City of Jacksonville Corrections Officers Retirement Plan

Actuarial Valuation and Review as of October 1, 2018

This report has been prepared at the request of the Board of Trustees to assist in administering the Plan. This valuation report may not otherwise be copied or reproduced in any form without the consent of the Board of Trustees and may only be provided to other parties in its entirety, unless expressly authorized by Segal. The measurements shown in this actuarial valuation may not be applicable for other purposes.

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April 10, 2019

Board of Trustees
City of Jacksonville Corrections Officers Retirement Plan
117 West Duval Street, Suite 330
Jacksonville, FL 32202

Dear Board Members:

I am pleased to submit this Actuarial Valuation and Review as of October 1, 2018. The census information on which our calculations were based was prepared by the Retirement System Administrative Office and the financial information was provided by the City's Finance Department. That assistance is gratefully acknowledged.

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.

The actuarial calculations were directed under the supervision of Jeffrey S. Williams. I am a member of the American Academy of Actuaries and I meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein.

I look forward to reviewing this report at your next meeting and to answering any questions.

Sincerely,

Segal Consulting, a Member of The Segal Group, Inc.

By: Jeffrey S. Williams

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Vice President and Consulting Actuary
Enrolled Actuary No. 17-7009

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City of Jacksonville Corrections Officers Retirement Plan Actuarial Valuation and Review as of October 1, 2018

Section 1: Actuarial Valuation Summary

Purpose and Basis

This report was prepared by Segal Consulting to present a valuation of the Plan as of October 1, 2018. The valuation was performed to determine whether the assets and contributions are sufficient to provide the prescribed benefits. The measurements shown in this actuarial valuation may not be applicable for other purposes. In particular, the measures herein are not necessarily appropriate for assessing the sufficiency of Plan assets to cover the estimated cost of settling the Plan's benefit obligations. 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; and changes in plan provisions or applicable law.

The contribution requirements presented in this report are based on:

- The benefit provisions of the Pension Plan, as administered by the Board;
- The characteristics of covered active participants, inactive vested participants, and retired participants and beneficiaries as of September 30, 2018, provided by the Retirement System Administrative Office;
- The assets of the Plan as of September 30, 2018, provided by the City's Finance Department;
- Economic assumptions regarding future salary increases and investment earnings;
- Other actuarial assumptions regarding employee terminations, retirement, death, etc. and
- The funding policy adopted by the Board, subject to the requirements of Part VII, Chapter 112, Florida Statutes.

Highlights

1. Segal Consulting (“Segal”) strongly recommends an actuarial funding method that targets 100% funding of the actuarial accrued liability. Generally, this implies payments that are ultimately at least enough to cover normal cost, interest on the unfunded actuarial accrued liability and the principal balance.
2. The City’s minimum required contribution calculated in the October 1, 2018 actuarial valuation is for the plan year beginning October 1, 2019.
3. Actual City contributions made during the fiscal year ending September 30, 2018 were $13,973,000, 100% of the City’s minimum required contribution for fiscal 2018.
4. The funded ratio (the ratio of the actuarial value of assets to actuarial accrued liability) is 49.70%, compared to the prior year funded ratio of 50.81%. This ratio is one measure of funding status, and its history is a measure of funding progress. Using the market value of assets, the funded ratio is 52.00%, compared to 52.30% as of the prior valuation date. These measurements are not necessarily appropriate for assessing the sufficiency of Plan assets to cover the estimated cost of settling the Plan’s benefit obligation or the need for or the amount of future contributions.
5. Actuarial Standard of Practice No. 4, Measuring Pension Obligations and Determining Pension Plan Costs or Contributions, states that an actuary preparing calculations of actuarially determined contributions should assess the material implications of the funding policy. This report includes two distinct contribution amounts, each with different implications.
    a. The **Florida Chapter 112 Determined Employer Contribution** is an amount consistent with a funding policy which seeks to stabilize the unfunded actuarial accrued liability (UAAL) as a percentage of total Corrections Officers Retirement Plan (CORP) payroll, including Defined Contribution participants, where UAAL is measured relative to assets currently available to make benefit payments. Under this policy, assuming that all assumptions are met in aggregate, the UAAL is expected to be reduced to zero over a period of 30 years after reflecting an amortization period reset. Over the short term, this contribution policy would be expected to keep the UAAL roughly level over the next few years, primarily making payments on interest, and begin paying down the UAAL after that point.
    b. The **City’s minimum required contribution**, which is the Chapter 112 contribution adjusted to comply with state law, reduced by amortization of discounted allocated surtax revenue, is an amount consistent with a funding policy which seeks to stabilize the contribution requirement as a percentage of total CORP payroll, including Corrections Officers Defined Contribution Plan participants, relative to an anticipated increase in contribution income set to begin in the fiscal year beginning October 1, 2030. Under this policy, assuming that all assumptions are met in aggregate, the UAAL is expected to be reduced to zero by October 1, 2060, after all of the surtax revenue allocated to the plan is collected and contributed. Over the short term, this contribution policy is expected to lead to an increase in the UAAL, prior to the revenue stream commencing and paying it down.

Use of this contribution policy has been authorized by the Florida State Legislature and Jacksonville City Council.

6. The City's minimum required contribution (the amount which will be contributed) for fiscal 2020 is $15,042,623, an increase of $544,835 from the City's minimum required contribution for fiscal 2019. The contribution as a percentage of projected payroll increased from 51.98% of projected payroll to 52.75% of projected payroll.
7. The unfunded actuarial accrued liability (UAAL) is $209,583,347, which is an increase of $23,943,848 since the prior valuation.
8. The actuarial loss from investment and other experience was $18,535, less than 0.01% of actuarial accrued liability.
   - The actuarial gain from investment experience was $1,528,436, or 0.38% of actuarial accrued liability.
   - The net experience loss from sources other than investment experience was $1,546,971, or 0.39% of the actuarial accrued liability.
9. The rate of return on the market value of assets was 9.76% for the October 1, 2017 to September 30, 2018 plan year. The return on the actuarial value of assets was 8.00% for the same period due to the recognition of prior years' investment gains and losses. This resulted in an actuarial gain when measured against the assumed rate of return of 7.20%.
10. Following the publication of the experience study for the five-year period ended September 30, 2017, the following actuarial assumptions and methods were approved by the Board and changed with this valuation:
    - The discount rate was lowered from 7.20% to 7.00%.
    - The inflation rate was reduced from 2.75% to 2.50%.
    - Withdrawal rates were increased for participants with fewer than eight years of service.
    - Disability rates were changed from sex-distinct rates to unisex rates, blending 75% of the previous male rates with 25% of the previous female rates.
    - Retirement rates for active participants with between 21 and 23 years of service were increased from 30% to 40% and set to 100% at 28 years of service.
    - The percent married assumption was increased from 50% to 60%.
    - The salary scale rates were increased for participants with fewer than two years of service and slightly reduced for participants with a larger amount of service.
    - The funding method was changed from Replacement Entry Age to Traditional Entry Age, with normal cost and expected employee contributions adjusted to reflect the closed nature of the Plan.
    - The amortization period for newly created bases was reduced from 30 to 29 years for the plan year ended 2018, and will be further reduced by one year for new bases in each successive year beyond 2018.

    As a result of these assumption changes, the employer normal cost decreased by $750,586 and the actuarial accrued liability increased by $19,111,594. The total impact was an increase in the City's minimum required contribution of $120,725, or 0.42% of projected payroll.
11. There were no changes in plan provisions reflected in this valuation.

12. The City changed the surtax allocation percentage from the prior valuation to the current valuation. In the 2017 valuation, CORP's allocation percentage was 5.60%; in the 2018 valuation, the allocation percentage has been increased to 5.70%. This change was directed by the City based on its updated calculation of the Corrections Officers Retirement Plan's share of the City's unfunded liabilities. The change in the surtax allocation percentage caused the City's required contribution to decrease by $95,367, or 0.33% of projected payroll.
13. The City is solely responsible for the assumption as to what percentage the surtax revenue will grow and Segal relies on the City for this assumption. This rate was set at 4.25% by the City for the projection period October 1, 2018 through December 31, 2060, and will be recalculated by the City every year and adopted by the City Council. Segal will ask the City each year to provide actual surtax revenue for the preceding fiscal year and an assumption as to future growth. The difference in actual and projected surtax revenue each year will be amortized as a gain or loss over 30 years. If surtax revenue grows more slowly or more quickly than expected, contribution requirements will increase or decrease accordingly.
14. The present value of the projected surtax revenue was determined and used in determination of the City's required contribution as follows:
    a. Actual 2018 surtax revenue was projected to increase by 4.25% each year thereafter through 2060.
    b. A share of 5.70% of the projected revenue for October 1, 2031 through December 31, 2060 was allocated to CORP.
    c. The revenue allocated to CORP was discounted at the valuation discount rate of 7.00% to October 1, 2018.
    d. The present value of projected surtax revenue as of October 1, 2018 allocated to CORP is $80,631,144.
    e. The present value amount of $80,631,144 was then amortized over a 30-year initial period (Section 3, Exhibit F), with subsequent charges amortized over new periods.
    f. After the amortized value amount was adjusted for the timing of contributions and projected to October 1, 2019, this amount was used as an offset to the Florida Chapter 112 Determined Employer Contribution to determine the City's minimum required contribution for fiscal 2020.
15. The present value of projected surtax revenue does not decrease the UAAL. The amortized value of the projected surtax revenue is used as an offset to the Chapter 112 contribution.
16. This report constitutes an actuarial valuation for the purpose of determining the actuarially determined contribution under the Plan's funding policy and measuring the progress of that funding policy. The Net Pension Liability (NPL) and Pension Expense under Governmental Accounting Standards Board (GASB) Statements No. 67 and No. 68, for inclusion in the plan and employer's financial statements as of September 30, 2019, will be provided separately.
17. GASB accounting does not permit any recognition of the allocated surtax revenue in determining the Net Pension Liability or Pension Expense. It is Segal's understanding that the City has discussed this issue with their external auditors and does not include any recognition of allocated surtax revenue in its audited financial statements.
18. This actuarial report as of October 1, 2018 is based on financial and demographic data as of that date. Changes subsequent to that date are not reflected and will affect future actuarial costs of the plan.

19. Since the actuarial valuation results are dependent on a given set of assumptions, there is a risk that emerging results may differ significantly as actual experience proves to be different from the assumptions.
20. The financial information received states all results rounded to the nearest thousand. The results in this valuation are shown to the nearest dollar. Therefore, occasionally rounded numbers are combined with unrounded ones.

Summary of Key Valuation Results

		2019	2018	2017
Contributions for fiscal year beginning October 1:	• Florida Chapter 112 determined employer contribution	$20,111,161	$19,141,501	$18,643,233
	• Less amortized value of discounted value of projected surtax revenue	-5,068,538	-4,643,713	-4,670,128
	• City's minimum required contribution*	15,042,623	14,497,788	13,973,105
	• Actual employer contributions	--	--	13,973,000
Actuarial accrued liability for plan year beginning October 1:	• Retired participants and beneficiaries		$280,451,383	$267,453,150
	• Inactive vested participants		2,911,360	417,773
	• Active participants		133,310,485	109,509,159
	• Total		416,673,228	377,380,082
	• Normal cost including administrative expenses for plan year beginning October 1		7,487,444	8,236,141
Assets for plan year beginning October 1:	• Market value of assets (MVA)		$216,667,000	$197,383,000
	• Actuarial value of assets (AVA)		207,089,881	191,740,583
	• Actuarial value of assets as a percentage of market value of assets		95.58%	97.14%
Funded status for plan year beginning October 1:	• Unfunded actuarial accrued liability on market value of assets		$200,006,228	$179,997,082
	• Funded percentage on MVA basis		52.00%	52.30%
	• Unfunded actuarial accrued liability on actuarial value of assets		$209,583,347	$185,639,499
	• Funded percentage on AVA basis		49.70%	50.81%
Key assumptions:	• Net investment return		7.00%	7.20%
	• Inflation rate		2.50%	2.75%
	• Payroll growth for amortization purposes		1.25%	1.25%
Demographic data for plan year beginning October 1	• Number of retired participants and beneficiaries		369	368
	• Number of inactive vested participants		7	4
	• Number of active participants		587	638
	• Covered payroll		$28,164,021	$27,548,015
	• Average payroll		47,980	43,179
	• Projected payroll for next fiscal year		28,516,071	27,892,365

*Pursuant to State Law Chapter 2016-146 and City of Jacksonville Ordinances 2017-257-E and 2017-258-E

Important Information About Actuarial Valuations

An actuarial valuation is a budgeting tool with respect to the financing of future projected obligations of a pension plan. It is an estimated forecast – the actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan.

In order to prepare a valuation, Segal Consulting ("Segal") relies on a number of input items. These include:

Plan of benefits	Plan provisions define the rules that will be used to determine benefit payments, and those rules, or the interpretation of them, may change over time. Even where they appear precise, outside factors may change how they operate. It is important to keep Segal informed with respect to plan provisions and administrative procedures, and to review the plan summary included in our report to confirm that Segal has correctly interpreted the plan of benefits.
Participant data	An actuarial valuation for a plan is based on data provided to the actuary by the Retirement System Administrative Office. Segal does not audit such data for completeness or accuracy, other than reviewing it for obvious inconsistencies compared to prior data and other information that appears unreasonable. It is important for Segal to receive the best possible data and to be informed about any known incomplete or inaccurate data.
Assets	The valuation is based on the market value of assets as of the valuation date, as provided by the City's Finance Department. The System uses an "actuarial value of assets" that differs from market value to gradually reflect year-to-year changes in the market value of assets in determining the contribution requirements.
Actuarial assumptions	In preparing an actuarial valuation, Segal projects the benefits to be paid to existing plan participants for the rest of their lives and the lives of their beneficiaries. This projection requires actuarial assumptions as to the probability of death, disability, withdrawal, and retirement of each participant for each year. In addition, the benefits projected to be paid for each of those events in each future year reflect actuarial assumptions as to salary increases and cost-of-living adjustments. The projected benefits are then discounted to a present value, based on the assumed rate of return that is expected to be achieved on the plan's assets. There is a reasonable range for each assumption used in the projection and the results may vary materially based on which assumptions are selected. It is important for any user of an actuarial valuation to understand this concept. Actuarial assumptions are periodically reviewed to ensure that future valuations reflect emerging plan experience. While future changes in actuarial assumptions may have a significant impact on the reported results, this does not mean that the previous assumptions were unreasonable.

The user of Segal's actuarial valuation (or other actuarial calculations) should keep the following in mind:

- The actuarial valuation is prepared at the request of the Retirement Board. Segal is not responsible for the use or misuse of its report, particularly by any other party.
- An actuarial valuation is a measurement of the plan's assets and liabilities at a specific date. Accordingly, except where otherwise noted, Segal did not perform an analysis of the potential range of future financial measures. The actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan.
- Actuarial results in this report are not rounded, but that does not imply precision.
- If the Retirement Board is aware of any event or trend that was not considered in this valuation that may materially change the results of the valuation, Segal should be advised, so that we can evaluate it.
- Segal does not provide investment, legal, accounting, or tax advice. Segal's valuation is based on our understanding of applicable guidance in these areas and of the plan's provisions, but they may be subject to alternative interpretations. The Retirement Board should look to their other advisors for expertise in these areas.

As Segal Consulting has no discretionary authority with respect to the management or assets of the Plan, it is not a fiduciary in its capacity as actuaries and consultants with respect to the Plan.

Participant Data

The Actuarial Valuation and Review considers the number and demographic characteristics of covered participants, including active participants, inactive vested participants, retired participants and beneficiaries.

This section presents a summary of significant statistical data on these participant groups.

More detailed information for this valuation year and the preceding valuation can be found in *Section 3, Exhibits A, B,* and *C*.

PARTICIPANT POPULATION: 2009 – 2018

Year Ended September 30	Active Participants	Inactive Vested Participants*	Retired Participants and Beneficiaries**	Total Non-Actives	Ratio of Non-Actives to Actives
2009	545	1	136	137	0.25
2010	688	1	164	165	0.24
2011	675	1	199	200	0.30
2012	629	1	241	242	0.38
2013	631	1	274	275	0.44
2014	616	1	306	307	0.50
2015	651	1	328	329	0.51
2016	610	4	355	359	0.59
2017	638	4	368	372	0.58
2018	587	7	369	376	0.64

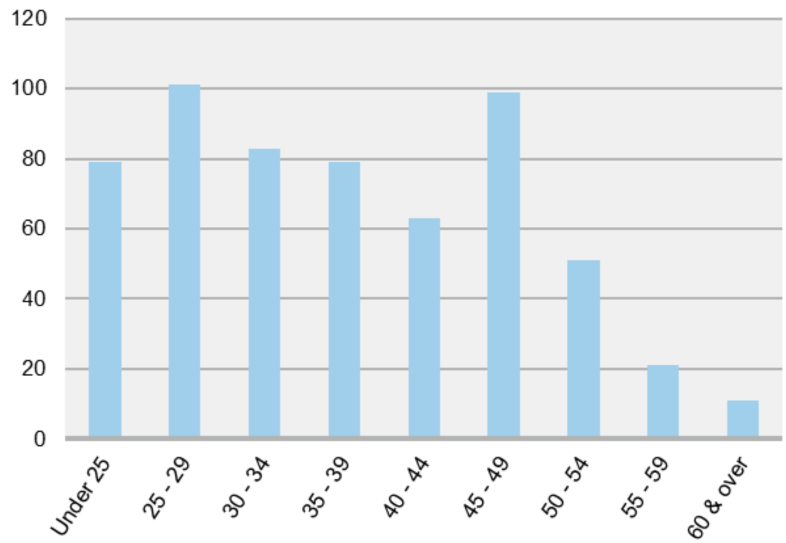
*Excludes terminated participants due a refund of employee contributions
**Includes DROP participants

Active Participants

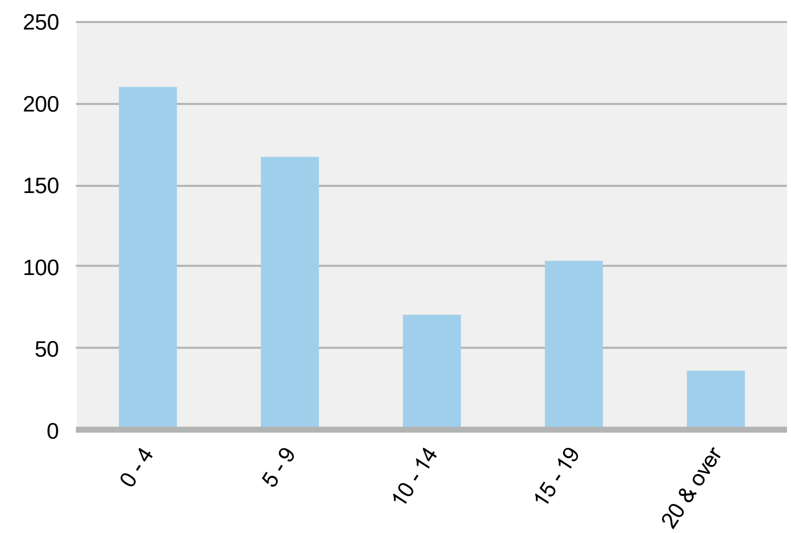
Plan costs are affected by the age, years of service and payroll of active participants. In this year's valuation, there were 587 active participants with an average age of 37.8, average years of service of 9.2 years and average payroll of $47,980. The 638 active participants in the prior valuation had an average age of 36.3, average service of 8.0 years and average payroll of $43,179.

Distribution of Active Participants as of September 30, 2018

ACTIVES BY AGE



ACTIVES BY YEARS OF SERVICE



Inactive Participants

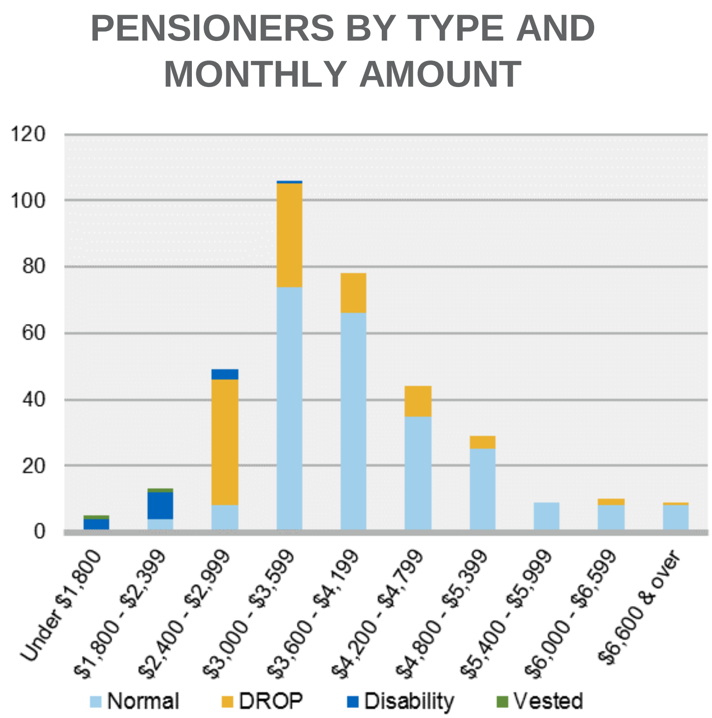
In this year's valuation, there were seven participants with a vested right to a deferred or immediate vested benefit.

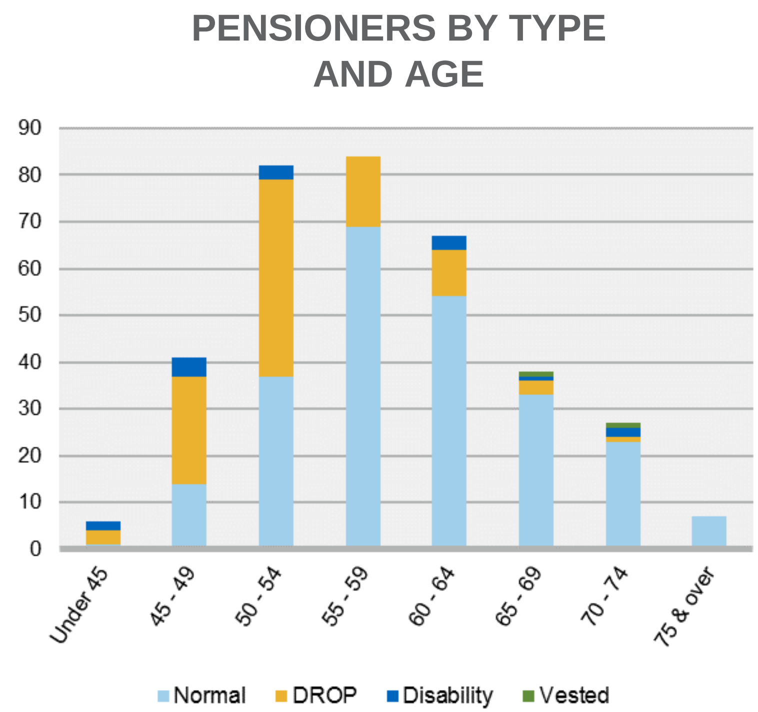
Retired Participants and Beneficiaries

As of September 30, 2018, 352 retired participants and 17 beneficiaries were receiving, or reserving for future receipt in the case of DROP retirees, total monthly benefits of $1,400,936. For comparison, in the previous valuation, there were 350 retired participants and 18 beneficiaries receiving monthly benefits of $1,370,397.

As of September 30, 2018, the average monthly benefit for retired participants is $3,797, compared to $3,724 in the previous valuation. The average age for retired participants is 58.2 in the current valuation, compared with 57.5 in the prior valuation.

Distribution of Pensioners as of September 30, 2018





Historical Plan Population

The chart below demonstrates the progression of the active population over the last nine years. The chart also shows the growth among the retired population over the same time period.

PARTICIPANT DATA STATISTICS: 2010 – 2018

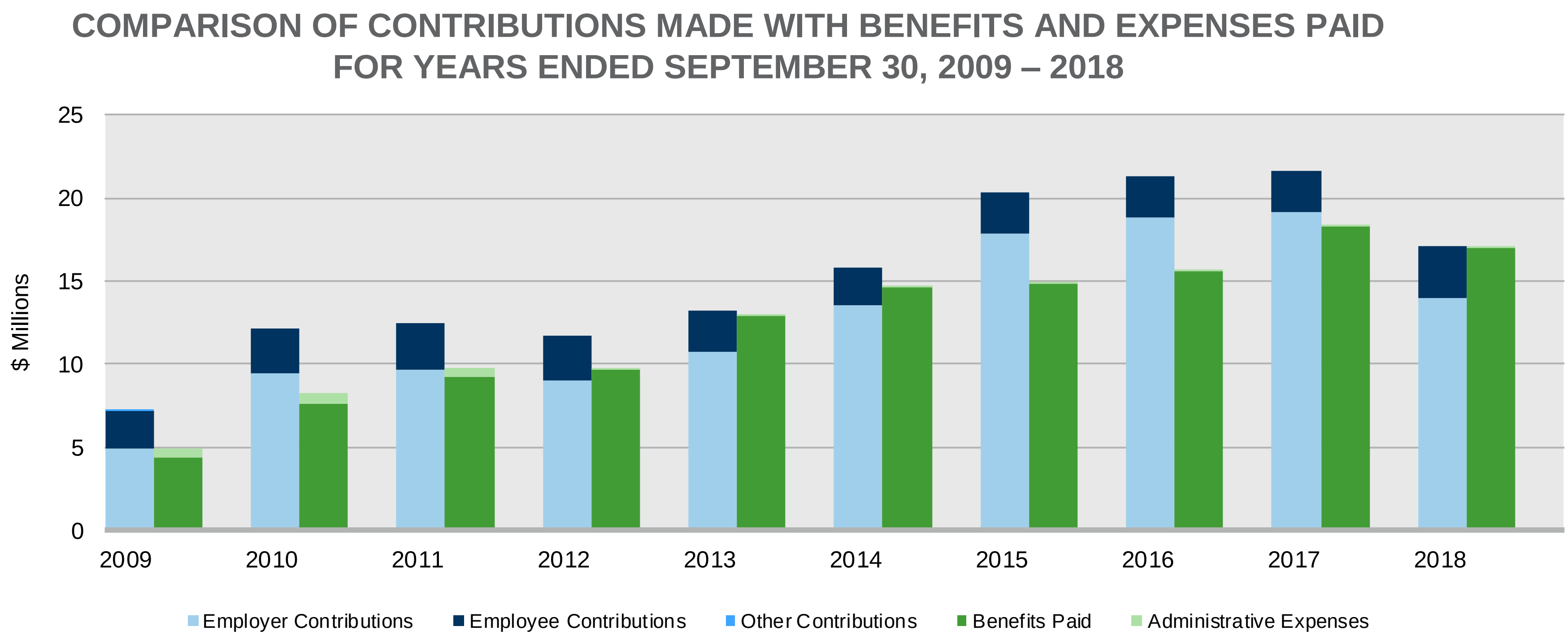
	Active Participants			Retired Participants and Beneficiaries*		
Year Ended September 30	Count	Average Age	Average Service	Count	Average Age	Average Monthly Amount
2010	688	38.3	8.6	164	54.8	3,354
2011	675	38.1	8.6	199	54.7	3,398
2012	629	38.3	8.8	241	55.4	3,359
2013	631	37.6	8.4	274	55.7	3,422
2014	616	37.4	8.3	306	56.0	3,532
2015	651	37.0	8.1	328	56.6	3,562
2016	610	37.1	8.3	355	57.1	3,655
2017	638	36.3	8.0	368	57.5	3,724
2018	587	37.8	9.2	369	58.2	3,797

*Includes DROP participants not yet in pay status

Financial Information

Retirement plan funding anticipates that, over the long term, both contributions (less administrative expenses) and investment earnings (less investment fees) will be needed to cover benefit payments. Retirement plan assets change as a result of the net impact of these income and expense components.

Additional financial information, including a summary of transactions for the valuation year, is presented in *Section 3*, *Exhibits D*, *E* and *F*.



It is desirable to have level and predictable plan costs from one year to the next. For this reason, the Board has approved an asset valuation method that gradually adjusts to market value. Under this valuation method, the full value of market fluctuations is not recognized in a single year and, as a result, the asset value and the plan costs are more stable. The amount of the adjustment to recognize market value is treated as income, which may be positive or negative. Realized and unrealized gains and losses are treated equally and, therefore, the sale of assets has no immediate effect on the actuarial value.

DETERMINATION OF ACTUARIAL VALUE OF ASSETS FOR YEAR ENDED SEPTEMBER 30, 2018

		Original Amount *	Percent Deferred	Unrecognized Amount**	
1.	Market value of assets, September 30, 2018				$216,667,000
2.	Calculation of unrecognized return				
(a)	Year ended September 30, 2018	$5,056,884	80%	$4,045,507	
(b)	Year ended September 30, 2017	14,240,149	60	8,544,090	
(c)	Year ended September 30, 2016	70,675	40	28,270	
(d)	Year ended September 30, 2015	-15,203,738	20	-3,040,748	
(e)	Year ended September 30, 2014	5,183,479	0	0	
(f)	Total unrecognized return				9,577,119
3.	Preliminary actuarial value: **(1) - (2f)**				$207,089,881
4.	Adjustment to be within 20% corridor				0
5.	Final actuarial value of assets as of September 30, 2018: **(3) + (4)**				207,089,881
6.	Actuarial value as a percentage of market value: **(5) ÷ (1)**				95.6%
7.	Amount deferred for future recognition: **(1) - (5)**				$9,577,119

*Total return minus expected return on a market value basis

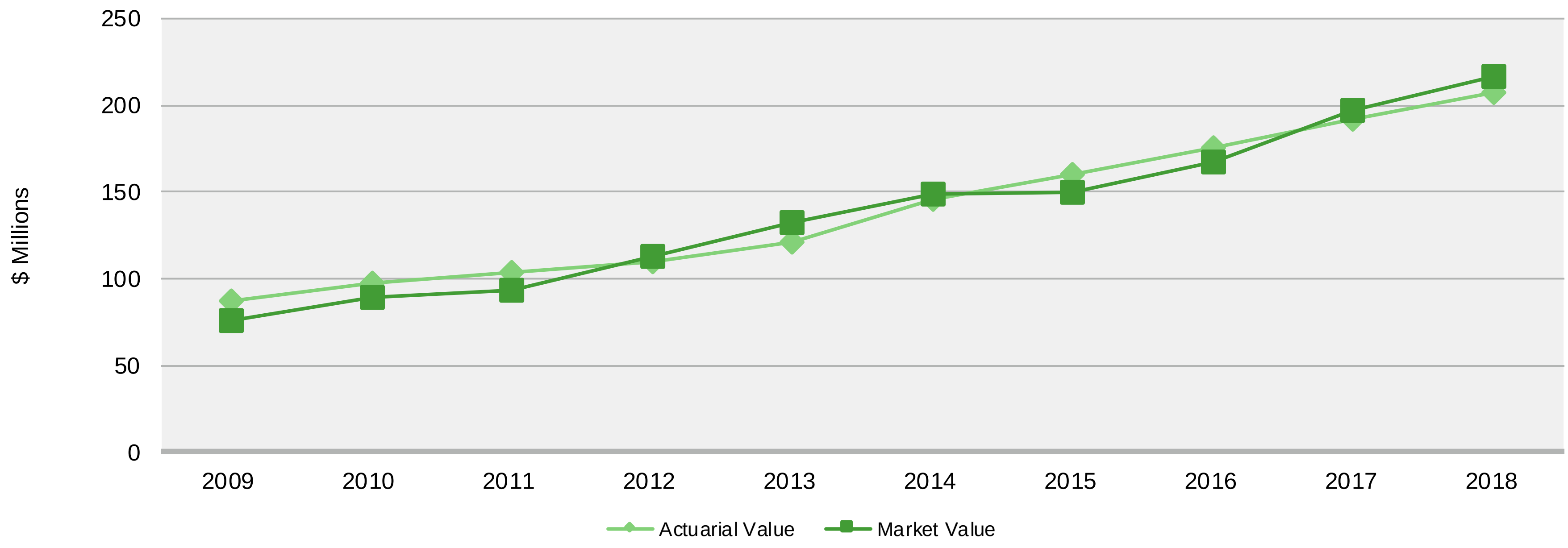
**Recognition at 20% per year over five years; effective October 1, 2014, the Plan accelerated the recognition of prior asset gain/loss bases by reflecting 72% of the asset

***Deferred return as of September 30, 2018 recognized in each of the next four years:

(a) Amount recognized on September 30, 2019	$832,794
(b) Amount recognized on September 30, 2020	3,873,542
(c) Amount recognized on September 30, 2021	3,859,407
(d) Amount recognized on September 30, 2022	1,011,377

Both the actuarial value and market value of assets are representations of the Plan's financial status. As investment gains and losses are gradually taken into account, the actuarial value of assets tracks the market value of assets. The actuarial asset value is significant because the Plan's liabilities are compared to these assets to determine what portion, if any, remains unfunded. Amortization of the unfunded actuarial accrued liability is an important element in determining the contribution requirement.

ACTUARIAL VALUE OF ASSETS VS. MARKET VALUE OF ASSETS AS OF SEPTEMBER 30, 2009 – 2018



Actuarial Experience

To calculate any actuarially determined contribution, assumptions are made about future events that affect the amount and timing of benefits to be paid and assets to be accumulated. Each year actual experience is measured against the assumptions. If overall experience is more favorable than anticipated (an actuarial gain), any contribution requirement will decrease from the previous year. On the other hand, any contribution requirement will increase if overall actuarial experience is less favorable than expected (an actuarial loss).

Taking account of experience gains or losses in one year without making a change in assumptions reflects the belief that the single year's experience was a short-term development and that, over the long term, experience will return to the original assumptions. For contribution requirements to remain stable, assumptions should approximate experience.

If assumptions are changed, the contribution requirement is adjusted to take into account a change in experience anticipated for all future years.

The total loss is $18,535, which includes $1,528,436 from investment gains and $1,546,971 in losses from all other sources. The net experience variation from individual sources other than investments was 0.4% of the actuarial accrued liability. A discussion of the major components of the actuarial experience is on the following pages.

ACTUARIAL EXPERIENCE FOR YEAR ENDED SEPTEMBER 30, 2018

1	Net gain from investments*	$1,528,436
2	Net loss from administrative expenses	-51,771
3	Net loss from other experience	-1,495,200
4	Net experience loss: 1 + 2 + 3	-$18,535

* Details on next page.

Investment Experience

A major component of projected asset growth is the assumed rate of return. The assumed return should represent the expected long-term rate of return, based on the Plan's investment policy. The rate of return on the market value of assets was 9.76% for the year ended September 30, 2018.

For valuation purposes, the assumed rate of return on the actuarial value of assets was 7.20% for the year ended September 30, 2018. The actual rate of return on an actuarial basis for the 2018 plan year was 8.00%. Since the actual return for the year was greater than the assumed return, the Plan experienced an actuarial gain during the year ended September 30, 2018 with regard to its investments.

INVESTMENT EXPERIENCE

		Year Ended September 30, 2018		Year Ended September 30, 2017	
		Market Value	Actuarial Value	Market Value	Actuarial Value
1	Net investment income	$19,269,000	$15,334,298	$26,747,000	$13,158,178
2	Average value of assets	197,390,500	191,748,083	169,011,500	176,957,905
3	Rate of return: 1 ÷ 2	9.76%	8.00%	15.83%	7.44%
4	Assumed rate of return	7.20%	7.20%	7.40%	7.40%
5	Expected investment income: 2 x 4	14,212,116	13,805,862	12,506,851	13,094,885
6	Actuarial gain/(loss): 1 – 5	$5,056,884	$1,528,436	$14,240,149	$63,293

Because actuarial planning is long term, it is useful to see how the assumed investment rate of return has followed actual experience over time. The chart below shows the rate of return on an actuarial basis compared to the actual market value investment return for the last 11 years, including averages over select time periods.

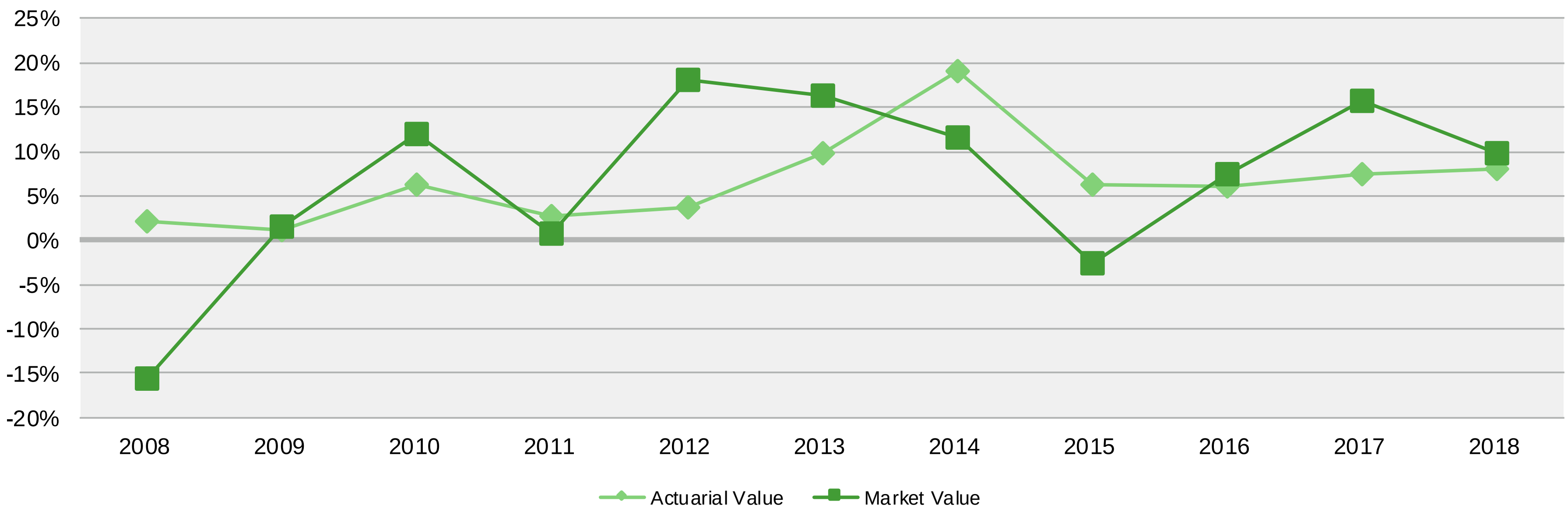
INVESTMENT RETURN – ACTUARIAL VALUE VS. MARKET VALUE: 2008 - 2018

	Actuarial Value Investment Return		Market Value Investment Return	
Year Ended September 30	Amount	Percent	Amount	Percent
2008	- -	2.14%	- -	-15.61%
2009	- -	1.23	- -	1.49
2010	$5,675,853	6.33	$9,391,000	12.03
2011	2,620,301	2.65	717,000	0.79
2012	3,890,663	3.73	17,166,000	18.14
2013	10,789,123	9.82	18,466,000	16.29
2014	23,230,602	19.12	15,468,000	11.66
2015	9,286,603	6.28	-3,849,000	-2.54
2016	9,803,158	6.02	11,548,000	7.55
2017	13,158,178	7.44	26,747,000	15.83
2018	15,334,298	8.00	19,269,000	9.76
Total	$93,788,779		$114,923,000	
Most recent five-year average return		8.84%		8.61%
Most recent nine-year average return		7.79%		9.73%

Note: Each year's yield is weighted by the average asset value in that year.

As described earlier in this section, the actuarial asset valuation method gradually recognizes fluctuations in the market value rate of return. The goal of this is to stabilize the actuarial rate of return and to produce more level pension plan costs.

MARKET AND ACTUARIAL RATES OF RETURN FOR YEARS ENDED SEPTEMBER 30, 2008 - 2018



Administrative Expenses

Administrative expenses for the year ended September 30, 2018 totaled $128,000 compared to the assumption of $75,000. This resulted in a loss of $51,771 for the year. Because the assumption is that expenses will equal the prior year's actual expenses, we have changed the assumption from $75,000 to $128,000 for the current year.

Other Experience

There are other differences between the expected and the actual experience that appear when the new valuation is compared with the projections from the previous valuation. These include:

- the extent of turnover among participants,
- retirement experience (earlier or later than projected),
- mortality (more or fewer deaths than projected),
- the number of disability retirements (more or fewer than projected), and
- salary increases (greater or smaller than projected).

The net loss from this other experience for the year ended September 30, 2018 amounted to $1,495,200, which is 0.4% of the actuarial accrued liability.

Changes in the Actuarial Accrued Liability

The actuarial accrued liability as of October 1, 2018 is $416,673,228, an increase of $39,293,146, or 10.4%, from the actuarial accrued liability as of the prior valuation date. The liability is expected to grow each year with normal cost and interest, and to decline due to benefit payments made. Additional fluctuations can occur due to actual experience that differs from expected (as discussed in the previous subsection).

Actuarial Assumptions and Methods

- Actuarial assumptions and methods were changed following the publication of the experience study for the five-year period ended September 30, 2017.
- As a result of these assumption changes, the employer normal cost decreased by 13.4% and the actuarial accrued liability increased by 4.8%.
- Details on actuarial assumptions and methods are in *Section 4, Exhibit I*.

Plan Provisions

- There were no changes in plan provisions since the prior valuation.
- A summary of plan provisions is in *Section 4, Exhibit II*.

Development of Unfunded Actuarial Accrued Liability

DEVELOPMENT FOR YEAR ENDED SEPTEMBER 30, 2018

1	Unfunded actuarial accrued liability at beginning of year		$185,639,499
2	Employer normal cost at beginning of year		5,481,340
3	Total contributions		-13,973,000
4	Interest		
	• For whole year on 1 + 2	$13,760,700	
	• For half year on 3	-455,321	
	Total interest		13,305,379
5	Expected unfunded actuarial accrued liability		$190,453,218
6	Changes due to:		
	• (Gain)/loss	18,535	
	• Assumptions and methods	19,111,594	
	• Plan provisions	0	
	Total changes		$19,130,129
7	Unfunded actuarial accrued liability at end of year		$209,583,347

Florida Chapter 112 Determined Employer Contribution and City's Minimum Required Contribution

The chart below shows the calculations of the Florida Chapter 112 determined employer contribution and the City's minimum required contribution pursuant to State Law Chapter 2016-146 and City of Jacksonville Ordinances 2017-257-E and 2017-258-E.

The contribution requirement as of October 1, 2018 are based on the data previously described, the actuarial assumptions and Plan provisions described in *Section 4*, including all changes affecting future costs adopted at the time of the actuarial valuation, actuarial gains and losses, and changes in the actuarial assumptions.

FLORIDA CHAPTER 112 DETERMINED CONTRIBUTION AND CITY'S MINIMUM REQUIRED CONTRIBUTION FOR YEAR BEGINNING OCTOBER 1

		2018		2017	
		Amount	% of Projected Payroll	Amount	% of Projected Payroll
1.	Total normal cost	$7,359,444	25.81%	$8,161,141	29.26%
2.	Administrative expenses	128,000	0.45%	75,000	0.27%
3.	Expected employee contributions	-2,615,684	-9.17%	-2,754,802	-9.88%
4.	Employer normal cost: (1) + (2) + (3)	4,871,760	17.08%	5,481,340	19.65%
5.	Actuarial accrued liability	416,673,228		377,380,082	
6.	Actuarial value of assets	207,089,881		191,740,583	
7.	Unfunded actuarial accrued liability: (5) - (6)	209,583,347		185,639,499	
8.	Payment on unfunded actuarial accrued liability	14,279,976	50.08%	12,728,760	45.64%
9.	Florida Chapter 112 determined employer contribution (4) + (8)[1]	20,111,161	70.53%	19,141,501	68.63%
10.	Amortized value of discounted value of projected surtax revenue[1, 2]	-5,068,538	-17.77%	-4,643,713	-16.65%
11.	City's minimum required contribution: (9) + (10)[2]	$15,042,623	52.75%	$14,497,788	51.98%
12.	Projected payroll	$28,516,071		$27,892,365	

[1]Adjusted for timing and projected to next fiscal year; contributions are assumed to be paid at the end of every month.

[2]Pursuant to State Law Chapter 2016-146 and City of Jacksonville Ordinances 2017-257-E and 2017-258-E

Reconciliation of City’s Minimum Required Contribution

The chart below details the changes in the City’s minimum required contribution from the prior valuation to the current year’s valuation.

RECONCILIATION OF CITY’S MINIMUM REQUIRED CONTRIBUTION FROM OCTOBER 1, 2018 TO OCTOBER 1, 2019

	Amount
City’s Minimum Required Contribution as of October 1, 2018	$14,497,788
• Effect of expected change in amortization payment due to payroll growth	109,201
• Effect of change in administrative expense assumption	55,710
• Effect of change in other actuarial assumptions and methods	123,307
• Effect of contribution deferral to budget year and balancing amortization bases for surtax credits	362,493
• Effect of gain on higher than projected fiscal year 2018 surtax	-102,396
• Effect of change in surtax allocation percentage	-97,305
• Effect of investment gain	-108,788
• Effect of other gains and losses on accrued liability	110,107
• Net effect of other changes, including composition and number of participants	92,506
Total change	$544,835
City’s Minimum Required Contribution as of October 1, 2019	$15,042,623

History of Employer Contributions

A history of the most recent years of contributions is shown below.

HISTORY OF EMPLOYER CONTRIBUTIONS: 2011 – 2020

Fiscal Year Ended September 30	City's Minimum Required Contribution	Actual Employer Contribution	Percentage Contributed
2011	$8,884,794	$9,711,000	109.30%
2012	11,860,912	9,066,000	76.44%
2013	12,884,770	10,742,000	83.37%
2014	14,884,963	13,522,000	90.84%
2015	17,618,896	17,832,000	101.21%
2016	18,863,935	18,864,000	100.00%
2017	19,155,820	19,162,000	100.03%
2018	13,973,105	13,973,000	100.00%
2019	14,497,788	- -	- -
2020	15,042,623	- -	- -

Risk

Since the actuarial valuation results are dependent on a given set of assumptions and data as of a specific date, there is a risk that emerging results may differ significantly as actual experience differs from the assumptions.

This report does not contain a detailed analysis of the potential range of future measurements, but does include a brief discussion of some risks that may affect the Plan. Upon request, a more detailed assessment of the risks can be provided to enable a better understanding of the risks specific to your Plan.

- Investment Risk (the risk that returns will be different than expected)

  The market value rate of return over the last 10 years has ranged from a low of -2.54% to a high of 18.14%.

- Longevity Risk (the risk that mortality experience will be different than expected)

  The actuarial valuation includes an expectation of future improvement in life expectancy. Emerging plan experience that does not match these expectations will result in either an increase or decrease in the actuarially determined contribution.

- Contribution Risk (the risk that actual contributions will be different from actuarially determined contribution)

  The Plan's funding policy requires payment of the City's minimum required contribution, which is the Florida Chapter 112 determined contribution reduced for anticipated funding from allocated surtax income. This policy produces a risk that this reduction in immediate funding might be either too larger or too small, depending on whether the surtax income grows as quickly as expected.

  If the City paid the Florida Chapter 112 determined contribution, the effective amortization period would be 28 years, meaning that the current contribution level, with amortization payments growing 1.25%, would be adequate to be expected to reduce the unfunded liability to zero over 28 years. Under the City's current policy of paying the City's minimum required contribution, over the immediate term, the unfunded liability has an expected growth rate of 2.2% and increases at this level can be expected to continue until the surtax income becomes payable to the Plan's trust. If plan experience is less favorable than anticipated, the unfunded liability will grow faster than 2.2% per year. By comparison, the surtax revenue is assumed to grow 4.25% per year.

  The City's minimum required contribution is determined pursuant to State Law Chapter 2016-146 and City of Jacksonville Ordinances 2017-257-E and 2017-258-E

  If the surtax revenue for fiscal 2018 had been 1% lower, the City's minimum required contribution would increase by $56,983, or 0.20% of projected payroll. For comparison purposes, the allocated surtax revenue is 37.2% of the market value of assets and 38.9% of the actuarial accrued liability.

- Demographic Risk (the risk that participant experience will be different than assumed)

  Examples of this risk include:

  - Actual retirements occurring earlier or later than assumed. The value of retirement plan benefits is sensitive to the rate of benefit accruals and any early retirement subsidies that apply.
  - More or less active participant turnover than assumed.
  - DROP participation other than anticipated.

- Actual Experience Over the Last Nine Years and Implications for the Future

  Past experience can help demonstrate the sensitivity of key results to the Plan's actual experience. Over the past nine years:

  The investment gain/loss for a year has ranged from a loss of $15,203,738 to a gain of $14,240,149. If all investment returns were equal to the assumed return over the last nine years, the market value of assets as of the current valuation date would be approximately $200,700,194 as opposed to the actual value of $216,667,000. Over the past nine years, the Plan's market value performance has, on average, exceeded the expected annual return.

  The non-investment gain/loss for a year has ranged from a loss of $7,402,084 to a gain of $1,978,720.

  The funded percentage on the actuarial value of assets has ranged from a low of 43.6% to a high of 50.8% since 2009.

  Segal Consulting has only been provided with data on surtax income for fiscal 2016, 2017 and 2018 and over this period, the surtax revenue grew by 3.9% for fiscal 2017 and by 6.2% for fiscal 2018. We encourage the City to consider reviewing any additional historical data on growth of their tax base to develop a sense of a range of possible outcomes for the surtax revenue that will be paid to the plan.

- Maturity Measures

  As pension plans mature, the cash need to fulfill benefit obligations will increase over time. Therefore, cash flow projections and analysis should be performed to assure that the Plan's asset allocation is aligned to meet emerging pension liabilities.

  Currently the Plan has a non-active to active participant ratio of 0.64. For the prior year benefits and expenses paid were $15,000 less than contributions received.

GFOA Solvency Test

The Actuarial Accrued Liability represents the present value of benefits earned, calculated using the plan's actuarial cost method. The Actuarial Value of Assets reflects the financial resources available to liquidate the liability. The portion of the liability covered by assets reflects the extent to which accumulated plan assets are sufficient to pay future benefits, and is shown for liabilities associated with employee contributions, pensioner liabilities, and other liabilities. The Government Finance Officers Association (GFOA) recommends that the funding policy aim to achieve a funded ratio of 100 percent.

GFOA SOLVENCY TEST AS OF SEPTEMBER 30

	2018	2017
Actuarial accrued liability (AAL)		
• Active member contributions	$18,019,525	$16,206,078
• Retirees and beneficiaries	280,451,383	267,453,150
• Active and inactive members (employer-financed)	118,202,320	93,720,854
Total	$416,673,228	$377,380,082
Actuarial value of assets	$207,089,881	$191,740,583
Cumulative portion of AAL covered		
• Active member contributions	100.00%	100.00%
• Retirees and beneficiaries	67.42%	65.63%
• Active and inactive members (employer-financed)	0.00%	0.00%

Section 3: Supplemental Information

EXHIBIT A – TABLE OF PLAN COVERAGE

Category	Year Ended September 30		Change From Prior Year
	2018	2017	
Active participants in valuation:			
• Number	587	638	-8.0%
• Average age	37.8	36.3	1.5
• Average years of service	9.2	8.0	1.2
• Total payroll	$28,164,021	$27,548,015	2.2%
• Average payroll	47,980	43,179	11.1%
• Employee contribution balances	18,019,525	16,206,078	11.2%
• Total active vested participants	377	366	3.0%
Inactive vested participants	7	4	75.0%
Retired participants:			
• Number in pay status	240	242	-0.8%
• Average age	60.2	57.4	0.7
• Average monthly benefit	$4,162	$4,045	2.9%
Disabled participants:			
• Number in pay status	15	16	-6.3%
• Average age	54.5	54.3	0.2
• Average monthly benefit	$2,265	$2,214	2.3%
Beneficiaries:			
• Number in pay status	17	18	-5.6%
• Average age	63.6	62.6	1.0
• Average monthly benefit	$2,327	$2,117	9.9%
DROP participants not yet in pay status:			
• Number	97	92	5.4%
• Average age	53.0	52.1	0.9
• Average monthly benefit	$3,445	$3,456	-0.3%

EXHIBIT B – PARTICIPANTS IN ACTIVE SERVICE AS OF SEPTEMBER 30, 2018
BY AGE, YEARS OF SERVICE, AND AVERAGE PAYROLL

		Years of Service					
Age	Total	0 - 4	5 - 9	10 - 14	15 – 19	20 - 24	25 - 29
Under 25	79	79	- -	- -	- -	- -	- -
	$36,405	$36,405	- -	- -	- -	- -	- -
25 - 29	101	74	26	1	- -	- -	- -
	39,004	37,172	$43,926	$46,644	- -	- -	- -
30 - 34	83	24	44	15	- -	- -	- -
	43,978	38,184	45,415	49,035	- -	- -	- -
35 - 39	79	11	26	21	21	- -	- -
	37,781	38,492	49,187	968	$60,100	- -	- -
40 - 44	63	7	16	6	27	7	- -
	55,447	39,087	50,295	50,630	61,380	$64,829	- -
45 - 49	99	8	28	12	30	18	3
	57,337	39,821	49,847	51,270	59,863	68,805	$104,160
50 - 54	51	4	15	7	19	5	1
	55,117	39,420	50,449	52,399	56,891	64,714	125,252
55 - 59	21	2	6	5	6	2	- -
	53,552	37,116	48,162	52,743	61,484	64,380	- -
60 - 64	10	1	6	2	1	- -	- -
	48,810	37,080	46,554	54,366	62,964	- -	- -
65 - 69	1	- -	- -	1	- -	- -	- -
	49,524	- -	- -	49,524	- -	- -	- -
Total	587	210	167	70	104	32	4
	$47,980	$37,275	$47,573	$51,161	$59,885	$67,020	$109,433

EXHIBIT C – RECONCILIATION OF PARTICIPANT DATA

	Active Participants	Inactive Vested Participants	Disableds	DROP Participants	Retired Participants	Beneficiaries	Total
Number as of October 1, 2017	**638**	**4**	**16**	**92**	**242**	**18**	**1,010**
• New participants	0	N/A	N/A	0	N/A	N/A	0
• Terminations – with vested rights	-2	2	0	0	0	0	0
• Terminations – without vested rights	-29	N/A	N/A	0	N/A	N/A	-29
• Retirements	-2	0	N/A	-1	3	N/A	0
• New disabilities	0	0	0	0	N/A	N/A	0
• New DROP participants	-7	0	N/A	7	N/A	N/A	0
• Return to work	1	0	0	-1	0	N/A	0
• Deceased	-1	0	-1	0	-3	0	-5
• New beneficiaries	0	0	0	0	0	1	1
• Lump sum cash-outs	0	0	0	0	0	0	0
• Rehire	0	0	N/A	0	0	N/A	0
• Certain period expired	N/A	N/A	0	0	0	-2	-2
• Data adjustments	2	1	0	0	-2	0	1
• Net transfers (to)/from General or DC	-13	0	0	0	0	0	-13
Number as of October 1, 2018	**587**	**7**	**15**	**97**	**240**	**17**	**963**

EXHIBIT D – SUMMARY STATEMENT OF INCOME AND EXPENSES ON A MARKET VALUE BASIS

	Year Ended September 30, 2018		Year Ended September 30, 2017	
Net assets at market value at the beginning of the year		$197,383,000		$167,387,000
Contribution income:				
• Employer contributions	$13,973,000		$19,162,000	
• Employer contributions	3,151,000		2,500,000	
• Less administrative expenses	-128,000		-75,000	
Net contribution income		*$16,996,000*		*$21,587,000*
Investment income:				
• Interest, dividends and other income	$5,687,000		$1,466,000	
• Asset appreciation	14,594,000		26,204,000	
• Less investment fees	-1,012,000		-923,000	
Net investment income		*$19,269,000*		*$26,747,000*
Total income available for benefits		**$36,265,000**		**$48,334,000**
Less benefit payments:				
• Benefit payments	-$13,174,000		-$12,157,000	
• DROP credits	-4,424,000		-3,934,000	
• Refunds	-6,645,000		-5,281,000	
• DROP withdrawals	6,419,000		4,710,000	
• DROP interest/adjustment	843,000		-1,676,000	
Net benefit payments		*-$16,981,000*		*-$18,338,000*
Change in market value of assets		**$19,284,000**		**$29,996,000**
Net assets at market value at the end of the year		**$216,667,000**		**$197,383,000**

EXHIBIT E – DEVELOPMENT OF THE FUND THROUGH SEPTEMBER 30, 2018

Year Ended September 30	Employer Contributions	Employee Contributions	Other Contributions	Net Investment Return*	Admin. Expenses	Benefit Payments	Market Value of Assets at Year-End	Actuarial Value of Assets at Year-End	Actuarial Value as a Percent of Market Value
2010	$9,491,000	$2,632,000	$485,000	$9,391,000	$560,000	$7,651,000	$89,622,000	$97,463,955	108.8%
2011	9,711,000	2,807,000	309,000	717,000	560,000	9,197,000	93,409,000	103,154,256	110.4%
2012	9,066,000	2,621,000	472,000	17,166,000	55,000	9,675,000	113,004,000	109,473,919	96.9%
2013	10,742,000	2,525,000	392,000	18,466,000	50,000	12,925,000	132,154,000	120,947,042	91.5%
2014	13,522,000	2,253,000	0	15,468,000	65,000	14,611,000	148,721,000	145,276,644	97.7%
2015	17,832,000	2,466,000	0	-3,849,000	73,000	14,874,000	150,223,000	159,914,247	106.5%
2016	18,864,000	2,410,000	0	11,548,000	75,000	15,583,000	167,387,000	175,333,405	104.7%
2017	19,162,000	2,500,000	0	26,747,000	75,000	18,338,000	197,383,000	191,740,583	97.1%
2018	13,973,000	3,151,000	0	19,269,000	128,000	16,981,000	216,667,000	207,089,881	95.6%

* On a market basis, net of investment fees

EXHIBIT F – TABLE OF AMORTIZATION BASES

Type*	Date Established	Initial Period	Initial Amount	Annual Payment*	Years Remaining	Outstanding Balance
Fresh start	10/01/2016	30	$178,901,268	$12,194,819	28	$178,600,837
Experience gain	10/01/2017	30	-2,816,018	-189,410	29	-2,814,363
Plan change	10/01/2017	30	9,863,395	663,427	29	9,857,595
Assumptions change	10/01/2017	30	-283,924	-19,097	29	-283,757
Experience loss	10/01/2018	29	5,111,441	344,006	29	5,111,441
Assumptions change	10/01/2018	29	19,111,594	1,286,231	29	19,111,594
Total				**$14,279,976**		**$209,583,347**

* Level percentage of payroll; per Part VII, Chapter 112.64(5)(b) of Florida Statutes, outstanding balances were amortized using a 1.25% payroll growth rate for October 1, 2018 valuation.

TABLE OF SURTAX AMORTIZATION BASES

Type	Date Established	Initial Period	Initial Amount	Annual Payment*	Years Remaining	Outstanding Balance
Discounted surtax revenue applied	10/01/2016	30	-$64,295,005	-$4,382,674	28	-$64,187,033
Surtax offset gain	10/01/2017	30	-1,534,336	-103,202	29	-1,533,433
Surtax offset allocation assumption change	10/01/2017	30	4,705,811	316,520	29	4,703,044
Surtax offset discount rate assumption change	10/01/2017	30	-3,286,369	-221,046	29	-3,284,436
Surtax offset gain	10/01/2018	29	-1,420,046	-95,571	29	-1,420,046
Surtax offset allocation assumption change	10/01/2018	29	-1,349,426	-90,818	29	-1,349,426
Surtax offset discount rate assumption change	10/01/2018	29	-3,713,867	-249,947	29	-3,713,867
Total				**-$4,826,738**		**-$70,785,197**

* Level percentage of payroll; per Part VII, Chapter 112.64(5)(b) of Florida Statutes, outstanding balances were amortized using a 1.25% payroll growth rate for October 1, 2018 valuation.

EXHIBIT G – DEFINITION OF PENSION TERMS

The following list defines certain technical terms for the convenience of the reader:

Actuarial Accrued Liability for Actives:	The equivalent of the accumulated normal costs allocated to the years before the valuation date.
Actuarial Accrued Liability for Pensioners and Beneficiaries:	The single-sum value of lifetime benefits to existing pensioners and beneficiaries. This sum takes account of life expectancies appropriate to the ages of the annuitants and the interest that the sum is expected to earn before it is entirely paid out in benefits.
Actuarial Cost Method:	A procedure allocating the Actuarial Present Value of Future Benefits to various time periods; a method used to determine the Normal Cost and the Actuarial Accrued Liability that are used to determine the actuarially determined contribution.
Actuarial Gain or Loss:	A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions, during the period between two Actuarial Valuation dates. Through the actuarial assumptions, rates of decrements, rates of salary increases, and rates of fund earnings have been forecasted. To the extent that actual experience differs from that assumed, Actuarial Accrued Liabilities emerge which may be the same as forecasted, or may be larger or smaller than projected. Actuarial gains are due to favorable experience, e.g., assets earn more than projected, salary increases are less than assumed, members retire later than assumed, etc. Favorable experience means actual results produce actuarial liabilities not as large as projected by the actuarial assumptions. On the other hand, actuarial losses are the result of unfavorable experience, i.e., actual results yield in actuarial liabilities that are larger than projected. Actuarial gains will shorten the time required for funding of the actuarial balance sheet deficiency while actuarial losses will lengthen the funding period.
Actuarially Equivalent:	Of equal actuarial present value, determined as of a given date and based on a given set of Actuarial Assumptions.
Actuarial Present Value (APV):	The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions. Each such amount or series of amounts is: Adjusted for the probable financial effect of certain intervening events (such as changes in compensation levels, marital status, etc.) Multiplied by the probability of the occurrence of an event (such as survival, death, disability, withdrawal, etc.) on which the payment is conditioned, and Discounted according to an assumed rate (or rates) of return to reflect the time value of money.

Actuarial Present Value of Future Plan Benefits:	The Actuarial Present Value of benefit amounts expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age, anticipated future compensation, and future service credits. The Actuarial Present Value of Future Plan Benefits includes the liabilities for active members, retired members, beneficiaries receiving benefits, and inactive members entitled to either a refund or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would provide sufficient assets to pay all projected benefits and expenses when due.
Actuarial Valuation:	The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a plan. An Actuarial Valuation for a governmental retirement system typically also includes calculations of items needed for compliance with GASB, such as the Actuarially Determined Contribution (ADC) and the Net Pension Liability (NPL).
Actuarial Value of Assets (AVA):	The value of the Fund's assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets, but commonly plans use a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the ADC.
Actuarially Determined:	Values that have been determined utilizing the principles of actuarial science. An actuarially determined value is derived by application of the appropriate actuarial assumptions to specified values determined by provisions of the law.
Actuarially Determined Contribution (ADC), or Florida Chapter 112 Determined Employer Contribution:	The employer's periodic required contributions, expressed as a dollar amount or a percentage of covered plan compensation, determined under the Plan's funding policy. The ADC consists of the Employer Normal Cost and the Amortization Payment.
Amortization Method:	A method for determining the Amortization Payment. The most common methods used are level dollar and level percentage of payroll. Under the Level Dollar method, the Amortization Payment is one of a stream of payments, all equal, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the Amortization Payment is one of a stream of increasing payments, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the stream of payments increases at the assumed rate at which total covered payroll of all active members will increase.
Amortization Payment:	The portion of the pension plan contribution, or ADC, that is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability.
Assumptions or Actuarial Assumptions:	The estimates upon which the cost of the Fund is calculated, including: <u>Investment return</u> - the rate of investment yield that the Fund will earn over the long-term future;

	Mortality rates - the death rates of employees and pensioners; life expectancy is based on these rates; Retirement rates - the rate or probability of retirement at a given age or service; Disability rates – the probability of disability retirement at a given age; Withdrawal rates - the rates at which employees of various ages are expected to leave employment for reasons other than death, disability, or retirement; Salary increase rates - the rates of salary increase due to inflation and productivity growth.
Closed Amortization Period:	A specific number of years that is counted down by one each year, and therefore declines to zero with the passage of time. For example, if the amortization period is initially set at 30 years, it is 29 years at the end of one year, 28 years at the end of two years, etc. See Open Amortization Period.
Decrements:	Those causes/events due to which a member's status (active-inactive-retiree-beneficiary) changes, that is: death, retirement, disability, or withdrawal.
Defined Benefit Plan:	A retirement plan in which benefits are defined by a formula applied to the member's compensation and/or years of service.
Defined Contribution Plan:	A retirement plan, such as a 401(k) plan, a 403(b) plan, or a 457 plan, in which the contributions to the plan are assigned to an account for each member, the plan's earnings are allocated to each account, and each member's benefits are a direct function of the account balance.
Employer Normal Cost:	The portion of the Normal Cost to be paid by the employer. This is equal to the Normal Cost less expected member contributions.
Experience Study:	A periodic review and analysis of the actual experience of the Fund that may lead to a revision of one or more actuarial assumptions. Actual rates of decrement and salary increases are compared to the actuarially assumed values and modified as deemed appropriate by the Actuary.
Funded Ratio:	The ratio of the actuarial value of assets (AVA) to the actuarial accrued liability (AAL). Plans sometimes calculate a market funded ratio, using the market value of assets (MVA), rather than the AVA.
GASB 67 and GASB 68:	Governmental Accounting Standards Board (GASB) Statements No. 67 and No. 68. These are the governmental accounting standards that set the accounting rules for public retirement systems and the employers that sponsor or contribute to them. Statement No. 68 sets the accounting rules for the employers that sponsor or contribute to public retirement systems, while Statement No. 67 sets the rules for the systems themselves.

Investment Return:	The rate of earnings of the Fund from its investments, including interest, dividends and capital gain and loss adjustments, computed as a percentage of the average value of the fund. For actuarial purposes, the investment return often reflects a smoothing of the capital gains and losses to avoid significant swings in the value of assets from one year to the next.
Net Pension Liability (NPL):	The Net Pension Liability is equal to the Total Pension Liability minus the Plan Fiduciary Net Position.
Normal Cost:	That portion of the Actuarial Present Value of pension plan benefits and expenses allocated to a valuation year by the Actuarial Cost Method. Any payment in respect of an Unfunded Actuarial Accrued Liability is not part of Normal Cost (see Amortization Payment). For pension plan benefits that are provided in part by employee contributions, Normal Cost refers to the total of employee contributions and employer Normal Cost unless otherwise specifically stated.
Open Amortization Period:	An open amortization period is one which is used to determine the Amortization Payment but which does not change over time. If the initial period is set as 30 years, the same 30-year period is used in determining the Amortization Period each year. In theory, if an Open Amortization Period with level percentage of payroll is used to amortize the Unfunded Actuarial Accrued Liability, the UAAL will never decrease, but will become smaller each year, in relation to covered payroll, if the actuarial assumptions are realized.
Plan Fiduciary Net Position:	Market value of assets.
Total Pension Liability (TPL):	The actuarial accrued liability under the entry age normal cost method and based on the blended discount rate as described in GASB 67 and 68.
Unfunded Actuarial Accrued Liability:	The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. This value may be negative, in which case it may be expressed as a negative Unfunded Actuarial Accrued Liability, also called the Funding Surplus.
Valuation Date or Actuarial Valuation Date:	The date as of which the value of assets is determined and as of which the Actuarial Present Value of Future Plan Benefits is determined. The expected benefits to be paid in the future are discounted to this date.

EXHIBIT H – SECTION 415

Section 415 of the Internal Revenue Code (IRC) specifies the maximum benefits that may be paid to an individual from a defined benefit plan and the maximum amounts that may be allocated each year to an individual's account in a defined contribution plan.

A qualified pension plan may not pay benefits in excess of the Section 415 limits. The ultimate penalty for non-compliance is disqualification: active participants could be taxed on their vested benefits and the IRS may seek to tax the income earned on the plan's assets.

In particular, Section 415(b) of the IRC limits the maximum annual benefit payable at the Normal Retirement Age to a dollar limit of $160,000 indexed for inflation. That limit is $210,000 for 2018. Normal Retirement Age for these purposes is age 62. These are the limits in simplified terms. They must be adjusted based on each participant's circumstances, for such things as form of benefits chosen and after tax contributions.

Benefits in excess of the limits may be paid through a qualified governmental excess plan that meets the requirements of Section 415(m).

Legal Counsel's review and interpretation of the law and regulations should be sought on any questions in this regard.

EXHIBIT I – SUPPLEMENTARY STATE OF FLORIDA INFORMATION
SUMMARY OF SALARY CHANGES

Year Ended September 30	Total Salary	Percent Change in Total Salary	Percent Change in Salary of Employees Remaining Active	Expected Percent Change in Salary of Employees Remaining Active
2008	$26,334,000	-2.77%	3.58%	5.58%
2009	27,661,000	5.04%	3.93%	5.18%
2010*	27,869,052	0.75%	N/A	N/A
2010	32,329,400	16.88%	2.45%	5.28%
2011	31,832,037	-1.54%	3.09%	5.80%
2012	28,944,158	-9.07%	0.78%	6.15%
2013	27,871,010	-3.71%	3.03%	1.72%
2014	27,373,702	-1.78%	3.89%	1.70%
2015	28,091,083	2.62%	3.08%	1.66%
2016	26,585,054	-5.36%	2.63%	4.26%
2017	27,548,015	3.62%	4.03%	8.21%
2018	28,164,021	2.24%	10.21%	8.31%

Note: The average total payroll growth for the most recent ten years was 0.67% per year. Additional analysis of bargained pay increase applicable for the next year and pay of DC plan participants was used to support a payroll increase assumption of 1.25%.

Salary history prior to October 1, 2010 was taken from the City's Comprehensive Annual Financial reports.

*Prior to the inclusion of new participants with greater than one year of employment.

EXHIBIT J – SUPPLEMENTARY STATE OF FLORIDA INFORMATION
RECENT HISTORY OF RECOMMENDED AND ACTUAL CONTRIBUTIONS

Fiscal Year Ended September 30	Valuation Date September 30	Contribution Rate as Percent of Valuation Payroll	Valuation Payroll	Florida Chapter 112 Recommended Contribution	City's Minimum Required Contribution	Actual Contribution
2011	2008*	31.78%	$27,957,188	$8,884,794	- -	$9,711,000
2012	2010	35.45%	33,460,929	11,860,912	- -	9,066,000
2013	2011	39.11%	32,946,158	12,884,770	- -	10,742,000
2014	2012	49.93%	29,812,483	14,884,963	- -	13,522,000
2015	2013	62.81%	28,049,384	17,618,896	- -	17,832,000
2016	2014	68.64%	27,480,459	18,863,935	- -	18,864,000
2017	2015	67.73%	28,282,102	19,155,820	- -	19,162,000
2018	2016	69.26%	26,917,306	18,643,233	$13,973,105	13,973,000
2019	2017	68.63%	27,892,365	19,141,501	14,497,788	- -
2020	2018	70.53%	28,516,071	20,111,161	15,042,623	- -

All amounts prior to the 2010 valuation date were prepared by the prior actuary.

* An actuarial valuation was not performed for the Plan year beginning October 1, 2009. The recommended contribution is based on the 2008 valuation's contribution rate.

EXHIBIT K – SUPPLEMENTARY STATE OF FLORIDA INFORMATION
COMPARATIVE SUMMARY OF PRINCIPAL VALUATION RESULTS

	Year Ended September 30, 2018		
	New Assumptions	Old Assumptions	Year Ended September 30, 2017
Participant data			
• Active members	587	587	638
• Total annual payroll	$28,164,021	$28,164,021	$27,548,015
• Retired members and beneficiaries	272	272	276
• Total annualized benefit	$12,868,296	$12,868,296	$12,629,026
• Terminated vested members	7	7	4
• Total annualized benefit	$202,044	$202,044	$67,680
• DROP participants	97	97	92
• Total annualized benefit	$4,010,280	$4,010,280	$3,815,746
Actuarial value of assets	$207,089,881	$207,089,881	$191,740,583
Present value of all future expected benefit payments:			
• Active members:			
» Retirement benefits	$165,972,475	$165,179,674	$159,951,241
» Vesting benefits	2,942,745	2,571,932	2,730,782
» Disability benefits	3,343,710	3,555,426	3,545,491
» Death benefits	1,876,033	1,735,766	1,743,975
» Return of contributions	18,019,525	18,019,525	16,206,078
» Total	$192,154,488	$191,062,323	$184,177,567
• Terminated vested members	2,911,360	2,797,535	417,773
• Retired members and beneficiaries	206,180,474	201,621,128	200,022,256
• DROP participants	74,270,909	72,368,676	67,430,894
Total	$475,517,231	$467,849,660	$452,048,490

EXHIBIT K – SUPPLEMENTARY STATE OF FLORIDA INFORMATION
COMPARATIVE SUMMARY OF PRINCIPAL VALUATION RESULTS (CONTINUED)

	Year Ended September 30, 2018		
	New Assumptions	Old Assumptions	Year Ended September 30, 2017
Unfunded actuarial accrued liability	$209,583,347	$190,471,753	$185,639,499
Actuarial present value of accrued benefits			
Vested accrued benefits			
Active members	$96,798,420	$88,980,661	$81,311,617
Inactive members	2,911,360	2,797,535	417,773
Pensioners and beneficiaries	206,180,474	201,621,126	200,022,256
DROP participants	74,270,909	72,368,676	67,430,894
Nonvested active members	1,217,353	1,193,251	1,373,735
Total	$381,378,516	$366,961,249	$350,556,275
Pension cost			
Normal cost, including administrative expenses	$7,487,444	$8,438,748	$8,236,141
Expected employee contributions	-2,615,684	-2,816,402	-2,754,802
Level % of payroll payment to amortize unfunded actuarial accrued liability	14,279,976	13,238,510	12,728,760
Amortized value of discounted value of allocated surtax revenue	-4,826,738	-4,485,973	-4,417,756
Total minimum annual cost payable monthly at valuation date	14,856,911	14,835,937	14,318,803
Total employer cost projected to budget year	15,042,623	15,021,386	14,497,788
Projected payroll	28,516,071	28,516,071	27,892,365
As % of projected payroll	52.75%	51.98%	51.98%
Present value of active members' future salaries at attained age	$210,908,216	$238,080,243	$252,014,362
Present value of expected future employee contributions	$20,890,104	$23,663,547	$25,088,896

EXHIBIT L – SUPPLEMENTARY STATE OF FLORIDA INFORMATION
ACTUARIAL PRESENT VALUE OF ACCUMULATED PLAN BENEFITS

Factors	Change in Actuarial Present Value of Accumulated Plan Benefits	
Actuarial present value of accumulated benefits as of October 1, 2017		$350,556,275
Benefits accumulated, net experience gain or loss, changes in data	$8,757,238	
Benefits paid	-16,981,000	
Interest	24,628,736	
Changes in assumptions and methods	14,417,267	
Plan changes	0	
Net increase	$30,822,241	
As % of payroll	109.44%	
Actuarial present value of accumulated benefits as of October 1, 2018		$381,378,516

EXHIBIT M – SUPPLEMENTARY STATE OF FLORIDA INFORMATION
RECONCILIATION OF DROP ACCOUNTS

Attained Age	Total Actives*	Eligible for Normal**	Number Retiring	Number Entering DROP
Under 40	390	- -	- -	- -
40	13	1	- -	- -
41	13	1	- -	- -
42	12	1	1	- -
43	11	3	- -	1
44	20	5	- -	- -
45	17	4	1	- -
46	19	4	- -	1
47	23	3	- -	- -
48	23	7	- -	1
49	15	4	- -	1
50	11	2	- -	- -
51	12	2	- -	1
52	13	1	- -	1
53	8	2	- -	- -
54	7	1	- -	- -
55	7	1	- -	- -
56	8	2	- -	- -
57	2	- -	- -	- -
58	3	1	- -	1
59	3	- -	- -	- -
60	- -	- -	- -	- -
61	3	- -	- -	- -
62	1	- -	- -	- -
63	2	- -	- -	- -
64	1	- -	- -	- -
65	1	- -	- -	- -
Total	638	45	2	7

*Number of active participants from prior valuation

**Number of active participants either eligible for retire as of October 1, 2017 or who became eligible during the plan year ended October 1, 2018.

Section 4: Actuarial Valuation Basis

EXHIBIT I – ACTUARIAL ASSUMPTIONS AND ACTUARIAL COST METHOD

Rationale for Assumptions	The information and analysis used in selecting each demographic assumption that has a significant effect on this actuarial valuation is shown in the Experience Study Report for the five-year period ended September 30, 2017.
Net Investment Return:	7.00% The net investment return assumption was chosen by the Retirement System's Board of Trustees, with input from the actuary. This assumption is a long-term estimate derived from historical data, current and recent market expectations, and professional judgment. As part of the analysis, a building block approach was used that reflects inflation expectations and anticipated risk premiums for each of the portfolio's asset classes, as well as the Plan's target asset allocation.
Salary Increases (including inflation):	See table below.
Inflation Rate:	2.50%

Salary Increases (including inflation):

Service	Rate (%)
0	7.50
1	6.50
2	6.00
3	5.50
4	5.25
5	5.00
6	4.50
7 - 10	4.00
11 - 14	3.75
15+	2.80

The inflation component of the salary scale has been adjusted from 2.50% to 7.00% for 2019, with subsequent increases resuming at the assumed inflation rate of 2.50%.

Payroll Growth:	1.25% used for amortization of unfunded liability amounts, based on the requirement in the Florida Statutes that the assumption for this purpose may not exceed the average annual growth for the preceding ten years. Negotiated pay level increases were taken into consideration in setting a payroll growth that is expected to be achieved and maintained on a ten-year average basis. The Fund's long-term payroll growth assumption is equal to the inflation assumption of 2.50%.
Value of Applicable Tax Revenue:	Actual revenue of $91,529,277 for fiscal 2018 is used as the basis of the City's revenue projection. This amount is prior to application of the allocation percentage.
Tax Revenue Growth Rate:	4.25%. This assumption is determined by the City. Segal has not reviewed the information used to set this assumption, but Segal previously reviewed the sensitivity of this assumption when it was initially set.
Projected Tax Revenue Allocation:	5.70%. This percentage is determined by the City. Last year's percentage was 5.60%.
Administrative Expenses:	Previous year's actual expenses; $128,000 for October 1, 2018.
Mortality Rates:	*Pre-retirement:* Male Non-Disabled (Special Risk): RP2000, 10% Combined Healthy White Collar / 90% Combined Healthy Blue Collar, set forward 2.5 years, projected generationally with Scale BBM Female Non-Disabled: RP2000, 100% Combined Healthy White Collar, set forward 2.5 years, projected generationally with Scale BBF *Healthy annuitants:* Male Non-Disabled (Special Risk): RP2000, 10% Annuitant White Collar / 90% Annuitant Blue Collar, set forward 2.5 years, projected generationally with Scale BBM Female Non-Disabled: RP2000, 100% Annuitant White Collar, set forward 2.5 years, projected generationally with Scale BBF *Disabled annuitants:* RP-2000 Disabled Retiree Mortality Table, set back four years for males and set forward two years for females The FRS Special Risk Tables, set forward 2.5 years reasonably reflects the healthy annuitant mortality experience of the Corrections Officers Retirement Plan as of the measurement date. The RP-2000 Disabled Retiree Mortality Table, set back four years for males and set forward two years for females reasonably reflect the disabled annuitant mortality experience as of the measurement date. The mortality improvement assumptions are mandated under state law.

Termination Rates before Retirement:

	Rate (%)			
	Mortality		Disability	
Age	Male	Female	Male	Female
20	0.04	0.02	0.03	0.03
25	0.04	0.02	0.04	0.04
30	0.09	0.04	0.05	0.05
35	0.12	0.05	0.08	0.08
40	0.15	0.08	0.12	0.12
45	0.20	0.13	0.18	0.18
50	0.31	0.20	0.30	0.30
55	0.58	0.35	0.47	0.47
60	1.12	0.64	0.75	0.75
65	2.00	1.16	0.00	0.00

* Mortality rates shown for base table

**100% of disabilities are assumed to be non-service incurred.

Retirement Rates:	100% retirement assumed at age 65 with 5 years of service; for ages less than 65, retirement rate assumptions are based on service as follows:

Service	Rate (%)*
Under 20	0%
20	50
21 - 24	40
25 - 27	50
28 & Over	100

Refund of Contributions:	95% of participants that are vested and terminate are assumed to take a refund of their employee contributions in lieu of their accrued benefit deferred to age 65.
Retirement Age for Inactive Vested Participants:	65
Unknown Data for Participants:	Same as those exhibited by participants with similar known characteristics. If not specified, participants are assumed to be male.
Weighted Average Retirement Age:	Age 62, determined as follows: The weighted average retirement age for each participant is calculated as the sum of the product of each potential current or future retirement age times the probability of surviving from current age to that age and then retiring at that age, assuming no other decrements. The overall weighted retirement age is the average of the individual retirement ages based on all the active participants included in the October 1, 2018 actuarial valuation.
Family Composition:	60% of participants are assumed to be married. None are assumed to have dependent children. Females are assumed to be three years younger than their spouses.
Actuarial Value of Assets:	Market value of assets less unrecognized returns in each of the last five years. Unrecognized return is equal to the difference between the actual and the expected market return, and is recognized over a five - year period, further adjusted, if necessary, to be within 20% of the market value.
Actuarial Cost Method:	Entry Age Normal Actuarial Cost Method. Entry Age is the age at the time the participant commenced employment. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis based on each member's benefit accrual rate and are allocated by compensation. Normal Cost is not included for participants who are assumed to retire with 100% certainty in the upcoming plan year based on the retirement assumptions.

Justification for Change in Actuarial Assumptions and Methods:	As a result of the experience study for the five-year period ended September 30, 2017, the following assumption and methodology changes were reflected in this valuation: - The discount rate was lowered from 7.20% to 7.00%. - Withdrawal rates were increased for participants with fewer than eight years of service. - Disability rates were changed from sex-distinct rates to unisex rates, blending 75% of the previous male rates with 25% of the previous female rates. - Retirement rates for active participants with between 21 and 23 years of service were increased from 30% to 40% and set to 100% at 28 years of service. - The percent married assumption was increased from 50% to 60%. - Inflation rates were reduced from 2.75% to 2.50%. - The salary scale rates were increased for participants with fewer than two years of service and slightly reduced for participants with a larger amount of service. - The funding method was changed from Replacement Entry Age to Traditional Entry Age. The Normal Cost and expected employee contributions were further updated to include a reduction for participants projected to retire during the year, to reflect the Plan now being closed to new entrants. - The amortization period was reduced from 30 to 29 years for new bases.

EXHIBIT II – SUMMARY OF PLAN PROVISIONS

This exhibit summarizes the major provisions of the Plan included in the valuation. It is not intended to be, nor should it be interpreted as, a complete statement of all plan provisions.

Plan Year:	October 1 through September 30	
Plan Status:	Closed as of September 30, 2017	
Normal Retirement:	*Age Requirement*	Age 65 with five years of Credited Service or any age with 20 years of Credited Service.
	Regular Benefit Amount	3.0% of Final Monthly Compensation times years of Credited Service for the first 20 years plus 2.0% of Final Monthly Compensation times years of Credited Service for years in excess of 20. However, the benefit may not exceed 80% of Final Monthly Compensation.
	Supplemental Benefit Amount	Monthly benefit of $5 times years of Credited Service, not less than $25 per month or more than $150 per month.
	Minimum Benefit Amount	$64.08 per whole year of Credited Service, not to exceed 30. Minimum accrual rate increases 4% each October 1st.
Early Retirement:	None	
Service-Incurred Disability	*Age Requirement*	None
	Service Requirement	None
	Regular Benefit Amount	50% of the average salary earned in the last three years immediately preceding disability retirement.
	Supplemental Benefit Amount	Monthly benefit of $5 times years of Credited Service, not less than $25 per month or more than $150 per month.
	Minimum Benefit Amount	$64.08 per whole year of Credited Service, not to exceed 30. Minimum accrual rate increases 4% each October 1st.
Non-service Incurred Disability:	*Age Requirement*	None
	Service Requirement	5 years of Credited Service
	Regular Benefit Amount	25% percent of the average salary earned in the last three years immediately preceding disability retirement. For each year of service in excess of 5 years, the benefit shall be increased 2.5%, to a maximum of 50%.
	Supplemental Benefit Amount	Monthly benefit of $5 times years of Credited Service, not less than $25 per month or more than $150 per month.

	Minimum Benefit Amount	$64.08 per whole year of Credited Service, not to exceed 30. Minimum accrual rate increases 4% each October 1st.
Vesting:	*Age Requirement*	None
	Service Requirement	5 years of Credited Service
	Regular Benefit Amount	Accrued Normal Retirement Benefit payable at age 65.
	Supplemental Benefit Amount	Monthly benefit of $5 times years of Credited Service, not less than $25 per month or more than $150 per month. Payable at Age 65.
	Minimum Benefit Amount	$64.08 per whole year of Credited Service, not to exceed 30. Minimum accrual rate increases 4% each October 1st.
Spouse's Pre-Retirement Death Benefit:	*Age Requirement*	None
	Service Requirement	None
	Regular Benefit Amount	If the Member is eligible for retirement, the surviving spouse is entitled to 75% of the member's accrued retirement benefit. If the Member is not eligible for retirement, the surviving spouse is entitled to 75% of the pension the Member would have received if the Member had worked to eligibility for Normal Retirement at current salary, using a 2% annual accrual rate.
	Supplemental Benefit Amount	Monthly benefit of $5 times years of Member's Credited Service, not less than $25 per month or more than $150 per month.
	Minimum Benefit Amount	75% of $64.08 per whole year of Member's Credited Service, not to exceed 30. Minimum accrual rate increases 4% each October 1st.
Spouse's Post-Retirement Death Benefit:	*Regular Benefit Amount*	Surviving spouse is entitled to 75% of the Member's regular benefit.
	Supplemental Benefit Amount	Surviving spouse is entitled to 100% of the Member's supplemental benefit.
	Minimum Benefit Amount	75% of the Member's Minimum Benefit Amount at retirement.
Member:	All City Corrections Officers hired prior to October 1, 2017.	
Member Contributions:	10% of Earnable Compensation, additional 2% of Earnable Compensation during DROP participation.	
Credited Service:	The number of full years and months worked from date of participation to date of termination or retirement, plus any prior service purchased.	
Final Monthly Compensation:	Average monthly rate of Earnable Compensation during the highest 36 consecutive months (78 pay periods) out of the last ten years of employment.	
Earnable Compensation:	Base pay for regular hours worked as an employee, plus service raises and excluding bonuses, adjusted compensation, overtime or any extra compensation over and above regularly budgeted salaries.	

Cost of Living Adjustment:	On the December 1st after the initial benefit commencement date, and on each December 1st thereafter, the regular benefit is increased by 3%.
DROP:	Members with 20 or more years of service may elect to defer receipt of their retirement benefits while continuing employment with the City for up to 5 years. Upon the effective date of participating in the DROP, a member's years of service and Final Monthly Compensation become frozen for purposes of determining pension benefits. Additional service beyond the date of DROP participation no longer accrues any additional benefits under the Retirement System. Benefits that would have been payable are accumulated at interest to date of termination and paid or rolled over in a single sum, and payments are made directly to the Member thereafter based on the accrued retirement benefit at the DROP start date. COLA increases start at termination of employment rather than at the start of the DROP.
Changes in Plan Provisions:	There have been no changes in plan provisions since the previous valuation.

GASB 67 and 68 Information

General Information – "Financial Statements", Note Disclosures and Required Supplementary Information for a Single Employer Pension Plan

Plan membership. At October 1, 2018, pension plan membership consisted of the following:

Retired members or beneficiaries currently receiving benefits	369
Vested terminated members entitled to but not yet receiving benefits[12]	7
Active members	587
Total	963

Benefits provided: Please see Section 4, Exhibit II, of the October 1, 2018 actuarial valuation for a summary of plan provisions.

Contributions: Each year, the City contributes the actuarially determined contribution consistent with the funding policy, as a percentage of pay. The actuarially determined contribution is equal to the normal cost of the Plan plus a payment on the unfunded actuarial accrued liability. The members contribute 10% of earnable compensation, plus 2% of earnable compensation during DROP participation.

Net Pension Liability

Reporting Date for Employer under GASB 68	September 30, 2019	September 30, 2018
Measurement Date for Employer under GASB 68	**September 30, 2018**	**September 30, 2017**
Components of the Net Pension Liability		
Total Pension Liability	$429,475,228	$395,237,321
Plan Fiduciary Net Position	229,469,000	213,023,000
Net Pension Liability	200,006,228	182,214,321
Plan Fiduciary Net Position as a percentage of the Total Pension Liability	53.43%	53.90%

The Net Pension Liability (NPL) for the plan was measured as of September 30, 2018 and 2017. Plan Fiduciary Net Position (plan assets) was valued as of the measurement dates and the Total Pension Liability (TPL) was determined based upon the TPL from actuarial valuations as of and 2017, respectively.

Plan provisions. The plan provisions used in the measurement of the NPL are the same as those used in the CORP actuarial valuations as of October 1, 2018 and October 1, 2017, respectively.

Actuarial assumptions. The TPL as of September 30, 2018 and 2017, that were measured by actuarial valuations as of October 1, 2018 and 2017, respectively, used the following actuarial assumptions, applied to all periods included in the measurement:

Inflation	**2.50%** (previously 2.75%)
Salary increases	**2.80% - 7.50%,** of which 2.50% is the Plan's long-term payroll inflation assumption. The inflation component of the salary increase assumption was adjusted to reflect bargained increases over the next year.
Investment rate of return	**7.00%**, net of pension plan investment expense, including inflation (previously 7.20%)
Other assumptions	See the October 1, 2018 actuarial valuation for a complete description of all actuarial assumptions. These assumptions were developed in the analysis of actuarial experience study for the period October 1, 2012 through September 30, 2017.

Target Asset Allocation

The long-term expected rate of return on pension plan investments was determined using a building-block method in which expected future real rates of return (expected returns, net of inflation) are developed for each major asset class. These returns are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage, adding expected inflation and subtracting expected investment expenses and a risk margin. The target allocation (approved by the Board) and projected arithmetic real rates of return for each major asset class, after deducting inflation, but before investment expenses, used in the derivation of the long-term expected investment rate of return assumption are summarized in the following table:

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return
Domestic equity	30.00%	6.41%
International equity	20.00%	6.96%
Fixed income	20.00%	1.96%
Real estate	15.00%	4.76%
Private equity	7.50%	10.41%
Alternatives	7.50%	3.83%
Total	100.00%	

Discount rate. The discount rates used to measure the Total Pension Liability (TPL) were 7.00% and 7.20% as of October 1, 2018 and October 1, 2017, respectively. The projection of cash flows used to determine the discount rate assumed plan member contributions will be made at the current contribution rate and that employer contributions will be made at rates equal to the actuarially determined contribution rates. For this purpose, only employer contributions that are intended to fund benefits for current plan members and their beneficiaries are included. Projected employer contributions that are intended to fund the service costs for future plan members and their beneficiaries, as well as projected contributions from future plan members, are not included. Based on those assumptions, the Plan Fiduciary Net Position (FNP) was projected to be available to make all projected future benefit payments for current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the TPL as of both September 30, 2018 and September 30, 2017.

Discount Rate Sensitivity

Sensitivity of the Net Pension Liability to changes in the discount rate. The following presents the Net Pension Liability (NPL) of the CORP as of October 1, 2018, which is allocated to all employers, calculated using the discount rate of 7.00%, as well as what the CORP's NPL would be if it were calculated using a discount rate that is 1-percentage-point lower (6.00%) or 1-percentage-point higher (8.00%) than the current rate.

Net Pension Liability	1% Decrease (6.00%)	Current Discount Rate (7.00%)	1% Increase (8.00%)
Total	$264,028,325	$200,006,228	$148,761,546

Schedule of Changes in Net Pension Liability – Last Two Fiscal Years

Reporting Date for Employer under GASB 68	September 30, 2019	September 30, 2018
Measurement Date for Employer under GASB 68	September 30, 2018	September 30, 2017
Total Pension Liability		
Service cost	$7,975,759	$7,329,735
Interest	28,317,858	27,283,975
Change of benefit terms	0	73,780
Differences between expected and actual experience	718,682	-2,054,491
Changes of assumptions	17,044,608	9,950,689
Benefit payments, including refunds of member contributions	-19,819,000	-17,438,000
Net change in Total Pension Liability	$34,237,907	$25,145,688
Total Pension Liability – beginning	395,237,321	370,091,633
Total Pension Liability – ending	$429,475,228	$395,237,321
Plan Fiduciary Net Position		
Contributions – employer	$13,973,000	$19,162,000
Contributions – employee	3,151,000	2,500,000
Net investment income	19,269,000	26,747,000
Benefit payments, including refunds of member contributions	-19,819,000	-17,438,000
Administrative expense	-128,000	-75,000
Net change in Plan Fiduciary Net Position	$16,446,000	$30,896,000
Plan Fiduciary Net Position – beginning	213,023,000	182,127,000
Plan Fiduciary Net Position – ending	$229,469,000	$213,023,000
Net Pension Liability – ending	$200,006,228	$182,214,321
Plan Fiduciary Net Position as a percentage of the Total Pension Liability	53.43%	53.90%
Covered employee payroll[1]	$28,164,021	$27,548,015
Plan Net Pension Liability as percentage of covered employee payroll	710.15%	661.44%

(1) Pensionable payroll as of the measurement date

Notes to Schedule:

Benefit changes:	*The employee contribution rate increased from 8% to 10% of pay effective October 1, 2017. For accounting purposes, this change is reflected on September 30, 2017.* *The Plan was closed to new entrants as of October 1, 2017.*
Change of Assumptions:	*As of September 30, 2017, the assumed investment return was lowered from 7.40% to 7.20%.* *As of September 30, 2018, the assumed investment return was lowered from 7.20% to 7.00%.* *As of September 30, 2018, inflation rates were reduced from 2.75% to 2.50%.* *As of September 30, 2018, withdrawal rates were increased for participants with fewer than eight years of service.* *As of September 30, 2018, disability rates were changed from sex-distinct rates to unisex rates, blending 75% of the previous male rates with 25% of the previous female rates.* *As of September 30, 2018, retirement rates for active participants with between 21 and 23 years of service were increased from 30% to 40% and set to 100% at 28 years of service.* *As of September 30, 2018, the percent married assumption was increased from 50% to 60%.* *As of September 30, 2018, the salary scale rates were increased for participants with fewer than two years of service and slightly reduced for participants with a larger amount of service.* *As of September 30, 2018, the funding method was changed from Replacement Entry Age to Traditional Entry Age. The Normal Cost and expected employee contributions were further updated to include a reduction for participants projected to retire during the year, to reflect the Plan now being closed to new entrants.* *As of September 30, 2018 the amortization period for newly created bases was reduced from 30 to 29 years for the plan year ended 2018, and will be further reduced by one year for new bases in each successive year beyond 2018.*

Schedule of Contributions – Last Ten Fiscal Years

Year Ended September 30	Actuarially Determined Contributions	Contributions in Relation to the Actuarially Determined Contributions	Contribution Deficiency / (Excess)	Covered-Employee Payroll[1]	Contributions as a Percentage of Covered Employee Payroll	Percentage of Payroll Actually Contributed Throughout the Year[2]
2009	$5,268,000	$5,247,000	$21,000	$27,661,000	18.97%	17.16%
2010	9,096,850	9,491,000	-394,150	32,329,400	29.36%	31.78%
2011	8,884,794	9,711,000	-826,206	31,832,037	30.51%	31.78%
2012	11,860,912	9,066,000	2,794,912	28,944,158	31.32%	35.45%
2013	12,884,770	10,742,000	2,142,770	27,871,010	38.54%	39.11%
2014	14,884,963	13,522,000	1,362,963	27,373,702	49.40%	49.93%
2015	17,618,896	17,832,000	-213,104	28,091,083	63.48%	62.81%
2016	18,863,935	18,864,000	-65	26,585,054	70.96%	68.64%
2017	19,155,820	19,162,000	-6,180	27,548,015	69.56%	N/A
2018	18,643,233	13,973,000	4,670,233	28,164,021	49.61%	N/A

See accompanying notes to this schedule on next page.

(1) Pensionable payroll as of the measurement date.

(2) The City contributed the percentage of payroll represented by the actuarially determined contribution in the corresponding actuarial valuation for years ending on or before September 30, 2016. Actual dollar contributions may be more or less than the actuarially determined contributions due to actual payroll being different from projected payroll. Effective with the September 30, 2017 fiscal year, the City implemented a policy to ensure that the calculated dollar amount of the actuarially determined contribution was met.

Effective with the September 30, 2018 fiscal year, the City began contributing based on an adjusted state minimum required contribution that reflects an adjustment for an offset for amortization of the discounted value of projected surtax revenue allocated to the plan beginning in 2030.

Methods and assumptions used to establish "actuarially determined contribution" rates:

Valuation date	Actuarially determined contribution rates are calculated as of October 1, two years prior to the end of the fiscal year in which contributions are reported
Actuarial cost method	Entry Age Actuarial Cost Method
Amortization method	Level percent of payroll, using 1.25% annual increases*
Remaining amortization period	All new bases are amortized over 30 years
Asset valuation method	The market value of assets less unrecognized returns in each of the last five years. Unrecognized return is equal to the difference between actual and expected returns on a market value basis and is recognized over a five-year period. The deferred return is further adjusted, if necessary, so that the actuarial value of assets will stay within 20% of the market value of assets.
Actuarial assumptions:	
Investment rate of return	7.40%, net of pension plan investment expense, including inflation.
Inflation rate	2.75%*
Projected salary increases	3.00% - 6.00%, of which 2.75% is the Plan's long-term payroll inflation assumption.
Cost of living adjustments	Plan provisions contain a 3.00% COLA
Other assumptions	Same as those used in the October 1, 2016 funding actuarial valuation.

**The Fund's payroll inflation assumption was 2.75% as of October 1, 2016. Per Part VII, Chapter 112.64(5)(a) of Florida Statutes, the payroll growth assumption used for amortization of the unfunded liability is not allowed to exceed the average annual payroll growth for the proceeding ten years. Based on applying this limitation to plan payroll, the payroll growth assumption for amortization purposes would have decreased from 0.68% to 0.00%. However, pursuant to Chapter 112.64(5)(b), and after adjusting this analysis to account for bargained pay level increases and inclusion of DC plan participants in the total payroll, the assumption was set at 1.25%.*

Pension Expense

Reporting Date for Employer under GASB 68	September 30, 2019	September 30, 2018
Measurement Date for Employer under GASB 68	**September 30, 2018**	**September 30, 2017**
Components of Pension Expense		
Service cost	$7,975,759	$7,329,735
Interest on the Total Pension Liability	28,317,858	27,283,975
Current-period benefit changes	0	73,780
Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	119,782	-293,497
Expensed portion of current-period changes of assumptions or other inputs	2,840,768	1,421,527
Member contributions	-$3,151,000	-2,500,000
Projected earnings on plan investments	-$15,236,028	-13,630,911
Expensed portion of current-period differences between actual and projected earnings on plan investments	-$806,596	-2,623,217
Administrative expense	128,000	75,000
Recognition of beginning of year deferred outflows of resources as pension expense	9,883,702	8,462,175
Recognition of beginning of year deferred inflows of resources as pension expense	-4,102,882	-1,186,165
Pension Expense	**$25,969,363**	**$24,412,402**

Deferred Outflows of Resources and Deferred Inflows of Resources

Reporting Date for Employer under GASB 68	September 30, 2019	September 30, 2018
Measurement Date for Employer under GASB 68	September 30, 2018	September 30, 2017
Deferred Outflows of Resources		
Changes of assumptions or other inputs	$33,713,121	$24,800,142
Net difference between projected and actual earnings on pension plan investments	0	0
Difference between expected and actual experience in the Total Pension Liability	3,030,952	3,526,710
Total Deferred Outflows of Resources	$36,744,073	$28,326,852
Deferred Inflows of Resources		
Changes of assumptions or other inputs	$532,716	$710,288
Net difference between projected and actual earnings on pension plan investments	7,376,609	4,081,277
Difference between expected and actual experience in the Total Pension Liability	2,277,831	2,773,914
Total Deferred Inflows of Resources	$10,187,156	$7,565,479
Deferred outflows of resources and deferred inflows of resources related to pension will be recognized as follows:		
Reporting Date for Employer under GASB 68 Year Ended September 30:		
2019	N/A	$5,780,820
2020	$8,740,783	6,586,829
2021	5,463,838	3,309,884
2022	2,852,833	698,879
2023	5,410,887	3,256,933
2024	4,088,576	1,128,028
Thereafter	0	0

The average of the expected service lives of all employees is determined by:

- Calculating each active employee’s expected remaining service life as the present value of $1 per year of future service at zero percent interest.
- Setting the remaining service life to zero for each nonactive or retired member.
- Dividing the sum of the above amounts by the total number of active employee, nonactive and retired members.

The average of the expected service lives for CORP as of October 1, 2018 is six years.

Schedule of Reconciliation of Net Pension Liability

Reporting Date for Employer under GASB 68	September 30, 2019	September 30, 2018
Measurement Date for Employer under GASB 68	September 30, 2018	September 30, 2017
Beginning Net Pension Liability	$182,214,321	$187,964,633
Pension expense	25,969,363	24,412,402
Employer contributions	-13,973,000	-19,162,000
New net deferred inflows/outflows	11,576,364	-3,724,704
Recognition of prior deferred inflows/outflows	-5,780,820	-7,276,010
Ending Net Pension Liability	$200,006,228	$182,214,321

Schedule of Recognition of Changes in Total Net Pension Liability

Increase (Decrease) in Pension Expense Arising from the Recognition of the Effects of Differences between Expected and Actual Experience on Total Pension Liability

Reporting Date for Employer under GASB 68 Year Ended September 30:

Reporting Date for Employer under GASB 68 Year Ended September 30	Differences between Expected and Actual Experience	Recognition Period (Years)	2018	2019	2020	2021	2022	2023	2024	Thereafter
2015	$5,963,454	7.00	$851,922	$851,922	$851,922	$851,922	$0	$0	$0	$0
2016	1,699,155	7.00	242,736	242,736	242,736	242,736	242,736	0	0	0
2017	-1,418,089	7.00	-202,584	-202,584	-202,584	-202,584	-202,584	-202,584	0	0
2018	-2,054,491	7.00	-293,497	-293,499	-293,499	-293,499	-293,499	-293,499	-293,499	0
2019	718,682	6.00	N/A	119,782	119,780	119,780	119,780	119,780	119,780	0
Net increase (decrease) in pension expense			N/A	$718,357	$718,355	$718,355	-$133,567	-$376,303	-$173,719	$0

Increase (Decrease) in Pension Expense Arising from the Recognition of the Effects of Assumption Changes

Reporting Date for Employer under GASB 68 Year Ended September 30:

Reporting Date for Employer under GASB 68 Year Ended September 30	Differences due to Assumption Changes	Recognition Period (Years)	2018	2019	2020	2021	2022	2023	2024	Thereafter
2015	$10,764,915	7.00	$1,537,845	$1,537,845	$1,537,845	$1,537,845	$0	$0	$0	$0
2016	-1,243,005	7.00	-177,572	-177,572	-177,572	-177,572	-177,572	0	0	0
2017	16,320,426	7.00	2,331,489	2,331,489	2,331,489	2,331,489	2,331,489	2,331,489	0	0
2018	9,950,689	7.00	1,421,527	1,421,527	1,421,527	1,421,527	1,421,527	1,421,527	1,421,527	0
2019	17,044,608	6.00	N/A	2,840,768	2,840,768	2,840,768	2,840,768	2,840,768	2,840,768	0
Net increase (decrease) in pension expense			N/A	$7,954,057	$7,954,057	$7,954,057	$6,416,212	$6,593,784	$4,262,295	$0

Increase (Decrease) in Pension Expense Arising from the Recognition of the Differences between Projected and Actual Earnings on Pension Plan Investments

Reporting Date for Employer under GASB 68 Year Ended September 30:

Reporting Date for Employer under GASB 68 Year Ended September 30	Differences between Expected and Actual Earnings	Recognition Period (Years)	2018	2019	2020	2021	2022	2023	2024	Thereafter
2015	-$4,030,046	5.00	-$806,009	-$806,009	$0	$0	$0	$0	$0	$0
2016	16,384,725	5.00	3,276,945	3,276,945	3,276,945	0	0	0	0	0
2017	1,106,188	5.00	221,238	221,238	221,238	221,238	0	0	0	0
2018	-13,116,089	5.00	-2,623,217	-2,623,218	-2,623,218	-2,623,218	-2,623,218	0	0	0
2019	-4,032,972	5.00	N/A	-806,596	-806,594	-806,594	-806,594	-806,594	0	0
Net increase (decrease) in pension expense			N/A	-$737,640	$68,371	-$3,208,574	-$3,429,812	-$806,594	$0	$0

Total Increase (Decrease) in Pension Expense

Reporting Date for Employer under GASB 68 Year Ended September 30:

Reporting Date for Employer under GASB 68 Year Ended September 30	Total Changes	2018	2019	2020	2021	2022	2023	2024	Thereafter
2015	$12,698,323	$1,583,758	$1,583,758	$2,389,767	$2,389,767	$0	$0	$0	$0
2016	16,840,875	3,342,109	3,342,109	3,342,109	65,164	65,164	0	0	0
2017	16,008,525	2,350,143	2,350,143	2,350,143	2,350,143	2,128,905	2,128,905	0	0
2018	-5,219,891	-1,495,187	-1,495,190	-1,495,190	-1,495,190	-1,495,190	1,128,028	1,128,028	0
2019	13,730,318	N/A	2,153,954	2,153,954	2,153,954	2,153,954	2,153,954	2,960,548	0
Net increase (decrease) in pension expense		N/A	$7,934,774	$8,740,783	$5,463,838	$2,852,833	$5,410,887	$4,088,576	$0

APPENDIX A – CALCULATION OF DISCOUNT RATE OF AS SEPTEMBER 30, 2018
PROJECTION OF PLAN FIDUCIARY NET POSITION
($in millions)

Year Beginning October 1	Projected Beginning Plan Fiduciary Net Position (a)	Projected Total Contributions (b)	Projected Benefit Payments (c)	Projected Administrative Expenses (d)	Projected Investment Earnings (e)	Projected Beginning Plan Fiduciary Net Position (f) = (a) + (b) – (c) – (d) + (e)
2018	$216,667,000	$17,113,472	$18,570,070	$132,753	$15,111,063	$230,188,712
2019	230,188,712	17,623,975	19,743,047	136,072	16,034,280	243,967,848
2020	243,967,848	17,446,138	20,930,408	139,473	16,950,918	257,295,023
2021	257,295,023	16,869,858	22,168,754	142,960	17,820,187	269,673,354
2022	269,673,354	16,344,891	23,379,271	146,534	18,625,803	281,118,243
2023	281,118,243	16,049,746	24,882,203	150,197	19,363,884	291,499,473
2024	291,499,473	15,805,831	26,075,001	153,953	20,040,154	301,116,504
|	|	|	|	|	|	|
2046	468,097,583	13,022,518	50,035,432	265,043	32,072,635	480,336,046
2047	480,336,046	1,572,476	49,938,188	271,669	32,557,695	482,441,506
2048	482,441,506	275,065	49,753,743	278,462	32,692,936	484,335,317
2049	484,335,317	281,943	49,481,390	285,423	32,863,232	487,477,409
|	|	|	|	|	|	|
2118	13,891,162,200	1,549,189	32	1,568,314	972,380,683	14,863,523,726
2119	14,863,523,726	1,587,918	4	1,607,522	1,040,445,975	15,903,950,092
2120	15,903,950,092	1,627,616	0	0	1,113,333,473	17,018,911,182

Notes

(1) The projected beginning plan fiduciary net position amounts shown have not been adjusted for the time value of money.

(2) The projection above is based on the actuarial valuation as of October 1, 2018, which was used as the basis of the TPL measurements as of September 30, 2018. The NPL measurement corresponding to this TPL measurement was used for the purpose of GASB 67 disclosures as of September 30, 2018 and GASB 68 disclosures as of September 30, 2019.

(3) Projected total contributions include employee rates applied to closed group projected payroll plus the projected employer contributions on closed group employer normal cost and an amortization payment on the unfunded liability. Employer contributions are lagged by one year and increased by 1.25% based on the assumed payroll growth for funding policy purposes as of October 1, 2018. Based on the closed amortization period for the unfunded liability and City estimates of tax income allocated to the plan, current funding policy is projected to be adequate to maintain solvency. Contributions are assumed to be paid at the beginning of each month.

(4) Projected benefit payments have been determined in accordance with Paragraph 39 of GASB Statement No. 67, and are based on the closed group of active, inactive vested, retired members and beneficiaries as of September 30, 2018. Benefit payments are assumed to be paid with an average timing equivalent to mid-year payment.

(5) Administrative expenses are $128,000 for the year beginning October 1, 2018, and are projected with 2.50% inflation. Expenses are assumed to be paid mid-year.

(6) Projected investment earnings are based on the assumed investment rate of return of 7.00% per annum.

(7) As illustrated in this Exhibit, the Plan's fiduciary net position was projected to be available to make all projected future benefit payments for current Plan members. In other words, there is no projected "cross-over date" when projected benefits are not covered by projected assets. Therefore, the long-term expected rate of return on Plan investments of 7.00% per annum was applied to all periods of projected benefit payments to determine the total pension liability, pursuant to paragraph 44 of GASB Statement No. 67.