
220	SHERIDAN	29	2,664,873	0	0	29	2,664,873
222	SILT	6	364,561	0	0	6	364,561
228	SNOWMASS VILLAGE	10	839,459	0	0	10	839,459
525	SOUTH ADAMS COUNTY FPD	0	0	86	8,391,870	86	8,391,870
7339	SOUTH FORK	2	98,156	0	0	2	98,156
5339	SOUTH FORK FPD	0	0	10	446,472	10	446,472
540	SOUTH METRO FIRE RESCUE FPD	0	0	572	63,169,670	572	63,169,670
7340	SOUTHEAST WELD FPD	0	0	24	1,598,640	24	1,598,640
7341	SOUTHEAST WELD FPD	0	0	1	159,666	1	159,666
548	SOUTHERN PARK COUNTY FPD	0	0	2	83,280	2	83,280
552	SOUTHWESTERN HIGHWAY 115 FPD	0	0	1	85,000	1	85,000
229	SPRINGFIELD	3	133,840	0	0	3	133,840
231	STEAMBOAT SPRINGS	22	1,670,576	32	2,465,845	54	4,136,421
232	STERLING	22	1,275,034	21	1,133,764	43	2,408,798
7348	STRASBURG FPD #8	0	0	3	168,999	3	168,999
7349	STRATMOOR HILLS FPD	0	0	6	323,968	6	323,968
237	TELLURIDE	11	982,016	0	0	11	982,016
545	TELLURIDE FPD	0	0	15	1,335,223	15	1,335,223
238	THORNTON	0	0	144	14,713,775	144	14,713,775
338	THORNTON	228	20,669,850	0	0	228	20,669,850
7354	TIMBERLINE FPD	0	0	6	470,638	6	470,638
2557	TRI-LAKES MONUMENT FPD	0	0	50	4,428,128	50	4,428,128
2400	TRINIDAD	0	0	1	61,395	1	61,395
240	TRINIDAD	25	1,412,895	13	860,250	38	2,273,145
595	UPPER PINE RIVER FPD	0	0	32	1,804,723	32	1,804,723
242	VAIL	26	2,331,782	37	3,072,463	63	5,404,245
7369	WELLINGTON FPD	0	0	19	1,185,866	19	1,185,866



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

City Code	City Name	Police		Fire		Total	
		No.	Earnings	No.	Earnings	No.	Earnings
7370	WELLINGTON FPD	0	0	6	567,497	6	567,497
7373	WEST DOUGLAS COUNTY FPD	0	0	1	97,829	1	97,829
534	WEST METRO FPD	0	0	362	36,895,529	362	36,895,529
5340	WEST METRO FPD	0	0	16	2,035,035	16	2,035,035
7375	WEST ROUTT FPD	0	0	8	333,709	8	333,709
2520	WESTMINSTER	0	0	2	236,655	2	236,655
252	WESTMINSTER	0	0	122	11,982,759	122	11,982,759
253	WHEAT RIDGE	84	7,508,238	0	0	84	7,508,238
254	WIGGINS	2	115,206	0	0	2	115,206
7384	WINDSOR SEVERANCE FPD	0	0	56	4,260,305	56	4,260,305
259	WOODLAND PARK	16	960,794	0	0	16	960,794
260	WRAY	6	310,694	0	0	6	310,694
262	YUMA	9	448,888	0	0	9	448,888
Totals		6,487	\$ 573,328,572	6,844	\$ 614,916,899	13,331	\$ 1,188,245,471



Table 19 - Summary of Inactive Members

	<u>Count</u>	<u>Average Age</u>	<u>Average Monthly Benefit</u>
Totally Disabled Members*	172	59.6	\$3,689
Occupationally Disabled Members*	1,072	59.2	\$2,039
Beneficiaries of Deceased Active Members	141	55.4	\$2,201

* 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 2018 for first use in this valuation following a regularly scheduled experience study. The rationale for all of the current assumptions is included in that report, dated September 21, 2018.

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	7.00%	11.25%
2	7.00%	11.25%
3	6.50%	10.75%
4	6.00%	10.25%
5	3.50%	7.75%
6	1.50%	5.75%
7	1.50%	5.75%
8	1.00%	5.25%
9	1.00%	5.25%
10	0.75%	5.00%
11	0.75%	5.00%
12	0.50%	4.75%
13	0.50%	4.75%
14	0.25%	4.50%
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 3.50% 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: 2006 central rates from the RP-2014 Annuitant Mortality Tables for males and females projected to 2018 using the MP-2017 projection scales, and then projected prospectively using the ultimate rates of the scale for all years.

Annual Rate per 1,000 Members					
Attained Age in 2022	Males	Females	Attained Age in 2022 (cont.)	Males	Females
(1)	(2)	(3)	(4)	(5)	(6)
50	3.90	2.63	70	16.66	12.61
55	5.59	3.70	75	26.61	20.72
60	7.85	5.53	80	44.94	35.46
65	11.24	8.16	85	78.73	63.36

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:

	Year of Retirement			
	2022	2027	2032	2037
Gender				
Male	30.1	30.6	31.0	31.5
Female	32.5	33.0	33.4	33.9

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

Annual Rate per 1,000 Members					
Attained Age in 2022	Males	Females	Attained Age in 2022 (cont.)	Males	Females
(1)	(2)	(3)	(4)	(5)	(6)
50	4.90	3.17	70	21.89	16.91
55	6.83	4.71	75	36.24	28.43
60	9.72	6.98	80	62.71	50.07
65	14.11	10.50	85	110.90	90.14

c. Totally disabled retirees: RP-2014 Disabled Mortality Tables, projected with Scale BB, with minimum probability of 3% for males and 2% for females.

Annual Rate per 1,000 Members					
Attained Age in 2022	Males	Females	Attained Age in 2022 (cont.)	Males	Females
(1)	(2)	(3)	(4)	(5)	(6)
50	30.00	20.00	70	40.09	27.65
55	30.00	20.00	75	53.85	40.61
60	30.00	20.00	80	76.99	62.11
65	32.33	21.14	85	115.11	94.68

2. Mortality rates (active members) – 2006 central rates from the RP-2014 Employee Mortality Tables for males and females projected to 2018 using the MP-2017 projection scales, and then projected prospectively using the ultimate rates of the scale for all years, 50% multiplier for off-duty mortality. Increased by 0.00015 for on-duty related Fire and Police experience. Sample rates are shown below:

Annual Rate per 1,000 Members					
Attained Age in 2022	Males	Females	Attained Age in 2022 (cont.)	Males	Females
(1)	(2)	(3)	(4)	(5)	(6)
20	0.33	0.23	40	0.48	0.37
25	0.39	0.24	45	0.63	0.47
30	0.39	0.26	50	0.96	0.67
35	0.44	0.31	55	1.51	1.00

3. Disability rates: Sample rates are shown below.

Annual Rate per 1,000 Members				
Age	Occupational Disability Rates (MP)	Occupational Disability Rates (SWDB)	Total Disability Rates (MP)	Total Disability Rates (SWDB)
(1)	(2)	(3)	(4)	(5)
25	0.25	0.48	0.01	0.02
30	1.18	2.26	0.11	0.17
35	1.60	3.05	0.23	0.34
40	2.35	4.48	0.35	0.52
45	4.09	5.53	0.48	0.72
50	8.86	8.22	0.63	0.94
55	15.53	11.56	0.78	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	98.5	8	25.5	16	9.4
1	84.6	9	21.3	17	9.1
2	72.3	10	17.9	18	8.8
3	61.4	11	15.3	19	8.5
4	51.9	12	13.3	20	8.1
5	43.6	13	11.7	21	7.5
6	36.5	14	10.7	22	6.5
7	30.5	15	9.9	23	5.2

5. Retirement rates: Members are assumed to retire at the time of attaining:
- A. Statewide Defined Benefit 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 SWDB service-based rates shown below.
 - C. All Other Plan members: Age 52 or current age, if greater.

C. Other Assumptions

1. Family status: 85% 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. SRA Offset: The SRA balances are projected forward using 7.00% investment returns. No future SRA contributions are assumed. At decrement, the account is converted to an annuity using current actuarial equivalence factors.
13. Decrement timing: Decrements of all types are assumed to occur mid-year.

14. 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.
15. Decrement relativity: Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.
16. 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.
17. 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.

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 Defined Benefit 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. 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, SRA or 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, SRA, and DROP

Plan benefits are reduced by the actuarially equivalent annuities of the Money Purchase, SRA, and DROP account balances. A blended rate based on the annual required contributions, as defined in the Statewide Defined Benefit Plan, is used to calculate the offset for Money Purchase Plans. 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 402.10(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 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:

	2022	2021	2020
Ratio of the market value of assets to total payroll	0.5	0.4	0.4
Ratio of actuarial accrued liability to payroll	0.5	0.5	0.5
Ratio of actives to retirees and beneficiaries	9.6	10.1	10.3
Net cash flow as a percentage of market value of assets	-2.0%	-2.2%	-2.6%
Duration of the actuarial accrued liability	20.8	21.8	21.4

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.