

# City of Jacksonville Beach Firefighters' Retirement System

Sixty-Eighth Annual Actuarial Valuation  
October 1, 2018



# Outline of Contents

## Report of October 1, 2018 Actuarial Valuation

Pages	Items
--	<b><i>Cover letter</i></b>
	<b><i>Valuation Results, Comments, Conclusion, Recommendations (if any) and Statement by Enrolled Actuary</i></b>
A-1	Funding objective
A-2/3	Contribution requirement
A-4/5	Funding progress indicators
A-6/9	Comments, recommendations (if any), conclusion, other observations, and statement by enrolled actuary
A-10/11	Risk Measures
A-12	Experience gain (loss)
A-13/14	Unfunded actuarial accrued liability
A-15	Contribution history
A-16	Actuarial balance sheet
A-17	5-Year projections of future funded ratios and employer contributions
	<b><i>Summary of Benefit Provisions and Valuation Data Submitted by the Retirement System</i></b>
B-1/3	Benefit provisions
B-4	Financial data
B-5	Funding value of assets
B-6/13	Participant data
	<b><i>Actuarial Cost Method, Actuarial Assumptions and Definitions of Technical Terms</i></b>
C-1	Actuarial cost method
C-2	Amortization schedule of unfunded actuarial accrued liability
C-3/10	Actuarial assumptions used for the valuation
C-11/12	Definitions of technical terms
	<b><i>Additional Disclosure Information</i></b>
D-1	Schedule of employer contributions
D-2	Actuarial accrued liability
D-3	Schedule of funding progress
	<b><i>Summary of Valuation Results in State Format</i></b>
E-1/4	State data

March 17, 2019

Board of Trustees  
City of Jacksonville Beach  
Firefighters' Retirement System  
Jacksonville Beach, Florida

The results of the October 1, 2018 Annual Actuarial Valuation of the City of Jacksonville Beach Firefighters' Retirement System are presented in this report. The purpose of the annual valuation is to measure the System's funding progress and to determine the City's contribution rate for the fiscal year beginning October 1, 2019 in accordance with established funding policies. The results of the valuation may not be applicable for other purposes. Disclosures under the Governmental Accounting Board (GASB) Statements No. 67 and No. 68 were issued in a separate report.

This report should not be relied on for any purpose other than those described above. It was prepared at the request of the Board and is intended for use by the Retirement System and those designated or approved by the Board. This report may be provided to parties other than the System only in its entirety and only with the permission of the Board. GRS is not responsible for unauthorized use of this report. The signing actuaries are independent of the plan sponsor.

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. We did not perform an analysis of the potential range of such future measurements under the scope of this assignment.

Valuation results, comments, recommendations and our certification are contained in Section A.

The valuation was based upon information compiled during the fiscal year ending September 30, 2018, furnished by the City, concerning pension fund benefits, financial transactions, and individual members, terminated members, retired members and beneficiaries. Data was checked for reasonableness and missing information, but was not audited. GRS is not responsible for the accuracy or completeness of the data provided to us. This information is summarized in Section B.

A description of the actuarial valuation process, actuarial assumptions and definitions of technical terms are contained in Section C. Additional Disclosure information is contained in Section D and a summary of valuation results in the State format is contained in Section E.

This report has been prepared by actuaries who have substantial experience valuing public employee retirement systems. We certify that the information contained in this report is accurate and fairly presents the actuarial position of the City of Jacksonville Beach Firefighters' Retirement System as of the valuation date. All calculations have been made in conformity with generally accepted actuarial principles and practices, and with the Actuarial Standards of Practice issued by the Actuarial Standards Board. It is our opinion that the actuarial assumptions used for the valuation produce results which are reasonable.

Brad Lee Armstrong and Jeffrey T. Tebeau are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

Respectfully submitted,



Brad Lee Armstrong, ASA, EA, FCA, MAAA



Jeffrey T. Tebeau, FSA, EA, MAAA

BLA/JTT:dj



## **SECTION A**

---

**VALUATION RESULTS, COMMENTS, CONCLUSION,  
RECOMMENDATIONS (IF ANY) AND STATEMENT BY  
ENROLLED ACTUARY**

## Funding Objective

The funding objective of the Retirement System is to establish and receive contributions, expressed as percents of active member payroll, which will achieve progress towards 100% funded status and will remain approximately level from year-to-year and will not have to be increased for future generations of citizens in the absence of benefit improvements. This objective is stated in the Ordinance and meets the requirements of Part VII, Chapter 112, Florida Statutes.

## Contribution Rates

The Retirement System is supported by member contributions, property insurance premium tax monies received from the State pursuant to Chapters 175 Florida Statutes, City contributions, and investment income from Retirement System assets.

Contributions which satisfy the funding objective are determined by the actuarial valuation and are sufficient to:

- (1) cover the actuarial costs allocated to the current year (the normal cost) by the actuarial cost methods described in Section C; and
- (2) finance over a period of future years the actuarial costs not covered by present assets and anticipated future normal costs (Unfunded Actuarial Accrued Liability).

**Contribution requirements** for the Plan and fiscal year beginning October 1, 2019 are shown on page A-2.

# Contributions to Finance Benefits of the Retirement System for the Plan Year Beginning October 1, 2019 to be Contributed During the Fiscal Year Beginning October 1, 2019

Contributions for	Contributions Expressed as Percents of UnDROPed Active Member Payroll
<i>Normal Cost</i>	
Service pensions	9.45 %
Disability pensions	1.94
Survivor pensions	
Pre-retirement	0.53
Termination benefits	
Deferred service pensions	3.00
Refunds of member contributions	<u>0.95</u>
Total Normal Cost	15.87
<i>Unfunded Actuarial Accrued Liability <sup>(1)</sup></i>	
Retired members and beneficiaries	0.00
Active and vested terminated members	<u>20.48</u>
Total unfunded actuarial accrued liability	20.48
<i>Administrative Expenses</i>	3.52
<i>Total Calculated Contribution Requirement</i>	39.87
<i>Adjustments to Calculated Contribution Requirement</i>	
Temporary full funding credit	0.00
FS 112.64(5) compliance	<u>1.58</u>
Total adjustments	1.58
<i>Total Adjusted Contribution Requirement</i>	41.45 %
Member portion	7.95 %
Estimated Chapter 175 and Additional Premium	6.63 %
Tax Revenue monies	
Estimated City portion	26.87 %

<sup>(1)</sup> *Unfunded Actuarial Accrued Liability was financed as level percents of unDROPed member payroll. Please refer to page A-13 for a schedule of financing periods.*

FS 112.64 requires that City contributions be deposited not less frequently than quarterly. FS 175.131 requires that Chapter 175 monies be deposited within 5 days of receipt from the State. Member contributions, which are in addition to the City/Chapter contributions, must be deposited immediately after each pay period.

**Procedures for determining dollar contributions** are shown on page A-3.  
**Comparative contribution amounts for prior fiscal years** are shown on page A-15.

## Chapter 99-1, Laws of Florida Minimum Compliance and Extra Benefits

	Prior Year			Cumulative		
	Premium Tax Distributions	Supplemental Compensation Fund	Total	Premium Tax Distributions	Supplemental Compensation Fund	Total
A. Additional premium tax revenues as of 9/30/2017			\$ 27,608			
B. Chapter 175 receipts during fiscal year ending 9/30/2018	\$138,621	\$4,135	142,756	\$2,549,140	\$980,323	\$3,529,463
C. Chapter 175 "frozen" receipts during fiscal year ending 9/30/2018	77,527	3,082	80,609	1,550,540	58,375	1,608,915
D. Qualifying benefit improvements since Chapter 99-1 effective date	129,254	0	129,254	1,949,132	51,395	2,000,527
E. Additional premium tax revenues as of 9/30/2018 [ A + B - C - D ] not less than 0			27,608			

## Determining Dollar Contributions

For any period of time, the percent-of-payroll contribution rate needs to be converted to dollar amounts. We recommend the following procedure.

The City/Chapter contribution amount is indicated in the following schedule. Included in these amounts is the projected increase in salary level between the valuation date and the fiscal year in which the contribution is made. The projection factor of 1.037733 [(1.025)<sup>1.5</sup>] is consistent with that used to calculate the actuarial liability. The member contribution amounts should not be used to reconcile actual member contributions.

Total Contribution Requirement	\$ 926,189
Less Member Contributions	177,641
Total Employer Contribution Requirement	748,549
Less Estimated Chapter 175 and Additional Premium	
Tax Revenue Monies	142,756
<b>Estimated Base City Contribution</b>	<b>\$ 605,793 *</b>

\* *Chapter 175 Florida Statutes. The base City contribution amount may need to be increased if the amount received under the provisions of Chapter 175, Florida Statutes, is not sufficient to meet the total employer contribution requirement. CAUTION: If the amount received under the provisions of Chapter 175, Florida Statutes, exceeds \$209,863 the City may NOT use any of the excess to reduce the City contribution shown.*

The above City/Chapter contribution amounts are estimated to be contributed, on average, halfway through the fiscal year. If contributions are made on a later schedule, interest should be added at the rate of .62% (.0062) for each month of delay.

## Funding Progress Achievement Indicators

There is no single all-encompassing measure of a retirement system's funding progress and current funded status.

A traditional measure has been the relationship of valuation assets to Unfunded Actuarial Accrued Liability - a measure that is influenced by the choice of actuarial cost method. This relationship is shown on page A-14.

**We believe a better understanding** of funding progress and status can be achieved using the following indicators.

**Indicator (1) *The actuarial present value of gains or losses realized in the operation of the retirement system.*** Gains and losses are expected to cancel each other over an economic cycle but sizable year-to-year fluctuations are common. An experience gain can result from assets increasing in value by more than anticipated, or by the system's obligation increasing by less than anticipated, or by other favorable combinations or deviation from expected asset and liability changes. Further details on the derivation of the gain (loss) are shown on page A-12.

**Indicator (2) *The ratio of valuation assets to the actuarial present value of credited projected benefits*** allocated in the proportion credited service is to projected total service. The ratio is expected to increase over time, but the basic trend may be interrupted by benefit improvements. This ratio is the most appropriate of the three described here for assessing the need for future contributions above the amounts needed to fund the normal cost.

**Indicator (3) *The ratio of the unfunded actuarial present value of credited projected benefits to member payroll.*** The unfunded actuarial present value of credited projected benefits is controlled by the funding program. The ratio to payroll is a relative index of condition where inflation is present in both components. The ratio is expected to decrease over time, but the basic trend may be interrupted by benefit improvements.

## Funding Progress Indicators\* - Historical Development (\$ amounts in thousands)

Valuation Date	Indicator (1)		Indicator (2)				Indicator (3)	
	Gain/(Loss)		Funding		Funded	Unfunded	Member	Ratio to
	Amount	% of AAL	Value of Assets	APVCPB <sup>^</sup>	Ratio	APVCPB <sup>^</sup>	Payroll	Payroll
10/1/1995 (a)	\$ 1,315	4.5 %	\$ 30,791	\$ 28,889	106.6 %	\$ (1,902)	\$ 10,601	(17.90) %
10/1/2000 (aa)	321	4.4	8,055	7,792	103.4	(263)	1,408	(18.69)
10/1/2004	(705)	(8.0)	7,549	8,521	88.6	972	1,468	66.23
10/1/2005	(592)	(6.5)	7,483	8,998	83.2	1,515	1,651	91.74
10/1/2006	151	1.6	7,502	9,083	82.6	1,581	1,768	89.41
10/1/2007 (a)	289	3.0	8,044	9,356	86.0	1,312	1,726	76.00
10/1/2008	(248)	(2.5)	8,366	9,711	86.2	1,345	1,928	69.76
10/1/2009 (a)	(229)	(2.1)	8,468	10,588	80.0	2,120	1,985	106.80
10/1/2010	(457)	(4.0)	8,434	10,960	77.0	2,526	2,079	121.50
10/1/2011	(507)	(4.2)	8,363	11,421	73.2	3,058	2,120	144.26
10/1/2012	303	2.4	8,888	11,679	76.1	2,791	2,066	135.11
10/1/2013	242	1.9	9,701	12,119	80.1	2,418	1,836	131.67
10/1/2014 (a)	99	0.7	10,438	12,223	85.4	1,785	1,868	95.58
10/1/2015 (a)	35	0.3	11,135	13,520	82.4	2,386	1,848	129.07
10/1/2016 (a)	(267)	(1.8)	11,526	14,796	77.9	3,270	2,052	159.35
10/1/2017 (a)	(233)	(1.5)	12,223	15,748	77.6	3,524	2,162	163.04
<b>10/1/2018 (a)</b>	<b>(151)</b>	<b>(0.9)</b>	<b>13,028</b>	<b>16,888</b>	<b>77.1</b>	<b>3,860</b>	<b>2,153</b>	<b>179.27</b>

(a) After changes in benefit provisions and/or actuarial assumptions and actuarial cost methods.

(aa) After Minimum Benefit changes.

<sup>^</sup> AAL starting with 2014.

\* None of these funding progress indicators are appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations.

## Comments and Conclusion

**Comment A:** For the fiscal year ended September 30, 2018, the Firefighters' System had a \$151,034 experience loss. The loss was attributed to lower-than-expected recognized investment return on the funding value of assets (7.3% recognized vs. 7.9% assumed) due to unfavorable returns in two out of the last four years and more pre-retirement deaths with beneficiaries than expected. The 10-year average payroll growth rate was 1.1% and compliance under Florida Statute 112.64(5) caused an increase in the City's contribution rate by 1.58% of payroll. Additional experience information is reported on pages B-7, B-13, C-4, C-5, and C-6. Before assumption changes, the funded ratio improved from 77.6% to 78.5% (before assumption changes) from 2017 to 2018 on a Funding Value of Assets basis and increased from 78.2% to 80.5% (before assumption changes) on a market value of assets basis.

**Comment B:** The assumed rate of return was lowered from 7.90% down to 7.75%. This change increased the computed contribution rate from 25.37% to 26.87% and decreased the funded ratio from 78.5% to 77.1%. The funded ratio on a market value basis is 79.0%. The Board's plan to lower the assumed rate of return to 7.60% for the 2019 valuation and 7.50% for the 2020 valuation will temporarily slow funding progress and increase the City's contribution rate.

**Looking Forward:** Due to the Board's use of a four-year smoothed market asset valuation method, greater-than-expected market returns during 2017 and 2018 and lower-than-expected market returns during 2015 and 2016 have only been partially recognized in developing the Funding Value of Assets as of September 30, 2018. The Market Value of Assets currently exceeds the Funding Value of Assets by \$316,399. If losses from investment returns below the 7.75% assumed or losses from other sources do not emerge, this will create a downward pressure on contribution requirements and a coinciding upward pressure on the funded ratios in subsequent valuation years. An additional risk factor to the level of the contribution rate is the 10-year average payroll growth, which was 1.10% for the 10 years ending September 30, 2018. If the average payroll growth is lower in subsequent reports, this will increase the City's contribution requirement pursuant to compliance with Florida Statute 112.64(5).

## Comments and Conclusion

**Risks to Future Employer Contribution Requirements:** There are ongoing risks to future employer contribution requirements to which the Retirement System is exposed, such as:

- Actual and Assumed Investment Rate of Return
- Actual and Assumed Mortality Rates
- Amortization Policy
- F.S. 112.64(5) Compliance Regarding Payroll Growth

We are recommending the Retirement System consider performing an experience study before the September 30, 2019 valuation.

**Conclusion:** It is the actuary's opinion that the required contribution rates determined by the most recent actuarial valuation are sufficient to meet the Retirement System's funding objective, presuming continued timely receipt of required contributions.

## Other Observations

### General Implications of Contribution Allocation Procedure or Funding Policy on Future Expected Contributions and Funded Status

Given the System's contribution allocation procedure, if all actuarial assumptions are met (including the assumption of the Retirement and Benefit System earning 7.75% on the Market Value of Assets), it is expected that:

1. The employer normal cost is sufficient to cover the cost of benefits accruing each year;
2. The Unfunded Actuarial Accrued Liabilities (UAAL) will continue to be amortized according to the schedule on page A-13, but may not be paid off in the definite future completely; and
3. The funded status of the Retirement and Benefit System will continue to increase gradually towards a 100% funded ratio.

### Limitations of Funded Status Measurements

Unless otherwise indicated, a funded status measurement presented in this report is based upon the Actuarial Accrued Liability (AAL) and the Funding Value of Assets (FVA). Unless otherwise indicated, with regard to any funded status measurements presented in this report:

1. The measurement is inappropriate for assessing the sufficiency of Retirement System assets to cover the estimated cost of settling the Retirement System's benefit obligations, for example: transferring the liability to an unrelated third party in a market value type transaction.
2. The measurement is dependent upon the Actuarial Cost Method which, in combination with the Retirement System's amortization policy, affects the timing and amounts of future contributions. The amounts of future contributions will most certainly differ from those assumed in this report due to future actual experience differing from assumed experience based upon the actuarial assumptions. A funded status measurement in this report of 100% is not synonymous with no required future contributions. Even though the funded status is over 100%, the Retirement System would still require future normal cost contributions (i.e., contributions to cover the cost of active membership accruing an additional year of service credit).
3. The measurement would produce a different result if the Market Value of Assets (MVA) were used instead of the FVA, unless the MVA is used in the measurement.

### Limitations of Project Scope

Actuarial standards do not require the actuary to evaluate the ability of the plan sponsor or other contributing entities to make required contributions to the plan when due. Such an evaluation was not within the scope of this project and is not within the actuary's domain of expertise. Consequently, the actuary performed no such evaluation.

## Statement by Enrolled Actuary

**Statement by Enrolled Actuary:** "This actuarial valuation 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."

3/17/2019

Date



Brad Lee Armstrong, ASA, EA, FCA, MAAA [17-5614]

## Risk Measures - Risks Associated with Measuring the Accrued Liability and Actuarially Determined Contribution

The determination of the accrued liability and the actuarially determined contribution requires the use of assumptions regarding future economic and demographic experience. Risk measures, as illustrated in this report, are intended to aid in the understanding of the effects of future experience differing from the assumptions used in the course of the actuarial valuation. Risk measures may also help with illustrating the potential volatility in the accrued liability and the actuarially determined contribution that result from the differences between actual experience and the actuarial assumptions.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions due to changing conditions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period, or additional cost or contribution requirements based on the System's funded status); and changes in plan provisions or applicable law. The scope of an actuarial valuation does not include an analysis of the potential range of such future measurements.

Examples of risk that may reasonably be anticipated to significantly affect the plan's future financial condition include:

1. Investment risk – actual investment returns may differ from the expected returns;
2. Asset/Liability mismatch – changes in asset values may not match changes in liabilities, thereby altering the gap between the accrued liability and assets and consequently altering the funded status and contribution requirements;
3. Contribution risk – actual contributions may differ from expected future contributions. For example, actual contributions may not be made in accordance with the plan's funding policy or material changes may occur in the anticipated number of covered employees, covered payroll, or other relevant contribution base;
4. Salary and Payroll risk – actual salaries and total payroll may differ from expected, resulting in actual future accrued liability and contributions differing from expected;
5. Longevity risk – members may live longer or shorter than expected and receive pensions for a period of time other than assumed; and
6. Other demographic risks – members may terminate, retire or become disabled at times or with benefits other than assumed resulting in actual future accrued liability and contributions differing from expected.

The effects of certain trends in experience can generally be anticipated. For example, if the investment return since the most recent actuarial valuation is less (or more) than the assumed rate, the cost of the plan can be expected to increase (or decrease). Likewise, if longevity is improving (or worsening), increases (or decreases) in cost can be anticipated.

The computed contribution shown on page A-2 may be considered as a minimum contribution rate that complies with the Board's funding policy. The timely receipt of the actuarially determined contributions is critical to support the financial health of the plan. Users of this report should be aware that contributions made at the actuarially determined rate do not necessarily guarantee benefit security.

## Risk Measures

(\$ in thousands)

Actuarial Valuation Date (9/30)	(1) Actuarial Value of Assets	(2) Actuarial Accrued Liability (AAL)	(3) Unfunded AAL (UAAL) (2) - (1)	(4) Payroll	(5) Funded Ratio (1) / (2)	(6) Retiree Liabilities (RetLiab)	(7) RetLiab / AAL (6)/(2)	(8) AAL / Payroll (2) / (4)	(9) Assets / Payroll (1) / (4)	(10) UAAL / Payroll (3) / (4)	(11) Non-Invest. Cash Flow (NICF)	(12) NICF / Assets (11)/(1)	(13) Market Rate of Return	(14) 5-year Trailing Average
2014 *	\$ 10,438	\$ 12,223	\$ 1,785	\$ 1,868	85.4%	\$ 7,076	57.9%	654.3%	558.8%	95.6%	\$ (162)	(1.5)%	10.1%	N/A
2015 *	11,135	13,520	2,385	1,848	82.4%	7,160	53.0%	731.4%	602.4%	129.0%	(213)	(1.9)%	(0.3)%	N/A
2016 *	11,526	14,796	3,270	2,052	77.9%	7,293	49.3%	721.0%	561.7%	159.4%	(414)	(3.6)%	8.1%	N/A
2017 *	12,223	15,748	3,525	2,162	77.6%	7,145	45.4%	728.5%	565.4%	163.1%	(151)	(1.2)%	11.9%	N/A
2018 *	13,028	16,888	3,860	2,153	77.1%	7,630	45.2%	784.3%	605.0%	179.3%	(80)	(0.6)%	9.1%	7.7%

\* Revised actuarial assumptions.

(5). The funded ratio is the most widely known measure of a plan's financial strength, but the trend in the funded ratio is much more important than the absolute ratio. The funded ratio should trend to 100%. As it approaches 100%, it is important to re-evaluate the level of investment risk in the portfolio and potentially to re-evaluate the assumed rate of return.

(6) and (7). The ratio of retiree liabilities to total accrued liabilities gives an indication of the maturity of the system. As the ratio increases, cash flow needs increase, and the liquidity needs of the portfolio change. A ratio on the order of 50% indicates a maturing system.

(8) and (9). The ratio of liabilities and assets to payroll gives an indication of both maturity and volatility. Many systems have ratios between 500% and 700%. Ratios significantly above that range may indicate difficulty in supporting the benefit level as a level % of payroll.

(10) The ratio of unfunded liability to payroll gives an indication of the plan sponsor's ability to actually pay off the unfunded liability. A ratio above approximately 300% or 400% may indicate difficulty in discharging the unfunded liability within a reasonable time frame.

(11) and (12). The ratio of Non-Investment Cash Flow to assets is an important measure of sustainability. Negative ratios are common and expected for a maturing system. In the longer term, this ratio should be on the order of approximately (4)%. A ratio that is significantly more negative than that for an extended period could be a leading indicator of potential exhaustion of assets.

(13) and (14). Investment return is probably the largest single risk that most systems face. The year-by-year return and the five-year geometric average both give an indication of the reasonableness of the system's assumed return. Of course past performance is not a guarantee of future results. Market rate shown is based on actuarial estimation method and will differ modestly from figures reported by the investment consultant.

## Experience Gain (Loss) Year Ended October 1, 2018

### DERIVATION

(1) UAAL* at start of year	\$3,524,404
(2) Normal cost for year (ER normal cost & expenses from the prior corresponding valuation x current valuation pay)	229,103
(3) Actual City/Chapter contribution	608,384
(4) Interest accrual .079 x [(1) + 1/2 [(2)-(3)]]	263,446
(5) Expected UAAL before changes	3,408,569
(6) Effect of timing/accounting	0
(7) Effect of assumption/cost method changes	300,556
(8) Effect of benefit changes	0
(9) Expected UAAL after changes	3,709,125
(10) Actual UAAL at end of year	3,860,159
(11) Gain (loss): (9) - (10)	\$ (151,034)
(12) % of AAL at start of year	(1.0)%

\*UAAL represents Unfunded Actuarial Accrued Liability.

Valuation Date September 30	Actuarial Gain (Loss) As % of Beginning Accrued Liabilities
2009	(2.1) %
2010	(4.0)
2011	(4.2)
2012	2.4
2013	1.9
2014	0.7
2015	0.3
2016	(2.0)
2017	(1.6)
<b>2018</b>	<b>(1.0)</b>

# Sources and Financing of Unfunded Actuarial Accrued Liability

Unfunded Actuarial Accrued Liability			Remaining Financing		Contribution			FS112.64(5) Compliance
Source of Unfunded Act. Accrued Liab.	Initial Amount	Fin. Per.	Current Amount	Period 9/30/2018	Amort. Factor	Dollar	% of Payroll	
Initial unfunded actuarial accrued liability								
			\$ (47,413)	2 yrs.	1.903343	\$ (24,910)	(1.16)%	(0.01)%
Changes from experience deviations.								
9/30/2002	\$ 637,858	25	621,590	9	7.248904	85,750	3.98%	0.23%
9/30/2003	(48,620)	25	(49,583)	10	7.871141	(6,299)	(0.29)%	(0.02)%
9/30/2004	704,589	25	744,393	11	8.463060	87,958	4.08%	0.29%
9/30/2005	591,854	25	642,529	12	9.026138	71,185	3.31%	0.25%
9/30/2006	(151,158)	25	(167,486)	13	9.561780	(17,516)	(0.81)%	(0.07)%
9/30/2007	(289,183)	25	(325,066)	14	10.071324	(32,276)	(1.50)%	(0.13)%
9/30/2008	248,390	25	281,853	15	10.556040	26,701	1.24%	0.11%
9/30/2009	228,877	25	261,061	16	11.017139	23,696	1.10%	0.11%
9/30/2010	457,120	25	508,738	17	11.455771	44,409	2.06%	0.22%
9/30/2011	506,544	25	556,841	18	11.873031	46,900	2.18%	0.23%
9/30/2012	(302,804)	25	(336,666)	19	12.269961	(27,438)	(1.27)%	(0.15)%
9/30/2013	(242,486)	25	(263,468)	20	12.647550	(20,832)	(0.97)%	(0.11)%
9/30/2014	(99,268)	25	(105,531)	21	13.006742	(8,114)	(0.38)%	(0.04)%
9/30/2015	(34,586)	25	(37,009)	22	13.348432	(2,773)	(0.13)%	(0.02)%
9/30/2016	266,779	25	277,692	23	13.673473	20,309	0.94%	0.13%
9/30/2017	233,079	25	235,836	24	13.982677	16,866	0.78%	0.11%
9/30/2018	151,034	25	151,034	25	14.276816	10,579	0.49%	0.07%
Changes from actuarial assumption and actuarial cost method revisions.								
9/30/1995	251,036	25 yrs.	83,131	2 yrs.	1.903343	43,676	2.03%	0.03%
9/30/2002	(152,905)	25	(149,005)	9	7.248904	(20,556)	(0.95)%	(0.06)%
9/30/2015	744,236	25	796,399	22	13.348432	59,662	2.77%	0.36%
9/30/2016	662,915	25	690,033	23	13.673473	50,465	2.34%	0.31%
9/30/2017	57,945	25	58,630	24	13.982677	4,193	0.19%	0.03%
9/30/2018	300,556	25	300,556	25	14.276816	21,052	0.98%	0.14%
Changes from amendments to benefit provisions.								
9/30/1997	161,519	25 yrs.	94,724	4 yrs.	3.625726	26,126	1.21%	0.04%
9/30/2000	359,387	25	303,296	7	5.907185	51,344	2.38%	0.11%
9/30/2007	111,694	25	125,554	14	10.071324	12,466	0.58%	0.05%
9/30/2009	365,850	25	417,292	16	11.017139	37,877	1.76%	0.17%
9/30/2014	(1,702,388)	25	(1,809,796)	21	13.006742	(139,143)	(6.46)%	(0.80)%
<b>Totals</b>			<b><u>\$3,860,159</u></b>			<b><u>\$441,357</u></b>	<b><u>20.48%</u></b>	<b><u>1.58%</u></b>

Weighted average remaining financing period: 17.2 yrs.

## Unfunded Actuarial Accrued Liability

	<u>October 1, 2018</u>	<u>October 1, 2017</u>
A. Actuarial present value of future benefits	\$19,195,686	\$18,072,298
B. Actuarial present value of future normal costs	<u>2,307,725</u>	<u>2,324,417</u>
C. Actuarial accrued liability	16,887,961	15,747,881
D. Funding value of assets	<u>13,027,802</u>	<u>12,223,477</u>
E. Unfunded actuarial accrued liability	<u>\$ 3,860,159</u>	<u>\$ 3,524,404</u>

The Unfunded Actuarial Accrued Liability (UAAL) is not a good measure of the System's funded status because the amount is dependent upon the actuarial cost method (please refer to page C-1). The funding progress indicators (2) and (3) on pages A-4 and A-5 are less dependent of the actuarial cost method and are a better guide to funded status and funding progress. The funded status and the funding progress indicators would be different if based on the market value of assets instead of the funding value of assets.

## Recommended and Actual Contributions Comparative Statement

Fiscal Year	Valuation Date	City/Chapter Dollar Contributions#		Recommended City/Chapter % of Payroll Contributions
		Recommended	Actual	
95/96	10/1/1994	\$ 790,417	\$ 818,057	11.20 %
96/97	10/1/1995 (a)	612,267	618,521	10.01
97/98	10/1/1996	563,577	563,577	10.00
98/99	10/1/1997 (a)	161,897	170,318	13.09
99/00	10/1/1998	157,388	200,849	12.17
00/01	10/1/1999	140,765	154,219	9.93
01/02	10/1/2000 (aa)	188,644	188,644	12.45
02/03	10/1/2001	181,171	210,934	14.34
03/04	10/1/2002 (a)	187,031	200,796	14.64
04/05	10/1/2003 (a)	201,242	195,785	14.01
05/06	10/1/2004	289,937	313,076	18.49
06/07	10/1/2005	345,883	518,567	19.61
07/08	10/1/2006	347,184	584,172	18.38
08/09	10/1/2007 (a)	329,117	425,843	17.85
09/10	10/1/2008	373,810	423,928	18.15
10/11	10/1/2009 (a)	501,859	533,544	23.67
11/12	10/1/2010	573,563	573,563	25.83
12/13	10/1/2011	639,810	639,810	28.25
13/14	10/1/2012 (a)	408,279	457,932	18.50
14/15	10/1/2013 (a)	368,361	389,997	18.78
15/16	10/1/2014 (a)	422,041	422,041	21.15
16/17	10/1/2015 (a)	501,375	501,375	25.76
17/18	10/1/2016 (a)	608,384	608,384	28.57
18/19	10/1/2017	657,730		29.32
<b>19/20</b>	<b>10/1/2018 (a)</b>	<b>748,549</b>		<b>33.50</b>

(a) After changes in benefit provisions and/or actuarial assumptions and/or actuarial cost methods.

(aa) After Minimum Benefit changes.

# Prior to the fiscal year ending 9/30/99, results include General, Police and Fire.

# Actuarial Balance Sheet - October 1, 2018

## Present Resources and Expected Future Resources

A. Funding value of system assets:	
1. Net assets from system financial statements (market value)	\$ 13,344,201
2. Funding value adjustment	<u>(316,399)</u>
3. Funding value of assets	13,027,802
B. Actuarial present value of expected future employer contributions:	
1. For normal costs	1,115,233
2. For unfunded actuarial accrued liability	<u>3,860,159</u>
3. Totals	4,975,392
C. Actuarial present value of expected future member contributions	<u>1,192,492</u>
D. Total Present and Expected Future Resources	<u><u>\$19,195,686</u></u>

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

A. To retired members and beneficiaries	\$ 7,629,857
B. To vested terminated members	0
C. To present active members:	
1. Allocated to service rendered prior to valuation date	9,230,496
2. Allocated to service likely to be rendered after valuation date	<u>2,307,725</u>
3. Totals	11,538,221
D. Extra Benefit Reserve	27,608
E. Reserve for DROP balances	0
F. Total Actuarial Present Value of Expected Future Benefit Payments	<u><u>\$19,195,686</u></u>

## 5-Year Projections of Future Funded Ratios and Future Employer Contributions

Year Ended 9/30	Active Count	Benefit		Actuarial	Actuarial	Funded Ratio	Total Employer Contribution			Less Estimated Chapter 175 and Additional Premium Tax Revenue		Estimated City's Contributions
		Payroll	Payments	Accrued Liability	Value of Assets		Fiscal Year	% of Payroll	Dollar Amount			
2018	30	\$ 2,153,226	\$ 772,485	\$ 16,887,961	\$ 13,027,802	77.1%	2020	33.50%	\$ 748,549	\$ 142,756	\$ 605,793	
2019	30	2,156,835	843,413	17,675,325	14,082,917	79.7%	2021	32.79%	733,858	142,756	591,102	
2020	30	2,211,126	910,717	18,454,227	15,239,762	82.6%	2022	31.10%	713,600	142,756	570,844	
2021	30	2,268,531	932,225	19,276,661	16,344,252	84.8%	2023	30.87%	726,646	142,756	583,890	
2022	30	2,297,360	968,990	20,124,994	17,473,141	86.8%	2024	29.34%	699,515	142,756	556,759	
2023	30	2,347,695	1,016,344	20,990,412	18,607,512	88.6%	2025	29.00%	706,638	142,756	563,882	

Chapter 175 monies are assumed to stay level in future years.

Uses 2.50% wage growth assumption.

We have not determined any additional possible impact due to F.S. 112.64(5).

Actuarial assumptions were those used for the 9/30/2018 valuation.

Future experience was assumed to be consistent with the actuarial assumptions. If experience differs from the actuarial assumptions, future results could be significantly different from the projected results above.

Existing schedule of unrecognized investment gains and losses are reflected in this projection.

## **SECTION B**

---

### **SUMMARY OF BENEFIT PROVISIONS AND VALUATION DATA SUBMITTED BY THE RETIREMENT SYSTEM**

# Summary of Benefit Provisions (as of October 1, 2018)

## Normal Retirement (no reduction factor for age):

### **Eligibility**

*Members with 10 or more years of service as of July 21, 2014:* 30 years of service regardless of age, or age 52 with 25 or more years of service, or age 55 with 5 or more years of service.

*Members with less than 10 years of service as of July 21, 2014:* 30 years of service regardless of age, or age 52 with 25 or more years of service, or age 55 with 10 or more years of service.

**Mandatory Retirement Age** - None.

### **Pension Amount**

*Members Not Eligible for Normal Retirement as of July 21, 2014:* Total credited service times 3.0% of final average compensation. Maximum pension is 90% of final average compensation or \$90,000, whichever is less. Accrued benefits as of July 21, 2014 in excess of the maximum amount are retained.

The normal form of benefit is a benefit payable for the life of the retired member with the first 10 years guaranteed. Optional benefit forms are available on an actuarial equivalent basis.

**Final Average Compensation** - Highest 5 years out of last 10. Compensation includes base pay plus longevity and incentive pay. Excludes overtime and all other forms of compensation.

## Early Retirement:

**Eligibility** - 20 years of service or age 50 with 10 years of service as of July 21, 2014. Members that do not meet these conditions are not eligible for Early Retirement.

**Pension Amount** - Computed as regular retirement, but reduced to take into account earlier commencement of retirement income payments, as follows:

**3.0% per year reduction prior to Normal Retirement**

## Deferred Retirement (vested benefit):

**Eligibility** - 10 or more years of service for members with less than 5 years of service and new hires as of July 21, 2014. Benefit begins at the earlier of: age 55 with 10 years of service, age 52 with 25 years of service, and age 65 with 5 years of service.

*Members with 5 or more years of service as of July 21, 2014:* 5 or more years of service. Benefit begins at regular retirement age of 55.

**Pension Amount** - Computed as a normal retirement but based upon service and final average compensation at time of termination.

## Summary of Benefit Provisions (Continued)

### Duty Disability Retirement:

**Eligibility** - No age or service requirements.

**Pension Amount** - Computed as a normal retirement to regular retirement age. Minimum benefit is not less than 50% of final average compensation. At regular retirement age, the participant has the option to have the benefit re-computed as a normal retirement with additional service credit granted from date of retirement to the later of normal retirement age or five years after date of disability. Minimum benefit is not less than 42% of final average compensation.

### Non-Duty Disability Retirement:

**Eligibility** - 10 or more years of service.

**Pension Amount** - Computed as a normal retirement. Minimum benefit is not less than 25% of final average compensation.

### Duty Death Before Retirement:

**Eligibility** - No age or service requirements.

**Pension Amount** - To spouse: 100% of the normal retirement benefit. Minimum benefit is not less than 35% of final average compensation.

### Non-Duty Death Before Retirement:

**Eligibility** - 5 or more years of service for members with more than 5 years of service as of July 21, 2014. 10 or more years of service for members with less than 5 years of service and new hires as of July 21, 2014.

**Pension Amount** - To spouse: 100% of the normal retirement benefit.

**Member Contributions:** 7.95% of pay.

**Cost-of-Living Adjustments:** A one-time, permanent benefit increase of 2% was granted to retirees who retired before January 1, 2009. Retirees who retire after January 1, 2009 and before July 21, 2014 will receive on the 2<sup>nd</sup> anniversary of retirement, a 2% benefit increase and an additional 2% compounded annually, inclusive of certain periods and/or survivor benefits. Members who were employed on and retire after July 21, 2014 receive a 2% benefit increase for service earned before July 21, 2014 and a 1% increase for service earned after July 21, 2014, compounded annually beginning two years after retirement. Members hired after July 21, 2014 are not eligible for a COLA.

**Premium Tax Monies:** A distribution of property insurance premium tax monies collected by the State pursuant to Chapter 175, Florida Statutes.

## Summary of Benefit Provisions (Concluded)

**City Contributions:** Actuarially determined amounts which together with member contributions and premium tax monies are sufficient to at least cover the requirements of the funding objective.

**Forfeiture of Retirement Benefits:** Retirement benefits granted by the Retirement System are subject to forfeiture if an employee is convicted of an offense specified in Sections 112.3173 and 175.195, Florida Statutes, pursuant to the procedures set forth in the cited statute.

**Prior Service Purchases:** A former member with credited service who wishes to return to city employment may restore the forfeited credited service to receive credit for prior service within ninety (90) days after return to city employment.

**Deferred Retirement Option Program (DROP):** Any eligible member of the retirement system who meets the requirements of retirement may elect to participate, deferring receipt of retirement benefits while continuing employment with the City. The deferred monthly benefits shall accrue in the reserve for pension payments fund on behalf of the participant, plus 3.5% annual interest compounded monthly less a service fee, for the specified period of the DROP participation not to exceed 36 consecutive months. Upon termination from the DROP, the participant shall receive all accrued DROP benefits either by lump sum, direct rollover or partial lump sum. The DROP was closed to new members on July 21, 2014.

### **Backwards Deferred Retirement Option Program (BackDROP):**

**Eligibility** – Same as normal retirement. Member must not be participating in the DROP on July 21, 2014 and must continue employment beyond the normal retirement date. The member may elect a BackDROP period for the number of months worked beyond their normal retirement date, up to a maximum of 36 months.

**Amount of Pension** – Computed as if the member had chosen to terminate on a day chosen by the member but not before the member's normal retirement date, using credited service and final average salary at the BackDROP date. In addition to the pension, there will be a lump sum payment equal to the pension benefits the member would have received had he/she retired on the BackDROP date with interest at the rate of 3.0% per year.

**Claims Procedure:** Claims for benefits should be filed with the Human Resources Department. If a claim is denied, you will be notified and informed of the procedure to request a hearing before the Board of Trustees. An applicant for benefits must appeal said denial within 20 days of being informed of the denial by filing an appeal with the Board Secretary. If no appeal is filed within the time period then the denial shall be final.

**Disclaimer:** The preceding summary briefly describes the principle benefits of the Retirement System. Detailed benefit conditions and limitations are contained in the City of Jacksonville Beach Firefighters' Retirement System Ordinance as amended, which establishes the System. The Internal Revenue Code, Florida Statutes, and the Ordinance all govern the operation of the System, and should be consulted before you take any action concerning your membership or benefits. In case of any conflict between this Summary and the Ordinance or other applicable law, the Ordinance or other applicable law will prevail. Copies of the Ordinance are available at the office of the City Clerk.

# Accounting Information Submitted for Valuation

## Revenues and Expenditures

	Year Ended September 30, 2018	Year Ended September 30, 2017
<b>Revenues:</b>		
a. Member contributions	\$ 161,383	\$ 168,792
b. City contributions	465,628	337,958
c. Premium taxes from State	142,756	163,417
d. Total contributions to System	<u>\$ 769,767</u>	<u>\$ 670,167</u>
e. Investment income:		
1. Interest and dividends	303,640	280,180
2. Realized gain on investments	377,046	322,149
3. Unrealized gain on investments	467,836	748,158
4. Investment expense	<u>(36,189)</u>	<u>(28,392)</u>
f. Total investment income	\$ 1,112,333	\$1,322,095
g. Total revenues	\$ 1,882,100	\$ 1,992,262
<b>Expenditures:</b>		
a. Refunds of member contributions	0	0
b. Benefits paid	774,227	750,335
c. Administrative expenses	75,780	71,311
d. Total expenditures	<u>\$ 850,007</u>	<u>\$ 821,646</u>
<b>Reserve Increase:</b>		
Total revenues minus total expenditures	\$ 1,032,093	\$ 1,170,616

## Summary of Assets (Market Value)

	Year Ended September 30, 2018	Year Ended September 30, 2017
Cash and Short-term Investments	\$ 479,335	\$ 323,816
Due from Other Government Units	4,136	8,432
Receivables less payables	20,048	18,909
Real Estate	697,747	640,916
U.S. Government Securities	1,818,947	1,021,936
Bonds - government	none	none
- corporate	1,499,679	2,233,317
Stocks - common	none	none
- preferred	none	none
Other (equity mutual funds)	<u>8,824,309</u>	<u>8,064,782</u>
Total assets	<u>\$13,344,201</u>	<u>\$12,312,108</u>

## Derivation of Funding Value of Retirement System Assets

	2017	2018	2019	2020	2021
<b><u>Beginning of Year Values</u></b>					
(1) Market Value	\$11,141,492	\$12,312,108			
(2) Funding Value	11,525,665	12,223,477			
<b><u>End of Year</u></b>					
(3) Market Value	12,312,108	13,344,201			
(4) Net Addition to Assets	(151,479)	(80,240)			
Excluding Investment Income#					
(5) Total Net Investment Income#	1,322,095	1,112,333			
=(3)-(1)-(4)					
(6) Projected Net Rate of Return#	7.90%	7.90%			
(7) Projected Investment Income	904,544	962,485			
=(6) x [ (2)+0.5 x (4) ]					
(8) Investment Income in Excess of Projected	417,551	149,848			
<b>Excess Investment Income Recognized</b>					
(9a) From Current Year = .25 x (8)	104,388	37,462			
(9b) From One Year Prior	(4,763)	104,388	\$ 37,462		
(9c) From Two Years Prior	(215,009)	(4,763)	104,388	\$ 37,462	
(9d) From Three Years Prior	60,131	(215,007)	(4,762)	104,387	\$37,462
(9e) Total Cap. Val. Change Recogn.	(55,253)	(77,920)	137,088	141,849	37,462
=(9a)+(9b)+(9c)+(9d)					
(10) Increase(Decr.) in Funding Value	697,812	804,325			
= (4) + (7) + (9e)					
<b><u>End of Year</u></b>					
(11) Market Value	12,312,108	13,344,201			
(12) Funding Value = (2)+(10)	12,223,477	13,027,802			
(13) Market Value Rate of Return	11.9%	9.1%			
(14) Funding Value Rate of Return	7.4%	7.3%			
(15) Ratio of Market to Funding Value	100.7%	102.4%			

# Net of expenses paid from investment income.

## Retired Member and Beneficiary Data Historical Schedule

Year Ended	Added		Removed		Net Increase		End of Year		Expected Removals	
	No.	Annual Pensions	No.	Annual Pensions	No.	Annual Pensions	No.	Annual Pensions	No.	Pensions
9/30/1975			3	\$ 5,238	(3)	\$ (5,238)	38	\$ 96,998		
9/30/1980	4	\$ 12,535	2	6,322	2	6,213	43	126,043		
9/30/1985	6	38,897	3	9,338	3	29,559	54	206,265	1.7	\$ 4,085
9/30/1990	6	63,868	5	14,043	1	49,825	63	346,855	1.9	6,447
9/30/1994	12	187,409	2	14,164	10	173,245	83	855,174	2.1	12,465
9/30/1995	8	184,693	6	24,617	2	160,076	85	1,015,250	2.3	14,657
9/30/1996	14	247,257	7	33,348	7	213,909	92	1,229,159	1.9	14,218
9/30/1997	5	65,068	4	22,208	1	42,860	93	1,272,018	2.0	16,685
9/30/1998 #							14	289,524	2.0	16,685
9/30/1999							14	289,524	0.2	3,497
9/30/2000	1	32,824			1	32,824	15	322,348	0.2	3,883
9/30/2001	3	136,130			3	136,130	18	458,478	0.2	4,487
9/30/2002	3	147,176 *			3	147,176	21	605,654	0.3	5,710
9/30/2003	1	54,211	2	55,764	(1)	(1,553)	20	604,101	0.3	7,094
9/30/2004	1	60,277			1	60,277	21	664,378	0.3	7,970
9/30/2005	4	70,107	1	15,608	3	54,499	24	718,877	0.4	8,984
9/30/2006							24	718,877	0.4	9,685
9/30/2007							24	718,877	0.4	10,710
9/30/2008							24	718,877	0.5	11,858
9/30/2009	1	42,517	1	28,994		13,523	24	732,400	0.5	13,143
9/30/2010			1	24,355	(1)	(24,355)	23	708,045	0.6	14,312
9/30/2011			2	48,190	(2)	(48,190)	21	659,855	0.6	14,354
9/30/2012							21	659,855	0.6	15,813
9/30/2013	3	82,016	1	14,397	2	67,619	23	727,474	0.7	17,445
9/30/2014	1	25,134			1	25,134	24	752,608	0.7	18,427
9/30/2015		1,386				1,386	24	753,994	0.8	20,452
9/30/2016	1	17,077	1	17,077		1,413	24	755,407	0.9	22,569
9/30/2017		1,442	1	8,585	(1)	(7,143)	23	748,264	0.8	20,245
<b>9/30/2018</b>	<b>3</b>	<b>73,674</b>	<b>2</b>	<b>49,453</b>	<b>1</b>	<b>24,221</b>	<b>24</b>	<b>772,485</b>	<b>0.7</b>	<b>21,083</b>
Expected for <b>9/30/2019</b>									<b>0.7</b>	<b>19,912</b>

# Prior to 1998 valuation, results include General, Police and Fire.

\* Includes changes in benefits due to minimum benefit requirement.

## Normal (Age and Service) Retirements

Valuation Year	Average				Newly Retired During Year			
	No.	Attained Age	Retirement Age	Annual Pensions	Averages			Annual Pensions
					No.	Retirement Age	Service	
2004	15	63.5 yrs.	55.0 yrs.	\$33,293	1	51.0 yrs.	30.2 yrs.	\$60,279
2005	16	63.1	55.0	30,772	1	50.0	10.2	15,057
2006	16	64.1	55.0	30,772				
2007	16	65.1	55.0	30,772				
2008	16	66.1	55.0	30,772				
2009	16	67.1	55.3	31,340				
2010	16	68.1	55.3	31,299				
2011	14	69.1	55.3	34,180				
2012	14	70.1	55.3	34,180				
2013	16	67.7	55.5	34,134	3	56.6	22.2	27,338
2014	17	68.7	54.2	33,604	1	55.0	21.7	25,134
2015	17	69.7	54.2	33,686				
2016	16	68.9	55.2	34,812				
2017	16	69.9	55.2	34,902				
<b>2018</b>	<b>14</b>	<b>69.2</b>	<b>54.9</b>	<b>36,461</b>				

## Retired Members and Beneficiaries Historical Comparison

Valuation Date	% Incr. in Annual Pensions#	No. of Active Per Retired	Pension Payroll as % of Active Payroll	Average Pension#
10/1/1990 *	16.8 %			\$ 5,506
10/1/1995	18.7	2.7 %	16.7 %	11,944
10/1/2000	11.3	2.2	22.9	21,490
10/1/2005	8.2	1.2	43.5	29,953
10/1/2006	0.0	1.3	40.7	29,953
10/1/2007	0.0	1.3	41.7	29,953
10/1/2008	0.0	1.3	37.3	29,953
10/1/2009	1.9	1.3	36.9	30,517
10/1/2010	(3.3)	1.3	34.1	30,785
10/1/2011	(6.8)	1.4	31.1	31,422
10/1/2012	0.0	1.4	31.9	31,422
10/1/2013	10.2	1.2	39.6	31,629
10/1/2014	3.5	1.2	40.3	31,359
10/1/2015	0.2	1.2	40.8	31,416
10/1/2016	0.2	1.3	36.8	31,475
10/1/2017	(0.9)	1.3	34.6	32,533
<b>10/1/2018</b>	<b>3.2</b>	<b>1.3</b>	<b>35.9</b>	<b>32,187</b>

# Prior to 1999 valuation, results include General, Police and Fire.

\* For the 5 years ending with the valuation date.

# Retired Members and Beneficiaries as of October 1, 2018 by Type of Pension Being Paid\*

## New Plan Pensions

Type of Pension Being Paid	No.	Annual Pension	Average Pension	Actuarial Liability
<i>Age and Service Pensions</i>				
Regular	3	\$ 42,651	\$ 14,217	\$ 426,786
Option I	3	168,483	56,161	1,514,820
Option II	5	169,871	33,974	1,712,535
Option III	3	129,451	43,150	1,615,140
Survivor Beneficiaries	6	125,959	20,993	1,244,560
<b>Total Age and Service Pensions</b>	<b>20</b>	<b>636,415</b>	<b>31,821</b>	<b>6,513,841</b>
<i>Disability Pensions</i>				
Regular	1	25,414	25,414	176,655
Option I	1	34,326	34,326	267,368
Option III	2	76,330	38,165	671,993
<b>Total Disability Pensions</b>	<b>4</b>	<b>136,070</b>	<b>34,018</b>	<b>1,116,016</b>
<b>Total New Plan Pensions</b>	<b>24</b>	<b>\$772,485</b>	<b>\$32,187</b>	<b>\$7,629,857</b>

- \* Regular - benefit terminating upon death of retired member  
 Option I - 10-year certain  
 Option II - 100% joint and survivor benefit  
 Option III - 50%, 66⅔% and 75% joint and survivor benefit  
 Surviving Beneficiaries - benefit terminating upon death of beneficiary

## Retired Members and Beneficiaries as of October 1, 2018 by Type of Pension Being Paid\*

### Old Plan Pensions

Type of Pension Being Paid	No.	Annual Pension	Average Pension	Actuarial Liability
<i>Age and Service Pensions</i>				
Survivor Beneficiaries	0	\$ -	N/A	\$ -
Total Age and Service Pensions	0	0	N/A	0
<b>Total Old Plan Pensions</b>	<b>0</b>	<b>\$ -</b>	<b>N/A</b>	<b>\$ -</b>
<i>Total New &amp; Old Plan Pensions Being Paid</i>				
<b>Pensions Being Paid</b>	<b>24</b>	<b>\$ 772,485</b>	<b>\$32,187</b>	<b>\$ 7,629,857</b>

\* Regular - benefit terminating upon death of retired member  
Automatic Spouse Benefit - 75% joint and survivor benefit  
Surviving Beneficiaries - benefit terminating upon death of beneficiary

## Retired Member and Beneficiary Data as of October 1, 2018 by Attained Ages

Attained Ages	New Plan		Old Plan		Totals	
	No.	Annual Benefits	No.	Annual Benefits	No.	Annual Benefits
40	1	\$ 39,224			1	\$ 39,224
59	1	25,133			1	25,133
60	2	56,683			2	56,683
65	2	92,530			2	92,530
66	1	34,326			1	34,326
68	4	174,895			4	174,895
69	1	42,850			1	42,850
70	1	45,013			1	45,013
71	4	148,961			4	148,961
76	2	45,225			2	45,225
77	1	7,960			1	7,960
79	1	4,800			1	4,800
82	1	17,077			1	17,077
84	1	16,474			1	16,474
90	1	21,334			1	21,334
<b>Totals</b>	<b>24</b>	<b>\$772,485</b>	<b>0</b>	<b>\$ -</b>	<b>24</b>	<b>\$772,485</b>

## Vested Terminated Members as of October 1, 2018 by Attained Ages

<b>Attained Ages</b>	<b>No.</b>	<b>Annual Benefits</b>
0	0	\$0
<b>Totals</b>	<b>0</b>	<b>\$0</b>

## Active and Vested Terminated Members Included in Valuation

Valuation Date	Active Members	Vested Terminated Members	Valuation Payroll	Average		
				Age	Service	Pay
10/1/2007	30	3	\$ 1,725,988	34.0 yrs.	5.3 yrs.	\$ 57,533
10/1/2008	31	3	1,927,966	35.3	5.9	62,192
10/1/2009	30	2	1,984,765	36.6	7.1	66,159
10/1/2010	30	2	2,078,655	37.4	7.9	69,289
10/1/2011	30	2	2,120,109	38.1	8.8	70,670
10/1/2012	30	2	2,065,908	38.5	9.5	68,864
10/1/2013	28	1	1,836,131	38.2	10.2	65,576
10/1/2014	28	0	1,867,968	39.2	11.3	66,713
10/1/2015	28	0	1,848,443	40.2	12.3	66,016
10/1/2016	30	0	2,052,021	40.3	12.4	68,401
10/1/2017	30	0	2,161,712	41.3	13.4	72,057
<b>10/1/2018</b>	<b>30</b>	<b>0</b>	<b>2,153,226</b>	<b>41.6</b>	<b>13.8</b>	<b>71,774</b>

## Number Added to and Removed from Active Membership

Year Ended	Number Added During Year		Terminations During Year										Active Members End of Year
			Normal Retirement		Disability Retirement		Died-in-Service		Withdrawal				
	A	E	A	E	A	E	A	E	A	A	A	E	E
2009	0	1	0	0.3	0	0.1	0	0.0	0	1	1	3.0	30
2010	1	1	0	0.3	0	0.1	0	0.0	0	1	1	2.4	30
2011	1	1	0	0.8	0	0.1	0	0.0	0	1	1	2.2	30
2012	1	1	0	0.8	0	0.1	0	0.0	0	1	1	2.2	30
2013	0	2	2	1.7	0	0.1	0	0.0	0	0	0	2.1	28
2014	0	0	0	0.4	0	0.1	0	0.0	0	0	0	1.9	28
2015	0	0	0	0.3	0	0.1	0	0.0	0	0	0	1.9	28
2016	2	0	0	0.7	0	0.1	0	0.0	0	0	0	1.8	30
2017	0	0	0	0.8	0	0.1	0	0.0	0	0	0	1.5	30
<b>2018</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>0.7</b>	<b>0</b>	<b>0.2</b>	<b>1</b>	<b>0.0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>1.4</b>	<b>30</b>
5-yr. Totals													
2014 - 2018	4	2	0	2.9	0	0.6	1	0.0	0	1	1	8.5	
Expected for 2019				1.4		0.2		0.0				1.5	

A represents actual number.

E represents expected number.

**Active Members as of October 1, 2018  
By Near Age and Years of Service  
(Excluding DROP Members)**

Near Age	Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
25-29	3							3	\$ 122,745
30-34		3						3	186,129
35-39			4					4	275,564
40-44			5	3	2			10	742,330
45-49			4	2	1			7	498,623
50-54								0	0
55-59				1		1	1	3	327,835
<b>Totals</b>	<b>3</b>	<b>3</b>	<b>13</b>	<b>6</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>30</b>	<b>\$2,153,226</b>

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

Age: 41.6 years

Service: 13.8 years

Annual Pay: \$71,774

## **SECTION C**

---

### **ACTUARIAL COST METHOD, ACTUARIAL ASSUMPTIONS AND DEFINITIONS OF TECHNICAL TERMS**

## Actuarial Cost Method

The actuarial cost method is a procedure for allocating the actuarial present value of benefits and expenses to time periods. The method used for your valuation is known as the individual entry-age actuarial cost method, and has the following characteristics:

- (i) The annual normal costs for each individual active member is sufficient to accumulate the value of the member's pension at time of retirement or BackDROP.
- (ii) Each annual normal cost is a constant percentage of the member's year-by-year projected pensionable compensation.

The entry-age actuarial cost method allocates the actuarial present value of each member's projected benefits on a level basis over the member's pensionable compensation between the entry age of the member and the estimated exit ages. This is based on our understanding of the approach preferred by the Florida Division of Retirement.

The portion of the actuarial present value allocated to the valuation year is called the normal cost. The portion of the actuarial present value not provided for by the actuarial present value of future normal costs is called the Actuarial Accrued Liability (AAL). Deducting accrued assets from the AAL determines the Unfunded Actuarial Accrued Liability (UAAL). The UAAL was financed as a level percent of member payroll. Please refer to page A-13 for a schedule of financing periods.

The characteristics of this method of financing the UAAL are shown on page C-2.

The sum of active member payroll was assumed to increase 2.50% a year for the purpose of determining the level percent contributions, except to the extent needed for FS 112.64(5) compliance. This assumption is consistent with the base rate of increase in salaries used to calculate actuarial present values.

## Level Percent of Active Member Payroll Amortization of Unfunded Actuarial Accrued Liability\* (amortization schedule \$ amounts in thousands)

Year Ended September 30	Payroll		Unfunded		Contribution	
	Inflated Dollars	Constant Value	Inflated Dollars	Constant Value	Inflated Dollars	Constant Value
2018	\$2,153	\$2,153	\$3,860	\$3,860	\$475	\$475
2019	2,177	2,153	3,663	3,624	480	475
2020	2,201	2,153	3,446	3,372	466	456
2021	2,225	2,153	3,227	3,123	471	456
2022	2,250	2,153	2,985	2,857	448	429
2027	2,376	2,153	1,673	1,517	338	306
2032	2,510	2,153	822	705	213	183
2037	2,651	2,153	502	408	19	16
2041	2,769	2,153	117	91	77	60
2042	2,800	2,153	45	35	47	36
2043	2,831	2,153	0	0	0	0
\$ 451,590 over 25 years 294,466 over 24 years 967,725 over 23 years 759,390 over 22 years (1,915,327) over 21 years (263,468) over 20 years (336,666) over 19 years 556,841 over 18 years 508,738 over 17 years 678,353 over 16 years 281,853 over 15 years (199,512) over 14 years (167,486) over 13 years			\$ 642,529 over 12 years 744,393 over 11 years (49,583) over 10 years 472,585 over 9 years 0 over 8 years 303,296 over 7 years 0 over 6 years 0 over 5 years 94,724 over 4 years 0 over 3 years 35,718 over 2 years 0 over 1 year			
			<b><u>\$ 3,860,159</u> TOTAL</b>			

Level percent-of-payroll financing of Unfunded Actuarial Accrued Liability (UAAL) treats each generation of taxpayers equally during the financing period. The alternative, level dollar financing, produces declining percent-of-payroll contributions and places a greater relative burden on current taxpayers.

The annual rate of increase in participant payroll used to compute the level percent-of-payroll contribution is the same rate of payroll growth used to compute actuarial liability and costs. It reflects across-the-board salary increases, not group size increases.

If future payroll growth is less than the assumed rate due to smaller than projected salary increases, the percent-of-payroll contribution rate for the UAAL will tend to decline.

If future payroll growth is less than the assumed rate due to decreases in the number of participants, the percent-of-payroll contribution rate for the UAAL will tend to increase but dollar contributions will be less than indicated in the preceding schedule.

## Actuarial Assumptions Used for the Valuation

Funding objective contribution requirements and actuarial present values are calculated by applying estimates of future plan activities (actuarial assumptions) to the benefit provisions and people information of the system, using the actuarial cost method described on page C-1. All actuarial assumptions used in this report are estimates of future experience.

The principal areas of risk which require estimates of future plan activities are:

- (i) long-term rates of investment return to be generated by the assets of the system
- (ii) patterns of pay increases to active members
- (iii) rates of mortality among active members, retired members and beneficiaries
- (iv) rates of withdrawal of active members
- (v) rates of disability among active members
- (vi) the age patterns of actual retirements

In making a valuation, the monetary effect of each activity is calculated for as long as a present covered person survives - - a period of time which can be as long as a century.

---

Actual activities of the system will not coincide exactly with estimated activities, due to their nature. Each valuation provides a complete recalculation of estimated future activities and takes into account the effect of differences between estimated and actual activity to date. The result is a continual series of adjustments (usually small) to the computed contribution rate. From time-to-time one or more of the assumptions are modified to reflect experience trends (but not random or temporary year-to-year fluctuations).

The actuarial assumptions are adopted by the Board of Trustees after consultation with the actuary. In general, the actuarial assumptions were based on the System's experience, as well as experience of plans similar in nature where the System's experience was insufficient. The reasonableness of the economic assumptions was based upon capital market expectations provided by various investment consultants (including the System's) and other sources such as the Social Security Trustees report. All actuarial assumptions are based on future expectations, not market measures.

## Actuarial Assumptions Used for the Valuation

The actuarial assumptions regarding the INFLATION rate, the SALARY INCREASE rates, and REAL INVESTMENT RETURN were effective October 1, 2018. These actuarial assumptions are used, in combination with the other actuarial assumptions, to (i) determine the present value of amounts expected to be paid in the future and (ii) establish rates of contribution which are expected to remain relatively level as a percent of covered payroll.

The annual interest rate used in making this valuation was 7.75%. It is composed of inflation and real investment return.

**Price Inflation.** 2.50% per annum, compounded annually. This is the rate at which growth in the supply of money and credit is estimated to exceed growth in the supply of goods and services. It may be thought of as the rate of depreciation of the purchasing power of the dollar. There are a number of indices for measuring the inflation rate. The recent inflation rate, as measured by the Consumer Price Index, has been:

	Year Ended September 30					Average	
	2018	2017	2016	2015	2014	3-Year	5-Year
Actual	<b>2.3%</b>	2.2%	1.5%	(0.0)%	1.7%	2.0%	1.5%
Assumed	<b>2.5%</b>	2.5%	3.0%	3.5%	3.5%	2.7%	3.0%

**Real Investment Return.** 5.25% per annum, compounded annually. This is the rate of return estimated to be produced by investing a pool of assets in an inflation-free environment. Recent real investment return for the Retirement System has been:

	Year Ended September 30					Average	
	2018	2017	2016	2015	2014	3-Year	5-Year
Net Rate	<b>7.3%</b>	7.4%	7.4%	8.8%	9.3%	7.4%	8.0%
Less Inflation Rate	<u>2.3%</u>	<u>2.2%</u>	<u>1.5%</u>	<u>(0.0)%</u>	<u>1.7%</u>	<u>2.0%</u>	<u>1.5%</u>
Net Real Rate	<b>5.0%</b>	5.2%	5.9%	8.8%	7.6%	5.4%	6.5%
Target Real Rate	<b>5.4%</b>	5.4%	5.0%	4.5%	4.5%	5.3%	5.0%

The total investment return rate was computed using the approximate formula  $i = I$  divided by  $1/2 (A + B - I)$ , where  $I$  is actual realized investment income plus market value adjustments,  $A$  is the beginning of year funding asset value and  $B$  is the end of year funding value of assets.

The preceding investment return rates reflect the particular characteristics of this Retirement System and should not be used to measure an investment advisor's performance or for comparison with other retirement systems. Such use will usually mislead.

## Actuarial Assumptions Used for the Valuation

**Salary Increases.** Employee salaries are estimated to increase between the date of hire and date of retirement. Salary increases occur in recognition of (i) individual merit and seniority, (ii) inflation-related depreciation of the purchasing power of salaries, and (iii) competition from other employers for personnel.

A schedule of estimated rates of increases in individual salaries for sample ages follows:

Attributable to:	Annual Rates for Salary Increase for Sample				
	20	30	40	50	60
Merit & Seniority	3.8%	2.7%	2.1%	1.1%	0.2%
General Increase in Wage Level Due to:					
Price Inflation	2.5%	2.5%	2.5%	2.5%	2.5%
Other Factors	<u>0.0%</u>	<u>0.0%</u>	<u>0.0%</u>	<u>0.0%</u>	<u>0.0%</u>
<b>Total</b>	<b>6.3%</b>	<b>5.2%</b>	<b>4.6%</b>	<b>3.6%</b>	<b>2.7%</b>

The valuation is based on a constant group size and total payroll increasing at the rate of the general increase in wage levels due to inflation and other causes, which in this case is 2.50% a year.

A schedule of recent salary change experience, as measured by average reported pay, follows:

	Year Ended September 30					Average		
	2018	2017	2016	2015	2014	3-Year	5-Year	10-Year
% Change:								
Actual (1)	(0.4)%	5.3%	7.3%	(1.0)%	1.7%	4.0%	2.5%	2.3%
Assumed	4.3%	4.4%	5.5%	6.2%	6.4%	4.7%	5.4%	5.9%
% Change in Total Payroll (2)	(0.4)%	5.3%	11.0%	(1.0)%	1.7%	5.2%	3.2%	1.1%

(1) Excluding terminations and new members.

(2) Including pays of members electing DROP participation but still working.

In order to achieve the funding objective of a contribution rate which remains level as a percent-of-payroll, the total rate of investment return must exceed the rate of average increase in salaries by an amount equal to the estimated real investment return rate. The schedule on the following page illustrates the recent history of the relationship between total investment return and average pay changes.

## Actuarial Assumptions Used for the Valuation

	Year Ended September 30					Average	
	2018	2017	2016	2015	2014	3-Year	5-Year
Net Investment Return Rate	7.3%	7.4%	7.4%	8.8%	9.3%	7.4%	8.0%
Rate of Change in Average Pay	(0.4)%	5.3%	7.3%	(1.0)%	1.7%	4.0%	2.5%
Difference: Actual	7.7%	2.1%	0.1%	9.8%	7.6%	3.4%	5.5%
Target	5.4%	5.4%	5.0%	4.5%	4.5%	5.3%	5.0%

**Mortality Table.** The mortality tables used to measure retired life mortality were the Florida Retirement System (FRS) Mortality Tables, as described below:

- Male non-disabled retiree mortality: fully generational mortality. 10% of the RP-2000 Annuitant White Collar Table and 90% of the RP-2000 Annuitant Blue Collar Table, projected with scale BB.
- Female non-disabled retiree mortality: fully generational mortality. 100% of the RP-2000 Annuitant White Collar Table, projected with scale BB.
- Male employee mortality: fully generational mortality. 10% of the RP-2000 Employee White Collar Table and 90% of the RP-2000 Employee Blue Collar Table, projected with scale BB.
- Female employee mortality: fully generational mortality. 100% of the RP-2000 Employee White Collar Table, projected with scale BB.
- Male disabled mortality: 60% of the RP-2000 Disabled Male Table set back 4 years and 40% of the RP-2000 Annuitant White Collar Table.
- Female disabled mortality: 60% of the RP-2000 Disabled Female Table, set forward 2 years and 40% of the RP-2000 Annuitant White Collar Table. Sample values follow:

Sample Ages in 2018	Value of		Future Life	
	\$1 Monthly for Life		Expectancy (Years)	
	Men	Women	Men	Women
50	\$139.28	\$145.85	33.97	38.36
55	133.48	140.64	29.33	33.34
60	125.65	133.69	24.76	28.44
65	115.57	124.53	20.35	23.70
70	103.08	113.15	16.22	19.23
75	88.60	99.67	12.48	15.15
80	73.02	84.44	9.26	11.51

The margin for future mortality improvements is included in projection scales. 75% of pre-retirement deaths were assumed to be duty related.

## Actuarial Assumptions Used for the Valuation

**Rates of withdrawal 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	% of Active Members Separating During Next Year
	0	20.00%
	1	15.00%
	2	12.00%
	3	10.00%
	4	7.00%
25	5 & Over	9.90%
30		9.68%
35		7.81%
40		4.84%
45		2.53%
50		2.09%
55		2.09%
60		2.09%

These rates were first used for the October 1, 2016 valuation.

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

Sample Ages	% of Active Members Becoming Disabled During Next Year
20	0.14%
25	0.18%
30	0.20%
35	0.28%
40	0.42%
45	0.64%
50	1.04%
55	1.84%
60	3.06%

The mortality table was set-forward 10 years from the age at disability for projecting disability costs. The rates assume 75% of disabilities will be duty related. These rates were first used for the October 1, 1995 valuation.

## Actuarial Assumptions Used for the Valuation

**Rates of Retirement.** These rates are used to measure the probabilities of an eligible member retiring during the next year.

Retirement		Yrs. of Service	Service Based	Early Retirement	Early Retirement
Ages	Age Based			Ages	Rates
52	50%	30	100%	40	5%
53	40%			41	5%
54	30%			42	5%
55	30%			43	5%
56	20%			44	5%
57	20%			45	5%
58	20%			46	5%
59	20%			47	5%
60	100%			48	5%
				49	5%
				50-54	5%

A Fire member is eligible for normal retirement after 30 years of service, or after attaining age 52 with 25 years of service, or after attaining age 55 with 5 (10 years if less than 10 years of service as of July 21, 2014) or more years of service.

A Fire member is eligible for early retirement after 20 years of service or after attaining age 50 with 10 years of service if eligible for early retirement by July 21, 2014.

These rates were first used for the October 1, 2002 valuation.

**Administrative Expenses.** Administrative expenses are projected to continue at the same percent-of-payroll as experienced during the preceding fiscal year.

**Investment Expenses.** Investment expenses are offset against gross investment income.

**Active Member Group Size.** The valuation was based on a constant active member group size. This is unchanged from previous valuations.

**Vested members** who terminate with a benefit worth less than 100% of their own accumulated contributions were assumed to forfeit their vested benefit.

**Compensation** reported for the actuarial valuation includes all amounts included in the final average compensation for benefit purposes.

# Summary of Assumptions Used September 30, 2018

## Pensions in an Inflationary Environment

### Value of \$1,000/month Retirement Benefit to an Individual Who Retires at Age 52 in an Environment of 2.50% Inflation

<u>Age</u>	<u>Value</u>
52	\$1,000
53	976
54	952
55	929
60	820
65	724
70	640
75	566
80	500
85	442

The life expectancy of a 55 year old male retiree is age 84. The life expectancy for a 55 year old female retiree is age 88. Half of the people will outlive their life expectancy. The effects of even moderate amounts of inflation can be significant for those who live to an advanced age.

## Summary of Assumptions Used

### Miscellaneous and Technical Assumptions

**Marriage Assumption.** 100% of males and 100% of females are assumed to be married for purposes of death-in-service benefits.

**Pay Increase Timing.** Beginning of (Fiscal) year. This is equivalent to assuming that reported pays represent amounts paid to members during the year ended on the valuation date.

**Decrement Timing.** Decrements of all types are assumed to occur mid-year.

**Eligibility Testing.** Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.

**Benefit Service.** Exact fractional service is used to determine the amount of benefit payable.

**Decrement Relativity.** Decrement rates are used without adjustment for multiple decrement table effects.

**Decrement Operation.** Disability and mortality decrements do not operate during the first 5 years of service. Disability and withdrawal do not operate during retirement eligibility.

**Normal Form of Benefit.** The normal form of benefit is a benefit payable for the life of the retired member with the first 10 years guaranteed. Optional benefit forms are available on an actuarial equivalent basis.

**Loads.** Pay was increased by 5% to reflect retroactive pay increases and lump sum amounts due to collective bargaining.

**Incidence of Contributions.** Contributions are assumed to be received continuously throughout the year based upon the computed percent-of-payroll shown in this report, and the actual payroll payable at the time contributions are made. New entrant normal cost contributions are applied to the funding of new entrant benefits.

## 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 future benefit payments and the actuarial present value of future normal costs. Also referred to as "accrued liability" or "past service liability."

**Actuarial Assumptions.** Estimates of expected future experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and salary increases. Decrement estimates (rates of mortality, disability, turnover and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic estimates (salary increases and investment income) consist of the underlying rates 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 benefit payments" between future normal costs and actuarial accrued liabilities. Sometimes referred to as the "actuarial valuation cost method."

**Actuarial Equivalent.** A single amount or series of amounts of equal actuarial present value to another single amount or series of amounts, computed on the basis of appropriate actuarial assumptions.

**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. Also referred to as "present value."

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

**Experience Gain (Loss).** The difference between actual actuarial costs and assumed actuarial costs -- during the period between two valuation dates.

**Funding Value of Assets.** Also referred to as actuarial value of assets, smoothed market value of assets, or valuation assets.

Valuation assets recognize assumed investment return fully each year. Differences between actual and assumed investment return are phased-in over a closed 4-year period. During periods when investment performance exceeds the assumed rate, valuation assets will tend to be less than market value. During periods when investment performance is less than the assumed rate, valuation assets will tend to be greater than market value. If assumed rates are exactly realized for 3 consecutive years, valuation assets will become equal to market value.

**Normal Cost.** The actuarial cost allocated to the current year by the actuarial cost method. Sometimes referred to as "current service cost."

## Definitions of Technical Terms

**Pension Benefit Obligation.** A standardized disclosure measure of the present value of pension benefits, adjusted for the effects of projected salary increases, estimated to be payable in the future as a result of employee service to date. The PBO is independent of the actuarial funding method used to determine contributions.

**Unfunded Actuarial Accrued Liability.** The difference between Actuarial Accrued Liability and the funding value of system assets. Sometimes referred to as "unfunded past service liability," "unfunded accrued liability" or "unfunded supplemental present value."

Most retirement systems have Unfunded Actuarial Accrued Liability. An amount arises each time new benefits are added and each time an experience loss occurs.

The existence of Unfunded Actuarial Accrued Liability is not in itself bad, any more than a mortgage on a house is bad. Unfunded Actuarial Accrued Liability does not represent a debt that is payable today. What is important is the ability to control the amount of Unfunded Actuarial Accrued Liability and the trend in the amount (after due allowance for devaluation of the dollar).

## SECTION D

---

### ADDITIONAL DISCLOSURE INFORMATION

**GASB Statements No. 67 and No. 68 are the accounting standards which replaced GASB Statements No. 25 and No. 27. GASB Statement No. 67 is first effective for fiscal year 2014 and GASB Statement No. 68 is first effective for fiscal year 2015. A separate GASB Statements No. 67 and No. 68 report has been issued outside of this report. This section contains historical GASB Statements No. 25 and No. 27 reporting information for prior fiscal years and illustrative information for fiscal year 2015 and after.**

## Contributions Required and Contributions Made

The City's funding policy provides for periodic employer contributions at actuarially determined rates that, expressed as percentages of annual covered payroll, are designed to accumulate sufficient assets to pay benefits when due. The normal cost and Actuarial Accrued Liability (AAL) are determined using an entry-age actuarial funding method. Unfunded Actuarial Accrued Liability (UAAL) is being amortized as a level percent-of-payroll over periods of 2 to 25 years.

During the year ended September 30, 2018 contributions totaling \$769,767 -- \$608,384 employer and \$161,383 employee -- were made in accordance with contribution requirements determined by an actuarial valuation of the plan as of October 1, 2016. The total employer contributions consisted of \$229,103 for normal cost and administrative expenses and \$379,281 for amortization of the UAAL and \$0 for additional premium tax revenue. Employer contributions represented 28.3% of covered payroll.

Significant actuarial assumptions used to compute contribution requirements were the same as those used to compute the standardized measure of the AAL.

### Computed Employer Contribution Comparative Schedule

Fiscal Year	Valuation Beginning October 1	Valuation Date	Contribution Rates As Percents of Valuation Payroll	Valuation Payroll	Dollar Contribution For Fiscal Year	
					Computed	Actual
2009		10/01/2008	18.15	\$ 1,927,966	\$ 373,810	\$423,928
2010		10/01/2009 *	23.67	1,984,765	501,859	533,544
2011		10/01/2010	25.83	2,078,655	573,563	573,563
2012		10/01/2011	28.25	2,120,109	639,810	639,810
2013		10/01/2012 *	18.50	2,065,908	408,279	457,932
2014		10/01/2013 *	18.78	1,836,131	368,361	389,997
2015		10/01/2014 *	21.15	1,867,968	422,041	422,041
2016		10/01/2015 *	25.76	1,848,443	501,375	501,375
2017		10/01/2016 *	28.57	2,052,021	608,384	608,384
2018		10/01/2017 *	29.32	2,161,712	657,730	
<b>2019</b>		<b>10/01/2018 *</b>	<b>33.50</b>	<b>2,153,226</b>	<b>748,549</b>	

\* After changes in benefit provisions and/or actuarial assumptions.

## Actuarial Accrued Liability

The Actuarial Accrued Liability (AAL) is a measure intended to help users assess (i) a pension fund's funded status on a going-concern basis, and (ii) progress being made toward accumulating the assets needed to pay benefits as due. Allocation of the actuarial present value of projected benefits between past and future service was based on service using the individual entry-age actuarial cost method. Assumptions, including projected pay increases, were the same as used to determine the Fund's level percent-of-payroll annual required contribution between entry-age and assumed exit age. Entry-age was established by subtracting credited service from current age on the valuation date.

The preceding methods comply with the financial reporting standards established by the Governmental Accounting Standards Board (GASB).

The entry age AAL was determined as part of an actuarial valuation of the plan as of October 1, 2018. Significant actuarial assumptions used in determining the entry age AAL include (a) a rate of return on the investment of present and future assets of 7.75% per year compounded annually, (b) projected salary increases of 2.50% per year compounded annually, 2.50% attributable to inflation and 0.00% attributable to other causes, (c) additional projected salary increases of 3.8% to 0.0% per year, depending on age, attributable to seniority/merit, and (d) the assumption that benefits will not increase after retirement.

As of October 1, 2018, the Unfunded Actuarial Accrued Liability (UAAL) was \$3,860,159 determined as follows:

Actuarial Accrued Liability:	
Active participants (24 vested and 6 non-vested)	\$ 9,230,496
Retired participants and beneficiaries currently receiving benefits (24 vested)	7,629,857
Vested terminated participants not yet receiving benefits (0 vested)	0
Extra Benefit Reserve	27,608
DROP Reserve	0
Total Actuarial Accrued Liability	<u>16,887,961</u>
Actuarial Value of Assets (market value was \$13,344,201)	<u>13,027,802</u>
Unfunded Actuarial Accrued Liability	\$ 3,860,159

During the year ended September 30, 2018 the Plan experienced a net change of \$1,140,080 in the AAL, of which \$300,556 was due to changes in actuarial assumptions. There were no changes in benefit provisions or methods.

## Supplementary Information Schedule of Funding Progress

Actuarial Valuation Date October 1	Actuarial Value of Assets# (a)	Actuarial Liability (AAL) Entry Age (b)	Unfunded AAL (b)-(a)	Funded Ratio (a)/(b)	Active Participant Covered Payroll (c)	Unfunded AAL as a Percentage of Active Member Covered Payroll ((b-a)/c)
1998	\$43,678	\$39,897	\$ (3,781)	109.5 %	\$10,536	(35.9) %
1999 @	7,324	7,294	(30)	100.4	1,318	(2.3)
2000 *	8,055	8,011	(44)	100.6	1,408	(3.2)
2001	8,257	8,467	210	97.5	1,174	17.9
2002	8,242	9,001	759	91.6	1,196	63.5
2003	8,049	8,816	767	91.3	1,345	57.0
2004	7,549	9,058	1,509	83.3	1,468	102.8
2005	7,483	9,707	2,224	77.1	1,651	134.7
2006	7,502	9,662	2,160	77.6	1,768	122.2
2007 *	8,044	10,099	2,055	79.7	1,726	119.1
2008 *	8,366	10,726	2,360	78.0	1,928	122.4
2009 *	8,468	11,472	3,004	73.8	1,985	151.4
2010	8,434	11,987	3,553	70.4	2,079	170.9
2011	8,363	12,512	4,149	66.8	2,120	195.7
2012	8,888	12,779	3,891	69.6	2,066	188.3
2013	9,701	13,271	3,570	73.1	1,836	194.4
2014 *	10,438	12,223	1,785	85.4	1,868	95.6
2015 *	11,135	13,520	2,385	82.4	1,848	129.0
2016 *	11,526	14,796	3,270	77.9	2,052	159.4
2017 *	12,223	15,748	3,525	77.6	2,162	163.1
<b>2018 *</b>	<b>13,028</b>	<b>16,888</b>	<b>3,860</b>	<b>77.1</b>	<b>2,153</b>	<b>179.3</b>

*Dollar amounts are in thousands.*

\* After changes in benefits and/or actuarial assumptions and/or actuarial cost methods.

# The Actuarial Value of Assets is four-year smoothed market value.

@ Prior to 1999 valuation, results include General, Police and Fire.

Analysis of the dollar amounts of Actuarial Value of Assets (AVA), Actuarial Accrued Liability (AAL), or Unfunded Actuarial Accrued Liability (UAAL) in isolation can be misleading. Expressing the AVA as a percentage of the AAL provides one indication of the System's funded status on a going-concern basis. Analysis of this percentage over time indicates whether the System is becoming financially stronger or weaker. Generally, the greater this percentage the stronger the plan. The UAAL and annual covered payroll are both affected by inflation. Expressing the UAAL as a percentage of covered payroll approximately adjusts for the effects of inflation and aids analysis of the progress being made in accumulating sufficient assets to pay benefits when due. Generally, the smaller this percentage the stronger the plan.

## **SECTION E**

---

### **SUMMARY OF VALUATION RESULTS IN STATE FORMAT**

## Summary of Valuation Results in State Format (\$ amounts in thousands)

	October 1, 2018		October 1, 2017
	After	Before	
(a) Participant Data			
(i) Active members - number	30	30	30
- annual payroll	\$ 2,153	\$ 2,153	\$ 2,162
(ii) Retired members & beneficiaries (excl. disability)			
- number	20	20	19
- annualized benefit payroll	636	636	612
(iii) Disabled members & beneficiaries			
- number	4	4	4
- annualized benefit payroll	136	136	136
(iv) Terminated vested members			
- number	0	0	0
- annualized deferred benefit payroll	0	0	0
(b) Assets			
(i) Actuarial value for funding	13,028	13,028	12,223
(ii) Market value	13,344	13,344	12,312
(c) Actuarial Liability			
(i) Actuarial present value of active member benefits:			
service retirement	9,275	9,032	8,629
termination benefits - pension	1,110	1,072	1,104
disability retirement	854	835	863
survivor benefits (pre-retirement)	261	254	265
termination benefits - refunds	38	37	38
extra benefit reserve	28	28	28
Total	11,566	11,258	10,927
(ii) Actuarial present value of terminated vested member benefits	0	0	0
(iii) Actuarial present value of retired member benefits:			
service retirement & survivors	6,514	6,435	6,017
DROP reserve	0	0	0
disability retirement & survivors	1,116	1,105	1,128
Total	7,630	7,540	7,145
(iv) Total actuarial present value of future benefit payments	19,196	18,798	18,072
(v) Payables	0	0	0
(vi) Actuarial accrued liability	16,888	16,587	15,748
(vii) Unfunded actuarial accrued liability <sup>(1)</sup>	\$ 3,860	\$ 3,560	\$ 3,524

(1) Please refer to page A-13 for requested detail.

## Summary of Valuation Results in State Format (\$ amounts in thousands)

	October 1, 2018		October 1, 2017
	After	Before	
(d) Actuarial Present Value of Accrued Benefits (calculated in accordance with FASB Statement No. 35)			
(i) Vested accrued benefits			
Retired members and beneficiaries	\$ 7,630	\$ 7,540	\$ 7,145
Terminated members	0	0	0
Active members (includes non-forfeitable accum. member contributions of \$2,440 for 2018 and \$2,295 for 2017)	6,821	6,663	6,193
Total	14,451	14,203	13,338
(ii) Non-vested accrued benefits	94	88	81
(iii) Total actuarial p.v. of accrued benefits	14,545	14,292	13,419
(iv) Actuarial p.v. of accrued benefits at begin. of year	13,419	13,419	12,718
(v) Changes attributable to:			
Amendments	0	0	0
Assumption change	253	0	46
Operation of decrements	1,647	1,647	1,405
Benefit payments	(774)	(774)	(750)
Other	none	none	none
(vi) Net change	1,126	873	701
(vii) Actuarial p.v. of accr. benefits at end of year	14,545	14,292	13,419
(e) Plan costs for fiscal year beginning October 1, 2019 and October 1, 2018 (EANC)			
(i) Normal costs			
Service pensions	9.45%	9.09%	9.05%
Disability pensions	1.94%	1.90%	1.89%
Survivor pensions (pre-retirement)	0.53%	0.52%	0.52%
Deferred service pensions	3.00%	2.87%	2.89%
Refunds of member contributions	0.95%	0.95%	0.94%
Total normal cost	15.87%	15.33%	15.29%
(ii) Payment to amortize unf'd. act. accr. liab.	20.48%	19.67%	18.46%
(iii) FS112.64(5) Compliance	1.58%	1.43%	0.22%
(iv) Administrative expenses	3.52%	3.52%	3.30%
(v) Amount to be paid by members	7.95%	7.95%	7.95%
(vi) Expected plan sponsor/Chapter 175 contribution	33.50%	32.00%	29.32%
- dollars	\$ 749	\$ 715	\$ 658

## Summary of Valuation Results in State Format (\$ amounts in thousands)

		<u>October 1, 2018</u>		<u>October 1, 2017</u>
		<u>After</u>	<u>Before</u>	
(f)	Past Contributions (fiscal year ending 9/30/2018 & 2017)			
	(i) Required minimum:			
	Plan sponsor / Chapter 175 monies	\$ 608	\$ 608	\$ 501
	Members	169	169	155
	Total	<u>777</u>	<u>777</u>	<u>656</u>
	(ii) Actual:			
	Plan sponsor / Chapter 175 monies	608	608	501
	Members	161	161	169
	Total	<u>769</u>	<u>769</u>	<u>670</u>
(g)	Net Experience Gain (Loss)	(151)	(151)	270
(h)	Other Disclosures			
	(i) Present value of active member future salaries			
	from attained age	\$15,000	\$14,885	\$15,601
	from entry age		not applicable to individual EANC method	
	(ii) Present value of active member future contribs.			
	from attained age	\$ 1,192	\$ 1,183	\$ 1,240
	from entry age		not applicable to individual EANC method	

## Reconciliation of Membership for the Plan Year Ended September 30, 2018

	Active Members	Vested Terminated Members	Service Retired	Disability Retired	All Beneficiaries
<b>No. at Start of Year</b>	<b>30</b>	<b>0</b>	<b>16</b>	<b>4</b>	<b>3</b>
Increase (Decrease) From					
Service Retirement					
DROP Retirement					
Disability Retirement					
Deaths	(1)		(2)		3
Other Pension Terminations					
Vested Terminations					
Non-Vested Terminations	(1)				
New Entrants/Rehires	2				
<b>No. at End of Year</b>	<b>30</b>	<b>0</b>	<b>14</b>	<b>4</b>	<b>6</b>