Fire and Police Pension Association Colorado Springs New Hire Pension Plan – Fire Component

Actuarial Valuation Report

For the Year Beginning January 1, 2018

GRS Retirement Consulting

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To: Board of Directors for the Fire and Police Pension Association

CC: Administrative Heads and Finance Officers of the City of Colorado Springs

Date: June 2018

Subject: **Actuarial Valuation Results as of January 1, 2018**

This report contains the actuarial valuation results as of January 1, 2018 for the Colorado Springs New Hire Pension Plan – Fire Component as determined by Gabriel, Roeder, Smith & Company (GRS), actuary for the Fire and Police Pension Association (FPPA). Questions about this report should be directed to FPPA, rather than to Gabriel, Roeder, Smith & Company.

Financing Objectives

This valuation was prepared to determine the actuarially determined contribution (ADC) for fiscal year 2019. The ARC for FY2019 is $4,519,669 and is shown in Table 1, Item 9.

The calculated employer contribution consists of the sum of two pieces: the normal cost and the amortization of the unfunded actuarial accrued liability (UAAL). The calculated contribution is shown in Table 1, Item 9. The normal cost (shown in Table 1, Item 2) can be viewed as the regular, ongoing cost of the Plan.

The UAAL is the amount by which the actuarial value of assets falls short of, or exceeds, the actuarial accrued liability for this Plan. Under the current statutes, the UAAL must be amortized under a level dollar method over a period of 20 years. The determined payment to amortize the UAAL is shown in Table 1, Item 8.

The Actuarially Determined Contribution may be considered as a minimum contribution rate that complies with state statute. Users of this report should be aware that contributions made at that rate do not guarantee benefit security. Given the importance of benefit security to any retirement system, we suggest that contributions to the Plan in excess of those presented in this report be considered.

The contribution rate in this report is determined using the actuarial assumptions and methods disclosed in Table 13 of this report. Page 3 of this letter includes short-term projections assuming alternate investment returns. With the exception of these short term funding projections, this report does not include an assessment of the risks of future experience not meeting the actuarial assumptions. Additional assessment of risks was outside the scope of this assignment. We encourage a review and assessment of investment and other significant risks that may have a material effect on the plan's financial condition.

Benefit Provisions

This actuarial valuation reflects the provisions that were applicable to the Colorado Springs New Hire Pension Plan-Fire Component as of the valuation date. The details of the actuarial calculations, based on the current benefit provisions, are described in this report.

SRA Contributions

As of January 1, 2018, the combined member/employer contribution rate is over 16.00% and therefore we recommend the SRA contribution rate be set to 0.00% as of January 1, 2019.

Actuarial Assumptions and Methods

The current actuarial methods and assumptions were adopted by the Board of Directors of FPPA for first use in the actuarial valuation as of January 1, 2016, based upon the actuary's analysis and recommendations from the 2015 Experience Study. For information regarding the rationale for the assumptions chosen, please see the experience study report dated June 1, 2015. There have been no changes in assumptions or methods since the prior valuation.

The assumptions and methods are detailed in Table 13 of the 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.

Because the plan is closed to new members, the amortization period was closed at 30 years effective January 1, 2008.

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

Assets

Table 4 shows the market value of assets for this department and Table 5 shows the development of the actuarial value. 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. This smoothed average approach is intended to ensure the smoothed value of assets will converge towards the market value in a reasonable amount of time.

Member Data

Member data as of January 1, 2018 was supplied by FPPA, as supplied by the department throughout the normal course of business. GRS reviewed the data and tested it for reasonableness and consistency. The member count is shown in Table 3.

Experience

The plan experienced a reduction in its calculated contribution between the 2017 actuarial valuation and this valuation. This decrease was primarily due to expected reductions in the normal cost for the closed group, liability gains from salary experience, and favorable asset returns.

Deferred Losses and Projected Actuarial Results

To allow the City to anticipate future contribution requirements for the Fund, we have projected the actuarial status of the Fund as of January 1, 2018. The table below provides the ADC for Fiscal Years 2019 - 2023 based on the January 1, 2018 actuarial valuation.

	Actuarially Determined Contribution (ADC)		
Fiscal Year	Assuming 3.5%	Assuming 7.5%	Assuming 11.5%
(FY)	return in FY	return in FY	return in FY
2019	$4,519,669	$4,519,669	$4,519,669
2020	4,473,313	4,353,546	4,233,779
2021	4,569,724	4,195,322	3,811,062
2022	4,811,284	4,032,075	3,210,750
2023	5,180,545	3,830,501	2,368,140

The projected liabilities are calculated by rolling forward the liabilities as of January 1, 2018, taking into account interest and benefit payments for the year, including mortality incidence and anticipated cost of living increases. The 7.5% scenario above coincides with the actuarial investment return assumption of 7.5%. The 3.5% and 11.5% scenarios were selected because there is statistically a high probability of the return for a two year period being inside the expected return +/- 4%.

The scenarios above are for illustration purposes only and are in no way to be used as expected investment performance. There are no other deviations from the expected taken into consideration besides the asset performance. Careful consideration of this projected contribution should be taken into account before any benefit enhancement is adopted.

Trends

As of January 1, 2018, there remains $3.0 million of deferred asset gains that will reduce future contribution levels, in the absence of offsetting losses. Additionally, it is anticipated that the dollar normal cost will continue to decrease over time.

Tables

This report includes the following sections:

- The executive summary includes a condensed summary of the demographic, financial, and actuarial data.
- Table 1 provides the details of the development of the determined contribution.
- Table 2 shows the sources of change in the calculated contribution since the prior valuation.
- Table 3 shows historical actuarial and demographic data for the department.
- Tables 4, 5, and 6 show the development of the financial information.
- Table 7 provides historical funding information.
- Table 8 provides the solvency test.
- Table 9 shows historical cash flow information.
- Tables 10, 11, and 12 show demographic data for the department.
- Table 13 shows the actuarial assumptions and methods used to calculate the liabilities.
- Table 14 is a summary of the benefit provisions for the department.
- Table 15 provides definitions of several terms used throughout the report.
- Table 16 provides Supplemental Studies

GASB Accounting

The Governmental Accounting Standards Board (GASB) Statement No. 67, Financial Reporting for Pension Plans (Issued 6/2012), has replaced the requirements under GASB Statement No. 25, Financial Reporting for Defined Benefit Pension Plans and Note Disclosures for Defined Contribution Plans (Issued 11/1994), effective for financial statements for fiscal years beginning after June 15, 2013. GASB Statement No. 68, Accounting and Financial Reporting for Pensions (Issued 6/2012), has replaced GASB Statement No. 27, Accounting for Pensions by State and Local Governmental Employers (Issued 11/1994), effective for fiscal years beginning after June 15, 2014. Plan reporting information for GASB Statement No. 67 can be found in the FPPA Comprehensive Annual Financial Report at FPPA's website - FPPAco.org. Colorado Springs receives a separate accounting report in order to meet their financial reporting requirements under GASB 68.

Certification

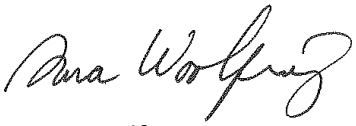
We certify that the information included herein and contained in the 2018 Actuarial Valuation Report is accurate and fairly presents the actuarial position of the Colorado Springs New Hire Pension Plan-Fire Component of January 1, 2018.

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

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

Joseph P. Newton, FSA, EA, MAAA
Senior Consultant



Dana Woolfrey, FSA, EA, MAAA
Consultant

Executive Summary

Item	January 1, 2018	January 1, 2017
Membership		
• Number of:		
- Active members	103	110
- Terminated vested members	6	7
- Inactive members	3	3
- Members in DROP	38	37
- Disabled members	0	0
- Retired members	122	118
- Beneficiaries	7	6
- Total	279	281
• Annualized payroll supplied by FPPA	$ 9,310,153	$ 9,619,561
• Annualized monthly benefits paid	$ 8,137,716	$ 7,776,185
Assets		
• Market value	$ 142,035,779	$ 126,527,898
• Actuarial value	$ 139,084,637	$ 131,529,543
• Return on market value	14.8 %	5.4 %
• Return on actuarial value	8.1 %	6.3 %
• Contribution	$ 5,264,542	$ 4,569,688
• Ratio of actuarial value to market value	97.9 %	104.0 %
Actuarial Information		
• Actuarial accrued liability	$ 168,492,702	$ 163,542,442
• Actuarial Value Basis		
- Unfunded actuarial accrued liability/(surplus)	$ 29,408,065	$ 32,012,899
- Funded ratio	82.5 %	80.4 %
• Market Value Basis		
- Unfunded actuarial accrued liability/(surplus)	$ 26,456,923	$ 37,014,544
- Funded ratio	84.3 %	77.4 %
• Amortization period (years)	20	21
Annual Determined Contribution (ADC)		
• For year ending December 31,	2019	2018
• Estimated contribution amount	$ 4,519,669	$ 4,981,787

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Table 1 – Development of Actuarially Determined Contribution

		January 1, 2018	January 1, 2017
1.	Valuation payroll	$ 9,310,153	$ 9,619,561
2.	Normal cost	$ 1,706,597	$ 1,818,795
3.	Administrative Expenses	$ 67,395	$ 209,340
4.	Actuarial accrued liability for active members		
	a. Present value of future benefits for active members	$ 63,080,164	$ 63,448,777
	b. Less: present value of future normal costs	(11,188,375)	(12,230,675)
	c. Actuarial accrued liability (a. + b.)	$ 51,891,789	$ 51,218,102
5.	Total actuarial accrued liability for:		
	a. Retirees and beneficiaries	$ 81,964,186	$ 78,476,954
	b. Terminated vested members	2,090,090	2,502,882
	c. Inactive members	398,276	398,276
	d. Members in DROP	32,148,361	30,946,228
	e. Active members (4c.)	51,891,789	51,218,102
	f. Total	$ 168,492,702	$ 163,542,442
6.	Actuarial value of assets	$ 139,084,637	$ 131,529,543
7.	Unfunded actuarial accrued liability (UAAL)/(surplus) (5f. - 6.)	$ 29,408,065	$ 32,012,899
8.	Funded ratio	82.55 %	80.43 %
9.	Determined payment to amortize the UAAL/(surplus) over 20 years from January 1, 2018	$ 2,745,677	$ 2,953,652
10.	Total calculated annual contribution for Fiscal Year:	2019	2018
	Actuarially Determined Contribution (2. + 3. + 9.)	$ 4,519,669	$ 4,981,787
11.	Total present value of benefits (5f. - 4b.)	$ 179,681,077	$ 175,773,117

Table 2 – Actuarial Gain/(Loss) on UAAL

1. Unfunded actuarial accrued liability (UAAL)	$	32,012,899
2. Total normal cost for 2017		1,872,966
3. Non Service Purchase Contributions during 2017		(5,132,890)
4. Administrative Expenses 2017		67,395
5. a) Interest on Item 1 for one year		2,400,967
b) Interest on Item 2, 3, and Item 4 for one-half year *		(119,720)
6. Change in UAAL due to:		
a. Benefit Improvements		0
b. Assumption Changes		0
7. Expected UAAL as of this valuation (1.+2.+3.+4.+5.)		31,101,618
8. Actual UAAL at end of period		29,408,065
9. Actuarial gain/(loss) for the period (8. – 7.)		1,693,553
SOURCE OF GAINS/(LOSSES)		
10. Asset gain/(loss) (See Table 6)	$	737,786
11. Salary/rank liability gain/(loss) for the period		415,388
12. Net liability gain/(loss) for the period (9. - 10. - 11.) #		540,380

Change in Calculated Contribution

1. Calculated contribution in 2017 valuation		$	4,981,787
2. Benefit changes	0		
3. Assumption/method changes	0		
4. Change in Normal Cost^	(112,198)		
5. Investment experience	(76,740)		
6. Salary/rank experience	(43,206)		
7. Other liability experience #	(229,974)		
8. Total change	(462,118)		
9. Calculated contribution in 2018 valuation		$	4,519,669

** Assume Normal Cost, contributions and administrative expense occurred in the mid-year.*

^ The normal cost is a measure of the rate at which active member benefits are accruing and directly relates to the active member payroll. The reduction in normal cost is due to the reduction in active member payroll through terminations.

 # Includes changes in administrative expenses.

Table 3 – Actuarial Experience

	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
1. Number of members										
a. Active	103	110	130	149	155	161	165	264	288	305
b. Retired	122	118	108	101	86	80	71	58	50	39
c. DROP	38	37	27	18	27	29	36	36	28	25
d. Beneficiaries	7	6	4	2	2	1	1	1	1	1
e. Terminated vested	6	7	9	9	9	10	10	10	8	6
f. Inactive	3	3	2	1	2	1	3	3	1	NA
g. Total	279	281	280	280	281	282	286	372	376	376
2. Covered payroll	$ 9,310,153	$ 9,619,561	$ 11,167,162	$ 12,537,370	$ 12,468,196	$ 12,349,627	$ 12,497,987	$ 19,664,027	$ 21,535,495	$ 22,483,956
3. Average compensation	$ 90,390	$ 87,451	$ 85,901	$ 84,143	$ 80,440	$ 76,706	$ 75,745	$ 74,485	$ 74,776	$ 73,718
4. Valuation results										
a. Normal cost	$ 1,706,597	$ 1,818,795	$ 2,050,714	$ 2,256,072	$ 2,310,185	$ 2,308,265	$ 2,361,981	$ 3,516,328	$ 3,818,781	$ 3,997,567
b. Accrued liability	168,492,702	163,542,442	157,971,179	145,875,351	138,255,953	129,466,329	124,211,363	127,909,057	121,361,624	113,068,434
c. Actuarial value of assets	139,084,637	131,529,543	126,813,938	120,350,555	111,882,235	103,516,709	98,326,872	108,848,941	100,709,022	92,515,096
d. Unfunded liability	29,408,065	32,012,899	31,157,241	25,524,796	26,373,718	25,949,620	25,884,491	19,060,116	20,652,602	20,553,338
e. Remaining amortization	20	21	22	23	24	25	26	27	28	29
f. Funded ratio	82.5%	80.4%	80.3%	82.5%	80.9%	80.0%	79.2%	85.1%	83.0%	81.8%
5. Actuarially Determined Estimated dollar contribution	$ 4,519,669	$ 4,981,787	$ 5,132,890	$ 4,522,810	$ 4,628,508	$ 4,546,999	$ 4,685,823	$ 5,199,980	$ 5,631,451	$ 5,952,279

Item 5 above is the calculated contribution as it is described throughout the report: normal cost plus the amortization of the UAAL under the policy as described in the current statutes. There is a one-year lag. As an example, the contribution shown in valuation year 2018 is payable in fiscal year 2019.

Table 4 – Reconciliation of Net Plan Assets

	Year Ending December 31, 2017	Year Ending December 31, 2016
1. Market value of assets at beginning of year	$ 126,527,898	$ 123,154,436
2. Revenue for the year		
a. Contributions		
i. Member contributions	$ 1,083,453	$ 1,045,342
ii. Employer contributions	4,181,089	3,485,586
iii. State contributions	0	0
iv. Contributions from the SWDD Plan	0	38,760
v. Total	$ 5,264,542	$ 4,569,688
b. Net investment income		
i. Interest	$ 363,357	$ 340,860
ii. Dividends	962,911	956,264
iii. Net change in accrued income	79,880	(5,735)
iv. Unrealized gain/(loss)	11,150,960	3,041,006
v. Realized gain/(loss)	6,037,931	2,748,733
vi. Defined contribution earnings (net)	(6,717)	(6,667)
vii. Investment expense	(1,281,432)	(1,015,549)
viii Direct allocated plan expense/(income)	(5,483)	(18,164)
ix. Allocated fees and expenses	(52,612)	(191,176)
x. Other Income	1,138,250	510,993
c. Total revenue	$ 23,651,588	$ 10,930,253
3. Expenditures for the year		
a. Benefit payments	$ (7,983,856)	$ (7,389,735)
b. Refunds	(150,551)	(167,056)
c. Plan directed expenses	(9,300)	0
d. Total expenditures	(8,143,707)	(7,556,791)
4. Increase in net assets (2c. + 3d.)	$ 15,507,881	$ 3,373,462
5. Market value of assets at end of year (1. + 4.)	$ 142,035,779	$ 126,527,898

Table 5 – Development of Actuarial Value of Assets

1.	Actuarial value of assets at beginning of year	$ 131,529,543
2.	Net new investments	
	a. Contributions	5,264,542
	b. Benefits paid	(7,983,856)
	c. Refunds	(150,551)
	d. Administrative Expenses	(67,395)
	e. Subtotal	(2,937,260)
3.	Assumed investment return rate for fiscal year	7.5%
4.	Assumed investment return for fiscal year	$ 9,754,568
5.	Expected Actuarial Value at end of year	$ 138,346,851
6.	Market value of assets at end of year	$ 142,035,779
7.	Excess return (6-5)	$ 3,688,928
8.	Development of amounts to be recognized as of January 1, 2018:	

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)
2013	$ 0	$ 0	$ 0	1	$ 0	$ 0
2014	0	0	0	2	0	0
2015	(2,744,626)	2,744,626	0	3	0	0
2016	(2,257,019)	2,257,019	0	4	0	0
2017	8,690,573	(5,001,645)	3,688,928	5	737,786	2,951,142
Total	$ 3,688,928	$ 0	$ 3,688,928		$ 737,786	$ 2,951,142

9.	Actuarial value of assets as of January 1, 2018 (Item 6 - Item 8)	$ 139,084,637
10.	Ratio of actuarial value to market value	97.9%

Amounts in column (1) for fiscal years ending 2013 through 2016 are from the prior valuation. The column (1) amount for fiscal year 2017 is developed using item 7 less the total of column (1) for fiscal years ending 2013 through 2016. To the extent possible, the 2017 excess or shortfall is used to reduce prior bases. In this case, both the 2016 base and 2016 base are offset by the 2017 Excess. The fiscal year 2013 through 2014 bases are $0 because they were previously offset.

Table 6 – Gain/(Loss) on Actuarial Value of Assets

	Year Ending December 31, 2017	Year Ending December 31, 2016
1. Actuarial assets as of January 1	$ 131,529,543	$ 126,813,938
2. Total contributions since prior valuation	$ 5,264,542	$ 4,569,688
3. Benefits, refunds, and administrative expense since prior valuation	$ (8,201,802)	$ (7,766,131)
4. Assumed net investment income at 7.5%		
a. Beginning assets	$ 9,864,716	$ 9,511,045
b. Contributions	197,420	171,363
c. Benefits, refunds, and administrative expense	(307,568)	(291,230)
d. Total	$ 9,754,568	$ 9,391,179
5. Expected actuarial assets (1. + 2. + 3. + 4.)	$ 138,346,851	$ 133,008,674
6. Actual actuarial assets as of December 31	$ 139,084,637	$ 131,529,543
7. Net asset gain/(loss) since prior valuation (6. - 5.)	$ 737,786	$ (1,479,131)
	Gain	Loss

Table 7 – Statement of Funding Progress

Date	Actuarial Value of Assets (AVA)	Actuarial Accrued Liability (AAL)	Unfunded (Surplus) Actuarial Accrued Liability (UAAL) (3) - (2)	Funded Ratio (2)/(3)	Annual Covered Payroll	UAAL as a % of payroll (4)/(6)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
January 1, 1998	$ 36,847,022	$ 30,351,861	$ (6,495,161)	121.4 %	$ 11,972,174	(54.3) %
January 1, 2000	50,722,513	40,520,761	(10,201,752)	125.2	14,279,040	(71.4)
January 1, 2002	57,728,219	52,687,510	(5,040,709)	109.6	18,282,885	(27.6)
January 1, 2004	62,859,916	66,756,828	3,896,912	94.2	21,214,606	18.0
January 1, 2005	71,474,295	81,608,422	10,134,127	87.6	23,344,108	43.0
January 1, 2006	84,519,478	86,903,116	2,383,638	97.3	26,640,305	9.0
January 1, 2007	98,290,761	99,137,903	847,142	99.1	26,867,827	3.0
January 1, 2008	104,946,386	107,389,381	2,442,995	97.7	23,827,770	10.3
January 1, 2009	92,515,096	113,068,434	20,553,338	81.8	22,483,956	91.4
January 1, 2010	100,709,022	121,361,624	20,652,602	83.0	21,535,495	95.9
January 1, 2011	108,848,941	127,909,057	19,060,116	85.1	19,664,027	96.9
January 1, 2012	98,326,872	124,211,363	25,884,491	79.2	12,497,987	207.1
January 1, 2013	103,516,709	129,466,329	25,949,620	80.0	12,349,627	210.1
January 1, 2014	111,882,235	138,255,953	26,373,718	80.9	12,468,196	211.5
January 1, 2015	120,350,555	145,875,351	25,524,796	82.5	12,537,370	203.6
January 1, 2016	126,813,938	157,971,179	31,157,241	80.3	11,167,162	279.0
January 1, 2017	131,529,543	163,542,442	32,012,899	80.4	9,619,561	332.8
January 1, 2018	139,084,637	168,492,702	29,408,065	82.5	9,310,153	315.9

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 8 – Solvency Test

Valuation Date	Aggregated Accrued Liabilities for: Active Members Contribution	Aggregated Accrued Liabilities for: Retirees Beneficiaries and Vested Terminations	Aggregated Accrued Liabilities for: Members (Employer Financed Portion)	Actuarial Value of Assets	Portion of Accrued Liabilities Covered by Reported Assets: (5)/(2)	Portion of Accrued Liabilities Covered by Reported Assets: [(5)-(2)-(3)]/(3)	Portion of Accrued Liabilities Covered by Reported Assets: [(5)-(2)-(3)]/(4)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
January 1, 2007	$ 17,106	$ 21,479	$ 60,554	$ 98,291	100.0%	100.0%	98.6%
January 1, 2008	16,186	29,492	61,711	104,946	100.0%	100.0%	96.0%
January 1, 2009	17,117	36,551	59,400	92,515	100.0%	100.0%	65.4%
January 1, 2010	17,531	46,439	57,391	100,709	100.0%	100.0%	64.0%
January 1, 2011	17,297	59,509	51,103	108,849	100.0%	100.0%	62.7%
January 1, 2012	12,800	70,830	40,581	98,327	100.0%	100.0%	36.2%
January 1, 2013	13,989	72,425	43,053	103,517	100.0%	100.0%	39.7%
January 1, 2014	14,705	75,027	48,525	111,882	100.0%	100.0%	45.6%
January 1, 2015	15,131	78,621	52,124	120,351	100.0%	100.0%	51.0%
January 1, 2016	13,776	97,364	46,831	126,814	100.0%	100.0%	33.5%
January 1, 2017	11,906	112,324	39,312	131,530	100.0%	100.0%	18.6%
January 1, 2018	12,055	116,601	39,837	139,085	100.0%	100.0%	26.2%

$ amounts in 000s

Table 9 – Cash Flow Analysis

Year Ending December 31,	Contributions for the Year	Expenditures During the Year			Transfer to FPPA Statewide DB	External Cash Flow for the Year	Market Value of Assets	External Cash Flow as Percent of Market Value
		Benefit Payments **	Expenses***	Total				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
2005	$ 4,246,521	$ (433,572)	$ (609,593)	$ (1,043,165)	$ 0	$ 3,203,356	$ 86,245,371	3.7 %
2006	4,635,325	(1,194,578)	(668,843)	(1,863,421)	0	2,771,904	102,563,833	2.7
2007	4,853,098	(1,904,689)	(776,908)	(2,681,598)	(7,126,881)	(4,955,381)	107,836,784	(4.6)
2008	3,823,945	(2,493,071)	(779,983)	(3,273,054)	0	550,891	77,095,913	0.7
2009	4,025,461	(3,075,980)	(654,327)	(3,730,307)	(174,888)	120,267	93,245,608	0.1
2010	5,123,834	(4,102,856)	(742,245)	(4,845,101)	0	278,733	106,862,046	0.3
2011	4,604,275	(5,047,853)	(818,801)	(5,866,654)	(14,827,301)	(16,089,679)	91,528,868	(17.6)
2012	4,017,079	(5,260,141)	(873,250)	(6,133,391)	0	(2,116,312)	100,831,706	(2.1)
2013	4,879,867	(5,230,250)	(973,410)	(6,203,660)	0	(1,323,793)	115,691,126	(1.1)
2014	4,627,045	(5,317,236)	(1,026,942)	(6,344,178)	0	(1,717,133)	122,730,229	(1.4)
2015	4,640,109	(6,228,574)	(194,094)	(6,422,668)	0	(1,782,559)	123,154,436	(1.4)
2016	4,569,688	(7,389,735)	(209,340)	(7,599,075)	0	(3,029,387)	126,527,898	(2.4)
2017	5,264,542	(7,983,856)	(58,095)	(8,041,951)	0	(2,777,408)	142,035,779	(2.0)
2018*	4,981,787	(8,376,881)	(59,837)	(8,436,718)	0	(3,454,931)	149,103,971	(2.3)
2019*	4,519,669	(8,883,875)	(61,633)	(8,945,508)	0	(4,425,839)	155,694,961	(2.8)

* Cash flow estimated based on expected contributions and expected benefit payments. Assets are assumed to increase at the annual return of 7.5% with all cash flow occurring in the middle of the year.
** Expected Benefit Payments for 2018 and beyond include expected retirements, expected mortality and if applicable, future cost of living increases.
*** Beginning in fiscal year ending December 31, 2015, expenses reflect administrative expense only. Prior years include investment expenses.

Table 10 – Membership Data

		January 1, 2018	January 1, 2017	January 1, 2016
1.	Active members			
	a. Number	103	110	130
	b. Total payroll	$ 9,310,153	$ 9,619,561	$ 11,167,162
	c. Average annual salary	$ 90,390	$ 87,451	$ 85,901
	d. Average age	47.8	47.3	47.5
	e. Average service	18.9	18.3	18.6
2.	Terminated vested			
	a. Number	6	7	9
	b. Total annual benefits	$ 186,947	$ 229,498	$ 294,237
	c. Average annual benefit	$ 31,158	$ 32,785	$ 32,693
	d. Average age	52.3	51.7	51.6
3.	Members In DROP			
	a. Number	38	37	27
	b. Total annual benefits	$ 2,249,418	$ 2,168,269	$ 1,559,880
	c. Average annual benefit	$ 59,195	$ 58,602	$ 57,773
	d. Average age	57.8	57.3	57.3
4.	Service retirees			
	a. Number	122	118	108
	b. Total annual benefits	$ 5,763,800	$ 5,504,277	$ 5,030,425
	c. Average annual benefit	$ 47,244	$ 46,646	$ 46,578
	d. Average age	63.7	63.0	62.7
5.	Beneficiaries			
	a. Number	7	6	4
	b. Total annual benefits	$ 124,498	$ 103,638	$ 67,103
	c. Average annual benefit	$ 17,785	$ 17,273	$ 16,776
	d. Average age	50.1	46.4	40.2
6.	Inactive members			
	a. Number	3	3	2

Table 11 – Summary of Retirees by Age and Type

	Retirees		Disabled Members		Beneficiaries		Members in DROP		All	
Age	Number	Average Monthly Pension	Number	Average Monthly Pension	Number	Average Monthly Pension	Number	Average Monthly Pension	Number	Average Monthly Pension
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Less than 50	0	$ 0	0	$ 0	2	$ 1,095	0	$ 0	2	$ 1,095
50-54	5	3,480	0	0	0	0	2	4,525	7	3,779
55-59	18	4,068	0	0	3	1,852	29	5,116	50	4,543
60-64	48	4,214	0	0	0	0	7	4,291	55	4,224
65-69	40	3,855	0	0	1	1,729	0	0	41	3,803
70-74	10	3,169	0	0	1	899	0	0	11	2,963
75-79	1	1,510	0	0	0	0	0	0	1	1,510
Greater than 80	0	0	0	0	0	0	0	0	0	0
All	122	3,937	0	0	7	1,482	38	4,933	167	4,061

Table 12 – Schedule of Retirants & Annuitants Added to and Removed from Rolls

	Added to Rolls		Removed from Rolls		Rolls-End of Year				
Valuation Year	Numbe	Annual Benefits*	Number	Annual Benefits	Number	Annual Benefits	% Increase in Annual Benefits	Average Annual Benefits	Average Age
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
2006	3	$ 106,428	0	$ 0	16	$ 379,356	39.0 %	$ 23,710	57.7
2007	26	1,160,157	0	0	42	1,539,513	305.8	36,655	57.6
2008	12	592,154	0	0	54	2,131,667	38.5	39,475	56.8
2009	11	536,669	0	0	65	2,668,336	25.2	41,051	57.2
2010	14	725,800	0	0	79	3,394,136	27.2	42,964	57.6
2011	16	901,143	0	0	95	4,295,279	26.5	45,213	58.7
2012	14	711,103	1	18,613	108	4,987,769	16.1	46,183	59.2
2013	2	96,704	0	0	110	5,084,473	1.9	46,222	60.1
2014	7	275,015	2	71,310	115	5,288,178	4.0	45,984	60.7
2015	6	257,233	0	0	121	5,545,411	4.9	45,830	61.4
2016	19	1,149,542	1	37,545	139	6,657,408	20.1	47,895	61.0
2017	23	1,149,453	1	30,677	161	7,776,184	16.8	48,299	61.1
2018	7	392,209	1	30,677	167	8,137,716	4.6	48,729	61.8

* Includes cost-of-living adjustments granted since the prior valuation.

Table 13 – Summary for Actuarial Assumptions, Methods, and Changes

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

1. Investment Return Rate — 7.50% per annum (net of investment expenses), compounded annually

2. Rates of Decrement due to:

   a) Retirement — As eligible for retirement under Rule of 75 with minimum age 50 or Normal Retirement:

50-54:	5%
55:	60%
56-59:	50%
60+:	100%

   b) Disability — Graduated rates, sample rates shown below:

	Annual Rate Per 1,000	
Age	Occupational Disability	Total Disability Rate
25	0.29	0.02
30	1.35	0.17
35	1.82	0.34
40	2.67	0.52
45	3.29	0.72
50	4.89	0.94
55	6.88	1.17

c) Pre-Retirement Mortality

RP-2014 Mortality Table for Blue Collar Employees, projected with Scale BB, 55% multiplier for off-duty mortality. Increased by 0.00020 for on-duty experience. These rates include margin for future mortality improvement.

	Annual Rate per 1,000 Members	
Attained Age in 2018	Males	Females
(1)	(2)	(3)
20	0.49	0.30
25	0.54	0.31
30	0.52	0.33
35	0.57	0.37
40	0.64	0.44
45	0.88	0.60
50	1.39	0.87
55	2.16	1.21

d) Withdrawal (any reason other than retirement, death, or disability) rates at selected ages are shown:

	Annual Rate per 1,000 Members		
Years of Service	Termination Rates	Years of Service	Termination Rates
0	108.4	12	14.6
1	93.1	13	12.9
2	79.5	14	11.8
3	67.5	15	10.9
4	57.1	16	10.3
5	48.0	17	10.0
6	40.2	18	9.7
7	33.6	19	9.4
8	28.1	20	8.9
9	23.4	21	8.3
10	19.7	22	7.2
11	16.8	23	5.7

3. Post-Retirement Mortality

Healthy Retirees, Beneficiaries

For ages less than 55, RP-2014 Mortality Tables for Blue Collar Employees. For ages 65 and older, RP-2014 Mortality Tables for Blue Collar Healthy Annuitants. For ages 55 through 64, a blend of the previous tables. All tables are projected with Scale BB.

	Annual Rate per 1,000 Members	
Attained Age in 2018	Males	Females
(1)	(2)	(3)
50	2.16	1.22
55	3.65	1.95
60	7.13	4.53
65	12.02	8.31
70	18.53	13.31
75	29.66	21.89
80	48.82	36.36
85	81.74	61.95

4. Salary Increase Rate

A service-related component shown below, plus a 2.5% inflation component and 1.5% productivity component, as follows:

Years of Service	Service-Related Component	Total Annual Rate of Increase Including 2.5% Inflation and 1.5% Productivity Component
1	10.00%	14.00%
2	8.50%	12.50%
3	8.00%	12.00%
4	7.50%	11.50%
5	2.50%	6.50%
6	1.50%	5.50%
7	1.50%	5.50%
8	1.00%	5.00%
9	0.75%	4.75%
10	0.50%	4.50%
11	0.50%	4.50%
12	0.50%	4.50%
13	0.25%	4.25%
14	0.25%	4.25%
15	0.00%	4.00%

Salary increases are assumed to occur once a year, on January 1st. 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.

5. Marital Status

a) Percent married	85% male and female
b) Age difference	Males are assumed to be two years older than females.

6. Benefit Escalation	2.4%
7. Payroll Growth	0.00% - The plan is closed to New Entrants. Therefore, no payroll growth was assumed in the amortization calculation.
8. Third Week Pay Impact	To account for third week pay, an additional salary increase of 2% is included after 10 years of service. Also, the final average pay is increased by 0.50% at the time of retirement. This is representative of a member beginning to receive third-week checks in their 11th year of service, continuing to receive them until retirement, and receiving two third-week checks in the final 18 months of employment (the period used in the final average compensation calculation).
9. Administrative Expense	An explicit administrative expense equal to the prior year actual expenses.

10. Changes in Actuarial Assumptions

There were no changes in actuarial methods since the prior valuation.

11. Actuarial Cost Method

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

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

The contribution requirements determined by this valuation will not be effective until one year later, and the determination of the requirement reflects this deferral. It is assumed that there will be no change in the normal cost due to the deferral, and it is assumed that payments are made in the middle of the year. The reflection of the one year lag is a change from the methodology of prior valuations.

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

12. Asset Valuation Method

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.

Table 14 – Summary of Benefit Provisions

Plan Description

Two plans from the City of Colorado Springs joined the Fire & Police Pension Association Defined Benefit System as of October 1, 2006. They are now one single-employer defined benefit pension plan, Colorado Springs New Hire Pension Plan ("Plan"), but with a fire component and a police component for fire and police employees hired by the City of Colorado Springs on or after April 8, 1978 but prior to October 1, 2006. The plans are closed to new members as of October 1, 2006.

Employers may not withdraw from the Fire & Police Pension Association Defined Benefit System once elected. The Plan members had opportunities to transfer to the Fire & Police Pension Association Defined Benefit System - Statewide Defined Benefit Plan in conjunction with the administrative change. The Plan assets are included in the Fire & Police Members' Benefit Investment Fund and the Fire & Police Members' Self-Directed Investment Fund (for Deferred Retirement Option Plan "DROP" assets and Separate Retirement Account assets from eligible retired members).

Plan Year

A twelve-month period ending December 31.

Members Included

Members included are active employees hired on or after April 8, 1978 but prior to October 1, 2006. As of October 1, 2006, administration of the plan has been transferred to the Fire & Police Pension Association and the plan has been closed. All members hired on or after October 1, 2006 will become members of the Fire & Police Pension Association Defined Benefit System - Statewide Defined Benefit Plan.

Compensation Considered

Basic salary, including longevity pay, sick pay taken in the normal course of employment, vacation leave pay taken in the normal course of employment, third week pay, and mandatory overtime (including Annual Pay in lieu of leave) that is part of the members annual fixed periodic compensation. Also, all salary amounts deferred for 457 or Section 125 "cafeteria plan" are included.

Contribution Rates

The Plan sets contribution rates at a level that enables all benefits to be fully funded at the retirement date of all members within each component as determined by the actuarial study. Effective January 1, 2017, the Fire Component actuarially determined contribution is $5,132,890.

Of this amount the members of the Plan contribute 10 percent of basic salary and the employer remitted the remainder. Effective January 1, 2018, the actuarially determined contribution is $4,981,787.

Final Average Salary

Final Average Salary is the average of monthly basic salary compensation awarded to the member during the 18 months immediately preceding termination or retirement.

Normal Retirement Date

A member's Normal Retirement Date shall be the date on which the member has completed at least 25 years of credited service and has attained age 55.

Normal Retirement Benefit

Any member who elects to retire on or after his Normal Retirement Date shall be eligible for a monthly pension equal to 2 percent of Final Average Salary for each year of service for the first 10 years, plus 2.85 percent of Final Average Salary for each year of service in excess of 10 years. The maximum monthly pension is 77 percent of Final Average Salary. The maximum pension is earned upon completing 30 years of service.

Early Retirement Benefit

A member shall be eligible for an Early Retirement Benefit payable on or after the attainment of age 50 and completion of 20 years of service. The Early Retirement Benefit is 2 percent of Final Average Salary for each year of service for the first 10 years, plus 2.85 percent of Final Average Salary for each year of service in excess of 10 years. The maximum monthly pension is 77 percent of Final Average Salary. The Early Retirement Benefit shall be reduced 4.615 percent for each year that the benefit commences before age 55.

Deferred Retirement Benefit

Any member retiring and eligible for a Normal Retirement Benefit may elect to defer receipt of such pension until attaining the age of 65 years. In the case of such an election, the annual deferred retirement pension shall be actuarially equivalent to the normal retirement pension.

Terminated Vested Benefit

A member who terminates with at least 10 years of active service may leave the contributions in the Plan and when the member attains age 55 be eligible to receive a monthly vested benefit equal to 2 percent of Final Average Salary for each year of credited service for the first 10 years, plus 2.85 percent of Final Average Salary for each year of credited service in excess of 10 years. The maximum benefit is 77 percent of Final Average Salary.

Severance Benefit

In lieu of a future pension, a member may upon termination elect to have the accumulated member contributions refunded in a lump sum. Interest is credited at 5 percent per annum.

Death & Disability Benefit of Active Members

Disabled members and survivors (spouse or dependent children) of active members who die prior to retirement eligibility are covered by the benefits provided by the Fire & Police Pension Association Statewide Death & Disability Plan.

Post-Retirement Death Benefit

If a retired member dies, the "qualified surviving spouse" shall receive, until death, a monthly pension equal to 70 percent of the monthly benefit the member was receiving prior to death, including cost-of-living increases. If there is no "qualified surviving spouse" or if the qualified surviving spouse dies, each qualified surviving child should receive equal shares of the qualified surviving spouses benefit, as long as the child remains a "qualified child." For purposes of this Plan, a spouse includes a partner in a civil union.

Cost-of-Living Adjustment (COLA)

Benefits are increased to reflect increases in the consumer price index but in no case may benefits be increased by more than 3 percent for any one year. Cost-of-living adjustments begin on October 1st immediately prior to the earlier of attainment of age 65 or 10 years after benefit payments commenced.

Deferred Retirement Option Plan (DROP)

A member may elect to participate in the DROP after reaching eligibility for Normal Retirement or the "Rule of 75" with a minimum age of 50 years. This means that a member must attain age 50 and the sum of his or her credited service must total 75 or greater at date of severance in order to qualify for the DROP program. A member continues to work while participating in the DROP, but must terminate employment within five years of entry into the DROP. The member's percentage of retirement benefit is frozen at the time of entry into the DROP. The monthly payments that begin at entry into the DROP are accumulated until the member terminates service, at which time the DROP accumulated benefits can be paid as a lump sum, if desired. The member continues contributing the member contribution rate which is credited to the DROP. The member shall self-direct the investments of their DROP funds.

Purchase of Service Credit

Active members of this Plan may purchase service credit for other employment completed within the United States not covered by this Plan. The cost of such service credit purchase shall be determined by the Fire & Police Pension Association Board of Directors and shall be on an actuarially equivalent basis. A member shall not be allowed to purchase service credit to the extent that the additional accrued benefits derived from the purchased service credit would result in the annual amount of the member's benefit exceeding the annual benefit limitation for defined benefit plans as determined under section 415 of the Internal Revenue Code (Ord. 04-107).

Stabilization Reserve Account (SRA)

Annually, at the discretion of the Fire & Police Pension Association Board of Directors, a contribution may be allocated to the SRA based on the actuarial study for the previous year. Amounts set aside in the SRA are allocated to individual accounts for each member. A member may receive the amounts in this individual account upon election of normal, vested, early, disability, deferred retirement, or in the event of the active member's death. If the cost of the defined benefit plan exceeds the combined member/employer contribution rate, funds from the SRA may be used to make up the shortfall. Effective January 1, 2008, the Separate Retirement Account contribution rate for members of the Fire Component was set at 0 percent. The rate will remain at 0 percent for calendar years 2017 and 2018.

There were no changes to the benefit provisions since the prior valuation.

Table 15 – Definition of Terms

1. Actuarial Cost Method

   A method for determining the actuarial present value of future benefits and allocating such value to time periods in the form of a normal cost and an actuarial accrued liability.

2. Present Value of Future Benefits

   This is computed by projecting the total future benefit cash flow from the Plan, using actuarial assumptions, and then discounting the cash flow to the valuation date.

3. Normal Cost

   Computed differently under different actuarial cost methods, the normal cost generally represents the value of the portion of the participant's anticipated retirement, termination, and/or death and disability benefits accrued during a year.

4. Actuarial Accrued Liability

   Computed differently under different actuarial cost methods. Generally actuarial accrued liability represents the value of the portion of the participant's anticipated retirement, termination, and/or death and disability benefits accrued as of the valuation date.

5. Entry Age Actuarial Cost Method

   A method under which a participant's actuarial present value of future benefits is allocated on a level basis over the earnings of the participant between his/her entry into the Plan and his/her assumed exit.

6. Unfunded Actuarial Accrued Liability

   The difference between total actuarial present value of future benefits over the sum of the tangible assets of the Plan and the actuarial present value of the members' future normal costs. The Plan is underfunded if the difference is positive and overfunded if the difference is negative.

7. Actuarial Value of Assets

   The value of cash, investments, and other property belonging to the Plan, as valued by the actuary for purposes of the actuarial valuation.

8. Actuarial Gain or Loss

From one valuation to the next, if the experience of the plan differs from that anticipated by the actuarial assumptions, an actuarial gain or loss occurs. For example, an actuarial gain would occur if the assets in the trust had a yield of 12% based on actuarial value, while the assumed yield on

Table 16 – Supplemental Studies

A. Costs associated with Closing the Plan to New Entrants

1. Amendment

The City of Colorado Springs has agreed to fund the additional funding requirements of closing the New Hire Fire Pension Plan. An actuarial valuation was performed in order to determine the difference between the New Hire Fire Pension Plan as an open and a closed plan. This difference will be funded annually by the City of Colorado Springs. All other costs of the New Hire Fire Pension Plan will continue to be equally shared by the members of the Plan and the City of Colorado Springs, capped at 10%.

The difference between the open and closed plan is the difference in payments on the Unfunded Accrued Liability for a payment assuming a growing payroll vs. a payment with non-increasing payroll.

2. Analysis

Item	Closed Plan	Open Plan	Difference
(1)	(2)	(3)	(4)
a. Unfunded Actuarial Accrued Liability	$ 29,408,065	$ 29,408,065	$ 0
b. Calculated Contribution	50.911%	27.154%	23.756%

3. Comments

The plan has an underfunded position and this creates a cost associated with closing the plan. If the plan reaches a surplus position again in the future due to better than expected experience, then at that time there would be no additional cost to the City.

For 2018, the employee contribution rate is 50% of the determined contribution rate based on an open plan but not more than 10.00%. The employer contribution rate is the remainder of the cost, or 41.232%. Therefore, the total employee/employer contribution rate will be 51.232% (10% + 41.232%).

B. 5-year Deterministic Projection

Because the Plan is closed to new members, the amortization policy was changed to be level dollar effective January 1, 2008. As the payroll for the closed group diminishes, it is expected that the normal cost for the group will decrease over time. The amortization payment decreases over the five-year projection period as the outstanding asset gains of 3.0 million are recognized.

The following exhibit provides an illustration of how the current valuation would expect the contribution amount to change over the next few valuations if all actuarial assumptions are met.

Year	Amortization Cost for UAAL	Normal Cost	Administrative Expenses	Total Contribution
2019	$ 2,744,790	$ 1,706,597	$ 67,395	$ 4,518,781
2020	2,665,015	1,624,224	64,307	4,353,546
2021	2,576,250	1,557,285	61,787	4,195,322
2022	2,479,801	1,492,937	59,337	4,032,075
2023	2,375,933	1,398,812	55,756	3,830,501