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# City of Lauderhill

## Firefighters' Retirement System

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Actuarial Valuation as of October 1, 2018



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January 28, 2019

REPORT TO DETERMINE MINIMUM FUNDING REQUIREMENTS  
FOR THE PLAN AND FISCAL YEAR  
ENDING SEPTEMBER 30, 2019





January 28, 2019

Board of Trustees  
City of Lauderhill Firefighters' Retirement System  
Lauderhill, Florida

**RE: Actuarial Valuation as of October 1, 2018**

Dear Board Members:

We are pleased to present the actuarial valuation as of October 1, 2018 for the City of Lauderhill Firefighters' Retirement System (the Plan). This report provides a review of the current funded status of the Plan, establishes the minimum funding requirements for the fiscal year ending September 30, 2019 and provides an analysis of experience since the last valuation. In addition to providing the summary and derivation of actuarial findings, this report describes the data, assumptions, and methods used to create these results.

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; 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.

Statement by Enrolled Actuary:

"This actuarial valuation and/or cost determination was prepared and completed by me or under my direct supervision, and I acknowledge responsibility for the results. To the best of my knowledge, the results are complete and accurate, and in my opinion, the techniques and assumptions used are reasonable and meet the requirements and intent of Part VII, Chapter 112, Florida Statutes. There is no benefit or expense to be provided by the plan and/or paid from the plan's assets for which liabilities or current costs have not been established or otherwise taken into account in the valuation. All known events or trends which may require a material increase in plan costs or required contribution rates have been taken into account in the valuation."

We look forward to the presentation of these results to you in person and we are always available to answer any questions you may have.

Sincerely,

A handwritten signature in black ink, appearing to read "Chad Little".

Chad M. Little, ASA, EA  
Partner, Consulting Actuary  
Enrollment Number 17-6619

A handwritten signature in black ink, appearing to read "Paula C. Freiman".

Paula C. Freiman, ASA, EA  
Partner, Consulting Actuary  
Enrollment Number 17-5796



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## Section

## 1

## Board Summary

This report presents the results of the October 1, 2018 actuarial valuation of the City of Lauderhill Firefighters' Retirement System (the Plan).

## Summary of Principal Valuation Results

A summary of the key valuation findings as of October 1, 2018 are compared with the results of the prior valuation below.

## Minimum Funding Requirements

<b>Fiscal Year Ending September 30,</b>	<b>2018</b>	<b>2019</b>
<b>Minimum Required Funding as a Dollar Amount</b>		
Estimated Minimum Required City Contribution	\$3,575,356	\$3,700,819
Estimated State Contribution	<u>197,219</u>	<u>186,395</u>
Total Minimum Funding Requirement (City plus State)	\$3,772,575	\$3,887,214
<b>Minimum Required Funding as a % of Payroll</b>		
Estimated Minimum Required City Contribution	44.10%	46.91%
Estimated State Contribution	<u>2.43%</u>	<u>2.36%</u>
Total Minimum Funding Requirement (City plus State)	46.53%	49.27%

## Funded Status

<b>Valuation Date October 1,</b>	<b>2017</b>	<b>2018</b>
Accrued Liability (AL)	\$91,998,042	\$100,227,513
Actuarial Value of Assets	<u>(76,062,075)</u>	<u>(82,412,419)</u>
Unfunded Accrued Liability (UAL)	\$15,935,967	\$17,815,094
Funded Percentage	82.68%	82.23%

## Key Assumptions

<b>Valuation Date October 1,</b>	<b>2017</b>	<b>2018</b>
Assumed Net Rate of Investment Return	7.85%	7.30%
Salary Increase Assumption	7.00%	Graded
Funding Method	Entry Age	Entry Age

## Summary of Significant Events

Determinations of the funded status of the Plan and minimum funding requirements are based on participant data, asset information, Plan provisions, actuarial methods and assumptions, as well as contributions made to the Plan by the State of Florida. Any significant events associated with these items are discussed in the following.

In preparing our report we relied, without audit, on information (some oral and some written) supplied by the Plan Administrator. This information includes, but is not limited to, statutory provisions, employee census, and financial information. In our examination of these data, we have found them to be reasonably consistent and comparable with data used for other purposes. Since the valuation results are dependent on the integrity of the data supplied, the results can be expected to differ if the underlying data is incomplete or missing. It should be noted that if any data or other information is inaccurate or incomplete, our calculations may need to be revised.

### Participant Data

While the number of active Members decreased from 82 to 81, total payroll decreased 0.2%. The following provides a summary of the average actual pay increases for continuing active members, by individual, to the expected pay increases for the 12-month periods ending on the date specified.

<b>Year Ending September 30</b>	<b>Actual</b>	<b>Assumed</b>
2018	3.6 %	7.0 %
2017	7.0 %	7.0 %
2016	4.6 %	7.0 %
2015	2.4 %	7.0 %
2014	3.2 %	7.0 %
2013	4.4 %	7.0 %
2012	7.2 %	7.0 %
2011	4.0 %	7.0 %
2010	0.5 %	7.0 %
2009	11.9 %	7.0 %
2008	9.4 %	7.0 %
2007	16.1 %	7.0 %
2006	7.2 %	7.0 %
2005	6.6 %	7.0 %
2004	7.7 %	7.0 %
2003	5.4 %	7.0 %
2002	4.6 %	7.0 %
2001	11.2 %	7.0 %
2000	8.2 %	7.0 %
1999	8.3 %	7.0 %
1998	9.0 %	7.0 %
21-Yr Avg	6.7 %	7.0 %
10-Yr Avg	4.8 %	7.0 %

Note that although the average individual salary increases were 4.8% over the last ten years they were 6.7% over the last 21 years.

Overall, there was a demographic gain primarily due to pay increases less than expected.

In general, should a pattern of consistent gains or losses develop, assumptions may require revision.

## Assets

While the investment return on the Market Value of Assets, net of investment expenses, was 9.30% for the year, the investment return on the Actuarial Value of Assets, net of investment expenses, was 8.52%. These returns are in comparison to the 7.85% assumed rate of return, net of investment expenses, resulting in an actuarial investment gain. The following provides a summary of the actual to the expected return on investments for the 12-month periods ending on the date specified.

<b>Year Ending September 30</b>	<b>Market Value</b>	<b>Actuarial Value</b>	<b>Assumed Return*</b>
2018	9.30 %	8.52 %	7.85 %
2017	12.88 %	8.13 %	7.85 %
2016	9.88 %	7.66 %	8.00 %
2015	(0.80)%	9.80 %	8.00 %
2014	8.83 %	11.38 %	8.00 %
2013	15.49 %	11.55 %	8.00 %
2012	19.82 %	5.86 %	8.00 %
2011	(1.65)%	(2.38)%	8.00 %
2010	9.61 %	2.05 %	8.00 %
2009	(4.24)%	0.11 %	8.00 %
	7.65 %	6.17 %	7.97 %

\*The board of trustees made a decision to revise the assumption used for valuation purposes from 8.0%, gross of investment expenses, as used in the October 1, 2015 actuarial valuation to 7.85%, net of investment expenses, for the October 1, 2016 actuarial valuation of the Plan. The returns shown above for the market value of assets and the actuarial value of assets are net of investment expenses.

Investment returns less than the assumed rate of return result in increased annual minimum required contributions.

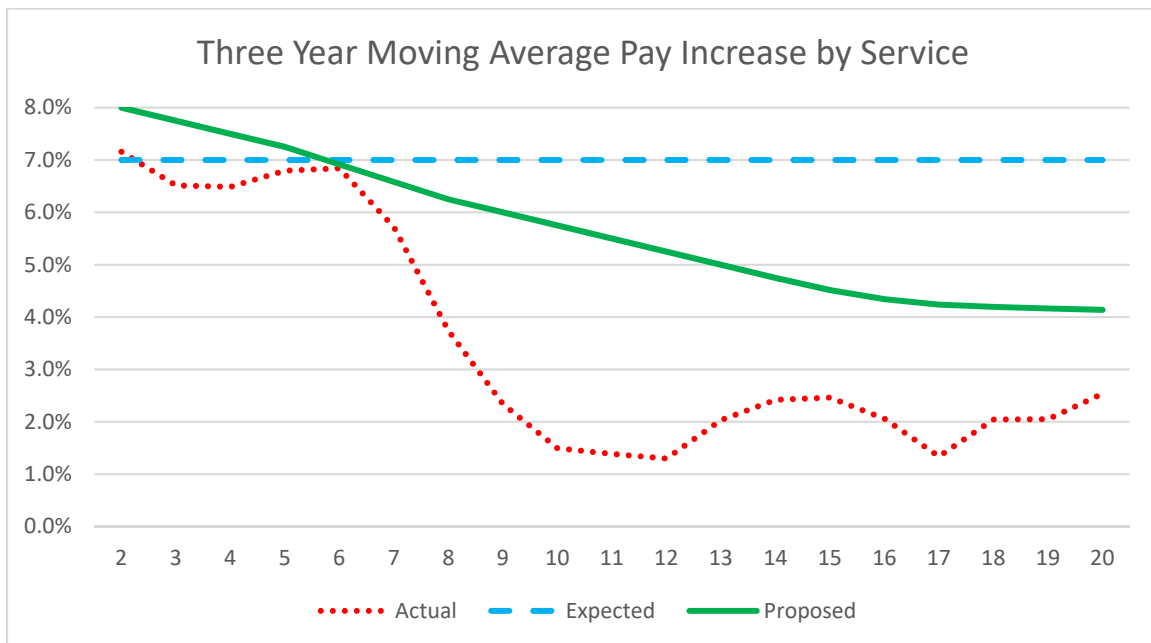
## Plan Provisions

Ordinance No. 170-10-152 effective retroactive to February 13, 2017 was adopted November 13, 2017 to revise Ordinance No. 170-01-103 that was effective upon adoption February 13, 2017. Ordinance No. 170-10-152 continues to establish mutual consent between the City and the union where 50% of the annual premium tax revenues are used to fund the Supplemental Benefit and 50% of annual premium tax revenues are used by the City to reduce its pension contributions or the unfunded liabilities of the Plan. The accumulated unused premium tax contributions as of September 30, 2016 are used to pay for the Supplemental Benefit. The change in provisions relates to whether the Supplemental Benefit is payable to beneficiaries. Ordinance No. 170-10-152 indicates the benefit will be paid to beneficiaries only if the member was retired or eligible to retire September 30, 2016 and for all other individuals who retire on or after October 1, 2016 the benefit is payable for only the life of the member. There is no change in liability shown in the October 1, 2018 valuation for this change in Plan provisions.

Because the cumulative net (gain) loss benchmark for the Supplemental Benefit is in a net (gain) position as of October 1, 2018, \$91,134 in assets are being reserved for use to pay the Supplemental Benefit as of October 1, 2018.

### Methods and Assumptions

A review of experience from 2012 to 2017 was presented to the Board of Trustees on November 13, 2018. The Board of Trustees adopted all recommended changes including implementing an assumption that 40% of actives are married and elect a 100% joint & survivor form of benefit at retirement (because the assumptions used for optional forms of benefits are different than the interest and mortality assumptions for the actuarial valuation), to revise rates of termination to assume a higher level of termination at earlier service levels with no incidence of termination beyond 10 years, to lower the net assumed rate of return to at least 7.3%, and to revise the individual salary increase assumption from a flat 7.0% to a table of rates based on service as shown in the following graph.



Mortality rates are as required by state statute and remain unchanged. In addition, there were no changes recommended or made to the assumed rates of retirement or disability.

The net assumed rate of investment return was revised from 7.85% used in the October 1, 2017 actuarial valuation to 7.3% for this October 1, 2018 actuarial valuation of the Plan as directed by the Board of Trustees. The 7.3% net assumed return is a prescribed assumption as defined by Actuarial Standard of Practice No. 27 (ASOP 27), as it is set by the Board. The prescribed assumption significantly conflicts with our judgment regarding what would constitute a reasonable assumption for the purpose of the measurement as discussed in ASOP 27. As discussed with the Board we recommend lowering the net assumed return further.

### State Contributions

The Estimated Minimum Required City Contribution shown on page 1 assumes that the premium tax money received from the State for fiscal 2019 will be in the same amount received for fiscal 2018. One-half of the fiscal 2018 premium is shown as applying toward the actuarially determined contribution. Should the amount received for fiscal 2019 be less than expected, the City will need to contribute any potential shortfall to the Plan.

## Section 2 Results Derivation

In this section, the assets and liabilities of the Plan are shown in detail. Assets and liabilities are then compared to determine the funded status and minimum funding requirements. Finally, analysis is performed to explain movement in results from the prior valuation.

While asset information is based on the fair market value of assets, along with any techniques used to smooth out market fluctuations, liabilities are determined through a combination of the benefit provisions, participant census data which contains information for the members who will receive those benefits, and the methods and assumptions used with regard to how benefits will be paid to members. A summary of participant data, an outline of the benefit provisions, and a description of the methods and assumptions used in this valuation are described in Section 4.

### Financial Information

Over the life of the Plan, the majority of assets are typically generated from investment return. In this section, we describe how the assets of the Plan are invested, show how the actuarial value of assets is derived, and review the investment results since the prior valuation.

#### Investment Allocation

Valuation Date October 1,	2017		2018	
Equities	\$49,949,771	63 %	\$56,616,952	66 %
Fixed income	13,041,267	17 %	13,013,615	15 %
Real estate	10,184,854	13 %	11,098,389	13 %
Farmland investment funds	1,956,980	2 %	2,032,174	2 %
Note receivable	1,000,000	1 %	1,000,000	1 %
Cash and equivalents	2,178,381	3 %	2,200,170	3 %
Net receivables	479,446	1 %	67,358	0 %
Fair Market Value of Assets	<u>\$78,790,699</u>	<u>100 %</u>	<u>\$86,028,658</u>	<u>100 %</u>

Note: The investment allocation as of October 1, 2017 was revised by the auditor when providing information as of October 1, 2018.

## Reconciliation of Market Value of Assets

<b>Year ending September 30,</b>	<b>2017</b>	<b>2018</b>
1. Market value at beginning of year	69,596,718	78,790,699
2. Contributions		
a. City	3,521,811	3,586,180
b. State	394,437	372,790
c. Employee contributions	<u>1,065,791</u>	<u>1,072,585</u>
d. Total contributions	4,982,039	5,031,555
3. Investment earnings		
a. Realized gains and losses	1,859,023	4,375,008
b. Unrealized gains and losses	6,615,723	1,925,808
c. Interest and dividends	868,501	1,409,738
d. Other income	1,919	5,324
e. Notes receivable income	70,000	71,750
f. Investment expense	<u>(434,554)</u>	<u>(462,181)</u>
g. Net investment income	8,980,612	7,325,447
4. Deductions		
a. Benefits paid	(3,802,111)	(4,036,124)
b. DROP payments	(442,154)	(524,228)
c. Supplemental plan payments	(268,392)	(234,249)
d. Refund of contributions	(35,787)	(107,919)
e. Administrative expenses	<u>(220,226)</u>	<u>(216,523)</u>
f. Total deductions	(4,768,670)	(5,119,043)
5. Net increase	9,193,981	7,237,959
6. Market value of assets end of year	78,790,699	86,028,658

## Development of Historical Gain or Loss on Market Value of Assets

<b>Year ending September 30,</b>	<b>2016</b>	
1. Market value of assets BOY	\$63,881,885	
2. Expected interest on beginning value	5,110,551	
3. Contributions		
a. City	\$3,822,621	
b. State	391,657	
c. Employee contributions	<u>986,417</u>	
d. Total Contributions	\$5,200,695	
4. Pension benefits	\$(5,553,031)	
5. Expenses		
a. Investment expenses	\$(423,980)	
b. Administrative expenses	<u>(219,180)</u>	
c. Total expenses	\$(643,160)	
6. Interest on items (3), (4) and (5)	(55,486)	
7. Expected assets at end of year	\$67,941,454	
8. Market value of assets EOY	\$69,596,718	
9. Gain (Loss) = (8) - (7)	\$1,655,264	
<b>Year ending September 30,</b>	<b>2017</b>	<b>2018</b>
1. Market value of assets BOY	\$69,596,718	\$78,790,699
2. Contributions		
a. City	\$3,521,811	\$3,586,180
b. State	394,437	372,790
c. Employee contributions	<u>1,065,791</u>	<u>1,072,585</u>
d. Total Contributions	\$4,982,039	\$5,031,555
3. Pension benefits + administrative expense	(4,768,670)	(5,119,043)
4. Net assumed return	5,456,235	6,167,004
5. Expected assets at end of year	\$75,266,322	\$84,870,215
6. Market value of assets EOY	\$78,790,699	\$86,028,658
7. Gain (Loss) = (6) - (5)	\$3,524,377	\$1,158,443

## Development of Actuarial Value of Assets

1.	Market Value of Assets as of 9/30/2018			\$86,028,658
2.	Phase-In Gains (Losses) Over Four Year Period			
		Original Gain (Loss)	Percent Unrecognized	Unrecognized Gain (Loss)
a.	Year Ending 9/30/2018	\$1,158,443	75 %	\$868,832
b.	Year Ending 9/30/2017	3,524,377	50 %	1,762,189
c.	Year Ending 9/30/2016	1,655,264	25 %	<u>413,816</u>
d.	Total			\$3,044,837
3.	Preliminary Actuarial Value of Assets as of 9/30/2018 = 1. - 2.d.			\$82,983,821
4.	Corridor Around Market Value			
a.	Minimum = 80% of Market Value of Assets			\$68,822,926
b.	Maximum = 120% of Market Value of Assets			\$103,234,390
c.	Corridor Adjustment to Preliminary Actuarial Value			\$0
5.	Cumulative Balance of State Monies Available for Benefit Improvement			\$480,268
6.	AVA Prior to Additional Supplement Increase = 3. + 4.c. - 5.			\$82,503,553
7.	Additional Supplemental Retirement Benefit Account Balance			\$91,134
8.	Actuarial Value of Assets as of 9/30/2018 = 6. - 7.			\$82,412,419

## Historical Asset Values

Year Ending September 30	Market Value of Assets		Actuarial Value of Assets
	Including DROP	Reported by Auditor	
2018	\$86,028,658	\$86,028,658	\$82,412,419
2017	78,790,699	78,790,699	76,062,075
2016	69,596,718	69,596,718	70,067,764
2015	63,881,885	63,881,885	65,524,026
2014	62,842,972	62,842,972	58,163,473
2013	56,334,474	55,236,797	49,705,303
2012	47,216,351	46,265,563	43,060,519
2011	39,163,277	37,433,460	39,620,622
2010	38,762,351	37,462,362	39,963,208
2009	35,818,770	33,196,711	38,262,703

Note: Beginning with the year ending 9/30/2014 DROP balances are included in the Market Value of Assets reported by the auditor. Prior to that year the Market Value of Assets excluded DROP balances. The Actuarial Value of Assets includes DROP balances in all years shown but excludes state premium taxes reserved for Supplemental Benefits.

## Historical Rates of Investment Return

Year Ending September 30	Market Value	Actuarial Value	Assumed Return*
2018	9.30 %	8.52 %	7.85 %
2017	12.88 %	8.13 %	7.85 %
2016	9.88 %	7.66 %	8.00 %
2015	(0.80)%	9.80 %	8.00 %
2014	8.83 %	11.38 %	8.00 %
2013	15.49 %	11.55 %	8.00 %
2012	19.82 %	5.86 %	8.00 %
2011	(1.65)%	(2.38)%	8.00 %
2010	9.61 %	2.05 %	8.00 %
2009	(4.24)%	0.11 %	8.00 %
	7.65 %	6.17 %	7.97 %

Note: The returns shown above for the Market Value of Assets and the Actuarial Value of Assets are net of investment expenses.

\*The board of trustees made a decision to revise the assumption used for valuation purposes from 8.0%, gross of investment expenses, as used in the October 1, 2015 actuarial valuation to 7.85%, net of investment expenses, for the October 1, 2016 actuarial valuation of the Plan.

## Derivation of State Contribution Funding Reserves

Year Ending September 30	State Contributions		
	Regular	Supplemental	Total
2018	\$372,790	\$0	\$372,790
2017	394,437	0	394,437
2016	391,657	0	391,657
2015	485,663	0	485,663
2014	492,840	0	492,840
2013	472,633	0	472,633
2012	440,960	0	440,960
2011	403,937	0	403,937
2010	407,979	0	407,979
2009	459,295	0	459,295
2008	360,239	60,369	420,608
2007	378,553	5,537	384,090
2006	250,977	0	250,977
2005	244,943	0	244,943
2004	228,714	0	228,714
2003	203,319	0	203,319
2002	134,534	0	134,534
2001	118,403	0	118,403
2000	132,060	0	132,060
1999	137,229	0	137,229
1998	137,869	0	<u>137,869</u>
			\$6,714,937

Year Ending September 30	Recognized State Funding			Cumulative Balance Available for Benefit Improvement
	Actuarially Determined Annual Funding	Supplemental Benefit	Recognized State Funding	
2018	\$186,395	\$233,830	\$420,225	\$480,268
2017	197,218	268,422	465,640	527,703
2016	167,361	338,414	505,775	598,906
2015	167,361	357,454	524,815	713,024
2014	167,361	345,399	512,760	752,176
2013	167,361	358,282	525,643	772,096
2012	167,361	314,896	482,257	825,106
2011	167,361	232,272	399,633	866,403
2010	167,361	171,041	338,402	862,099
2009	167,361	93,670	261,031	792,522
2008	167,361	63,528	230,889	594,258
2007	167,361	34,741	202,102	404,539
2006	167,361	0	167,361	222,551
2005	167,361	0	167,361	138,935
2004	167,361	0	167,361	61,353
2003	203,319	0	203,319	0
2002	134,534	0	134,534	0
2001	118,403	0	118,403	0
2000	132,060	0	132,060	0
1999	137,229	0	137,229	0
1998	<u>137,869</u>	<u>0</u>	<u>137,869</u>	0
	\$3,422,720	\$2,811,949	\$6,234,669	



## Present Value of Benefits

Valuation as of October 1,	2017	2018
1. Active Members		
a. Service Retirement	\$57,406,543	\$58,098,224
b. Deferred Benefits	1,455,929	337,844
c. Survivor Benefits	286,379	281,072
d. Disability Benefits	<u>2,011,067</u>	<u>2,080,769</u>
e. Total	\$61,159,918	\$60,797,909
2. Inactive Members		
a. Retirement (Including DROP)	\$46,725,124	\$53,723,162
b. Terminated Vested	189,926	688,687
c. Beneficiaries	4,325,362	4,569,181
d. Disability Retirement	<u>1,910,734</u>	<u>1,303,830</u>
e. Total	\$53,151,146	\$60,284,860
3. Accumulated Tier 2 Multiplier Purchase Contributions with Interest	\$50,099	\$75,280
4. All Members	\$114,361,163	\$121,158,049

## Accrued Liability

Valuation as of October 1,	2017	2018
1. Active Members		
a. Service Retirement	\$38,035,693	\$39,607,446
b. Deferred Benefits	48,982	(511,394)
c. Survivor Benefits	92,210	95,975
d. Disability Benefits	<u>619,912</u>	<u>675,346</u>
e. Total	\$38,796,797	\$39,867,373
2. Inactive Members		
a. Retirement (Including DROP)	\$46,725,124	\$53,723,162
b. Terminated Vested	189,926	688,687
c. Beneficiaries	4,325,362	4,569,181
d. Disability Retirement	<u>1,910,734</u>	<u>1,303,830</u>
e. Total	\$53,151,146	\$60,284,860
3. Accumulated Tier 2 Multiplier Purchase Contributions with Interest	\$50,099	\$75,280
4. All Members	\$91,998,042	\$100,227,513

## Normal Cost

Valuation as of October 1,	2017	2018
<b>1. Preliminary Normal Cost</b>		
a. Service Retirement	\$2,379,118	\$2,378,047
b. Deferred Benefits	175,457	110,909
c. Survivor Benefits	24,532	23,639
d. Disability Benefits	<u>177,550</u>	<u>181,717</u>
e. Total	\$2,756,657	\$2,694,312
<b>2. Total Normal Cost</b>		
a. Preliminary Normal Cost	\$2,756,657	\$2,694,312
b. Expense Load	<u>220,226</u>	<u>216,523</u>
c. Total Normal Cost	\$2,976,883	\$2,910,835
d. Total Normal Cost as a % of Pay	36.72 %	36.90 %
<b>3. Actual Employer Normal Cost</b>		
a. Preliminary Normal Cost	\$2,756,657	
b. Actual Administrative Expense	216,523	
c. Actual Employee Contributions	<u>(1,072,585)</u>	
d. Actual Employer Normal Cost	\$1,900,595	
<b>4. Payroll</b>		
a. Payroll Expected in Funding Year	\$7,884,407	\$7,601,956
b. Annualized Payroll in Funding Year	\$8,107,203	\$7,888,814

## Unfunded Accrued Liability

### Derivation of Unfunded Accrued Liability (UAL)

<b>Unfunded Accrued Liability as of October 1,</b>	<b>2018</b>
1. Actuarial Accrued Liability	\$100,227,513
2. Actuarial Value of Assets	<u>82,412,419</u>
3. Unfunded Accrued Liability	\$17,815,094
<b>Determination of Expected Unfunded Accrued Liability</b>	
1. Unfunded Accrued Liability for Prior Year	\$15,935,967
2. Employer Normal Cost (Including Administrative Expense)	1,900,595
3. Interest for a full year on (1) and (2)	1,400,170
4. Contributions for this Period	
a. State contributions toward minimum funding	\$186,395
b. State contributions used for supplemental benefits	233,830
c. City	<u>3,586,180</u>
d. Total	\$4,006,405
5. Interest on Contribution for Time on Deposit	140,758
6. Plan change - supplemental benefits paid from State contributions	233,830
7. Plan change - supplemental benefit account increase from actuarial gain	91,134
8. Other changes in plan, methods or assumptions	<u>4,732,870</u>
9. Expected Unfunded Accrued Liability	\$20,147,403
<b>Calculation of (Gain) or Loss</b>	
1. Actual Unfunded Accrued Liability	\$17,815,094
2. Expected Unfunded Accrued Liability	<u>20,147,403</u>
3. Total (Gain) or Loss	\$(2,332,309)
4. Breakdown of (Gain) or Loss	
a. Portion of (Gain) / Loss Due to Investments	\$(528,724)
b. Portion of (Gain) / Loss Due to Demographic Experience	<u>(1,803,585)</u>
c. Total (Gain) or Loss	\$(2,332,309)
<b>Determination of Actuarial Asset Gain (Loss)</b>	
1. Actuarial Value of Assets - Beginning of Year	\$76,062,075
2. Contributions	
a. City	\$3,586,180
b. State	420,225
c. Employee contributions	<u>1,072,585</u>
d. Total contributions	\$5,078,990
3. Benefit Payments + Administrative Expenses	(5,119,043)
4. Expected Return on Assets	5,952,807
5. Expected Actuarial Value at End of Year	\$81,974,829
6. Actuarial Value of Assets - End of Year - Prior to Portion of Gain to Supplement	\$82,503,553
7. Gain (Loss) for Plan Year = (6) - (5)	\$528,724
8. Actual Investment Income	\$6,481,531
9. Actual % Return	8.52 %

## Amortization of Unfunded Liability

The Unfunded Accrued Liability is being amortized in a level dollar amount based on the net assumed investment return assumption. Changes in the Unfunded Accrued Liability due to Plan changes, assumption changes, method changes, or gains and losses are all amortized over a 25-year period effective October 1, 2016. Prior to this change there was a 30-year amortization period.

## Amortization Bases

	<b>10/1</b>	<b>Source</b>	<b>Original Balance</b>	<b>Remaining Balance</b>	<b>Adjusted Remaining Balance</b>	<b>Years Remain</b>	<b>Amort Payment</b>
1.	1997	Funding Method	\$1,388,294	\$441,613	\$440,336	4	\$121,977
2.	1998	Plan Amendment	2,280,896	1,390,471	1,386,445	10	186,528
3.	2001	(Gain)/Loss	693,992	498,084	496,642	13	56,326
4.	2002	(Gain)/Loss	2,590,283	1,938,767	1,933,154	14	209,730
5.	2003	(Gain)/Loss	351,479	273,106	272,315	15	28,395
6.	2003	Plan Amendment	1,954,593	1,518,771	1,514,374	15	157,907
7.	2004	(Gain)/Loss	754,262	586,581	584,883	16	58,854
8.	2005	(Gain)/Loss	(51,468)	(41,259)	(41,140)	17	(4,009)
9.	2005	Software Change	(370,516)	(297,022)	(296,162)	17	(28,861)
10.	2006	(Gain)/Loss	(866,092)	(713,564)	(711,498)	18	(67,354)
11.	2006	Plan Amendment	5,295,975	4,363,297	4,350,665	18	411,856
12.	2007	(Gain)/Loss	6,078	5,136	5,121	19	472
13.	2008	(Gain)/Loss	1,229,709	1,067,798	1,064,707	20	95,858
14.	2009	(Gain)/Loss	4,331,045	3,863,583	3,852,398	21	339,376
15.	2010	(Gain)/Loss	1,092,000	994,364	991,485	22	85,627
16.	2010	Method Change	(131,558)	(119,795)	(119,448)	22	(10,316)
17.	2011	Plan Amendment	(114,527)	(105,191)	(104,886)	23	(8,895)
18.	2011	(Gain)/Loss	4,025,679	3,697,557	3,686,852	23	312,674
19.	2012	(Gain)/Loss	1,168,892	1,091,920	1,088,759	24	90,812
20.	2012	Assumption Change	2,128,355	1,988,203	1,982,447	24	165,353
21.	2013	(Gain)/Loss	(2,265,872)	(2,149,917)	(2,143,693)	25	(176,095)
22.	2013	Assumption Change	89,691	85,101	84,855	25	6,970
23.	2014	(Gain)/Loss	(2,740,798)	(2,631,143)	(2,623,526)	26	(212,512)
24.	2014	Assumption Change	96,389	92,532	92,264	26	7,474
25.	2015	(Gain)/Loss	(3,292,562)	(3,180,151)	(3,170,944)	27	(253,566)
26.	2015	Assumption Change	101,056	97,605	97,322	27	7,782
27.	2016	(Gain)/Loss	(988,580)	(954,785)	(952,021)	23	(80,739)
28.	2016	Assumption Change	1,946,542	1,880,000	1,874,557	23	158,977
29.	2017	(Gain)/Loss	(542,975)	(535,384)	(533,834)	24	(44,526)
30.	2017	Assumption Change	224,755	221,612	220,970	24	18,431
31.	2018	(Gain)/Loss	(2,332,309)	(2,332,309)	(2,332,309)	25	(191,589)
32.	2018	Supplement	91,134	91,134	91,134	25	7,486
33.	2018	Assumption Change	4,732,870	4,732,870	4,732,870	25	388,785
				\$17,859,585	\$17,815,094		\$1,839,188

## Projected Unfunded Accrued Liability and Amortization Payments

<b>Year Beginning October 1,</b>	<b>Outstanding Bases</b>	<b>Amortization Payment</b>
2018	\$17,815,094	\$1,839,188
2019	17,142,147	1,839,188
2020	16,420,075	1,839,188
2021	15,645,292	1,839,189
2022	14,813,948	1,717,208
2023	14,052,802	1,717,214
2024	13,236,086	1,717,209
2025	12,359,755	1,717,212
2026	11,419,449	1,717,212
2027	10,410,500	1,717,214
2028	9,327,896	1,530,682
2029	8,366,410	1,530,685
2030	7,334,733	1,530,681
2031	6,227,748	1,474,356
2032	5,100,389	1,264,626
2033	4,115,774	1,078,328
2034	3,259,179	1,019,468
2035	2,403,210	1,052,339
2036	1,449,485	707,841
2037	795,784	707,365
2038	94,874	611,505
2039	(554,345)	272,132
2040	(886,810)	196,818
2041	(1,162,732)	(185,199)
2042	(1,048,893)	(415,265)
2043	(679,884)	(450,821)
2044	(245,784)	(245,784)

## Actions Taken to Reduce Unfunded Actuarial Accrued Liability

The required contributions calculated each year include a payment for the amortization of the unfunded actuarial accrued liability. This payment is designed to reduce the unfunded actuarial accrued liability in an orderly fashion over the next 27 years.

## Minimum Funding Requirements

Year Ending September 30,	2018	2019
1. Total Normal Cost	\$2,976,883	\$2,910,835
2. Amortization of UAL	1,686,649	1,839,188
3. Interest	<u>190,784</u>	<u>180,179</u>
4. Total Minimum Required Contribution	\$4,854,316	\$4,930,202
5. Expected City Minimum Required Funding	\$3,575,356	\$3,700,819
6. State Funding Expected	197,219	186,395
7. Employee Contributions Expected*	<u>1,081,741</u>	<u>1,042,988</u>
8. Total Minimum Required Contribution	\$4,854,316	\$4,930,202
9. City Funding as a % of Pay	44.10 %	46.91 %
10. State Funding Expected as a % of Pay	2.43 %	2.36 %
11. Employee Contributions as a % of Pay	<u>13.34 %</u>	<u>13.22 %</u>
12. Total Required Funding as a % of Pay	59.87 %	62.49 %
13. City Plus State Funding	\$3,772,575	\$3,887,214
14. City Plus State Funding as a % of Pay	46.53 %	49.27 %
15. Payroll		
a. Payroll Expected in Funding Year	\$7,884,407	\$7,601,956
b. Annualized Payroll in Funding Year	8,107,203	7,888,814
16. Net Assumed Return on Investments	7.85 %	7.30 %

\*Employee contributions expected are those based on payroll expected in the funding year which takes into account the expected decrement of members during the year.

## Reconciliations

### Reconciliation of Funded Status

<b>As of Prior Valuation</b>	<b>82.68 %</b>
Changes in Funded Status due to:	
Normal Operation of Plan	1.57 %
Investment Experience	0.54 %
Demographic Experience	1.61 %
Supplement Balance Increase	(0.10)%
Assumption Change	<u>(4.07)%</u>
Total Changes	(0.45)%

<b>As of Current Valuation</b>	<b>82.23 %</b>
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### Reconciliation of City Minimum Funding Requirement

<b>As of Prior Valuation</b>	<b>\$3,575,356</b>
Changes in Required Contribution due to:	
Expected Change	\$72,157
Change in Expense Load	(3,848)
Change in Expected State \$	10,399
Investment Experience	(47,117)
Demographic Experience	(296,388)
Supplement Balance Increase	8,122
Assumption Change	<u>382,138</u>
Total Changes	\$125,463

<b>As of Current Valuation</b>	<b>\$3,700,819</b>
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## Cumulative Actuarial Experience

(1)	(2)	(3)	(4) = (2) + (3)	(5)	(6)
Valuation Date 10/1	Investment (Gain) or Loss	Demographic (Gain) or Loss	Total Actuarial (Gain) or Loss	Cumulative (Gain) Loss Benchmark for Variable Benefit	Cumulative (Gain) Loss Benchmark for Supplemental Benefit
1998	*	*	(143,872)	(143,872)	
1999	*	*	890,787	803,037	
2000	*	*	179,313	982,350	
2001	*	*	693,992	1,676,342	
2002	*	*	2,590,283	4,266,625	
2003	*	*	351,479	4,618,104	351,479
2004	*	*	754,262	5,372,366	1,105,741
2005	*	*	(51,468)	5,320,898	1,054,273
2006	*	*	(866,092)	4,454,806	188,181
2007	(1,469,400)	1,475,478	6,078	4,460,884	194,259
2008	667,161	562,548	1,229,709	5,690,593	1,423,968
2009	2,818,559	1,512,486	4,331,045	10,021,638	5,755,013
2010	2,060,463	(968,463)	1,092,000	11,113,638	6,847,013
2011	3,874,093	151,586	4,025,679	15,139,317	10,872,692
2012	516,110	652,782	1,168,892	16,308,209	12,041,584
2013	(1,949,444)	(316,428)	(2,265,872)	14,042,337	9,775,712
2014	(2,188,950)	(551,848)	(2,740,798)	11,301,539	7,034,914
2015	(1,576,871)	(1,715,691)	(3,292,562)	8,008,977	3,742,352
2016	(238,680)	(749,900)	(988,580)	7,020,397	2,753,772
2017	(216,526)	(326,449)	(542,975)	6,477,422	2,210,797
2018	(528,724)	(1,803,585)	(2,332,309)	4,145,113	(121,512)

\*The portion of the total actuarial (gain) or loss attributable to investments and demographic experience is not known prior to October 1, 2007.

Note: The Variable Benefit was paid October 1, 1999 with liability totaling \$56,122. The Supplemental Retirement Benefit Account is increased \$91,134 as of October 1, 2018 since the cumulative value of (gains) and losses benchmark for the Supplemental Benefit was in a net (gain) position.

Section  
3

# Accounting Information

## Information Required by GASB 67/68

A supplemental report provides information under the Governmental Accounting Standards Board No. 67/68.

## Statement of Accumulated Plan Benefits (FASB 35)

The following table is based on prior accounting standards and is required by the State. The present value of accrued benefits is an estimate of the liability for all benefits accrued to date.

Year Beginning October 1,	2017	2018
1. Actuarial present value of accumulated plan benefits		
a. Participants currently receiving benefits	\$52,961,220	\$59,596,173
b. Other participants	<u>25,768,998</u>	<u>29,501,367</u>
c. Total vested plan benefits	\$78,730,218	\$89,097,540
d. Total non-vested plan benefits	<u>2,304,153</u>	<u>3,176,676</u>
e. Total accumulated plan benefits	\$81,034,371	\$92,274,216
2. Change in present value of accumulated plan benefits		
a. Accumulated plan benefits beginning of year		\$81,034,371
b. Increase (decrease) during year due to:		
i. Plan amendment		\$0
ii. Change in assumptions or methods		7,100,176
iii. Benefits paid		(4,902,520)
iv. Other (including increase for interest due to decrease in the discount period and benefits accumulated)		<u>9,042,189</u>
v. Net increase (decrease)		\$11,239,845
c. Accumulated plan benefits end of year		\$92,274,216

Note: The balance of the Supplemental Retirement Benefit Account is not included in the above.

## Other Disclosures Required by the State of Florida

Year Beginning October 1,	2017	2018
Present value of active member:		
Future salaries (attained age)	\$66,712,133	\$61,601,200
Future contributions (attained age)	9,152,905	8,451,685

## Required Disclosure Under F.S. 112.664(1)

As required under F.S. Section 112.664(1) we have produced the following information:

- (a) Total pension liability calculated based on mortality used in one of the last two Florida Retirement System (FRS) valuations. This actuarial valuation assumes mortality as used in the July 1, 2016, 2017 and 2018 actuarial valuation for special risk members of FRS.
- (b) Total pension liability calculated using an assumed interest rate that is 200 basis points lower than that assumed in the valuation of the Plan.
- (c) Determination of the number of months or years for which the current market value of assets is adequate to sustain the payment of expected retirement benefits.
- (d) Recommended contribution to the Plan using the most recent valuation and the contributions necessary prepared pursuant to (a) and (b) stated as a dollar amount and % of payroll.

	2% Decrease (5.30%)	Current Discount Rate (7.30%)	2% Increase (9.30%)
Total pension liability	\$130,879,061	\$100,798,915	\$80,773,823
Plan fiduciary net position	<u>(86,028,658)</u>	<u>(86,028,658)</u>	<u>(86,028,658)</u>
Net pension liability	<u>\$44,850,403</u>	<u>\$14,770,257</u>	<u>\$(5,254,835)</u>
 Plan fiduciary net position as a percentage of the total pension liability	 65.73%	 85.35%	 106.51%
 Years of benefit payments:			
Expected for current members:	100	100	100
Paid for with current assets:	15.75	19.55	30.15
 City Plus State Contribution Requirement, Plus Expected Employee Contributions			
Dollar Amount	\$8,427,442	\$4,930,202	\$2,252,686
Percent of Payroll	106.82%	62.49%	28.55%

Note: Exhibits in Section 2 of this report entitled 'Present Value of Benefits' and 'Accrued Liability' exclude the Supplemental Retirement Benefit Account balance because it is deducted from the Actuarial Value of Assets for the funding valuation. The total pension liability shown above includes the cumulative balance of State monies available for benefit improvement totaling \$480,268 plus the portion of the supplemental benefit account associated with actuarial gains totaling \$91,134.

## Required Disclosure Under F.S. 112.664(2)(b)2.

F.S. Section 112.664(2)(b)2. - For the previous five years, beginning with 2013, a side-by-side comparison of the plan's assumed rate of return compared to the actual rate of return, as well as the percentages of cash, equity, bond and alternative investments in the plan portfolio.

Year Ending September 30,	2018	2017	2016	2015	2014
Assumed rate of return					
Net of Investment Expense	7.85%	7.85%			
Gross of Investment Expense			8.00%	8.00%	8.00%
Actual rate of return					
Net of Investment Expense	9.3%	12.9%			
Gross of Investment Expense			10.6%	(0.1%)	9.6%
Percentages of assets in:					
Cash	3%	3%	4%	6%	5%
Equity	66%	63%	60%	60%	62%
Bond	15%	17%	18%	16%	16%
Alternative	16%	17%	18%	18%	17%
Total	100%	100%	100%	100%	100%

Section  
4Supplementary  
Information

## Summary of Participant Data

## Member Statistics

Year Beginning October 1,	2017	2018
<u>Active Participants</u>		
Number	82	81
Average Age	38.9	38.6
Average Credited Service	11.0	10.8
Percent Male	91.5	91.4
Average Valuation Salary	\$92,400	\$92,298
Total Valuation Salary (Prior to Impute)	\$7,576,825	\$7,476,164
Total Valuation Salary (Imputed to Next Year)	\$8,107,203	\$7,888,814
Payroll Expected in Funding Year	\$7,884,407	\$7,601,956
Accumulated Employee Contributions With Interest	\$12,558,585	\$12,689,092
Multiplier Purchase Contributions With Interest	\$50,099	\$75,280
<u>Terminated With Rights to Deferred Benefits</u>		
Number	1	2
Average Age	31.3	34.9
Percent Male	100.0	100.0
Average Monthly Benefit	\$2,258	\$3,136
<u>DROP</u>		
Number	4	4
Average Age	55.0	52.6
Percent Male	100.0	100.0
Average Monthly Benefit	\$5,953	\$6,047
DROP Balances	\$623,597	\$463,389

## Member Statistics (Continued)

<b>Year Beginning October 1,</b>	<b>2017</b>	<b>2018</b>
<u>Service Retirements</u>		
Number	60	64
Average Age	60.9	61.4
Percent Male	96.7	96.9
Average Monthly Benefit	\$4,740	\$4,928
<u>Beneficiaries</u>		
Number	6	6
Average Age	61.8	62.8
Percent Male	0.0	0.0
Average Monthly Benefit	\$4,798	\$4,870
<u>Disability Retirements</u>		
Number	5	4
Average Age	51.7	56.6
Percent Male	80.0	75.0
Average Monthly Benefit	\$2,816	\$2,436
<u>Total In Payment Status</u>		
Number	71	74
Average Age	60.3	61.2
Percent Male	87.3	87.8
Average Monthly Benefit	\$4,609	\$4,789

## Number of Active Members by Age and Service as of October 1, 2018

Age	Service						Total	
	<1	<5	<10	<15	<20	<25		<30
<25	4	1						5
<30		3	3					6
<35		2	9	5				16
<40		3	5	6	4			18
<45		1	2	8	9	1		21
<50		1		4	4			9
<55				1	2	1		4
<60				1	1			2
<65								
Total	4	11	19	25	20	2		81

## Active Valuation Pay by Age and Service as of October 1, 2018

Age	Service						Total	
	<1	<5	<10	<15	<20	<25		<30
<25	53,175	64,080						55,356
<30		73,432	80,794					77,113
<35		71,319	87,064	98,922				88,802
<40		70,533	95,780	97,767	97,128			92,534
<45		67,251	91,702	101,367	112,115	120,446		104,337
<50		73,255		97,516	101,607			96,639
<55				90,912	103,263	109,289		101,682
<60				91,778	90,939			91,359
<65								
Total	53,175	70,829	88,856	98,596	105,072	114,868		92,298

## Reconciliation of DROP Accounts

<b>Year Ending September 30,</b>	<b>2017</b>	<b>2018</b>
DROP Balances as of Beginning of Year	751,144.06	623,597.11
Additions	276,942.88	333,768.01
Investment Return	37,663.70	30,251.88
Distributions	<u>442,153.53</u>	<u>524,228.27</u>
DROP Balances as of End of Year	623,597.11	463,388.73

## Reconciliation of Plan Participants

	Active	Deferred	DROP	Retiree	Survivor	Disabled	Totals
<b>As of October 1, 2017</b>	<b>82</b>	<b>1</b>	<b>4</b>	<b>60</b>	<b>6</b>	<b>5</b>	<b>158</b>
Active							
To Retiree	(2)			2			
To DROP	(2)		2				0
To Nonvested Term	(1)						(1)
DROP							
To Retiree			(2)	2			0
Disability							
To Vested Term		1				(1)	0
New Hires	4						4
<b>As of October 1, 2018</b>	<b>81</b>	<b>2</b>	<b>4</b>	<b>64</b>	<b>6</b>	<b>4</b>	<b>161</b>

## Outline of Plan Provisions

Plan Type: Single-employer Defined Benefit Pension Plan

Legal Authority: The Plan was established and is amended by local ordinance.

Effective Date: July 1, 1977. The Plan was most recently amended November 13, 2017 retroactively effective February 13, 2017 with Ordinance No. 170-10-152.

Plan Administrator: The Board of Trustees

Board Composition: Two members are elected from among the fire employees of the City, who are members of the plan, two city residents appointed by the Commission and one person is chosen by a majority of the previous four members.

Plan Year: The 12-month period from October 1<sup>st</sup> to the following September 30<sup>th</sup>.

Funding Requirements: Employer contributions are actuarially determined and subject to State statute. Employee contributions are as described below and may be amended by ordinance.

Premium Tax Revenues: State insurance premium tax revenues remitted annually to the City which are collected on casualty insurance policies in the City in accordance with Florida Statutes (F.S.) Chapter 175. Commencing October 1, 2016, the City and union mutually consent that 50% of the Premium Tax Revenues received by the City are used to reduce its pension contributions or the UAL (whichever the City prefers), and 50% used to fund the "Supplemental Retirement Benefit Account."

Member: Firefighters become Members immediately upon hire (after medical examination and the firefighter acceptance of the terms and conditions which may include a declaration of ineligibility for disability benefits, designation of a Beneficiary and authorization for Employee Contribution deductions). Employees hired prior to October 1, 2009 are part of Tier One. Employees hired on or after October 1, 2009 are part of Tier Two.

Actuarial Equivalence: Actuarial Equivalence is determined using an interest rate of 7.0% and the 1971 Group Annuity Mortality Table for males.

Credited Service: Years and completed months of service (omitting intervening years and fractional parts of years when not employed as a full-time firefighter by the City) for which Employee Contributions are not withdrawn. Credited Service may be granted for an authorized leave of absence (not more than 6 months) and military leave (not more than 5 years assuming the member returns to service within one year).

Vesting: 100% upon earning ten years of Credited Service.

Earnings: Fixed monthly remuneration paid by the City to a firefighter, excluding overtime, bonuses and any other non-regular payment.

Employee Contributions: Effective October 1, 1997, 13.72% of Earnings.

Accumulated Contributions means a member's own contributions and contributions picked up on behalf of a Member, plus interest compounded annually. All benefits payable under this system are in lieu of a refund of Accumulated Contributions. In any event, each Member is granted the payment of benefits at least equal to Accumulated Contributions with interest.

A Member who terminates non-vested is entitled to a refund of accumulated Employee Contributions with interest.

Vested Members who terminate employment prior to being eligible to receive an annuity may leave their Accumulated Contributions in the fund, and begin commencement of the Accrued Benefit as early as age 50 as defined under the Early Retirement Benefit.

Contributions may be repaid with interest within 90 days after reemployment in order to maintain prior Credited Service.

Average Monthly Earnings: Effective October 1, 2003, for Tier One Members, 1/12 of the average of annual Earnings for the three highest consecutive years of the last ten full years immediately preceding the actual retirement or termination date. The Average Monthly Earnings for Tier Two Members who retire with 25 or more years of Credited Service is computed in the same manner. The Average Monthly Earnings for Tier Two Members who retire with less than 25 years of Credited service is 1/12 of the average annual Earnings for the four highest consecutive years of the last ten full years immediately preceding the actual retirement or termination date.

Normal Retirement Date: Effective October 1, 1998, the first day of the month coincident with or next following the earliest of (i) age 55 and completion of 10 years of Credited Service, or (ii) 20 years Credited Service, regardless of age.

Normal Retirement Benefit: The Accrued Benefit.

Accrued Benefit: Effective for Members retiring on or after October 1, 2003 who are part of Tier One:

3.0% x Average Monthly Earnings x Credited Service Prior to 10/1/2003

Plus

4.0% x Average Monthly Earnings x Credited Service on or After 10/1/2003

The Tier Two Accrued Benefit is 3.0% x Average Monthly Earnings x Credited Service, limited to not more than 75% of Average Monthly Earnings. Tier Two members may increase their pension multiplier to 3.5% provided all costs associated with such an increase (or its actuarially equivalent cost) are borne solely by the Tier Two Member as determined by the Plan actuary. Tier Two members who increase their pension multiplier to 3.5% are not subject to the 75% cap. In no circumstance should a Tier Two Member's total benefit exceed 100% of Average Monthly Earnings.

This benefit is payable as a 10-year certain and continuous annuity.

Early Retirement Date: The first day of the month coincident with or next following the attainment of age 50 and the completion of 10 years of Credited Service.

Early Retirement Benefit: The Accrued Benefit reduced by 3% per year by which the commencement of benefits precedes the Normal Retirement Date.

Delayed Retirement Date: A date following the Normal Retirement Date upon which a Member actually retires.

Delayed Retirement Benefit: On the first day of any month coincident with or next following the Delayed Retirement Date, the benefit payable is computed as described under the Normal Retirement Benefit based on Average Monthly Earnings and Credited Service as of the Delayed Retirement Date.

Cost-of-Living Adjustment (COLA): Effective October 1, 2006, for Tier One Members, a 1.5% annual COLA is payable after three years of retirement (for both then current and future retirees).

Tier Two Members' monthly retirement benefits are increased annually after three years of retirement by the net investment return of the Plan. However, the Tier Two COLA is not less than 0% and not more than 1.5% annually.

Following the death of the retiree, the COLA is paid to each beneficiary.

Variable Benefit: For all firefighters employed on or after October 1, 1997, a Variable Benefit will be paid, effective October 1, 1999. Effective each October 1, a benefit increase of no more than 3% may be granted which is funded solely based on the investment return of the system and only in such amount as exceeds both (1) the investment return assumed for purpose of the actuarial valuation and (2) the total experience gains as compared to actuarial assumptions. Members who retired during the prior fiscal year are provided a prorata increase reflecting the number of payments they received divided by 12.

Supplemental Benefit: This type of benefit and the payment of such benefit shall be determined by negotiations between the City and the union.

The Supplemental Benefit will be paid only to eligible persons who retired on or after October 1, 2000. The first Supplemental Benefit is paid effective October 1, 2003, if funding is available.

The "Supplemental Retirement Benefit Account" is annually funded with 75% of the prior year's actuarial gain remaining after the application of payment of the Variable Benefit plus

- prior to October 1, 2016, with any increase in State contributions over that received for fiscal 1997 in the amount of \$167,361 after all minimum benefits are paid; and
- effective October 1, 2016, 50% of annual Premium Tax Revenues.

In practice, the Supplemental Benefit payable in the year from October 1, 2016 to September 30, 2017 was based on the Supplemental Retirement Benefit Account balance on October 1, 2016 determined using the funding described in the first bullet, above. The Supplemental Benefit payable in the year from October 1, 2017 to September 30, 2018 was based on the Supplemental Retirement Benefit Account balance on October 1, 2017 determined using the funding described in the second bullet, above.

The Supplemental Benefit is re-determined each October 1 in an amount equal to the Supplemental Retirement Benefit Account divided by the total number of retirees and vested participants. Payments are made on a monthly basis. In no event will the Supplemental Benefits paid to a retiree exceed one year's payment of individual retiree health insurance provided by the City for the previous year ending September 30.

All funds not distributed to retirees remain in the Supplemental Retirement Benefit Account to be used for additional future benefits to eligible retirees and their eligible designated beneficiaries. The accumulated balance of Premium Tax Revenues received prior to 2016 are used to fund benefits payable from the Supplemental Retirement Benefit Account. Note that as Supplemental Benefits are paid, the accumulated balance of Premium Tax Revenues is reduced.

The Supplemental Benefit is paid to the beneficiaries of eligible retirees if the retiree was retired or eligible to retire as of September 30, 2016. For all other individuals who retired on or after October 1, 2016 and who were not eligible to retire until on or after October 1, 2016, the Supplemental Benefit terminates upon death.

Participants in the DROP do not receive the Supplemental Benefit until commencement of retirement benefits after the end of the DROP.

Disability Retirement: Members become eligible for service incurred disability benefits immediately upon Plan entry. Members become eligible for non-service incurred disability benefits upon earning 2 years of Credited Service.

The benefit payable to any Member who is wholly prevented either mentally or physically from rendering useful and efficient service as a firefighter is the greater of (i) 50% of the rate of monthly Earnings in effect on the date of disability and (ii) the Accrued Benefit. Total benefits paid (including workers compensation for example) shall not exceed 100% of the employee's salary.

The Average Final Compensation used in the calculation of the Accrued Benefit is the average taken over the period of actual employment if employed fewer than five years.

This benefit is payable as a 10-year certain and continuous annuity.

Members may be required to undergo a reexamination annually to confirm continued existence of the disability condition. In the event of recovery from disability, the period of time while disabled is included as Credited Service in future retirement benefits for (i) those who are immediately reemployed as a firefighter upon recovery, and (ii) those who are not immediately reemployed as a firefighter because they were not offered a position. Members who are offered reemployment and do not accept are treated as if they terminated employment on the date of disability.

At age fifty-five (55), the firefighter shall have the option of converting the disability to a normal retirement benefit, provided eligibility requirements are met.

**Death Benefits:** For purposes of death benefits, the date of death is treated as being the end of the calendar month in which the member dies.

In the event of service incurred death, the benefit payable is the amount greater in value between a monthly benefit equal to 20% of the rate of monthly Earnings at the time of death or a refund of contributions with interest. The monthly benefit is payable to the Spouse until the death of the Spouse. If there is no Spouse or upon the death of the Spouse, the monthly benefit is divided equally among the Member's surviving children under the age of 18 until the youngest child reaches the age of 18. If there is no Spouse and the value of a refund of contributions with interest is greater than the value of the monthly benefit, the refund of contributions with interest is divided equally amongst surviving children under the age of 18. The Member may choose one or more persons other than their spouse and children under the age of 18 to receive the refund of contributions with interest. If there is no designated beneficiary, no Spouse and no children under the age of 18, the refund of contributions with interest is payable to the Member's estate.

In the event of service incurred death of a firefighter who had earned at least 10 years of Credited Service at the time of their death, the beneficiary may instead elect to receive the Accrued Benefit payable as a 10-year certain only annuity commencing when the Member would have reached their Normal Retirement Date, or with reduction for early commencement as defined for an early retirement benefit payable at the Early Retirement Date.

In the event of non-service incurred death of an active Member who has attained their Normal Retirement Date or the Early Retirement Date, a death benefit is payable to the Member's Spouse as if the Member retired from employment on the date of death, elected to receive a benefit in the form of a 50% joint and survivor annuity, and died the next day. Upon the death of the surviving Spouse, this monthly benefit is divided equally among the Member's surviving children under the age of 18 until the youngest child reaches the age of 18. If at the time of death there is no Spouse, the monthly benefit is payable in the form of a 10-year certain and continuous annuity where the monthly benefit is divided equally among the Member's surviving children under the age of 18 until the youngest child reaches the age of 18. However, at the election of the Spouse or children (for a Member who did not designate a beneficiary other than their Spouse or children), a firefighter who has continued employment beyond his Normal Retirement Date and has made an election as to the form of benefit desired upon retirement prior to death, the monthly benefit will be paid in the form of benefit chosen by the Member as if the Member retired on the day of death. For Members who designated a beneficiary other than their Spouse or children, the designated beneficiary is entitled to receive the Accrued Benefit payable as a 10-year certain only annuity

commencing when the Member would have reached their Normal Retirement Date, or with reduction for early commencement as defined for an early retirement benefit payable at the Early Retirement Date.

In the event of non-service incurred death of an active Member who is not eligible for Normal Retirement or Early Retirement, and the Member earned less than 10 years of Credited Service at the time of death, a refund of employee contributions with interest is payable. For Members who had earned at least 10 years of Credited Service at the time of their death, the designated beneficiary is entitled to receive the Accrued Benefit payable as a 10-year certain only annuity commencing when the Member would have reached their Normal Retirement Date, or with reduction for early commencement as defined for an early retirement benefit payable at the Early Retirement Date.

Optional Forms of Benefit: The Accrued Benefit described above is payable in the form of a 10-year certain and continuous annuity (except as noted to be a 10-year certain only annuity under certain death benefits). Members may optionally choose an actuarially equivalent single life annuity, joint and survivor annuity (based on a fraction designated by the Member), a joint and last survivor annuity (with 50%, 66 2/3%, 75%, or 100% continuance), or joint and survivor annuity with an optional "pop-up" to the single life annuity form in the event the beneficiary predeceases the Member. Members may also choose benefits to be paid in any form approved by the board so long as actuarial equivalence with the benefit otherwise payable is maintained. The value of optional benefits shall be actuarially equivalent to the value of benefits otherwise payable, and the present value of payments to the retiring Member must be at least equal to 50% of the total present value of payments to the retiring Member and his beneficiary.

Deferred Retirement Option Plan (DROP): Effective October 1, 2003, Tier One Members are eligible to enter the DROP on the first day of the month following the Member's completion of 20 years of Credited Service or upon earning a pension benefit equal to 80%. The maximum participation in the DROP is 60 months. For Tier One Members who enter the DROP more than 90 days after attaining the 80% Accrued Benefit, the amount of time after the accrual of the 80% benefit until the entry into the DROP will result in a commensurate reduction in the maximum time allowed for DROP participation. Members who were in the DROP on the effective date of the adoption of this section may extend their DROP participation so that their maximum participation in the DROP is 60 months. Members with 20 years of Credited Service as of October 1, 2000 were eligible to elect within a 90 day period after the enactment of this section to enter the DROP retroactively to October 1, 2000. The maximum participation in the DROP was 36 months as of October 1, 2000.

Tier Two Members may enter the DROP on the first day of the month following completion of 25 years of Credited Service for a maximum period of 60 months. However, the DROP term for Tier Two Members is reduced one month for each month of eligibility following the completion of 25 years of Credited Service during which the Member did not participate in the DROP.

DROP participants are not eligible for death or disability benefits.

The Accrued Benefit is frozen and no further Employee Contributions are payable at DROP entry. No payment shall be made for accrued unused leave upon entering the DROP, nor shall the amount of accrued unpaid leave be used in the calculation of the amount of pension benefits.

The monthly retirement benefits, including any variable benefits that would have been payable had the Member elected to cease employment and not join the DROP, are deposited in the participant's DROP account. These payments accumulate with interest, credited quarterly, at a rate equal to the actual rate of return achieved by the trust fund net of administrative expenses. However, DROP account earnings for Tier Two Members is never less than 0% per month. At the option of the Tier One Member, the DROP account will be paid a fixed amount as determined by the board of trustees (currently 65.625% of the Plan's actuarially assumed investment return), but no higher than the actuarially assumed investment earnings. Following resignation and prior to distribution, a rate of interest, as determined by the board of trustees, shall be credited to the participant's DROP account.

Within 30 days following the end of any calendar quarter after the termination of the Member's employment as a firefighter, the balance credited to the DROP account is distributed in a single lump sum, either directly to the Member (subject to applicable tax withholding) or as a direct rollover.

Defined Contribution Plan Component: Ordinance No. 160-01-100 was adopted effective February 8, 2016 which created a defined contribution (DC) component to the Plan. This component of the Plan is not activated until a portion of Chapter 175 premium tax revenues have been assigned to fund the DC Plan.

## Description of Assumptions and Methods

Assumed Rate of Investment Return: 7.3% per year, net of investment expenses (revised from 7.85% in the prior valuation).

Salary Increase – Individual: In the prior valuation individual salary increases were assumed at 7.0% per year. For the current valuation salary increases vary based on service.

Service	Rate	Service	Rate
0	8.25%	11	5.25%
1	8.00%	12	5.00%
2	7.75%	13	4.75%
3	7.50%	14	4.50%
4	7.25%	15	4.30%
5	7.00%	16	4.22%
6	6.50%	17	4.19%
7	6.25%	18	4.16%
8	6.00%	19	4.14%
9	5.75%	>=20	4.11%
10	5.50%		

Mortality: The mortality table is that used for special risk employees in the valuation of FRS as of July 1, 2016, 2017, and 2018 as required by state statute. The mortality rates are as follows:

Healthy mortality (Pre-retirement):

Males: 10% RP-00 Combined Healthy White Collar +  
90% RP-00 Combined Healthy Blue Collar  
Females: 100% RP-00 Combined Healthy White Collar  
Both male and female rates fully generational using Scale BB

Healthy mortality (Post-retirement):

Males: 10% RP-00 Annuitant White Collar +  
90% RP-00 Annuitant Blue Collar  
Females: 100% RP-00 Annuitant White Collar  
Both male and female rates fully generational using Scale BB

Disabled mortality:

Males: 60% RP-00 Disabled Retiree Set Back 4 Years +  
40% RP-00 Annuitant White Collar  
Females: 60% RP-00 Disabled Retiree Set Forward 2 Yrs +  
40% RP-00 Annuitant White Collar

No mortality improvement is assumed for disabled lives.

Retirement: For the current valuation retirement is assumed at 50% of those eligible to retire or DROP with 20 through 24 years of service with 100% choosing to retire or DROP at 25 years of service or upon reaching age 55 with 10 years of service.

Termination: For the current valuation, unisex rates, as follows:

<u>Service</u>	<u>Rate</u>	<u>Service</u>	<u>Rate</u>
0	6.0%	6	3.5%
1	5.5%	7	3.0%
2	5.3%	8	2.8%
3	5.0%	9	2.7%
4	4.5%	10	2.6%
5	4.0%	>=11	0.0%

Rates of termination were as follows in the prior valuation.

<u>Service</u>	<u>Rate</u>	<u>Service</u>	<u>Rate</u>	<u>Service</u>	<u>Rate</u>	<u>Service</u>	<u>Rate</u>
0-1	3.8%	6	3.0%	11	2.4%	16	1.3%
2	3.7%	7	2.8%	12	2.1%	17	1.1%
3	3.5%	8	2.8%	13	1.8%	18	0.9%
4	3.3%	9	2.7%	14	1.6%	19	0.9%
5	3.2%	10	2.6%	15	1.4%	20+	0.0%

Disability: Unisex rates, as follows:

<u>Age</u>	<u>Rate</u>	<u>Age</u>	<u>Rate</u>	<u>Age</u>	<u>Rate</u>	<u>Age</u>	<u>Rate</u>
15-21	0.14%	36	0.24%	46	0.59%	56	1.68%
22-25	0.15%	37	0.25%	47	0.70%	57	1.81%
26-27	0.16%	38	0.26%	48	0.79%	58	1.95%
28-29	0.17%	39	0.28%	49	0.90%	59	2.09%
30	0.18%	40	0.30%	50	1.00%	>=60	0.00%
31	0.19%	41	0.32%	51	1.10%		
32	0.20%	42	0.35%	52	1.20%		
33	0.21%	43	0.39%	53	1.31%		
34	0.22%	44	0.44%	54	1.43%		
35	0.23%	45	0.51%	55	1.55%		

On and Off Duty Disability and Death: 75% of disabilities are assumed to be in the line of duty.

Percentage Married at Retirement: 40% of active Members are assumed to be married at retirement and elect the 100% joint & survivor form of benefit.

Spouse Ages: Where spousal information was supplied, that information was used. Otherwise, wives are assumed to be three years younger than their husbands.

Funding Method: Entry Age Normal (level percent of salary).

Administrative Expenses: Actual administrative expense for the prior year is added to the Normal Cost.

Actuarial Value of Assets: The market value of assets is adjusted to recognize gains and losses over a four-year period. The Actuarial Value of Assets shall not be more than 120% or less than 80% of the market value of assets.

## Glossary of Actuarial Terms

Present Value of Benefits (PVB): The present value, as of the valuation date, of all benefits that will become payable by the Plan for the current group of members in the census.

Normal Cost (NC): The value of the portion of the total benefit for active members which accrues in the year following the valuation date. Under the Entry Age Normal (Level Percent of Salary) funding method, the NC is a constant fraction of salary from the member's date of entry into the Plan to the member's assumed date of termination, retirement, disability or death.

Accrued Liability (AL): This is the portion of the PVB attributable to the past at the valuation date. For active members, AL is the annual NC accumulated from date of entry to the valuation date for each member. For retired and terminated members, the PVB and the AL are equal. The AL is the estimated liability owed by the pension fund at the valuation date.

Unfunded Accrued Liability (UAL): Any excess of the Accrued Liability over the fund assets. A negative UAL indicates fund assets are greater than the Accrued Liability, otherwise known as a surplus.

Actuarial Value of Assets: The value of assets used in the actuarial valuation of the Plan which is compared to the AL to determine the UAL and minimum funding requirements. A method may be used to smooth out short term volatility in the fair market value of assets.