

City of Sioux Falls Firefighters' Pension Fund  
Annual Actuarial Valuation Report  
December 31, 2018



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February 26, 2019

Retirement Board  
City of Sioux Falls Firefighters' Pension Fund  
Sioux Falls, South Dakota

Ladies and Gentlemen:

The results of the December 31, 2018 actuarial valuation of the City of Sioux Falls Firefighters' Pension Fund are presented in this report. The purpose of the valuation was to measure the Fund's funding progress, and to determine the employer contribution for the 2020 fiscal year. This report should not be relied upon for any other purpose. This report may be distributed to parties other than the Retirement Board only in its entirety and only with the permission of the Board. Gabriel, Roeder, Smith & Company is not responsible for unauthorized use of this report.

The valuation was based upon the assumptions and methods adopted by the Board, information furnished by the Fund concerning Pension Fund benefits, financial transactions, individual members, terminated members, retirees and beneficiaries. Data was checked for internal and year to year consistency, but was not audited by us. As a result, we are unable to assume responsibility for the accuracy or completeness of the data provided.

Future actuarial measurements may differ significantly from those presented in this report due to such factors as experience differing from that anticipated by actuarial assumptions, changes in plan provisions, actuarial assumptions/methods or applicable law. Due to the limited scope of this assignment, we did not perform an analysis of the potential range of future measurements. This valuation was based on the assumption that the plan sponsor will continue to make the contributions necessary to fund this plan in the future. A determination regarding whether or not the plan sponsor is actually able to do so is outside our scope of expertise and was not performed.

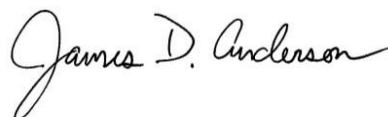
The fiscal year 2020 contributions shown in this report were determined using the actuarial assumptions and methods disclosed in Section C of this report. This report includes risk metrics on pages B-3, C-2 and D-1 but does not include a more robust assessment of the risks of future experience not meeting the actuarial assumptions. This additional assessment of risk was beyond the scope of this assignment. We encourage a review and assessment of investment and other significant risks which may have a material impact on the Fund's financial position.

To the best of our knowledge, this report is complete and accurate and was made in conformity with generally accepted actuarial principles and practices, and with the Actuarial Standards Board and in compliance with the applicable state statutes. Louise M. Gates and James D. Anderson are independent of the plan sponsor and are Members of the American Academy of Actuaries (MAAA) who meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. It is our opinion that the actuarial assumptions used for the valuation produce results which are reasonable.

Respectfully submitted,



Louise M. Gates, ASA, FCA, MAAA



James D. Anderson, FSA, EA, FCA, MAAA

LMG/JDA

**SECTION A**

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**VALUATION RESULTS**

# Financial Objective

The financial objective of the Pension Fund is to establish and receive contributions that will accumulate reserves during members' working lifetimes which will be sufficient to pay promised benefits throughout retirement.

## Contributions

The Pension Fund is supported by member contributions, City contributions, State contributions (insurance premium taxes) and investment income from Pension Fund assets.

Contributions which satisfy the financial objective are determined by an annual actuarial valuation and are sufficient to:

- (1) cover the actuarial present value of benefits assigned to the current year by the actuarial cost methods described in Section C (the normal cost); and
- (2) amortize over a period of future years the actuarial present value of benefits not covered by valuation assets and anticipated future normal costs (unfunded actuarial accrued liability).

Pension contribution requirements for the year beginning January 1, 2020 are shown on page A-2.

Given the plan's contribution allocation procedure, if all actuarial assumptions are met (including the assumption of the plan earning 7.30% on the actuarial value of assets), then the following outcomes are expected:

1. The employer normal cost is expected to decrease over time due to the closure of the plan to new hires.
2. The unfunded liability is expected to be paid off by the year 2039.

The funded status of the plan is expected to reach a 100% funded ratio by the year 2039.

## Contributions Computed to Meet the Financial Objective of the Pension Fund for the Fiscal Year Beginning January 1, 2020

Contributions for	Contribution Dollars
Total Normal Cost	\$3,411,943
Employee Portion	1,183,059
Plan Sponsor Portion	2,228,884
 Unfunded Actuarial Accrued Liabilities (UAAL) Contribution	 \$1,736,946
 Total Computed Contribution*	 \$3,965,830

\* *plan sponsor contribution*

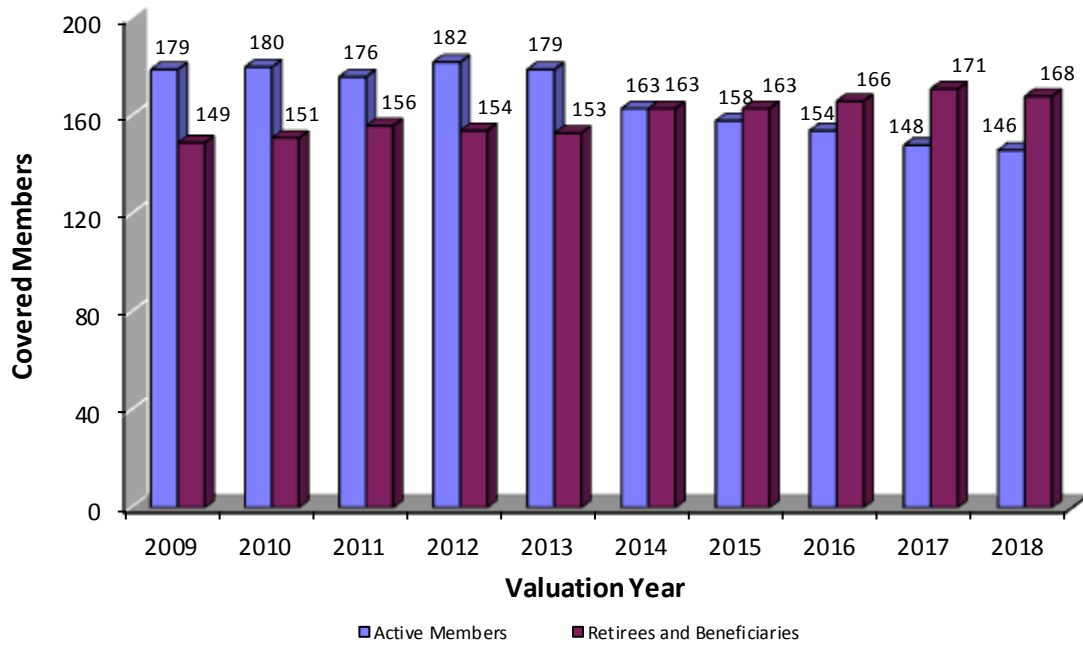
City Firefighter employees hired on or after July 1, 2013 become members of the South Dakota Retirement System (SDRS) instead of joining the Pension Fund. Contributions are expressed in terms of dollars in this report instead of as percentages of payroll. This is due to the use of the level dollar amortization method (appropriate for systems closed to new hires) to finance the Pension Fund's unfunded actuarial accrued liabilities (UAAL).

The Pension Fund's UAAL was amortized as a level dollar amount over a period of 19 years.

The employee contribution to the Pension Fund shown above was based on an employee contribution rate of 10.0% and plan member payroll projected to the year 2020.

The employer contribution shown above includes contributions for the stipend benefit which became effective on January 1, 2014.

# Active and Retired Pension Fund Members



The chart above shows current and future pension benefit recipients on each valuation date during the last 10 years.

## Computed Pension Contributions Comparative Statement

Fiscal Year	Valuation Date December 31	% of Payroll Contributions	Dollar Contributions <sup>^</sup>
2006	2004 @	16.21 %	
2007	2005	17.14	
2008	2006	15.99	
2009	2007 @	16.36	
2010	2008	19.97	
2011	2009	24.55	
2012	2010	25.21	
2013	2011 @	24.31	
2014	2012 @#		\$4,484,256
2015	2013 @		4,424,656
2016	2014 @		4,407,249
2017	2015 @		4,663,613
2018	2016		4,270,282
2019	2017 @		3,991,024
2020	2018		3,965,830

@ After changes in actuarial assumptions or methods

# After changes in benefit provisions

<sup>^</sup> Includes state paid pension contributions



# Actuarial Balance Sheet - December 31, 2018

## Present Pension Resources and Expected Future Resources

A.	Valuation assets	\$155,539,534
B.	Actuarial present value of expected future employer contributions	
	1. For normal costs	18,050,514
	2. For unfunded actuarial accrued liabilities	18,669,701
	3. Total	<u>36,720,215</u>
C.	Actuarial present value of expected future member contributions	<u>9,700,336</u>
D.	Total actuarial present value of present and expected future resources	<u><u>\$201,960,085</u></u>

## Actuarial Present Value of Expected Future Pension Benefit Payments and Reserves

A.	To retirees and beneficiaries	\$ 107,121,666
B.	To vested terminated members	885,341
C.	To present active members	
	1. Allocated to service rendered prior to valuation date	66,202,228
	2. Allocated to service likely to be rendered after valuation date	27,750,850
	3. Total	<u>93,953,078</u>
D.	Total actuarial present value of expected future benefit payments	<u><u>\$201,960,085</u></u>

## Derivation of Actuarial Gain (Loss) Year Ended December 31, 2018

The actuarial gains or losses realized in the operation of the Pension Fund provide an experience test. Gains and losses are expected to cancel each other over a period of years but sizable year to year fluctuations are common. Detail on the derivation of the actuarial gain (loss) is shown below, along with a year by year comparative schedule.

(1) UAAL at the start of the year	\$19,862,056
(2) Normal cost	3,374,857
(3) Contributions	8,625,132
(4) Interest accrual	1,258,295
(5) Expected UAAL before changes	15,870,076
(6) Change from benefit changes	0
(7) Change from revised actuarial methods/assumptions	0
(8) Expected UAAL after changes	15,870,076
(9) Actual UAAL at end of year	18,669,701
(10) Gain (loss) (8) - (9)	(2,799,625)
(11) Gain (loss) as percent of actuarial accrued liabilities at start of year	(1.7)%

Valuation Date December 31	Actuarial Gain (Loss) as % of Beginning Accrued Liabilities
2009	(5.7) %
2010	0.7
2011	(3.9)
2012	(0.4)
2013	3.2
2014	1.8
2015	0.9
2016	2.6
2017	1.9
2018	(1.7)

# Comments

**Comment A:** There were no benefit changes reported to the actuary in connection with this valuation of the Pension Fund. In addition, there were no assumption changes since the last valuation of the Fund.

**Comment B:** Pension Fund experience was unfavorable during the 2018 plan year. During calendar year 2018, the investment return on plan assets was lower than long term expectations. The market value smoothing techniques used in this valuation of the Pension Fund recognize both past and present investment experience. As a result, the recognized rate of return for the year was 3.84%. This experience was offset in part by post retirement cost of living adjustments which were lower than anticipated by actuarial assumptions. Details of this asset smoothing method are shown on page B-3.

**Comment C:** As of the valuation date, the Pension Fund's funding percent based on the total value of assets held in trust is 98.5%. As of December 31, 2017 the funding percent was 99.5%. If the market value of assets were used to determine the funding percent, the result would be 89.5% as of the valuation date.

Unless otherwise indicated, the funding status measurement presented in this report is based upon the actuarial accrued liability and the actuarial value of assets (including assets held in the unallocated income reserve). With regard to the funding status measurement presented in this report, it is important to note the following:

- The measurement is inappropriate for assessing the sufficiency of pension plan assets to cover the estimated cost of settling the plan's benefit obligations.
- The measurement is inappropriate for assessing the need for or the amount of future employer contributions.
- The measurement will produce a different result if the market value of assets is used instead of the actuarial value of assets, unless the actuarial value of assets equals the market value of assets.

**Comment D:** As directed by the Pension Fund, \$3.0 million was transferred from the UI reserve to the pension reserve. This transfer was made to stabilize employer contributions to the Pension Fund in accordance with Pension Fund policy.

**Comment E:** The last study of Pension Fund experience was prepared in 2013. Given the elapsed time since the last actuarial study of Pension Fund experience and the availability of new mortality tables, we recommend an experience study. Ideally, this would be prepared within the next year or two.

## **SECTION B**

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### **SUMMARY OF BENEFIT PROVISIONS AND VALUATION DATA**

# Benefit Provisions Evaluated and/or Considered (December 31, 2018)

## **Pension Fund Eligibility:**

New City Firefighter employees hired on or before June 30, 2013 will become members of the Firefighters Pension Fund. Individuals hired after June 30, 2013 will become members of the South Dakota Retirement System.

## **Regular Retirement:**

Eligibility - Age 55 with 20 or more years of service; or the sum of a member's age and years of service equals eighty (80) with a minimum retirement age of 50.

Annual Amount - Final average compensation times the sum of a) 2.5% times the first 25 years of service, plus b) 1.5% times service in excess of 25 years.

Type of Final Average Compensation - Average of last 3 years before retirement. Some lump sums are included.

## **Early Reduced Retirement:**

Eligibility - 20 or more years of service.

Annual Amount - Same as regular retirement except that the benefit is actuarially reduced.

## **Deferred Retirement (vested benefit):**

Eligibility - 15 years of service; benefit payable at deferred retirement age.

Annual Amount - Computed as a regular retirement benefit but based on service and final average compensation at termination.

## **Duty Disability Retirement:**

Eligibility - No age or service requirements. Must be in receipt of Workers' Compensation.

Annual Amount - Computed as a regular retirement benefit, based on a minimum of 10 years of service. Minimum benefit is 50% of a first-class firefighter's salary. Workers' compensation payments are offset.

## **Non-Duty Disability Retirement:**

Eligibility - 10 years of service.

Annual Amount - Computed as a regular retirement benefit. Minimum benefit is 20% of a first-class firefighter's salary.

# Benefit Provisions Evaluated and/or Considered (December 31, 2018)

## **Duty Death Before Retirement:**

Eligibility - No age or service requirement. Also payable in case of death of duty-disability retiree within 5 years of retirement. Workers' Compensation must be payable.

Annual Amount - Refund of accumulated contributions. Spouse receives a pension of 1/3 of first-class firefighter's salary until death. Unmarried children under age 18 or an eligible handicapped child will receive equal share of 1/4 of a first-class firefighter's salary (if no spouse, each child receives 1/4 to a maximum of 1/2). The minimum monthly benefit for each eligible child is \$200. If there are no spouse or eligible children, dependent parents each receive 1/6 of a first-class firefighter's salary. Workers' Compensation payments are offset.

## **Non-Duty Death Before Retirement:**

Eligibility - 10 years of service.

Annual Amount - Surviving spouse receives a monthly benefit for life computed as a regular retirement benefit but actuarially reduced in accordance with a 100% joint and survivor election. In addition each eligible or handicapped child is paid a minimum monthly benefit of \$200.

## **Post-Retirement Cost-of-Living Adjustments:**

An annual increase equal to 100% of the June CPI change each year (with a cap of 3%) applied to the member's current benefit. The first increase is granted after 36 months of retirement.

## **Member Contributions:**

8% of compensation until January 1, 2014.  
9% of compensation effective January 6, 2014.  
10% of compensation on and after January 5, 2015.

## **Stipend Benefit:**

Eligibility - Members who retire from City employment (regular, early reduced or disability retirement) after December 31, 2013 are eligible to receive a monthly stipend benefit payable from the Pension Fund until age 65 (or Medicare eligibility) in lieu of retiree health plan benefits.

Annual Amount - \$40 per month times years of service at retirement. Benefit is payable to the member only until he/she becomes eligible for Medicare or dies (if earlier). No benefit is payable to a surviving spouse or child of a deceased Pension Fund Member. This benefit increases by 3% each year beginning in January 2015.

## Derivation of Valuation Assets

	Pension	Unallocated Income Reserve	Total
A. Funding Value, 12/31/17	\$148,872,090		
B. Market Value, Beginning of Year	145,823,577	\$19,051,694	\$164,875,271
C1. Non-Investment Net Cash Flow	(2,070,062)		
C2. Transfer from UI Reserve	3,000,000	-3,000,000	
D. Total Investment Income	(6,860,376)		
E. Market Value, End of Year	139,893,139	16,051,694	155,944,833
F. Phase-in Factor	20%		
G. Expected Income	10,901,605		
H. Market Value Gain (Loss): [(D1) – (G)]	(17,761,981)		
I. Method Change			
J. Recognition of Gain (Loss)			
J1. Year One	(3,552,396)		
J2. Year Two	7,867		
J3. Year Three	194,561		
J4. Year Four	(1,849,535)		
J5. Year Five	35,404		
J6. Total (J1...J5)	(5,164,099)		
K. Funding Value, 12/31/18 (A) +(C1)+(C2)+(G)+(J6)	155,539,534	16,051,694	171,591,228
L. Funding Value Rate of Return	3.84%		

The net market value rate of return on total assets held in trust was -4.2%

## Asset Information Reported for Valuation Comparative Statement - Market Value

Year Ended Dec. 31	Assets Beginning of Year	Revenues			Expenses			Assets Year-End
		Member Contrib.	Employer Contrib.	Net Investment Income	Retirement Benefits	Contrib. Refunds	Other Net Expenses*	
2004	\$ 68,201,048	\$729,784	\$1,269,502	\$ 9,856,321	\$3,130,455	\$27,170	\$366,281	\$ 76,532,749
2005	76,532,749	733,442	1,448,282	6,666,149	3,460,068	1,038	467,077	81,452,439
2006	81,452,439	804,140	2,096,083	12,813,932	3,755,563	133,085	539,948	92,737,998
2007	92,737,998	832,892	2,716,461	7,602,334	4,173,282	42,932	611,256	99,062,215
2008	99,062,215	856,843	2,685,905	(26,092,662)	4,440,801	22,529	633,148	71,415,823
2009	71,415,823	926,257	2,852,790	16,900,840	4,930,354	43,069	583,877	86,538,410
2010	86,538,410	887,101	3,171,070	12,255,865	5,211,418	34,640	464,318	97,142,070
2011	97,142,070	916,965	3,718,003	1,987,241	5,558,803	3,589	541,016	97,660,871
2012	97,660,871	911,291	3,970,160	13,981,467	5,848,569	0	478,398	110,196,822
2013	110,196,822	926,949	4,016,011 **	21,915,937	5,937,848	16,103	461,128	130,640,640
2014	130,640,640	1,056,622	4,089,313 ***	8,885,483	6,470,814	70,653	412,698	137,717,893
2015	137,717,893	1,150,548	4,424,656	(250,585)	6,881,461	32,636	401,620	135,726,795
2016	135,726,795	1,169,466	4,407,249	11,314,306	7,092,026	31,061	435,230	145,059,499
2017	145,059,499	1,188,155	4,663,612	23,857,466	7,460,482	0	2,432,979	164,875,271
2018	164,875,271	1,181,980	4,443,152 ***	(6,743,039)	7,695,194	0	117,337	155,944,833

\* Up to and including the year 2017, this item reflects retiree health benefits including any transfers out of the fund

\*\* Employer contributions in 2013 include contributions to the unallocated income reserve

\*\*\* Before reserve transfer



## Additions to and Removals from Retired/Survivor Membership Comparative Statement

Year Ended Dec. 31	Additions		Removals		End of Year Totals		Average Annual Benefits	Present Value of Benefits	Expected Removals
	No.	Annual Benefits*	No.	Annual Benefits	No.	Annual Benefits			
2004	13	\$ 538,951	3	\$ 39,371	122	\$ 3,256,535	\$26,693	\$42,695,611	3.1
2005	8	339,439	2	35,965	128	3,560,009	27,813	46,338,790	3.3
2006	9	484,345	4	76,783	133	3,967,571	29,831	52,332,720	3.6
2007	7	371,127	3	31,735	137	4,306,963	31,438	57,295,812	3.7
2008	9	527,492	5	160,035	141	4,674,420	33,152	64,060,877	3.8
2009	14	567,145	6	83,800	149	5,157,765	34,616	70,864,899	3.9
2010	7	299,458	5	108,324	151	5,348,899	35,423	73,447,548	3.9
2011	11	567,883	6	159,270	156	5,757,512	36,907	79,914,932	4.0
2012	2	190,469	4	124,027	154	5,823,954	37,818	82,278,462	4.2
2013	3	219,347	4	125,800	153	5,917,501	38,676	84,573,093	3.7
2014	16	871,488	6	176,262	163	6,612,727	40,569	97,235,026	3.7
2015	6	430,488	6	209,943	163	6,833,272	41,922	102,197,293	3.4
2016	5	212,268	2	67,529	166	6,978,011	42,036	103,629,811	3.4
2017	8	505,288	3	115,406	171	7,367,893	43,087	107,941,613	3.6
2018	2	190,946	5	177,670	168	7,381,169	43,936	107,121,666	3.9

\* Includes post-retirement cost-of-living adjustments.

## Retirees and Beneficiaries December 31, 2018 Tabulated by Type of Benefits Being Paid

<u>Type of Benefits Being Paid</u>	<u>No.</u>	<u>Annual Pension Benefit</u>	<u>No.</u>	<u>Annual Stipend</u>
Age and Service Benefits	127	\$ 6,172,814	24	\$341,935
Disability Retirement Benefits*	9	227,235	3	24,761
Survivor Benefits	32	981,120	0	0
<b>Total</b>	<b>168</b>	<b>\$7,381,169</b>	<b>27</b>	<b>\$366,696</b>

\* Includes survivors of disabled retirees.

## Retirees and Beneficiaries by Age as of December 31, 2018

Age	No.	Annual Pensions
40 - 44	1	\$ 30,806
45 - 49	2	63,455
50 - 54	2	111,859
55 - 59	23	1,237,707
60 - 64	44	2,148,752
65 - 69	39	1,763,371
70 - 74	20	790,623
75 - 79	13	623,022
80 - 84	9	267,553
85 +	15	344,021
<b>Total</b>	<b>168</b>	<b>\$ 7,381,169</b>

## Vested Deferred Retirements as of December 31, 2018

There were 4 inactive members reported as of December 31, 2018 with estimated deferred annual retirement allowances totaling \$153,661. An inactive member is a person who has left City employment with entitlement to retirement benefits upon meeting eligibility conditions for benefit commencement. The table below shows the inactive members and their estimated pension benefits.

<b>Age</b>	<b>No.</b>	<b>Estimated Pensions</b>
40-44	1	\$ 29,209
45-49	2	73,425
50-54	1	51,027
<b>Totals</b>	<b>4</b>	<b>\$153,661</b>

## Active Members Included in Valuation

Valn. Date Dec. 31	Active Members			Vested Term.	Valuation	Age	Average		% Incr.
	Chiefs	Other	Total	Members	Payroll		Service	Pay	
2004	12	151	163	4	\$8,624,759	41	12.5	\$52,913	3.9%
2005	12	154	166	4	8,917,110	41	12.3	53,718	1.5
2006	12	166	178	5	9,493,382	40	10.7	53,334	(0.7)
2007	11	166	177	4	9,991,111	40	10.9	56,447	5.8
2008	12	170	182	4	10,461,858	40	10.5	57,483	1.8
2009	13	166	179	3	11,189,155	40	10.4	62,509	8.7
2010	12	168	180	3	10,913,504	40	10.6	60,631	(3.0)
2011	11	165	176	4	10,827,592	40	10.5	61,520	1.5
2012	13	169	182	5	11,525,947	41	11.2	63,329	2.9
2013	11	168	179	5	11,573,294	42	12.2	64,655	2.1
2014	8	155	163	5	10,910,044	42	12.2	66,933	3.5
2015	8	150	158	5	11,230,191	43	12.8	71,077	6.2
2016	8	146	154	4	11,479,484	44	13.6	74,542	4.9
2017	10	138	148	3	11,406,732	44	14.1	77,073	3.4
2018	11	135	146	4	11,710,123	45	15.1	80,206	4.1

## Additions to and Removals from Active Membership Actual and Expected Numbers

Year Ended Dec. 31	Number Added During Year		Retirement		Disability Retirement		Died-in- Service		Other Terminations		Members End of Year
	A	E	A	E	A	E	A	E	A	E	
	2009	8	11	8	2.0	0	0.2	1	0.2	2	
2010	8	7	5	2.4	0	0.2	0	0.2	2	3.3	180
2011	8	12	7	2.1	0	0.2	0	0.2	5	3.1	176
2012	7	1	0	1.6	0	0.2	0	0.2	1	2.9	182
2013	0	0	0	4.5	1	0.3	0	0.2	2	1.9	179
2014	0	0	11	7.4	2	0.3	0	0.2	3	1.6	163
2015	0	0	4	3.3	1	0.3	0	0.2	0	1.4	158
2016	0	0	3	2.1	0	0.3	0	0.2	1	1.3	154
2017	0	0	6	5.4	0	0.4	0	0.2	0	1.2	148
2018	0	0	1	4.5	0	0.4	0	0.2	1	1.1	146
<b>5-Year Totals</b>	<b>0</b>	<b>0</b>	<b>25</b>	<b>22.7</b>	<b>3</b>	<b>1.7</b>	<b>0</b>	<b>1.0</b>	<b>5</b>	<b>6.6</b>	

A - Represents actual number.

E - Represents the expected number based on assumptions outlined in Section C of this report.

# Active Firefighter Members December 31, 2018 by Age and Years of Service

Age	Years of Service on Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Payroll
25-29		1						1	\$ 74,998
30-34		5	2					7	498,236
35-39		13	12	2				27	2,056,464
40-44		5	21	10				36	2,778,653
45-49		2	9	8	2			21	1,658,057
50-54		2	5	8	13	1		29	2,342,109
55-59			3	4	4	1		12	991,131
62				1				1	82,220
64			1					1	74,324
<b>Totals</b>	<b>0</b>	<b>28</b>	<b>53</b>	<b>33</b>	<b>19</b>	<b>2</b>	<b>0</b>	<b>135</b>	<b>\$10,556,192</b>

While not used in the financial computations, the following group averages are computed and shown because of their general interest.

Age: 44.9 years  
Service: 14.5 years  
Annual Pay: \$78,194

# Active Member Fire Management December 31, 2018 by Age and Years of Service

Age	Years of Service on Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Payroll
40-44				4				4	\$ 397,167
45-49				1	2			3	321,702
50-54			1		1	1		3	336,627
55-59							1	1	98,434
<b>Totals</b>			<b>1</b>	<b>5</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>11</b>	<b>\$1,153,930</b>

While not used in the financial computations, the following group averages are computed and shown because of their general interest.

Age: 47.2 years  
Service: 21.0 years  
Annual Pay: \$115,393



## SECTION C

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### **ACTUARIAL METHODS AND ASSUMPTIONS AND DEFINITIONS OF TECHNICAL TERMS**

# Actuarial Methods Used for the Valuation

## Actuarial Cost Method

The normal cost and the allocation of actuarial present values between service rendered before and after the valuation date were determined using an individual entry-age actuarial cost method having the following characteristics:

- (i) the annual normal costs for each individual active member, payable from the member's actual date of employment to projected date of retirement, are sufficient to accumulate the actuarial present value of the member's benefit at the time of retirement;
- (ii) each annual normal cost is a constant percentage of the member's year-by-year projected covered pay.

## Amortization of Unfunded Actuarial Accrued Liabilities

The Pension Plan unfunded actuarial accrued liability (UAAL) was determined using the funding value of assets and actuarial accrued pension liability calculated as of the valuation date. The UAAL amortization payment (one component of the contribution requirement), was developed using a level dollar amortization method that fully amortizes the UAAL over a 19-year period. This UAAL payment reflects payments expected to be made between the valuation date and the date contributions determined by this report are scheduled to begin.

## Asset Valuation Method

The funding value of assets used in the Pension Plan valuation recognizes assumed investment income fully each year. Differences between actual and assumed investment income are phased-in over a 5-year period. During periods when investment performance exceeds the assumed rate, the funding value of assets will tend to be less than market value. During periods when investment performance is less than the assumed rate, the funding value of assets will tend to be greater than market value. This is the result of phasing-in differences between actual investment income (market value basis) and expected investment income (funding value basis).

# Actuarial Assumptions Used for the Valuation

## **Investment Return** (net of expenses)

7.30% per year, compounded annually for the pension plan. This rate consists of a net real rate of return of 3.05% per year plus a long-term rate of wage inflation of 4.25% per year.

This assumption is used to equate the value of payments due at different points in time and was first used for the December 31, 2017 valuation.

Net Market rates of investment return during the last 5 plan years are shown below:

For the Year Ending December 31					
	2018	2017	2016	2015	2014
Rate of investment Return	-4.19%	17.00%	18.32%	-0.06%	7.09%

**Pay Projections:** These assumptions are used to project current pays to those upon which benefits will be based. The base economic assumptions were first used for the December 31, 2007 valuation. The merit and longevity assumptions shown below were first used for the December 31, 2012 valuation.

Service (Years)	Annual Rate of Pay Increase for Sample Ages		
	Base (Economic)	Merit and Longevity	Total
1-4	4.25 %	4.50 %	8.75 %
5-12	4.25	2.00	6.25
13	4.25	1.00	5.25
14+	4.25	0.00	4.25

The assumed rate of price inflation used in the pension valuation is 2.75% per year.

**Mortality Table:** The RP-2000 Combined Healthy Annuitant Mortality Table projected to 2020 using Projection Scale BB, with 100% of the table rates used for both men and women. Sample values follow:

Sample Ages	Future Life Expectancy (Years)	
	Men	Women
55	28.37	30.90
60	23.94	26.34
65	19.74	21.98
70	15.83	17.93
75	12.26	14.25
80	9.13	10.95

## Actuarial Assumptions Used for the Valuation

**Rates of separation from active membership:** The rates do not apply to members eligible to retire and do not include separation on account of death or disability. This assumption measures the probabilities of members remaining in employment.

Sample Ages	Years of Service	Percent Separating within Next Year
ALL	0	6.00 %
	1	2.00
	2	1.50
	3	1.25
	4	1.25
25	5 & Over	2.50
30		2.00
35		1.50
40		1.00
45		0.50
50		0.00
55		0.00
60		0.00

The service based rates were first used in the December 31, 2012 valuation. The age based rates were first used in the December 31, 2004 valuation.

**Rates of Disability:** These assumptions represent the probabilities of active members becoming disabled.

Sample Ages	Percent Becoming Disabled within Next Year
20	0.08 %
25	0.08
30	0.08
35	0.08
40	0.20
45	0.27
50	0.49
55	0.89

# Actuarial Assumptions Used for the Valuation

**Rates of Retirement:** These rates are used to measure the probabilities of an eligible member retiring under the Regular and Early reduced retirement provisions during the next year.

Percents of Active Members Retiring within the Next Year			
Retirement Ages	Regular Retirement Rates	Service (Yrs)	Early Retirement Rates
50	50 %	20	2 %
51	50	21	2
52	50	22	2
53	50	23	2
54	60	24	2
55	60	25	2
56	60	26	2
57	70	27	2
58	70	28	2
59	70	29	2
60 & Over	100	30 & Over	2

A member was assumed to be eligible for regular retirement after attaining age 55 and completing 20 or more years of service, or if the sum of age and service equals eighty (80). A member was assumed to be eligible for early reduced retirement after completing 20 years of service.

The early retirement rates were first used for the December 31, 2004 valuation. The regular retirement rates were first used for the December 31, 2012 valuation.

## Miscellaneous and Technical Assumptions

<b>Marriage Assumption:</b>	80% of participants are assumed to be married for purposes of death-in-service benefits. In each case males were assumed to be 3 years older than females.
<b>Pay Increase Timing:</b>	Beginning of year.
<b>Decrement Timing:</b>	Decrements of all types are assumed to occur mid-year.
<b>Eligibility Testing:</b>	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.
<b>Benefit Service:</b>	Exact fractional service is used to determine the amount of benefit payable.
<b>Other:</b>	Disability and turnover decrements do not operate during retirement eligibility.
<b>Miscellaneous Loading Factors:</b>	The calculated retirement benefits were increased by 13% to account for the inclusion of unused sick leave and vacation time in the calculation of Final Average Compensation (FAC) and by 1% to account for the impact of subsidized optional forms of payment.
<b>Death/Disability Assumption:</b>	Fifty percent of disabilities and deaths were assumed to be duty related. Fifty percent were assumed to be unrelated to duty. The recovery rate from disability was assumed to be 0 (i.e., no disabled individual was assumed to recover and return to work).
<b>Forfeiture Assumption:</b>	All vested terminated members were assumed to elect a deferred retirement benefit.

# Definitions of Technical Terms

**Accrued Service** - Service credited under the system which was rendered before the date of the actuarial valuation.

**Actuarial Accrued Liability** - The difference between the actuarial present value of system benefits and the actuarial present value of future normal costs. Also referred to as “past service liability.”

**Actuarial Assumptions** - Estimates of future experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and salary increases. Decrement assumptions (rates of mortality, disability, turnover and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (salary increases and investment income) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation.

**Actuarial Cost Method** - A mathematical budgeting procedure for allocating the dollar amount of the “actuarial present value of future benefits” between future normal costs and actuarial accrued liability. Sometimes referred to as the “actuarial funding method.”

**Actuarial Equivalent** - One series of payments is said to be actuarially equivalent to another series of payments if the two series have the same actuarial present value.

**Actuarial Gain (Loss)** - The difference between actual unfunded actuarial accrued liabilities and anticipated unfunded actuarial accrued liabilities -- during the period between two valuation dates. It is a measurement of the difference between actual and expected experience.

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

**Amortization** - Paying off an interest-discounted amount with periodic payments of interest and (generally) principal -- as opposed to paying it off with a lump sum payment.

**Normal Cost** - The portion of the actuarial present value of future benefits that is assigned to the current year by the actuarial cost method. Sometimes referred to as “current service cost.”

**Unfunded Actuarial Accrued Liabilities** - The difference between actuarial accrued liabilities and valuation assets. Sometimes referred to as “unfunded past service liability” or “unfunded supplemental present value.”

Most retirement systems have unfunded actuarial accrued liabilities. They arise each time new benefits are added and each time an actuarial loss occurs. The existence of unfunded actuarial accrued liabilities is not in itself bad, any more than a mortgage on a house is bad. Unfunded actuarial accrued liabilities do not represent a debt that is payable today. What is important is the ability to amortize the unfunded actuarial accrued liabilities and the trend in their amount (after due allowance for devaluation of the dollar).

## **SECTION D**

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### **ADDITIONAL DISCLOSURES**



# Supplementary Information

## Schedule of Pension Funding Progress

Actuarial Valuation Year	Actuarial Value of Assets* (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (UAAL) (b)-(a)	Funded Ratio (a)/(b)	Covered Payroll (c)	UAAL as a % of Covered Payroll ((b-a)/c)
2009	\$ 93,760,099	\$ 108,557,299	\$ 14,797,200	86.4 %	\$ 11,189,155	132.2%
2010	96,339,891	110,709,933	14,370,042	87.0	10,913,504	131.7
2011	96,992,162	115,353,137	18,360,975	84.1	10,827,592	169.6
2012	102,540,544	130,254,837	27,714,293	78.7	11,525,947	240.5
2013	111,829,762	139,068,860	27,239,098	80.4	11,573,294	235.4
2014	121,333,559	148,032,067	26,698,508	82.0	10,910,044	244.7
2015	129,788,774	157,437,460	27,648,686	82.4	11,230,191	246.2
2016	139,937,741	163,234,586	23,296,845	85.7	11,479,484	202.9
2017	167,923,784	168,734,146	810,362	99.5	11,406,732	7.1
2018	171,591,228	174,209,235	2,618,007	98.5	11,710,123	22.4

\* Includes assets held in the Unallocated Income Reserve

## Schedule of Employer Contributions

Valuation Year Ended December 31	Fiscal Year Ended December 31	Contribution Rates as % of Valuation Payroll	Computed Dollar Contributions	Actual Contributions	% Contributed
2009	2011	24.55 %	\$2,985,389	\$2,773,506	93%
2010	2012	25.21	2,990,124	2,871,209	96
2011	2013	24.31	2,860,678	2,816,770	98
2012 ^	2014	24.31	4,484,256	4,484,256	100
2013 ^	2015		4,424,656	4,424,656	100
2014 ^	2016		4,407,249	4,407,249	100
2015 ^	2017		4,663,613	4,663,612	100
2016	2018		4,270,282	4,443,152	100
2017 ^	2019		3,991,024		
2018	2020		3,965,830		

^ New methods and/or assumptions

Computed dollar contributions before the 2012 valuation year are based on contribution rates and projected valuation payroll. Actual contributions were reported by the City. Deviations may be attributable to differences between projected and actual payroll.



February 26, 2019

Ms. Angie Uthe  
City of Sioux Falls Firefighters' Pension Fund  
City Hall - 224 West 9th Street  
Sioux Falls, South Dakota 57104-6407

Dear Angie:

Enclosed is a copy of the annual actuarial valuation report of the liabilities and contribution requirements associated with the City of Sioux Falls Firefighters' Pension Fund.

Sincerely,

A handwritten signature in blue ink that reads "Louise Gates". The signature is written in a cursive, flowing style.

Louise M. Gates, ASA, FCA, MAAA

Enclosure