



City of Jacksonville General Employees Retirement Plan

**Actuarial Valuation and Review as of
October 1, 2018**

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April 10, 2019

Board of Trustees
City of Jacksonville General Employees 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:

A handwritten signature in black ink, appearing to read "Jeffrey S. Williams", written over a horizontal line.

Jeffrey S. Williams, FCA, ASA, MAAA, EA
Vice President and Consulting Actuary
Enrolled Actuary No. 17-7009

Table of Contents

City of Jacksonville General Employees Retirement Plan Actuarial Valuation and Review as of October 1, 2018

Section 1: Actuarial Valuation Summary

Purpose and Basis	4
Highlights	5
Summary of Key Valuation Results	9
Important Information About Actuarial Valuations	10

Section 2: Actuarial Valuation Results

Participant Data.....	12
Financial Information.....	16
Actuarial Experience	19
Changes in the Actuarial Accrued Liability	24
Development of Unfunded Actuarial Accrued Liability.....	25
Florida Chapter 112 Determined Employer Contribution and City's Minimum Required Contribution.....	26
History of Employer Contributions	28
Risk	29
GFOA Solvency Test	31

Section 3: Supplemental Information

Exhibit A – Table of Plan Coverage	32
Exhibit B – Participants in Active Service as of September 30, 2018	33
Exhibit C – Reconciliation of Participant Data	34
Exhibit D – Summary Statement of Income and Expenses on a Market Value Basis	35
Exhibit E – Summary Statement of Plan Assets	36
Exhibit F – Development of the Fund Through September 30, 2018	37
Exhibit G – Table of Amortization Bases.....	38
Exhibit H – Definition of Pension Terms.....	39
Exhibit I – Section 415.....	43
Exhibit J – Supplementary State of Florida Information Summary of Salary Changes	44
Exhibit K – Supplementary State of Florida Information Recent History of Recommended and Actual Contributions	45
Exhibit L – Supplementary State of Florida Information Comparative Summary of Principal Valuation Results .	46
Exhibit M – Supplementary State of Florida Information Actuarial Present Value of Accumulated Plan Benefits	48

Section 4: Actuarial Valuation Basis

Exhibit I – Actuarial Assumptions and Actuarial Cost Method	49
Exhibit II – Summary of Plan Provisions	57

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 contributions made during the fiscal year ending September 30, 2018 were \$71,024,000, 101.22% of the City’s required minimum contribution for fiscal 2018.
4. The funded ratio (the ratio of the actuarial value of assets to actuarial accrued liability) is 63.24%, compared to the prior year funded ratio of 64.36%. 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 65.23%, compared to 66.58% 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 General Employees Retirement Plan (GERP) 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 required minimum 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 GERP payroll, including General Employee 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” refers to the cumulative minimum required contribution for all contributing employers.
7. The City’s minimum required contribution (the amount which will be contributed) for fiscal 2020 is \$71,249,679, an increase of \$2,002,155 from the amount being contributed in fiscal 2019. The contribution as a percentage of projected payroll increased from 26.46% of projected payroll to 27.64% of projected payroll.
8. The unfunded actuarial accrued liability (UAAL) is \$1,175,135,210, which is an increase of \$93,821,769 since the prior valuation.
9. The actuarial gain from investment and other experience was \$24,525,852, or 0.79% of actuarial accrued liability.
 - The actuarial gain from investment experience was \$12,019,727, or 0.39% of actuarial accrued liability.
 - The net experience gain from sources other than investment experience was \$12,506,125, or 0.40% of the actuarial accrued liability.
10. The rate of return on the market value of assets was 7.37% for the October 1, 2017 to September 30, 2018 plan year. The return on the actuarial value of assets was 8.46% 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%.
11. 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 changed from 2.75% to 2.50%.
 - COJ withdrawal rates were changed from sex-distinct to unisex with the rate table expanded through 25 years of service, and increased rates in earlier years of service.
 - JEA withdrawal rates were changed from sex-distinct to unisex with the rate table expanded through 25 years of service, and mostly decreased rates of withdrawal for most years.
 - Disability rates were changed from sex-distinct to unisex, using a blend of 60% of the previous male disability rates and 40% of the previous female disability rates.
 - Retirement rates for COJ and JEA participants were combined, with updated age-based rates for participants with fewer than 31 years of service and service based rates for participants with at least 31 years of service. The 90% BACKDROP election assumption for eligible participants was removed (it is now implicit in the updated table), and 100% retirement is now assumed at the earlier of 70 years of age or 40 years of service.
 - The percent married assumption was changed from 65% of males and 50% of females to 75% of males and 55% of females.
 - The Fund’s long-term payroll growth assumption was changed from 2.75% to 2.50%.
 - The salary scale was updated to reflect 2.50% inflation, with rates of salary increases decreased across most years for COJ participants and increased across most years for JEA participants.

- 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 \$672,419 and the actuarial accrued liability increased by \$88,449,536. The total impact was an increase in the City's minimum required contribution of \$2,888,307, or 1.12% of projected payroll.

12. The following plan change is included for the first time in this valuation:

- Liabilities for GERP participants that were included in the City's Disability Plan have been transferred back into GERP, along with a transfer of \$11,397,000 in assets. The 0.3% of employee contributions that were previously allocated to the Disability Plan are now being allocated to GERP.

As a result of this plan change, the employer normal cost increased by \$59,736 and the actuarial accrued liability increased by \$17,317,390. The total impact was an increase in the City's minimum required contribution of \$471,739, or 0.18% of projected payroll.

13. The City changed the surtax allocation percentage from the prior valuation to the current valuation. In the 2017 valuation, GERP's allocation percentage was 31.90%; in the 2018 valuation, the allocation percentage has been increased to 33.40%. This change was directed by the City based on its updated calculation of the General Employees Retirement Plan's share of the City's unfunded liabilities. The change in the surtax allocation percentage caused the City's minimum required contribution to decrease by \$1,397,849, or 0.54% of projected payroll.

14. 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.

15. 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 33.40% of the projected revenue for October 1, 2031 through December 31, 2060 was allocated to GERP.
- c. The revenue allocated to GERP 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 GERP is \$472,470,212.
- e. The present value amount of \$472,470,212 was then amortized over a 30-year initial period (Section 3, Exhibit G), 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.
16. 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.
17. 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, 2018, will be provided separately.
18. 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.
19. 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.
20. 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.
21. 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	\$100,620,425	\$95,290,428	\$93,743,647
	• Less amortized value of discounted value of projected surtax revenue	<u>-29,370,746</u>	<u>-26,042,904</u>	<u>-23,577,426</u>
	• City's required minimum contribution*	\$71,249,679	\$69,247,524	\$70,166,221
	• Actual employer contributions	- -	- -	71,024,000
Actuarial accrued liability for plan year beginning October 1:	• Retired participants and beneficiaries		\$2,179,539,282	\$2,075,478,777
	• Inactive vested participants		25,251,691	24,376,413
	• Active participants		991,889,543	933,791,108
	• Total		3,196,680,516	3,033,646,298
	• Total normal cost including administrative expenses for plan year beginning October 1		41,097,477	43,165,881
Assets for plan year beginning October 1:	• Market value of assets (MVA)		\$2,085,056,000	\$2,019,668,000
	• Actuarial value of assets (AVA)		2,021,545,306	1,952,332,857
	• Actuarial value of assets as a percentage of market value of assets		96.95%	96.67%
Funded status for plan year beginning October 1:	• Unfunded actuarial accrued liability on market value of assets		\$1,111,624,516	\$1,013,978,298
	• Funded percentage on MVA basis		65.23%	66.58%
	• Unfunded actuarial accrued liability on actuarial value of assets		\$1,175,135,210	\$1,081,313,441
	• Funded percentage on AVA basis		63.24%	64.36%
Key assumptions:	• Net investment return		7.00%	7.20%
	• Inflation rate		2.50%	2.75%
	• Payroll growth for amortization purposes		1.50%	1.50%
Demographic data for plan year beginning October 1	• Number of retired participants and beneficiaries		5,176	5,105
	• Number of inactive vested participants		185	195
	• Number of active participants		4,234	4,644
	• Covered payroll		\$253,982,175	\$257,850,484
	• Average payroll		59,986	55,523
	• Projected payroll for next fiscal year		257,791,908	261,718,241

*Pursuant to State Law Chapter 2016-146 and City of Jacksonville Ordinance 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 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 State 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.

Section 2: Actuarial Valuation Results

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	5,113	82	4,465	4,547	0.89
2010	6,280	97	4,504	4,601	0.73
2011	6,109	90	4,603	4,693	0.77
2012	5,485	81	4,783	4,864	0.89
2013	5,139	78	4,896	4,974	0.97
2014	5,026	76	4,907	4,983	0.99
2015	4,817	65	4,976	5,041	1.05
2016	4,678	217	5,065	5,282	1.13
2017	4,644	195	5,105	5,300	1.14
2018	4,234	185	5,176	5,361	1.27

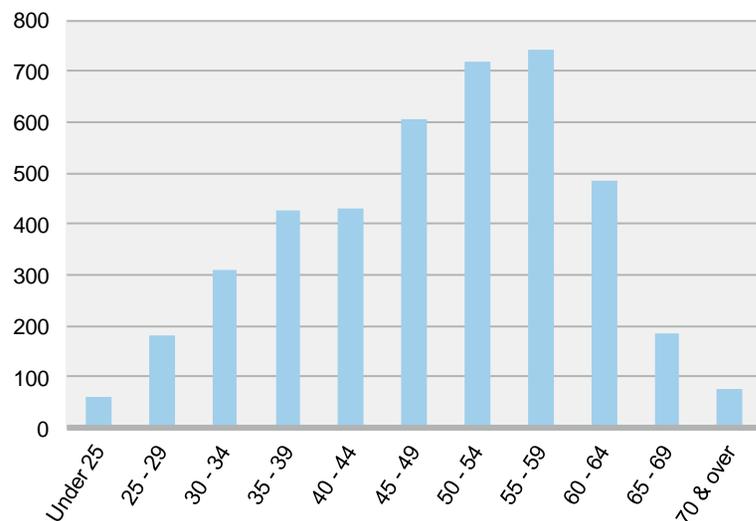
*Excludes terminated participants due a refund of employee contributions

Active Participants

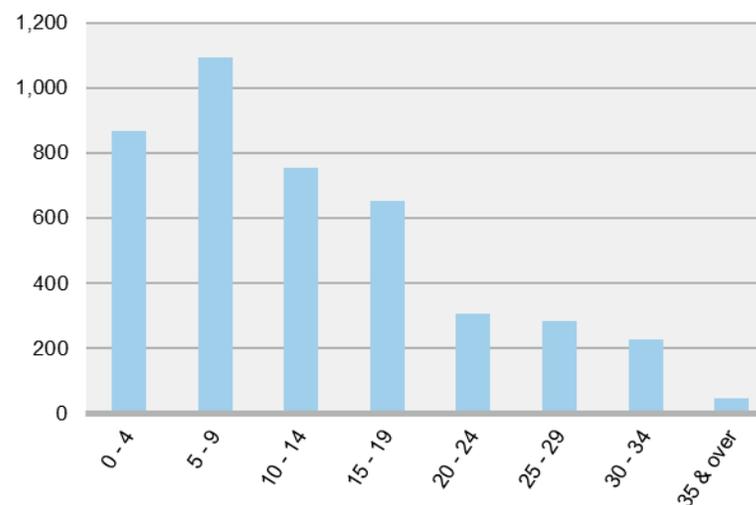
Plan costs are affected by the age, years of service and payroll of active participants. In this year's valuation, there were 4,234 active participants with an average age of 49.3, average years of service of 13.2 years and average payroll of \$59,986. The 4,644 active participants in the prior valuation had an average age of 48.6, average service of 12.5 years and average payroll of \$55,523.

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 185 participants with a vested right to a deferred or immediate vested benefit.

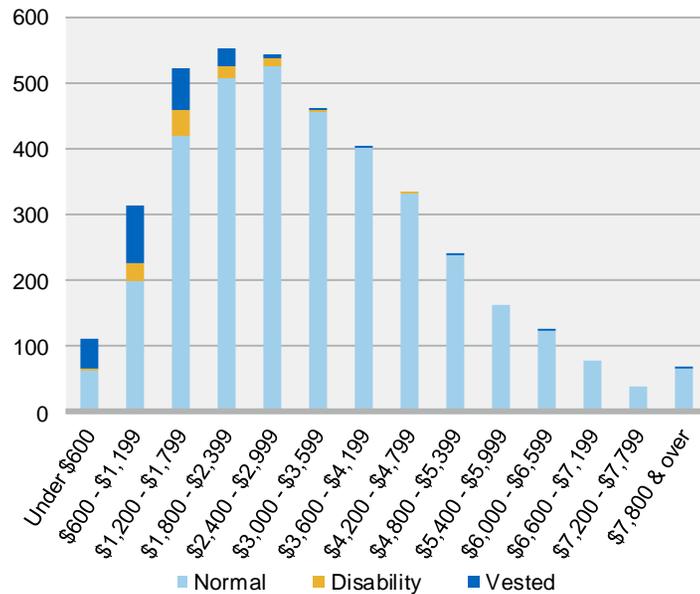
Retired Participants and Beneficiaries

As of September 30, 2018, 3,958 retired participants and 1,218 beneficiaries were receiving total monthly benefits of \$15,107,674. For comparison, in the previous valuation, there were 3,882 retired participants and 1,223 beneficiaries receiving monthly benefits of \$14,521,511.

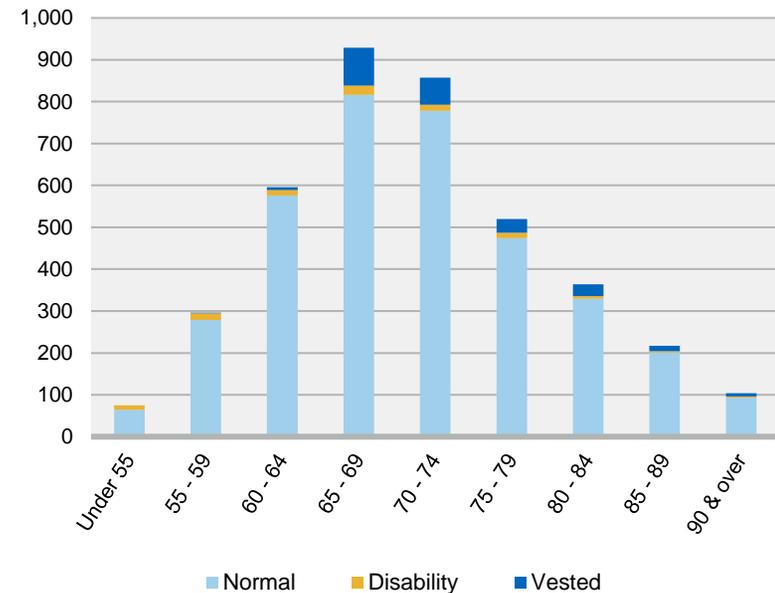
As of September 30, 2018, the average monthly benefit for retired participants is \$2,919, compared to \$2,845 in the previous valuation. The average age for retired participants is 72.1 in the current valuation, compared with 71.1 in the prior valuation.

Distribution of Pensioners as of September 30, 2018

PENSIONERS BY TYPE AND MONTHLY AMOUNT



PENSIONERS BY TYPE AND AGE



Historical Plan Population

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

PARTICIPANT DATA STATISTICS: 2010 – 2018

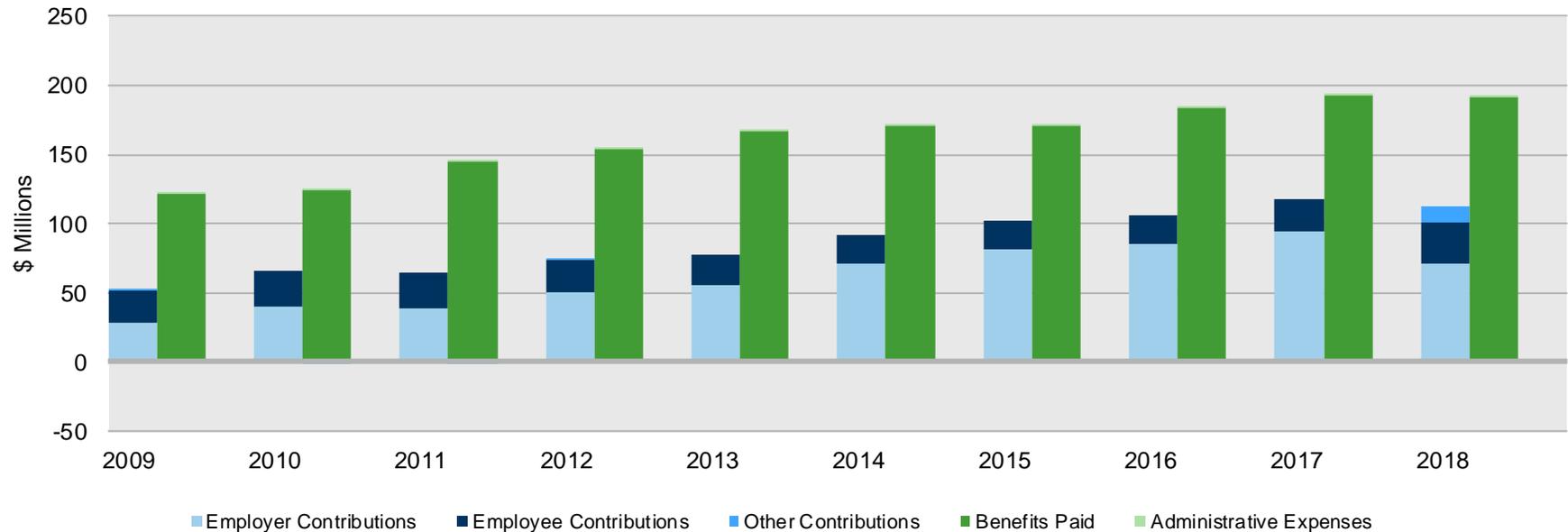
Year Ended September 30	Active Participants			Retired Participants and Beneficiaries		
	Count	Average Age	Average Service	Count	Average Age	Average Monthly Amount
2010	6,280	47.0	10.5	4,504	70.4	2,240
2011	6,109	47.4	10.8	4,603	70.6	2,335
2012	5,485	47.7	11.2	4,783	70.5	2,441
2013	5,139	48.1	11.6	4,896	70.7	2,528
2014	5,026	48.3	11.8	4,907	70.9	2,606
2015	4,817	48.5	12.1	4,976	71.2	2,675
2016	4,678	48.5	12.5	5,065	71.4	2,756
2017	4,644	48.6	12.5	5,105	71.7	2,845
2018	4,234	49.3	13.2	5,176	72.1	2,919

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*.

COMPARISON OF CONTRIBUTIONS MADE WITH BENEFITS AND EXPENSES PAID FOR YEARS ENDED SEPTEMBER 30, 2009 – 2018



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

1. Market value of assets, September 30, 2018			\$2,085,056,000
2. Calculation of unrecognized return	Original Amount *	Percent Deferred	Unrecognized Amount**
(a) Year ended September 30, 2018	\$3,347,148	80%	\$2,677,718
(b) Year ended September 30, 2017	133,575,436	60	80,145,261
(c) Year ended September 30, 2016	39,489,525	40	15,795,810
(d) Year ended September 30, 2015	-175,540,475	20	-35,108,095
(e) Year ended September 30, 2014	63,631,545	0	0
(f) Total unrecognized return			63,510,694
3. Preliminary actuarial value: (1) - (2f)			\$2,021,545,306
4. Adjustment to be within 20% corridor			0
5. Final actuarial value of assets as of September 30, 2018: (3) + (4)			<u>2,021,545,306</u>
6. Actuarial value as a percentage of market value: (5) ÷ (1)			97.0%
7. Amount deferred for future recognition: (1) - (5)			\$63,510,694

*Total return minus expected return on a market value basis

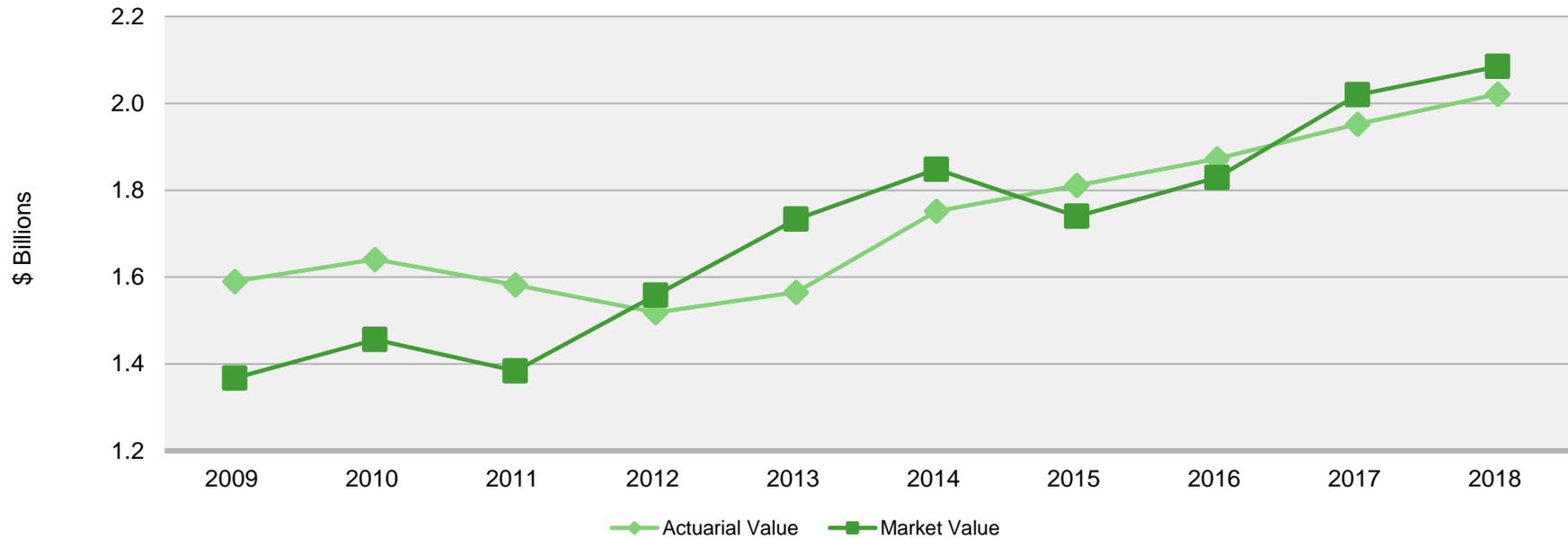
**Recognition at 20% per year over five years; effective October 1, 2014, the Plan accelerated the recognition of prior year asset gain/loss bases by reflecting 45% of the outstanding gain/loss immediately.

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

(a) Amount recognized on September 30, 2019	\$174,327
(b) Amount recognized on September 30, 2020	35,282,422
(c) Amount recognized on September 30, 2021	27,384,517
(d) Amount recognized on September 30, 2022	669,430
(e) Amount recognized on September 30, 2023	0

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 gain is \$24,525,852, which includes \$12,019,727 from investment gains and \$12,506,125 in gains 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*	\$12,019,727
2	Net loss from administrative expenses	-388,211
3	Net gain from other experience	12,894,336
4	Net experience gain: 1 + 2 + 3	\$24,525,852

* 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 7.37% 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 7.83%. 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	\$145,470,000	\$149,294,449	\$266,138,000	\$155,254,757
2 Average value of assets	1,973,928,500	1,906,593,357	1,791,386,000	1,834,934,100
3 Rate of return: 1 ÷ 2	7.37%	7.83%	14.86%	8.46%
4 Assumed rate of return	7.20%	7.20%	7.40%	7.40%
5 Expected investment income: 2 x 4	142,122,852	137,274,722	132,562,564	135,785,123
6 Actuarial gain/(loss): 1 – 5	<u>\$3,347,148</u>	<u>\$12,019,727</u>	<u>\$133,575,436</u>	<u>\$19,469,634</u>

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.

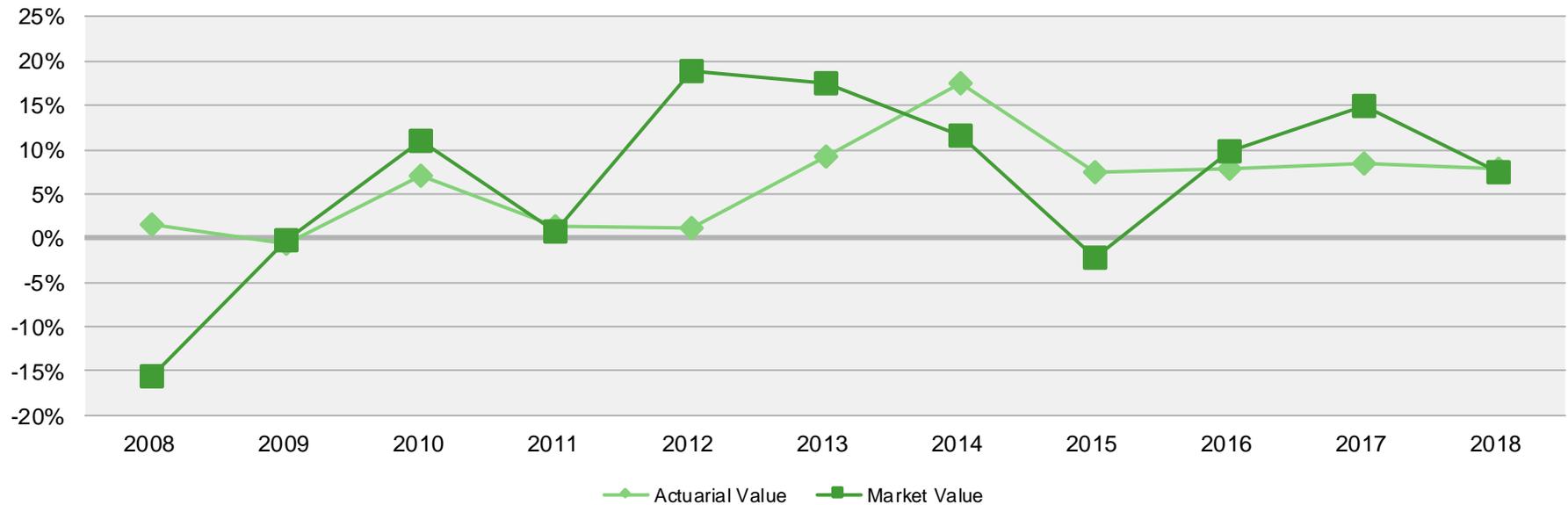
INVESTMENT RETURN – ACTUARIAL VALUE VS. MARKET VALUE: 2008 - 2018

Year Ended September 30	Actuarial Value Investment Return		Market Value Investment Return	
	Amount	Percent	Amount	Percent
2008	--	1.59%	--	-15.65%
2009	--	-0.70	--	-0.31
2010	\$110,280,623	7.07	\$148,054,000	11.07
2011	22,313,906	1.39	9,313,000	0.66
2012	16,512,253	1.07	254,394,000	18.92
2013	136,580,384	9.27	264,541,000	17.48
2014	266,591,200	17.48	194,864,000	11.51
2015	128,075,601	7.46	-39,506,000	-2.18
2016	139,333,989	7.86	167,067,000	9.82
2017	155,254,757	8.46	266,138,000	14.86
2018	149,294,449	7.83	145,470,000	7.37
Total	\$1,124,237,162		\$1,410,335,000	
Most recent five-year average return		9.58%		8.18%
Most recent nine-year average return		7.53%		9.67%

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 \$1,193,000 compared to the assumption of \$787,000. This resulted in a loss of \$388,211 for the year. Because it is expected that these expenses will continue to increase, we have changed the assumption from \$787,000 to \$1,193,000 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 gain from this other experience for the year ended September 30, 2018 amounted to \$12,894,336, 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 \$3,196,680,516, an increase of \$163,034,218, or 5.4%, 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

- 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 3.7% and the actuarial accrued liability increased by 2.9%.
- Details on actuarial assumptions and methods are in *Section 4, Exhibit I*.

Plan Provisions

- Since the previous valuation, liabilities for General Employees Retirement Plan participants that were included in the City's Disability Plan have been transferred back into GERP, along with a transfer of \$11,397,000 in assets. The 0.3% of employee contributions that were previously allocated to the Disability Plan are now being allocated to GERP.
- As a result of these plan changes, the employer normal cost increased by 0.3% and the actuarial accrued liability increased by 0.5%.
- 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	\$1,081,313,441
2	Employer normal cost at beginning of year	18,154,384
3	Employer contributions	-71,024,000
4	Interest	
	• For whole year on 1 + 2	\$79,161,683
	• For half year on 3	<u>-2,314,372</u>
	Total interest	<u>76,847,311</u>
5	Expected unfunded actuarial accrued liability	\$1,105,291,136
6	Changes due to:	
	• (Gain)/loss	-24,525,852
	• Assumptions and methods	88,449,536
	• Plan provisions	<u>5,920,390</u>
	Total changes	<u>\$69,844,074</u>
7	Unfunded actuarial accrued liability at end of year	<u>\$1,175,135,210</u>

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	\$39,904,477	15.48%	\$42,378,881	16.19%
2. Administrative expenses	1,193,000	0.46%	787,000	0.30%
3. Expected employee contributions	<u>-23,628,493</u>	<u>-9.17%</u>	<u>-25,011,497</u>	<u>-9.56%</u>
4. Employer normal cost: (1) + (2) + (3)	17,468,984	6.78%	18,154,384	6.94%
5. Actuarial accrued liability	3,196,680,516		3,033,646,298	
6. Actuarial value of assets	2,021,545,306		1,952,332,857	
7. Unfunded actuarial accrued liability: (5) - (6)	1,175,135,210		1,081,313,441	
8. Payment on unfunded actuarial accrued liability	78,115,225	30.30%	72,276,044	27.62%
9. Florida Chapter 112 determined employer contribution (4) + (8) ¹	100,620,425	39.03%	95,290,428	36.41%
10. Amortized value of discounted value of projected surtax revenue ^{1, 2}	-29,370,746	-11.39%	-26,042,904	-9.95%
11. City's minimum required contribution: (9) + (10) ²	<u>\$71,249,679</u>	<u>27.64%</u>	<u>\$69,247,524</u>	<u>26.46%</u>
12. Projected payroll	\$257,791,908		\$261,718,241	

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

²Pursuant 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	\$69,247,524
• Effect of plan amendment	471,739
• Effect of expected change in amortization payment due to payroll growth	751,762
• Effect of change in administrative expense assumption	427,820
• Effect of change in other actuarial assumptions and methods	2,916,229
• Effect of contribution deferral to budget year and balancing amortization bases for surtax credits	1,641,076
• Effect of gain on higher than projected fiscal year 2018 surtax	-570,140
• Effect of change in surtax allocation percentage	-1,426,649
• Effect of investment gain	-835,709
• Effect of other gains and losses on accrued liability	-869,528
• Net effect of other changes, including composition and number of participants	-504,445
Total change	\$2,002,155
City's Minimum Required Contribution as of October 1, 2019	\$71,249,679

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	\$39,123,971	\$39,378,000	100.65%
2012	57,497,706	49,899,000	86.78%
2013	66,659,915	55,386,000	83.09%
2014	81,351,295	71,000,000	87.28%
2015	86,069,361	81,751,000	94.98%
2016	89,058,931	84,898,000	95.33%
2017	94,526,754	94,700,000	100.18%
2018	70,166,211	71,024,000	101.22%
2019	69,247,529	--	--
2020	71,249,679	--	--

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 -2.18% to a high of 18.92%.

- 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 large 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 1.5%, 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 required contribution, over the immediate term, the unfunded liability has an expected growth rate of 2.4% 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 2.4% per year. By comparison, the surtax revenue is assumed to grow 4.25% per year.

If the surtax revenue for fiscal 2018 had been 1% lower, the City's required contribution would increase by \$326,283, or 0.13% of projected payroll. For comparison purposes, the allocated surtax revenue is 22.7% of the market value of assets and 14.8% 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.
- Participants' use of plan provisions allowing conversion of benefits from the DB plan to the DC plan.

➤ 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 on a market value basis for a year has ranged from a loss of \$175,540,475 to a gain of \$147,228,359. 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 \$1,791,513,032 as opposed to the actual value of \$2,085,056,000. 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 \$55,702,357 to a gain of \$20,285,622.

The funded percentage on the actuarial value of assets has ranged from a low of 62.3% to a high of 75.9% since 2010.

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 1.27. For the prior year benefits and expenses paid were \$91.5 million more than contributions received. As the Plan matures, more cash will be needed from the investment portfolio to meet benefit payments.

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	\$185,538,727	\$182,131,911
• Retirees and beneficiaries	2,179,539,282	2,075,478,777
• Active and inactive members (employer-financed)	831,602,507	776,035,610
Total	\$3,196,680,516	\$3,033,646,298
Actuarial value of assets	\$2,021,545,306	\$1,952,332,857
Cumulative portion of AAL covered		
• Active member contributions	100.00%	100.00%
• Retirees and beneficiaries	84.24%	85.29%
• 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	4,234	4,644	-8.8%
• Average age	49.3	48.6	0.7
• Average years of service	13.2	12.5	0.7
• Projected total payroll	\$253,982,175	\$257,850,484	-1.5%
• Projected average payroll	59,986	55,523	8.0%
• Account balances	185,538,727	182,131,911	1.9%
• Total active vested participants	3,366	3,534	-4.8%
Inactive vested participants	185	195	-5.1%
Retired participants:			
• Number in pay status	3,856	3,807	1.3%
• Average age	70.8	70.4	0.4
• Average monthly benefit	\$3,266	\$3,185	2.5%
Disabled participants:			
• Number in pay status	102	75	36.0%
• Average age	67.2	69.7	-2.5
• Average monthly benefit	\$1,631	\$1,561	4.5%
Beneficiaries:			
• Number in pay status	1,218	1,223	-0.4%
• Average age	76.3	76.0	0.3
• Average monthly benefit	\$1,929	\$1,862	3.6%

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

Age	Years of Service									
	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
Under 25	61	61	--	--	--	--	--	--	--	--
	\$32,980	\$32,980	--	--	--	--	--	--	--	\$0
25 - 29	183	132	50	1	--	--	--	--	--	--
	47,777	43,813	\$57,533	\$83,200	--	--	--	--	--	--
30 - 34	309	137	116	53	3	--	--	--	--	--
	55,298	47,669	62,580	60,163	\$36,225	--	--	--	--	--
35 - 39	427	117	142	125	41	2	--	--	--	--
	59,020	50,675	59,407	66,309	60,583	\$32,082	--	--	--	--
40 - 44	431	95	130	100	82	24	--	--	--	--
	62,206	52,454	61,238	67,528	66,427	69,445	--	--	--	--
45 - 49	608	112	162	115	113	66	34	6	--	--
	61,397	51,915	58,950	70,332	62,605	63,239	\$66,132	\$63,377	--	--
50 - 54	721	95	161	113	115	87	87	61	2	--
	64,793	55,927	58,754	64,306	65,137	69,284	76,954	71,087	\$63,446	--
55 - 59	744	73	159	112	144	63	81	94	18	--
	61,762	53,852	53,508	63,188	60,870	63,909	69,100	67,431	94,877	--
60 - 64	486	28	106	94	101	41	47	51	17	1
	59,451	61,822	50,569	55,156	65,555	61,405	57,204	65,015	84,468	\$38,091
65 - 69	186	13	49	29	36	16	24	13	1	5
	58,992	69,740	38,024	61,639	61,572	63,953	71,042	69,854	45,771	103,292
70 & over	78	5	18	13	18	7	10	3	1	3
	54,696	88,090	38,714	43,639	60,532	69,793	54,012	67,126	52,349	63,244
Total	4,234	868	1,093	755	653	306	283	228	39	9
	\$59,986	\$49,971	\$56,697	\$63,953	\$63,242	\$65,320	\$68,814	\$67,896	\$86,378	\$82,698

EXHIBIT C – RECONCILIATION OF PARTICIPANT DATA

	Active Participants	Inactive Vested Participants	Disableds	Retired Participants	Beneficiaries	Total
Number as of October 1, 2017	4,644	195	75	3,807	1,223	9,944
• New participants	0	N/A	N/A	N/A	N/A	0
• Terminations – with vested rights	-1	1	0	0	0	0
• Terminations – without vested rights	-216	N/A	N/A	N/A	N/A	-216
• Retirements	-151	-8	N/A	159	N/A	0
• New disabilities	-1	0	35	N/A	N/A	34
• Return to work	1	-1	0	0	N/A	0
• Deceased	-11	0	-8	-112	-64	-195
• New beneficiaries	0	0	0	0	62	62
• Lump sum cash-outs	-32	-2	0	0	0	34
• Rehire	0	0	N/A	0	N/A	0
• Certain period expired	N/A	N/A	0	0	-6	-6
• Data adjustments	6	0	0	0	3	11
• Net transfers (to)/from DC Plan or Corrections	0	0	0	2	0	-5
Number as of October 1, 2018	4,234	185	102	3,856	1,218	9,595

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	\$2,019,668,000	\$1,829,242,000
Contribution income:		
• Employer contributions	\$71,024,000	\$94,700,000
• Employee contributions	29,919,000	23,037,000
• Transfers contributions	11,397,000	0
• Less administrative expenses	<u>-1,193,000</u>	<u>-787,000</u>
<i>Net contribution income</i>	<i>\$111,147,000</i>	<i>\$116,950,000</i>
Investment income:		
• Interest, dividends and other income	\$19,788,000	\$19,084,000
• Asset appreciation	134,552,000	256,159,000
• Less investment fees	<u>-8,870,000</u>	<u>-9,105,000</u>
<i>Net investment income</i>	<i><u>\$145,470,000</u></i>	<i><u>\$266,138,000</u></i>
Total income available for benefits	\$256,617,000	\$383,088,000
Less benefit payments:		
• Benefit payments	-\$175,217,000	-\$173,197,000
• Refunds	-16,012,000	-19,465,000
<i>Net benefit payments</i>	<i>-\$191,229,000</i>	<i>-\$192,662,000</i>
Change in market value of assets	\$65,388,000	\$190,426,000
Net assets at market value at the end of the year	\$2,085,056,000	\$2,019,668,000

EXHIBIT E – SUMMARY STATEMENT OF PLAN ASSETS

	September 30, 2018	September 30, 2017
Cash equivalents and short-term investments	\$14,969,000	\$4,480,000
Total accounts receivable	\$3,239,000	\$4,815,000
Investments:		
• Equities	\$1,359,167,000	\$1,319,476,000
• Fixed income	420,108,000	425,372,000
• Real estate	365,820,000	338,655,000
• Other assets	156,499,000	149,356,000
• Equity in pooled investments	<u>-229,369,000</u>	<u>-214,465,000</u>
Total investments at market value	\$2,072,225,000	\$2,018,394,000
Total assets	\$2,090,433,000	\$2,027,689,000
Total accounts payable	-5,377,000	-8,021,000
Net assets at market value	\$2,085,056,000	\$2,019,668,000
Net assets at actuarial value	\$2,021,545,306	\$1,952,332,857

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

Year Ended September 30	Employer Contributions	Employee Contributions	Other Contributions and Transfers	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	\$40,551,000	\$25,196,000	-\$2,000	\$148,054,000	\$775,000	\$124,656,000	\$1,456,079,000	\$1,640,892,767	112.7%
2011	39,378,000	25,051,000	-6,000	9,313,000	701,000	144,899,000	1,384,227,000	1,582,041,673	114.3%
2012	49,899,000	24,098,000	1,040,000	254,394,000	705,000	154,308,000	1,558,645,000	1,518,577,926	97.4%
2013	55,386,000	21,878,000	0	264,541,000	671,000	166,460,000	1,733,319,000	1,565,291,310	90.3%
2014	71,000,000	20,961,000	0	194,864,000	828,000	171,127,000	1,848,189,000	1,751,888,510	94.8%
2015	81,751,000	20,893,000	0	-39,506,000	762,000	170,674,000	1,739,891,000	1,811,172,111	104.1%
2016	84,898,000	21,840,000	0	167,067,000	762,000	183,692,000	1,829,242,000	1,872,790,100	102.4%
2017	94,700,000	23,037,000	0	266,138,000	787,000	192,662,000	2,019,668,000	1,952,332,857	96.7%
2018	71,024,000	29,919,000	11,397,000	145,470,000	1,193,000	191,229,000	2,085,056,000	2,021,545,306	97.0%

* On a market basis, net of investment fees

EXHIBIT G – TABLE OF AMORTIZATION BASES

Type*	Date Established	Initial Period	Initial Amount	Annual Payment*	Years Remaining	Outstanding Balance
Fresh start	10/01/2016	30	\$1,024,497,072	\$68,369,421	28	\$1,026,576,652
Experience gain	10/01/2017	30	-5,594,096	-367,451	29	-5,601,185
Plan change	10/01/2017	30	-3,528,667	-231,782	29	-3,533,138
Assumptions change	10/01/2017	30	64,164,450	4,214,678	29	64,245,761
Experience gain	10/01/2018	29	-922,806	-60,538	29	-922,806
Assumptions change	10/01/2018	29	88,449,536	5,802,505	29	88,449,536
Plan change	10/01/2018	29	5,920,390	388,392	29	5,920,390
Total				\$78,115,225		\$1,175,135,210

* Level percentage of payroll; per Part VII, Chapter 112.64(5)(b) of Florida Statutes, outstanding balances were amortized using a 1.50% 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	-\$322,190,859	-\$22,168,630	28	-\$332,865,158
Surtax offset gain	10/01/2017	30	-7,927,401	-520,716	29	-7,937,448
Surtax offset allocation assumption change	10/01/2017	30	-10,588,075	-695,484	29	-10,601,493
Surtax offset discount rate assumption change	10/01/2017	30	-18,720,570	-1,229,671	29	-18,744,293
Surtax offset gain	10/01/2018	29	-8,089,137	-530,670	29	-8,089,187
Surtax offset allocation assumption change	10/01/2018	29	-20,241,389	-1,327,884	29	-20,241,389
Surtax offset discount rate assumption change	10/01/2018	29	-21,761,957	-1,427,637	29	-21,761,957
Total				-\$27,900,692		-\$420,240,925

* Level percentage of payroll; per Part VII, Chapter 112.64(5)(b) of Florida Statutes, outstanding balances were amortized using a 1.50% payroll growth rate for October 1, 2018 valuation.

EXHIBIT H – 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):	<p>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:</p> <ul style="list-style-type: none"> 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;

	<p><u>Mortality rates</u> - the death rates of employees and pensioners; life expectancy is based on these rates;</p> <p><u>Retirement rates</u> - the rate or probability of retirement at a given age or service;</p> <p><u>Disability rates</u> – the probability of disability retirement at a given age;</p> <p><u>Withdrawal rates</u> - the rates at which employees of various ages are expected to leave employment for reasons other than death, disability, or retirement;</p> <p><u>Salary increase rates</u> - the rates of salary increase due to inflation and productivity growth.</p>
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 I – 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 age at retirement, 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 J – 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	\$262,345,000	5.41%	5.08%	5.72%
2009	276,257,000	5.30%	3.16%	5.42%
2010*	275,173,962	-0.39%	0.61%	5.36%
2010	322,530,502	17.21%	N/A	N/A
2011	314,054,361	-2.63%	0.94%	5.62%
2012	283,020,575	-9.88%	2.31%	5.83%
2013	265,404,735	-6.22%	1.60%	2.84%
2014	262,368,813	-1.14%	0.04%	2.84%
2015	254,034,479	-3.18%	3.85%	2.48%
2016	250,894,295	-1.24%	2.76%	4.27%
2017	257,850,484	2.77%	4.64%	5.30%
2018	253,982,175	-1.50%	7.33%	5.13%

Note: The average total payroll growth for the most recent ten years was -0.32% per year. Additional analysis of bargained pay increases applicable for the next year and pay of DC plan participants unused to support a payroll increases assumption of 1.50%.

Salary history prior to October 1, 2016 was taken from the City's Comprehensive Annual Financial Report.

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

**EXHIBIT K – 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*	13.50%	\$289,807,191	\$39,123,971	--	\$39,378,000
2012	2010	17.22%	333,819,070	57,497,706	--	49,899,000
2013	2011	20.51%	325,046,264	66,659,915	--	55,386,000
2014	2012	27.91%	291,511,192	81,351,295	--	71,000,000
2015	2013	31.60%	272,358,339	86,069,361	--	81,751,000
2016	2014	33.20%	268,245,874	89,058,931	--	84,898,000
2017	2015	36.79%	256,930,472	94,526,764	--	94,700,000
2018	2016	36.81%	254,657,709	93,743,647	\$70,166,211	71,024,000
2019	2017	36.41%	261,718,241	95,290,428	69,247,529	--
2020	2018	39.03%	257,791,908	100,620,425	71,249,679	--

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 L – SUPPLEMENTARY STATE OF FLORIDA INFORMATION
COMPARATIVE SUMMARY OF PRINCIPAL VALUATION RESULTS**

	Year Ended September 30, 2018			Year Ended September 30, 2017
	New Plan New Assumptions	Old Plan New Assumptions	Old Plan Old Assumptions	
Participant data				
• Active members	4,234	4,234	4,234	4,644
• Total annual payroll	\$253,982,175	\$253,982,175	\$253,982,175	\$257,850,484
• Retired members and beneficiaries	5,176	5,176	5,171	5,105
• Total annualized benefit	\$181,292,088	\$180,586,476	\$180,586,476	\$174,258,132
• Terminated vested members	185	185	185	195
• Total annualized benefit	\$3,344,160	\$3,344,160	\$3,344,160	\$3,595,668
Actuarial value of assets	\$2,021,545,306	\$2,010,148,306	\$2,010,148,300	\$1,952,332,857
Present value of all future expected benefit payments:				
• Active members:				
» Retirement benefits	\$1,074,750,796	\$1,077,956,558	\$1,027,637,252	\$1,040,860,445
» Vesting benefits	26,569,658	26,231,255	23,793,175	25,101,055
» Disability benefits	17,377,689	--	--	--
» Death benefits	39,378,770	39,374,794	31,476,056	31,655,677
» Return of contributions	<u>185,538,727</u>	<u>185,538,727</u>	<u>185,538,727</u>	<u>182,131,911</u>
» Total	\$1,343,613,640	\$1,329,101,334	\$1,268,445,210	\$1,279,749,088
• Terminated vested members	25,251,691	25,251,691	24,146,332	24,376,413
• Retired members and beneficiaries	<u>2,179,539,282</u>	<u>2,169,969,788</u>	<u>2,131,444,218</u>	<u>2,075,478,777</u>
Total	\$3,548,404,613	\$3,524,322,813	\$3,424,035,760	\$3,379,604,278

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

	Year Ended September 30, 2018			Year Ended September 30, 2017
	New Plan New Assumptions	Old Plan New Assumptions	Old Plan Old Assumptions	
Unfunded actuarial accrued liability	\$1,175,135,210	\$1,169,214,820	\$1,080,765,284	\$1,081,313,441
Actuarial present value of accrued benefits				
Vested accrued benefits				
Active members	\$685,187,700	\$685,187,700	\$701,685,320	\$709,668,688
Inactive members	25,251,691	25,251,691	24,146,332	24,376,413
Pensioners and beneficiaries	2,179,539,282	2,169,969,788	2,131,444,218	2,075,478,777
Nonvested active members	<u>39,787,473</u>	<u>35,992,632</u>	<u>8,942,489</u>	<u>9,172,794</u>
Total	\$2,929,766,146	\$2,916,401,811	\$2,866,218,359	\$2,818,696,672
Pension cost				
Normal cost, including administrative expenses	\$41,097,477	\$40,328,887	\$42,717,902	\$43,165,881
Expected employee contributions	-23,628,493	-22,919,639	-24,636,235	-25,011,497
Level % of payroll payment to amortize unfunded actuarial accrued liability	78,115,225	77,726,833	73,299,296	72,276,044
Amortized value of discounted value of allocated surtax revenue	-27,900,692	-27,900,692	-25,619,124	-24,719,669
Total minimum annual cost payable monthly at valuation date	70,196,729	69,731,961	68,271,996	68,224,162
Total employer cost projected to budget year	71,249,679	70,777,940	69,296,076	69,247,524
Projected payroll	257,791,908	257,791,908	257,791,908	261,718,241
As % of projected payroll	27.64%	27.46%	26.88%	26.46%
Present value of active members' future salaries at attained age	\$2,049,771,913	\$2,049,771,913	\$1,997,519,777	\$2,067,156,255
Present value of expected future employee contributions	\$204,977,191	\$198,827,876	\$193,759,418	\$200,514,157

**EXHIBIT M – 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	\$2,818,696,672
Benefits accumulated, net experience gain or loss, changes in data	\$42,688,771
Benefits paid	-191,229,000
Interest	196,061,916
Changes in assumptions and methods	50,183,452
Plan changes	<u>13,364,335</u>
Net increase	\$111,069,474
As % of payroll	43.73%
Actuarial present value of accumulated benefits as of October 1, 2018	\$2,929,766,146

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. The 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 provided by Segal Marco Advisors, as well as the Plan's target asset allocation.

Salary Increases (including inflation):

COJ		JEA	
Service	Rate (%)	Service	Rate (%)
0	6.5	0-4	7.5
1	6.1	5	5.1
2	5.7	6	4.9
3	5.3	7	4.7
4	4.9	8	4.5
5	4.5	9	4.3
6	4.4	10	4.1
7	4.3	11	3.9
8	4.2	12	3.7
9	4.1	13-24	3.5
10	4.0	25+	3.0
11	3.9		
12	3.8		
13	3.7		
14	3.6		
15	3.5		
16	3.4		
17	3.3		
18	3.2		
19	3.1		
20	3.0		

The inflation component of the salary scale for COJ employees has been adjusted from 2.50% to 4.50% for 2018-2019, with subsequent increases resuming at the assumed inflation rate of 2.50%.

	The inflation component of the salary scale for JEA employees has been adjusted from 2.50% to 3.00% for 2018, with subsequent increases resuming at the assumed inflation rate of 2.50%.	
Inflation Rate:	2.50%	
Payroll Growth:	1.50% 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 and pay of DC Plan participants 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%.	
Interest in BackDROP Account:	4.00%	
Mortality Rates:	<i>Healthy pre-retirement:</i>	50% RP2000 Combined Healthy White Collar and 50% RP2000 Combined Healthy Blue Collar, set forward 2.5 years, projected generationally with Scale BB for males; RP2000 Combined Healthy White Collar, set forward 2.5 years, projected generationally with Scale BB for females.
	<i>Healthy post-retirement:</i>	50% RP2000 White Collar Annuitant and 50% RP2000 Blue Collar Annuitant, set forward 2.5 years, projected generationally with Scale BB for males; RP2000 White Collar Annuitant, set forward 2.5 years, projected generationally with Scale BB for females.
	<i>Disabled:</i>	RP-2000 Disabled Retiree Mortality Table, setback four years for males and set forward two years for females
		The FRS Non-Special Risk Tables, set forward 2.5 years reasonably reflect the healthy annuitant mortality experience of the General Employees 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:

Age	Rate (%)			
	Mortality*		Disability	Withdrawal**
	Male	Female		
20	0.04	0.02	0.01	0.01
25	0.04	0.02	0.01	0.01
30	0.07	0.04	0.02	0.02
35	0.10	0.05	0.03	0.03
40	0.13	0.08	0.04	0.04
45	0.19	0.13	0.06	0.06
50	0.29	0.20	0.10	0.10
55	0.52	0.35	0.16	0.16
60	0.97	0.64	0.25	0.25
65	1.77	1.16	0.00	0.00

* Mortality rates shown for base table.

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

Termination Rates before Retirement: continued

Service	Withdrawal*	
	COJ	JEA
0	16.00	6.00
1	15.00	5.50
2	13.00	4.50
3	10.00	3.50
4	9.50	3.25
5	9.00	3.00
6	8.50	2.75
7	8.00	2.50
8	7.50	2.25
9	7.00	2.00
10	6.50	2.00
11	5.60	2.00
12	4.70	2.00
13	3.80	2.00
14	2.90	2.00
15	2.00	2.00
16	1.80	1.80
17	1.60	1.60
18	1.40	1.40
19	1.20	1.20
20	1.00	1.00
21	0.80	0.80
22	0.60	0.60
23	0.40	0.40
24+	0.20	0.20

**All withdrawal rates are set to 0% after eligibility for retirement.*

Retirement Rates:

Fewer Than 31 Years of Service	
Age	Rate (%)*
45-54	5
55	15
56-60	7
61-63	10
64-65	30
66-69	20
70 & Over	100

31 or More Years of Service	
Service	Rate (%)*
31-33	15
34-35	30
36	35
37	60
38-39	50
40	100

* 100% retirement is assumed at the earlier of age 70 or 40 years of service.

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
Weighted Average Retirement Age:	Age 65, 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.
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.
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:	33.4%. This percentage is determined by the City.
Administrative Expenses:	Previous year's actual expenses; \$1,193,000 for October 1, 2018.

Family Composition:	75% of males and 55% of females 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:	<p>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.</p> <p>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.</p>

Justification for Change in Actuarial Assumptions and Methods:

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 changed from 2.75% to 2.50%.
- COJ withdrawal rates were changed from sex-distinct to unisex with the rate table expanded through 25 years of service, and increased rates in earlier years of service.
- JEA withdrawal rates were changed from sex-distinct to unisex with the rate table expanded through 25 years of service, and mostly decreased rates of withdrawal for most years.
- Disability rates were changed from sex-distinct to unisex, using a blend of 60% of the previous male disability rates and 40% of the previous female disability rates.
- Retirement rates for COJ and JEA participants were combined, with updated age-based rates for participants with fewer than 31 years of service and service based rates for participants with at least 31 years of service. The 90% BACKDROP election assumption for eligible participants was removed (it is now implicit in the updated table), and 100% retirement is now assumed at the earlier of 70 years of age of 40 years of service.
- The percent married assumption was changed from 65% of males and 50% of females to 75% of males and 55% of females.
- The Fund's long-term payroll growth assumption was changed from 2.75% to 2.50%.
- The salary scale was updated to reflect 2.50% inflation, with rates of salary increases decreased across most years for COJ participants and increased across most years for JEA participants.
- 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.

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 October 1, 2017	
Normal Retirement:	<i>Age Requirement</i>	Age 65 with five years of Credited Service, age 55 with 20 years of Credited Service or any age with 30 years of Credited Service.
	<i>Regular Benefit Amount</i>	2.5% of Final Monthly Compensation times years of Credited Service, not more than 80% of Final Monthly Compensation.
	<i>Supplemental Benefit Amount</i>	Monthly benefit of \$5 times years of Credited Service, not less than \$25 per month or more than \$150 per month.
	<i>Minimum Benefit Amount</i>	\$64.08 per whole year of Credited Service, not to exceed 30. Minimum accrual rate increases 4% each October 1 st .
Early Retirement:	<i>Age Requirement</i>	Age 50 with 20 years of Credited Service
	<i>Regular Benefit Amount</i>	Accrued Service Retirement Regular Benefit Amount reduced by 0.5 percent for each month the benefit commencement precedes age 55.
	<i>Supplemental Benefit Amount</i>	Monthly benefit of \$5 times years of Credited Service, not less than \$25 per month or more than \$150 per month.
	<i>Minimum Benefit Amount</i>	\$64.08 per whole year of Credited Service, not to exceed 30. Minimum accrual rate increases 4% each October 1 st .
	<i>Age Requirement</i>	Any age with 25 years of Credited Service
	<i>Regular Benefit Amount</i>	2.0% of Final Monthly Compensation times years of Credited Service
	<i>Supplemental Benefit Amount</i>	Monthly benefit of \$5 times years of Credited Service, not less than \$25 per month or more than \$150 per month.
	<i>Minimum Benefit Amount</i>	\$64.08 per whole year of Credited Service, not to exceed 30. Minimum accrual rate increases 4% each October 1 st .

Vesting:	<i>Age Requirement</i>	None
	<i>Service Requirement</i>	5 years of Credited Service
	<i>Regular Benefit Amount</i>	Accrued Service Retirement Regular Benefit payable at age 65.
	<i>Supplemental Benefit Amount</i>	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.
Spouse's Pre-Retirement Death Benefit:	<i>Minimum Benefit Amount</i>	\$64.08 per whole year of Credited Service, not to exceed 30. Minimum accrual rate increases 4% each October 1 st .
	<i>Age Requirement</i>	None
	<i>Service Requirement</i>	None
	<i>Regular Benefit Amount</i>	If the Member is eligible for retirement, the surviving spouse is entitled to 75% of the member's accrued regular 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 a Service Retirement at current salary with the benefit based on a 2% accrual rate.
Spouse's Post-Retirement Death Benefit:	<i>Supplemental Benefit Amount</i>	Monthly benefit of \$5 times years of Member's Credited Service, not less than \$25 per month or more than \$150 per month.
	<i>Minimum Benefit Amount</i>	75% of \$64.08 per whole year of Member's Credited Service, not to exceed 30.
	<i>Regular Benefit Amount</i>	Surviving spouse is entitled to 75% of the Member's regular benefit.
Spouse's Post-Retirement Death Benefit:	<i>Supplemental Benefit Amount</i>	Surviving spouse is entitled to 100% of the Member's supplemental benefit.
	<i>Minimum Benefit Amount</i>	75% of \$64.08 per whole year of Member's Credited Service, not to exceed 30. Minimum accrual rate increases 4% each October 1 st .
	<i>Regular Benefit Amount</i>	Surviving spouse is entitled to 75% of the Member's regular benefit.
Member:	All full-time JEA, JHA, NFTPO, and City General Employees hired prior to October 1, 2017.	
Member Contributions:	10.0% of Earnable Compensation	
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 April 1 st nearest the fifth anniversary of the initial benefit commencement date, and on each April 1 st thereafter, the regular benefit is increased by 3%.
BackDROP:	Members with 30 or more years of service may elect to have their retirement benefits calculated as if the member had retired up to 5 years earlier on or after October 1, 2005. Benefits that would have been payable are accumulated with interest to date of termination and paid or rolled over in a single sum, and payments are made directly to the Member thereafter. The 5-year wait to receive COLA increases starts at termination of employment rather than at the start of BackDROP.
Partial Lump-sum Option (PLOP):	Members who are eligible for retirement may elect to receive a lump-sum benefit of up to 15% of the benefit value and a reduced life annuity actuarially equivalent to the benefit that would otherwise be payable.
Changes in Plan Provisions:	<p>The following plan change has been reflected for the first time in this valuation:</p> <ul style="list-style-type: none"> ➤ Liabilities for GERP participants that were included in the City's Disability Plan have been transferred back into GERP, along with a transfer of \$11,397,000 in assets. The 0.3% of employee contributions that were previously allocated to the Disability Plan are now being allocated to GERP.

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GASB 67 and 68 Information

General Information – “Financial Statements”, Note Disclosures and Required Supplementary Information for a Cost-Sharing Pension Plan

Plan Description

Plan administration. City of Jacksonville General Employees' Retirement Plan (GERP)

Plan membership. At September 30, 2018, pension plan membership consisted of the following:

Retired members or beneficiaries currently receiving benefits	5,176
Vested terminated members entitled to but not yet receiving benefits	185
Active members	4,234
Total	9,595

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

Contributions: 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. The members contribute 10.0% of earnable compensation.

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	\$3,196,680,516	\$3,040,720,610
Plan Fiduciary Net Position	2,085,056,000	2,019,668,000
Net Pension Liability	1,111,624,516	1,021,052,610
Plan Fiduciary Net Position as a percentage of the Total Pension Liability	65.23%	66.42%

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 September 30, 2018 and 2017, respectively.

Plan provisions. The plan provisions used in the measurement of the NPL are the same as those used in the GERP actuarial valuations as of September 30, 2018 and September 30, 2017, respectively.

Actuarial assumptions. The TPL as of September 30, 2018 and 2017, which 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	3.00% - 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 expenses, 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 GERP as of October 1, 2018, which is allocated to all employers, calculated using the discount rate of 7.00%, as well as what the GERP'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%)
City of Jacksonville	\$707,857,072	\$526,354,208	\$375,219,423
Jacksonville Electrical Authority	756,293,332	562,370,843	400,894,416
Jacksonville Housing Authority	28,403,980	21,120,866	15,056,323
North Florida Transportation Planning Organization	2,391,914	1,778,599	1,267,901
Total for all Employers	\$1,494,946,298	\$1,111,624,516	\$792,438,063

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	\$41,477,192	\$37,697,443
Interest	215,033,998	210,508,574
Change of benefit terms	17,317,390	1,149,225
Differences between expected and actual experience	-7,274,767	16,293,511
Changes of assumptions	80,635,093	64,389,844
Benefit payments, including refunds of member contributions	<u>-191,229,000</u>	<u>-192,662,000</u>
Net change in Total Pension Liability	\$155,959,906	\$137,376,597
Total Pension Liability – beginning	<u>3,040,720,610</u>	<u>2,903,344,013</u>
Total Pension Liability – ending	<u>\$3,196,680,516</u>	<u>\$3,040,720,610</u>
Plan Fiduciary Net Position		
Contributions – employer	\$71,024,000	\$94,700,000
Contributions – employee	29,919,000	23,037,000
Net investment income	145,470,000	266,138,000
Benefit payments, including refunds of member contributions	-191,229,000	-192,662,000
Administrative expense	-1,193,000	-787,000
Other	<u>11,397,000</u>	<u>0</u>
Net change in Plan Fiduciary Net Position	\$65,388,000	\$190,426,000
Plan Fiduciary Net Position – beginning	<u>2,019,668,000</u>	<u>1,829,242,000</u>
Plan Fiduciary Net Position – ending	\$2,085,056,000	\$2,019,668,000
Net Pension Liability – ending	<u>\$1,111,624,516</u>	<u>\$1,021,052,610</u>
Plan Fiduciary Net Position as a percentage of the Total Pension Liability	65.23%	66.42%
Covered employee payroll ⁽¹⁾	\$253,982,175	\$257,850,484
Plan Net Pension Liability as percentage of covered employee payroll	437.68%	395.99%

⁽¹⁾ Pensionable payroll as of the measurement date.

Notes to Schedule:

Benefit changes:

The employee contribution rate increased from 7.7% to 9.7% of pay effective October 1, 2017. For accounting purposes, this change is reflected on September 30, 2017.

Liabilities for GERP participants that were included in the City's Disability Plan have been transferred back into GERP, along with a transfer of \$11,397,000 in assets. The 0.3% of employee contributions that were previously allocated to the Disability Plan are now being allocated to GERP. For accounting purposes, this change is reflected on September 30, 2018.

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 the inflation rate was changed from 2.75% to 2.50%.

As of September 30, 2018 COJ withdrawal rates were changed from sex-distinct to unisex with the rate table expanded through 25 years of service, and increased rates in earlier years of service.

As of September 30, 2018 JEA withdrawal rates were changed from sex-distinct to unisex with the rate table expanded through 25 years of service, and mostly decreased rates of withdrawal for most years.

As of September 30, 2018 disability rates were changed from sex-distinct to unisex, using a blend of 60% of the previous male disability rates and 40% of the previous female disability rates.

As of September 30, 2018 retirement rates for COJ and JEA participants were combined, with updated age-based rates for participants with fewer than 31 years of service and service based rates for participants with at least 31 years of service. The 90% BACKDROP election assumption for eligible participants was removed (it is now implicit in the updated table), and 100% retirement is now assumed at the earlier of 70 years of age of 40 years of service.

As of September 30, 2018 the percent married assumption was changed from 65% of males and 50% of females to 75% of males and 55% of females.

As of September 30, 2018 the Fund's long-term payroll growth assumption was changed from 2.75% to 2.50%.

As of September 30, 2018 the salary scale was updated to reflect 2.50% inflation, with rates of salary increases decreased across most years for COJ participants and increased across most years for JEA participants.

As of September 30, 2018 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.

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 October 1	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	\$29,374,000	\$29,530,000	-\$156,000	\$276,257,000	10.69%	10.43%
2010	38,611,842	40,551,000	-1,939,158	322,530,502	12.57%	13.50%
2011	39,123,971	39,378,000	-254,029	314,054,361	12.54%	13.50%
2012	57,497,706	49,899,000	7,598,706	283,020,575	17.63%	17.22%
2013	66,659,915	55,386,000	11,273,915	265,404,735	20.87%	20.51%
2014	81,351,295	71,000,000	10,351,295	262,368,813	27.06%	27.91%
2015	86,069,361	81,751,000	4,318,361	254,034,479	32.18%	31.60%
2016	89,058,931	84,898,000	4,160,931	250,894,295	33.84%	33.20%
2017	94,526,754	94,700,000	-173,246	257,850,484	36.73%	36.79%
2018	93,743,647	71,024,000	22,719,647	253,982,175	27.96%	27.55%

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 1.50% 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 1.14% to 0.57%. 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 1.50%.*

Determination of Proportionate Share

Actual Employer Contributions by Employer October 1, 2017 to September 30, 2018			
Employer	Contributions	Percentage	NPL
City of Jacksonville	\$33,627,000	47.35%	\$526,354,208
Jacksonville Electrical Authority	35,929,000	50.59%	562,370,843
Jacksonville Housing Authority	1,353,000	1.90%	21,120,866
North Florida Transportation Planning Organization	<u>115,000</u>	<u>0.16%</u>	<u>1,778,599</u>
Total for all Employers	\$71,024,000	100.00%	\$1,111,624,516

Notes:

Based on the October 1, 2017 through October 1, 2018 employer contributions as provided by the City's Finance Department.

The following items are allocated based on the corresponding proportionate share:

- Net Pension Liability
- Service cost
- Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability
- Member contributions
- Projected earnings on plan investments
- Expensed portion of current-period differences between actual and projected earnings on plan investments
- Administrative expense
- Recognition of beginning of year deferred outflows of resources as pension expense
- Recognition of beginning of year deferred inflows of resources as pension expense

Pension Expense – Total for all Employers

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	\$41,477,192	\$37,697,443
Interest on the Total Pension Liability	215,033,998	210,508,574
Expensed portion of current-period changes in proportion and differences between employer's contributions and proportionate share of contributions	--	--
Current-period benefit changes	17,317,390	1,149,225
Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	-1,818,691	3,258,703
Expensed portion of current-period changes of assumptions or other inputs	20,158,774	12,877,968
Member contributions	-29,919,000	-23,037,000
Projected earnings on plan investments	-142,533,144	-132,562,564
Expensed portion of current-period differences between actual and projected earnings on plan investments	-587,372	-26,715,088
Administrative expense	1,193,000	787,000
Other	-11,397,000	--
Recognition of beginning of year deferred outflows of resources as pension expense	98,231,116	82,094,445
Recognition of beginning of year deferred inflows of resources as pension expense	-52,976,451	-26,261,364
Net amortization of deferred amounts from changes in proportion and differences between employer's contributions and proportionate share of contributions	--	--
Pension Expense	\$154,179,812	\$139,797,342

Deferred Outflows of Resources and Deferred Inflows of Resources – Total for all Employers

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 in proportion and differences between employer's contributions and proportionate share of contributions ⁽¹⁾	\$20,328,156	\$18,554,801
Changes of assumptions or other inputs	128,297,914	115,598,546
Net difference between projected and actual earnings on pension plan investments	0	0
Difference between expected and actual experience in the Total Pension Liability	<u>33,950,842</u>	<u>49,296,912</u>
Total Deferred Outflows of Resources	\$182,576,912	\$183,450,259
Deferred Inflows of Resources		
Changes in proportion and differences between employer's contributions and proportionate share of contributions ⁽¹⁾	\$20,328,156	\$18,554,801
Changes of assumptions or other inputs	3,608,892	7,217,784
Net difference between projected and actual earnings on pension plan investments	63,182,460	73,064,182
Difference between expected and actual experience in the Total Pension Liability	<u>6,413,065</u>	<u>2,985,247</u>
Total Deferred Inflows of Resources	\$93,532,573	\$101,822,014
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	\$45,254,665
2020	\$56,499,816	38,747,106
2021	25,957,601	8,204,892
2022	7,174,294	-10,578,415
2023	-587,371	0
2024	0	0
Thereafter	0	0

⁽¹⁾ Calculated in accordance with Paragraphs 54 and 55 of GASB 68.

There are changes in each employer's proportionate share of the total Net Pension Liability (NPL) during the measurement period ended September 30, 2018. The net effect of the change on the employer's proportionate share of the collective NPL and collective deferred outflows of resources and deferred inflows of resources is recognized over the average of the expected remaining service lives of all employees that are provided with pensions through GERP which is four years determined as of October 1, 2018. This is described in Paragraph 33a. of GASB 68.

In addition, the difference between the actual employer contributions and the proportionate share of the employer contributions during the measurement period ended September 30, 2018 is recognized over the same period. This is zero because the proportionate share was determined using the actual employer contributions.

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

- Calculating each active employee's expected remaining years of service using the valuation assumptions.
- Setting the remaining service life to zero for each non-active or retired member.
- Dividing the sum of the above amounts by the total number of active employee, non-active and retired members.

Schedule of Reconciliation of Net Pension Liability – Total for all Employers

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	\$1,021,052,610	\$1,074,102,013
Pension expense	154,179,812	139,797,342
Employer contributions	-71,024,000	-94,700,000
New net deferred inflows/outflows	52,670,759	-42,313,664
New net deferred flows due to change in proportion	0	0
Recognition of prior deferred inflows/outflows	<u>-45,254,665</u>	<u>-55,833,081</u>
Ending Net Pension Liability	\$1,111,624,516	\$1,021,052,610

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 October 1:

Reporting Date for Employer under GASB 68 Year Ended October 1	Differences between Expected and Actual Experience	Recognition Period (Years)	2018	2019	2020	2021	2022	2023	2024	Thereafter
2015	-\$5,356,346	5	-\$1,071,269	-\$1,071,269	\$0	\$0	\$0	\$0	\$0	\$0
2016	-4,784,947	5	-956,989	-956,989	-956,989	0	0	0	0	0
2017	60,436,838	5	12,087,368	12,087,368	12,087,368	12,087,368	0	0	0	0
2018	16,293,511	5	3,258,703	3,258,702	3,258,702	3,258,702	3,258,702	0	0	0
2019	-7,274,767	4	N/A	<u>-1,818,691</u>	<u>-1,818,692</u>	<u>-1,818,692</u>	<u>-1,818,692</u>	<u>0</u>	<u>0</u>	<u>0</u>
Net increase (decrease) in pension expense			N/A	\$11,499,121	\$12,570,389	\$13,527,378	\$1,440,010	\$0	\$0	\$0

The average of the expected remaining service lives of all employees that are provided with pensions through GERP (active and inactive employees) determined as of September 30, 2018 is four years.

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

Reporting Date for Employer under GASB 68 Year Ended October 1:

Reporting Date for Employer under GASB 68 Year Ended October 1	Effect of Assumption Changes	Recognition Period (Years)	2018	2019	2020	2021	2022	2023	2024	Thereafter
2015	\$101,525,690	5	\$20,305,138	\$20,305,138	\$0	\$0	\$0	\$0	\$0	\$0
2016	-18,044,461	5	-3,608,892	-3,608,892	-3,608,892	0	0	0	0	0
2017	72,969,220	5	14,593,844	14,593,844	14,593,844	14,593,844	0	0	0	0
2018	64,389,844	5	12,877,968	12,877,969	12,877,969	12,877,969	12,877,969	0	0	0
2019	80,635,093	4	N/A	<u>20,158,774</u>	<u>20,158,773</u>	<u>20,158,773</u>	<u>20,158,773</u>	<u>0</u>	<u>0</u>	<u>0</u>
Net increase (decrease) in pension expense			N/A	\$64,326,833	\$44,021,694	\$47,630,586	\$33,036,742	\$0	\$0	\$0

The average of the expected remaining service lives of all employees that are provided with pensions through GERP (active and inactive employees) determined as of September 30, 2018 is four years.

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 October 1:

Reporting Date for Employer under GASB 68 Year Ended October 1	Differences between Projected and Actual Earnings	Recognition Period (Years)	2018	2019	2020	2021	2022	2023	2024	Thereafter
2015	-\$63,631,545	5	-\$12,726,309	-\$12,726,309	\$0	\$0	\$0	\$0	\$0	\$0
2016	175,540,575	5	35,108,095	35,108,095	35,108,095	0	0	0	0	0
2017	-39,489,525	5	-7,897,905	-7,897,905	-7,897,905	-7,897,905	0	0	0	0
2018	-133,575,436	5	-26,715,088	-26,715,087	-26,715,087	-26,715,087	-26,715,087	0	0	0
2019	-2,936,856	5	N/A	<u>-587,372</u>	<u>-587,371</u>	<u>-587,371</u>	<u>-587,371</u>	<u>-587,371</u>	<u>0</u>	<u>0</u>
Net increase (decrease) in pension expense			N/A	-\$12,818,578	-\$92,268	-\$35,200,363	-\$27,302,458	-\$587,371	\$0	\$0

Total Increase (Decrease) in Pension Expense

Reporting Date for Employer under GASB 68 Year Ended October 1:

Reporting Date for Employer under GASB 68 Year Ended October 1	Total Changes	2018	2019	2020	2021	2022	2023	2024	Thereafter
2015	\$32,537,799	\$6,507,560	\$6,507,560	\$0	\$0	\$0	\$0	\$0	\$0
2016	152,711,167	30,542,214	30,542,214	30,542,214	0	0	0	0	0
2017	93,916,533	18,783,307	18,783,307	18,783,307	18,783,307	0	0	0	0
2018	-52,892,081	-10,578,417	-10,578,416	-10,578,416	-10,578,416	-10,578,416	0	0	0
2019	70,423,470	N/A	<u>17,752,711</u>	<u>17,752,710</u>	<u>17,752,710</u>	<u>17,752,710</u>	<u>-587,371</u>	<u>0</u>	<u>0</u>
Net increase (decrease) in pension expense		N/A	\$63,007,376	\$56,499,815	\$25,957,601	\$7,174,294	-\$587,371	\$0	\$0

Pension Expense - City of Jacksonville

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	\$19,639,453	\$17,480,302
Interest on the Total Pension Liability	101,818,598	97,612,826
Expensed portion of current-period changes in proportion and differences between employer's contributions and proportionate share of contributions	2,301,590	-2,217,931
Current-period benefit changes	8,199,784	532,896
Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	-861,150	1,511,061
Expensed portion of current-period changes of assumptions or other inputs	9,545,179	5,971,514
Member contributions	-14,166,647	-10,682,257
Projected earnings on plan investments	-67,489,444	-61,469,261
Expensed portion of current-period differences between actual and projected earnings on plan investments	-278,121	-12,387,786
Administrative expense	564,886	364,932
Other	-5,396,480	-
Recognition of beginning of year deferred outflows of resources as pension expense	46,512,433	38,067,194
Recognition of beginning of year deferred inflows of resources as pension expense	-25,084,350	-12,177,394
Net amortization of deferred amounts from changes in proportion and differences between employer's contributions and proportionate share of contributions	<u>-5,680,959</u>	<u>-3,463,028</u>
Pension Expense	\$69,624,772	\$59,143,068

Deferred Outflows of Resources and Deferred Inflows of Resources - City of Jacksonville

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 in proportion and differences between employer's contributions and proportionate share of contributions ⁽¹⁾	\$6,904,769	\$0
Changes of assumptions or other inputs	60,749,062	53,603,046
Net difference between projected and actual earnings on pension plan investments	0	0
Difference between expected and actual experience in the Total Pension Liability	<u>16,075,724</u>	<u>22,858,978</u>
Total Deferred Outflows of Resources	\$83,729,555	\$76,462,024

Deferred Inflows of Resources

Changes in proportion and differences between employer's contributions and proportionate share of contributions ⁽¹⁾	\$12,072,193	\$17,753,152
Changes of assumptions or other inputs	1,708,810	3,346,886
Net difference between projected and actual earnings on pension plan investments	29,916,895	33,879,861
Difference between expected and actual experience in the Total Pension Liability	<u>3,036,586</u>	<u>1,384,259</u>
Total Deferred Inflows of Resources	\$46,734,484	\$56,364,158

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	\$15,303,629
2020	\$23,373,293	\$12,286,074
2021	10,419,211	-368,695
2022	3,480,687	-7,123,142
2023	-278,120	0
2024	0	0
Thereafter	0	0

⁽¹⁾ Calculated in accordance with Paragraphs 54 and 55 of GASB 68.

Schedule of Proportionate Share of the Net Pension Liability - City of Jacksonville

Reporting Date for Employer under GASB 68 as of September 30	Proportion of the Net Pension Liability	Proportionate share of Net Pension Liability	Covered-employee payroll	Proportionate share of the Net Pension Liability as a percentage of its covered-employee payroll	Plan Fiduciary Net Position as a percentage of the Total Pension Liability
2017	46.37%	\$473,462,095	\$118,506,089	399.53%	63.71%
2018	47.35%	526,354,208	113,773,163	462.63%	65.23%

Pension Expense - Jacksonville Electrical Authority

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	\$20,983,310	\$19,482,039
Interest on the Total Pension Liability	108,785,700	108,790,831
Expensed portion of current-period changes in proportion and differences between employer's contributions and proportionate share of contributions	-2,559,932	2,343,136
Current-period benefit changes	8,760,868	593,919
Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	-920,076	1,684,098
Expensed portion of current-period changes of assumptions or other inputs	10,198,324	6,655,334
Member contributions	-15,136,022	-11,905,522
Projected earnings on plan investments	-72,107,518	-68,508,333
Expensed portion of current-period differences between actual and projected earnings on plan investments	-297,151	-13,806,357
Administrative expense	603,539	406,722
Other	-5,765,742	--
Recognition of beginning of year deferred outflows of resources as pension expense	49,695,122	42,426,409
Recognition of beginning of year deferred inflows of resources as pension expense	-26,800,787	-13,571,873
Net amortization of deferred amounts from changes in proportion and differences between employer's contributions and proportionate share of contributions	<u>4,863,239</u>	<u>2,520,103</u>
Pension Expense	\$80,302,874	\$77,110,506

Deferred Outflows of Resources and Deferred Inflows of Resources - Jacksonville Electrical Authority

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 in proportion and differences between employer's contributions and proportionate share of contributions ⁽¹⁾	\$11,588,446	\$16,451,686
Changes of assumptions or other inputs	64,905,915	59,741,328
Net difference between projected and actual earnings on pension plan investments	0	0
Difference between expected and actual experience in the Total Pension Liability	<u>17,175,731</u>	<u>25,476,644</u>
Total Deferred Outflows of Resources	\$93,670,092	\$101,669,658
Deferred Inflows of Resources		
Changes in proportion and differences between employer's contributions and proportionate share of contributions ⁽¹⁾	\$7,679,794	\$0
Changes of assumptions or other inputs	1,825,738	3,730,151
Net difference between projected and actual earnings on pension plan investments	31,964,007	37,759,569
Difference between expected and actual experience in the Total Pension Liability	<u>3,244,370</u>	<u>1,542,776</u>
Total Deferred Inflows of Resources	\$44,713,909	\$43,032,496
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	\$28,250,850
2020	\$30,886,564	\$24,887,743
2021	14,954,090	8,622,359
2022	3,412,680	-3,123,789
2023	-297,151	0
2024	0	0
Thereafter	0	0

⁽¹⁾ Calculated in accordance with Paragraphs 54 and 55 of GASB 68.

Schedule of Proportionate Share of the Net Pension Liability - Jacksonville Electrical Authority

Reporting Date for Employer under GASB 68 as of September 30	Proportion of the Net Pension Liability	Proportionate share of Net Pension Liability	Covered-employee payroll	Proportionate share of the Net Pension Liability as a percentage of its covered-employee payroll	Plan Fiduciary Net Position as a percentage of the Total Pension Liability
2017	51.68%	\$527,679,989	\$134,443,316	392.49%	63.71%
2018	50.59%	562,370,843	135,708,572	414.40%	65.23%

Pension Expense - Jacksonville Housing Authority

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	\$788,067	\$674,783
Interest on the Total Pension Liability	4,085,646	3,768,103
Expensed portion of current-period changes in proportion and differences between employer's contributions and proportionate share of contributions	258,342	-89,431
Current-period benefit changes	329,030	20,571
Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	-34,555	58,331
Expensed portion of current-period changes of assumptions or other inputs	383,017	230,516
Member contributions	-568,461	-412,362
Projected earnings on plan investments	-2,708,130	-2,372,870
Expensed portion of current-period differences between actual and projected earnings on plan investments	-11,160	-478,200
Administrative expense	22,667	14,087
Other	-216,543	-
Recognition of beginning of year deferred outflows of resources as pension expense	1,866,391	1,469,491
Recognition of beginning of year deferred inflows of resources as pension expense	-1,006,553	-470,078
Net amortization of deferred amounts from changes in proportion and differences between employer's contributions and proportionate share of contributions	<u>708,470</u>	<u>797,900</u>
Pension Expense	\$3,896,228	\$3,210,841

Deferred Outflows of Resources and Deferred Inflows of Resources - Jacksonville Housing Authority

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 in proportion and differences between employer's contributions and proportionate share of contributions ⁽¹⁾	\$1,673,205	\$1,796,356
Changes of assumptions or other inputs	2,437,660	2,069,214
Net difference between projected and actual earnings on pension plan investments	0	0
Difference between expected and actual experience in the Total Pension Liability	<u>645,066</u>	<u>882,415</u>
Total Deferred Outflows of Resources	\$4,755,931	\$4,747,985
Deferred Inflows of Resources		
Changes in proportion and differences between employer's contributions and proportionate share of contributions ⁽¹⁾	\$468,850	\$658,556
Changes of assumptions or other inputs	68,569	129,198
Net difference between projected and actual earnings on pension plan investments	1,200,467	1,307,849
Difference between expected and actual experience in the Total Pension Liability	<u>121,848</u>	<u>53,436</u>
Total Deferred Inflows of Resources	\$1,859,734	\$2,149,039
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	\$1,518,529
2020	\$2,040,308	\$1,402,044
2021	561,828	-42,839
2022	305,221	-278,786
2023	-11,160	0
2024	0	0
Thereafter	0	0

⁽¹⁾ Calculated in accordance with Paragraphs 54 and 55 of GASB 68.

Schedule of Proportionate Share of the Net Pension Liability - Jacksonville Housing Authority

Reporting Date for Employer under GASB 68 as of September 30	Proportion of the Net Pension Liability	Proportionate share of Net Pension Liability	Covered-employee payroll	Proportionate share of the Net Pension Liability as a percentage of its covered-employee payroll	Plan Fiduciary Net Position as a percentage of the Total Pension Liability
2017	1.79%	\$18,276,842	\$4,475,739	408.35%	63.71%
2018	1.90%	21,120,866	4,054,520	520.92%	65.23%

Pension Expense - North Florida Transportation Planning Organization

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	\$66,363	\$60,315
Interest on the Total Pension Liability	344,054	336,814
Expensed portion of current-period changes in proportion and differences between employer's contributions and proportionate share of contributions	- -	-35,774
Current-period benefit changes	27,708	1,839
Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	-2,910	5,214
Expensed portion of current-period changes of assumptions or other inputs	32,254	20,605
Member contributions	-47,870	-36,859
Projected earnings on plan investments	-228,053	-212,100
Expensed portion of current-period differences between actual and projected earnings on plan investments	-940	-42,744
Administrative expense	1,909	1,259
Other	-18,235	- -
Recognition of beginning of year deferred outflows of resources as pension expense	157,170	131,351
Recognition of beginning of year deferred inflows of resources as pension expense	-84,762	-42,018
Net amortization of deferred amounts from changes in proportion and differences between employer's contributions and proportionate share of contributions	<u>109,250</u>	<u>145,025</u>
Pension Expense	\$355,938	\$332,927

Deferred Outflows of Resources and Deferred Inflows of Resources - North Florida Transportation Planning Organization

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 in proportion and differences between employer's contributions and proportionate share of contributions ⁽¹⁾	\$161,735	\$306,759
Changes of assumptions or other inputs	205,277	184,958
Net difference between projected and actual earnings on pension plan investments	0	0
Difference between expected and actual experience in the Total Pension Liability	<u>54,321</u>	<u>78,875</u>
Total Deferred Outflows of Resources	\$421,333	\$570,592
Deferred Inflows of Resources		
Changes in proportion and differences between employer's contributions and proportionate share of contributions ⁽¹⁾	\$107,319	\$143,093
Changes of assumptions or other inputs	5,774	11,548
Net difference between projected and actual earnings on pension plan investments	101,092	116,903
Difference between expected and actual experience in the Total Pension Liability	<u>10,261</u>	<u>4,776</u>
Total Deferred Inflows of Resources	\$224,446	\$276,320
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	\$181,657
2020	\$199,650	\$171,245
2021	22,471	-5,933
2022	-24,294	-52,698
2023	-940	0
2024	0	0
Thereafter	0	0

⁽¹⁾ Calculated in accordance with Paragraphs 54 and 55 of GASB 68.

Schedule of Proportionate Share of the Net Pension Liability - North Florida
Transportation Planning Organization

Reporting Date for Employer under GASB 68 as of September 30	Proportion of the Net Pension Liability	Proportionate share of Net Pension Liability	Covered- employee payroll	Proportionate share of the Net Pension Liability as a percentage of its covered- employee payroll	Plan Fiduciary Net Position as a percentage of the Total Pension Liability
2017	0.16%	\$1,633,684	\$425,340	384.09%	63.71%
2018	0.16%	1,778,599	445,920	398.86%	65.23%

**APPENDIX A – CALCULATION OF DISCOUNT RATE OF AS OCTOBER 1, 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) + €
2018	\$2,085,056,000	\$92,876,017	\$199,991,587	\$1,237,298	\$142,161,570	\$2,118,864,702
2019	2,118,864,702	94,199,140	206,543,056	1,268,231	144,344,104	2,149,596,659
2020	2,149,596,659	93,289,362	212,198,692	1,299,937	146,264,442	2,175,651,833
2021	2,175,651,833	89,322,768	219,274,622	1,332,435	147,700,678	2,192,068,222
2022	2,192,068,222	86,122,248	226,363,888	1,365,746	148,488,517	2,198,949,353
2023	2,198,949,353	85,339,051	232,210,555	1,399,889	148,736,956	2,199,414,916
2024	2,199,414,916	84,668,066	237,850,442	1,434,886	148,547,440	2,193,345,095
2046	2,059,107,218	78,832,522	284,236,908	2,470,261	140,439,399	2,093,886,431
2047	2,093,886,431	5,577,251	279,642,075	2,532,018	140,620,711	2,064,468,875
2048	2,064,468,875	4,732,755	273,860,387	2,595,319	138,890,574	2,042,723,813
2049	2,042,723,813	4,281,704	266,775,430	2,660,202	137,763,578	2,031,141,990
2118	70,040,534,852	14,474,506	37	14,617,112	4,902,832,447	74,943,224,656
2119	74,943,224,656	14,836,369	6	14,982,540	5,246,020,610	80,189,099,088
2120	80,189,099,088	15,207,278	0	0	5,613,769,191	85,818,075,558

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 1.50% 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 \$1,193,000 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.