



City of Miami Fire Fighters' and Police Officers' Retirement Trust

October 1, 2017 | Actuarial Valuation Report

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At the request of the plan sponsor, this report summarizes the City of Miami Fire Fighters' and Police Officers' Retirement Trust as of October 1, 2017. The purpose of this report is to communicate the following results of the valuation:

- Determine Funded Status; and
- Determine Recommended Contribution for the fiscal year October 1, 2018 through September 30, 2019.

This report has been prepared in accordance with the applicable Federal and State laws. Consequently, it may not be appropriate for other purposes. Please contact Nyhart prior to disclosing this report to any other party or relying on its content for any purpose other than that explained above. Failure to do so may result in misrepresentation or misinterpretation of this report.

The results in this report were prepared using information provided to us by other parties. The census information has been provided to us by the plan administrator. Asset information has been provided to us by the plan administrator. We have reviewed the provided data for reasonableness when compared to prior information provided, but have not audited the data. Where relevant data may be missing, we have made assumptions we believe to be reasonable. We are not aware of any significant issues with and have relied on the data provided. Any errors in the data provided may result in a different result than those provided in this report. A summary of the data used in the valuation is included in this report.

The actuarial assumptions and methods were chosen by the Board. In our opinion, all actuarial assumptions and methods are individually reasonable and in combination represent our best estimate of anticipated experience of the plan. Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following:

- plan experience differing from that anticipated by the economic or demographic assumptions;
- changes in economic or demographic assumptions;
- increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period);
and
- changes in plan provisions or applicable law.

We did not perform an analysis of the potential range of future measurements due to the limited scope of our engagement. This report has been prepared in accordance with generally accepted actuarial principles and practice.

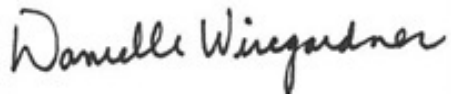
This actuarial valuation and/or cost determination was prepared and completed by me or under my direct supervision, and I acknowledge responsibility for the results. To the best of my knowledge, the results are complete and accurate, and in my opinion, the techniques and assumptions used are reasonable 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.

With respect to reporting standards for defined benefit retirement plans or systems contained in Section 112.664(1), F.S., the actuarial disclosures required under this section were 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, meet the requirements of Section 112.664 (1), Florida Statutes, and Rule 60T-1.0035, Florida Administrative Code.

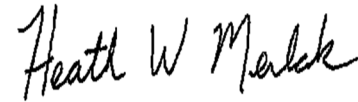
Neither Nyhart nor any of its employees have any relationship with the plan or its sponsor which could impair or appear to impair the objectivity of this report. To the extent that this report or any attachment concerns tax matters, it is not intended to be used and cannot be used by a taxpayer for the purpose of avoiding penalties that may be imposed by law.

The undersigned are compliant with the continuing education requirements of the Qualification Standards for Actuaries Issuing Statements of Actuarial Opinion in the United States and are available for any questions.

Nyhart



Danielle Winegardner, FSA, EA, MAAA
Enrolled Actuary No. 17-08260



Heath W. Merlak, FSA, EA, MAAA
Enrolled Actuary No. 17-05967

June 20, 2018

Date

Copies of this Report are to be furnished to the Division of Retirement within 60 days of receipt from the actuary at the following addresses:

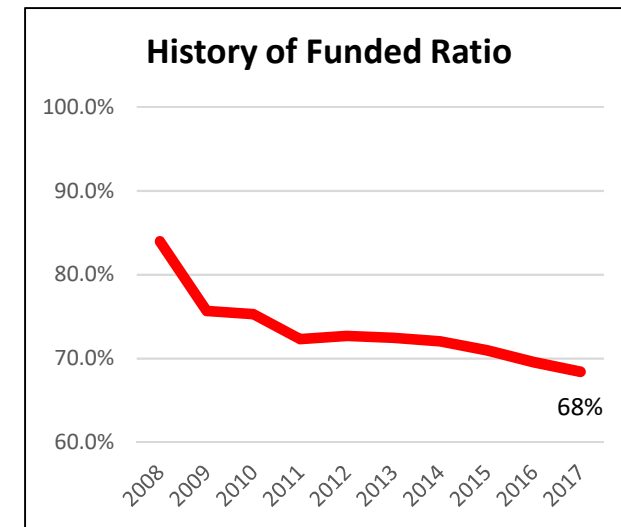
Mr. Steve Bardin
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Summary Results

The actuarial valuation's primary purpose is to produce a scorecard measure displaying the funding progress of the plan toward the ultimate goal of paying benefits at retirement. The accrued liability is based on an entry age level percentage of pay.

	October 1, 2016	October 1, 2017
Funded Status Measures		
Accrued Liability	\$1,654,140,143	\$1,705,061,093
Actuarial Value of Assets	1,150,653,520	1,161,585,161
Unfunded Accrued Liability	\$503,486,623	\$543,475,932
Funded Percentage (AVA)	69.6%	68.1%
Funded percentage (MVA)	67.1%	66.3%
Cost Measures		
Recommended Contribution For Next Fiscal Year	\$50,591,604	\$56,030,260
Recommended Contribution (as a percentage of payroll)	38.0%	39.6%
Asset Performance		
Market Value of Assets (MVA)	\$1,109,146,744	\$1,131,066,046
Actuarial Value of Assets (AVA)	\$1,150,653,520	\$1,161,585,161
Actuarial Value/Market Value	103.70%	102.70%
Participant Information		
Active Members	1,869	1,943
Terminated Vested Members	15	16
Terminated Members, due a Refund of Employee Contributions	N/A	97
Retirees, Beneficiaries, and Disabled Members	2,014	2,059
DROP Participants	191	129
Total	4,089	4,244
Expected Payroll	\$133,083,231	\$141,497,840
Total Payroll	\$153,785,532	\$159,787,486



Changes Since Prior Valuation and Key Notes

To better reflect anticipated experience, the interest rate assumption was reduced from 7.42% to 7.34%. This change results in an increase in the Present Value of Future Benefits and the recommended contribution.

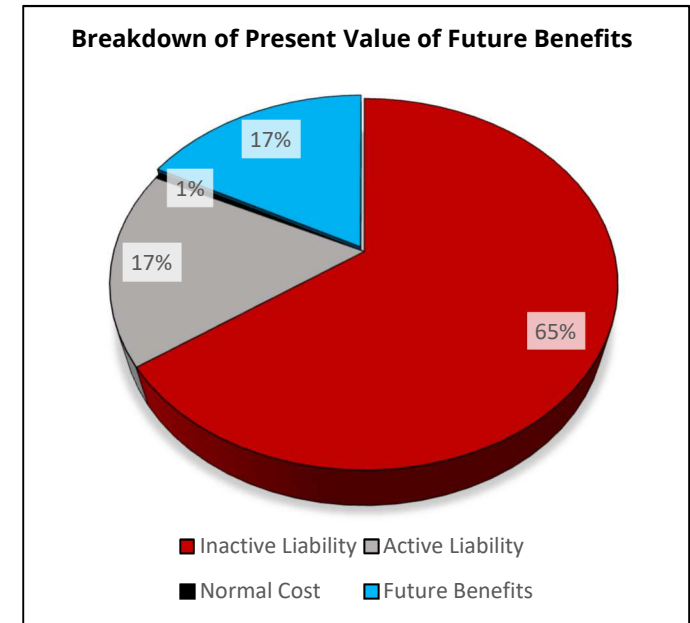
The administrative expense has increased to \$2,128,469 from the prior year.

There have been no plan changes since the last valuation.

Present Value of Future Benefits

The Present Value of Future Benefits represents the current future benefits payable to the participant.

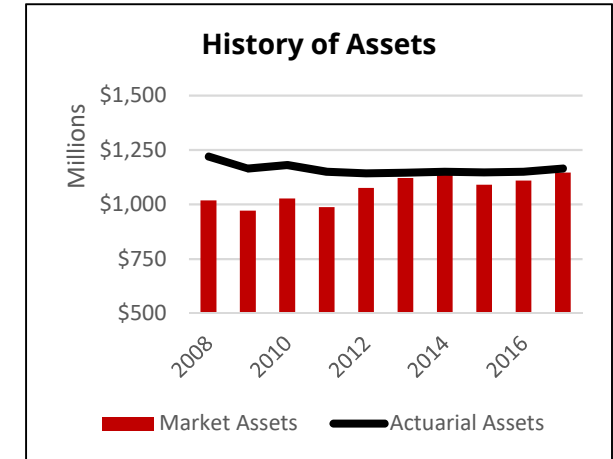
	October 1, 2017
Present Value of Future Benefits	
Active members	
Retirement	\$584,030,682
Disability	74,196,482
Death	25,871,816
Termination	33,406,118
Refund of contributions	3,670,136
Total active	\$721,175,234
Inactive members	
Retired members	\$1,177,975,191
DROP members	109,884,848
Beneficiaries	30,927,194
Disabled members	27,333,263
Terminated vested members	5,333,777
Total inactive	\$1,351,454,273
Total	\$2,072,629,507
 Present value of future payrolls	 \$2,081,445,994



Asset Information

The amount of assets backing the pension promise is the most significant driver of volatility and future costs within a pension plan. The investment performance of the assets directly offsets the ultimate cost.

	October 1, 2017
Market Value Reconciliation	
Market value of assets, beginning of prior year	\$1,109,146,744
Employer contributions (incl. discounted accrued items)	47,102,220
Member contributions	13,206,378
Investment income, net expenses	90,329,132
Benefit payments and refunds	(126,492,923)
Administrative expenses	(2,058,797)
Other expenses	(166,708)
	\$1,131,066,046
Return on Market Value	8.24%
Actuarial value of assets	
Value at beginning of current year	\$1,161,585,161



Asset Information (continued)

Plan Assets are used to develop funded percentages and contribution requirements

October 1, 2017

1.	Expected actuarial value of assets	
	(a) Actuarial value of assets – beginning of prior year	\$1,150,653,520
	(b) City Contributions	47,102,220
	(c) Member Contributions	13,206,378
	(d) Benefits payments and refunds	126,492,923
	(e) Expected return	84,745,745
	(f) Expected actuarial value of assets – beginning of current year	\$1,169,214,940
2.	Market value of assets – beginning of current year	\$1,131,066,046
3.	Present value of COLA transfers	
	(a) Current year	\$0
	(b) Next year	0
	(c) Total	\$0
4.	Market value net COLA transfer [(2)-(3)]	\$1,131,066,046
5.	Amount subject to phase in [(4)-(1f)]	(\$38,148,894)
6.	Phase in of asset gain loss [(5)x20%]	(\$7,629,779)
7.	Preliminary actuarial value of assets – beginning of current year [(1f)+(6)]	\$1,161,585,161
8.	80% of Market value of assets	\$904,852,837
9.	120% of Market value of assets	\$1,357,279,255
10.	Adjusted actuarial value of assets	\$1,161,585,161
11.	Contribution surplus account balance	\$0
12.	Final actuarial value of assets – beginning of current year [(10)-(11)]	\$1,161,585,161
13.	Return on actuarial value of assets	6.76%

Reconciliation of Gain/Loss

October 1, 2017

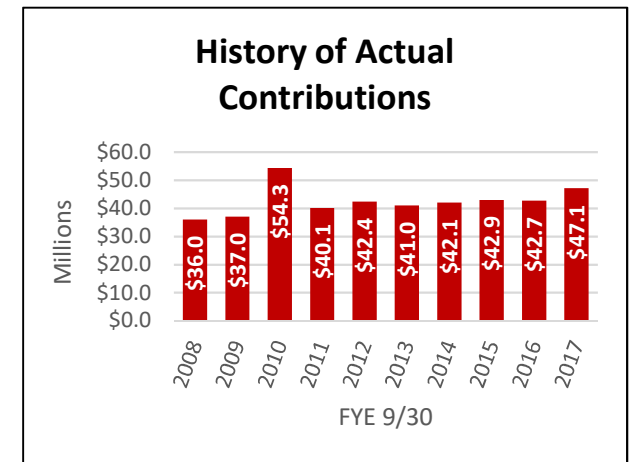
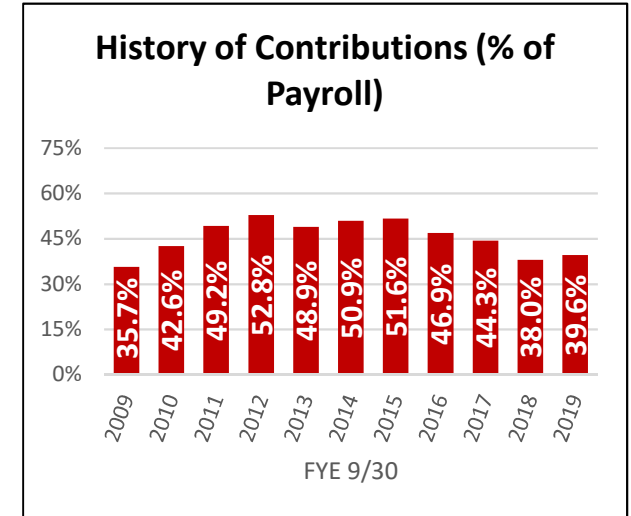
Liability (gain)/loss

Present value of future benefits	\$2,002,093,386
Present value of employee contributions	(169,544,933)
Expected employee contribution	11,192,036
Benefit payments	(126,492,923)
Interest	132,196,623
Expected liability	\$1,849,444,189
Assumption change	20,178,475
Expected after changes	\$1,869,622,664
Actual liability	\$1,898,125,168
Liability (gain)/loss	\$28,502,504
Asset (gain)/loss	
Actuarial value of assets, beginning of prior year	\$1,150,653,520
Contributions	60,308,598
Benefit payments and expenses	(126,492,923)
Expected Investment return	84,745,745
Expected actuarial value of assets, beginning of current year	\$1,169,214,940
Actual actuarial value of assets, beginning of current year	\$1,161,585,161
Asset (gain)/loss	\$7,629,779
Total (gain)/loss	\$36,132,283

Development of Recommended Contribution

The actuarial determined contribution is the annual amount necessary to fund the plan according to funding policies and/or applicable laws.

	October 1, 2017
1. Present value of future benefits	\$2,072,629,507
2. Actuarial value of assets	1,161,585,161
3. Present value of future member contributions	174,504,339
4. Present value of future normal Cost [(1)-(2)-(3)]	\$736,540,007
5. Present value of future payroll	\$2,081,445,994
6. Normal cost accrual rate [(4)/(5)]	35.39%
7. Administrative expenses	\$2,128,469
8. Expected payroll	\$141,497,840
9. Applicable interest	7.34%
10. Normal cost	\$52,198,863
11. Interest to estimated payment date	\$3,831,397
12. Total recommended contribution as of end of year [(10)+(11)]	\$56,030,260
13. As a percentage of expected payroll	39.60%
14. As a percentage of total payroll	35.07%



Demographic Information

The foundation of a reliable actuarial report is the member information provided by the plan sponsor. Monitoring trends in demographic information is crucial for long-term pension planning.

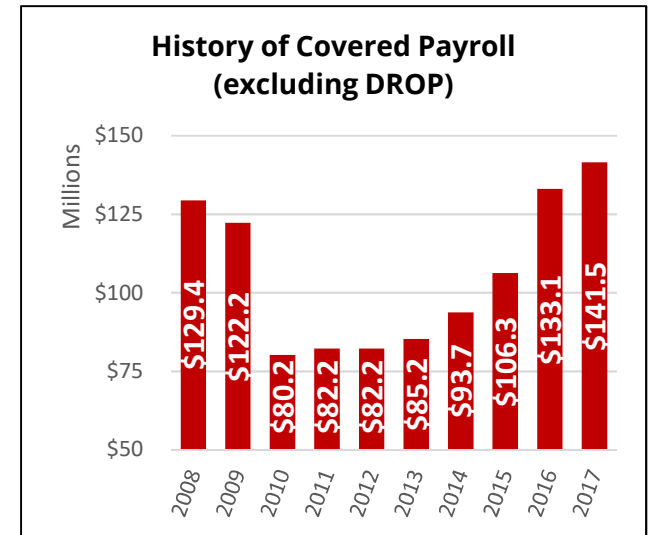
October 1, 2017

Member Counts

Active Members	1,943
Retired Members	1,666
Beneficiaries	257
Disabled Members	136
Terminated Vested Members, due a Monthly Benefit	16
Terminated Members, due a Refund of Employee Contributions	97
DROP Members	<u>129</u>
Total	4,244

Active Participant Demographics

Average Age	36.12
Average Service	9.09
Average Compensation	\$72,824
Covered Payroll	\$141,497,840
Total Payroll	\$159,787,486



Demographic Information (continued)

October 1, 2017

Retired Member Statistics

Average Age	65.22
Average Monthly Benefit	\$5,499

Beneficiary Statistics

Average Age	76.91
Average Monthly Benefit	\$1,146

Disabled Member Statistics

Average Age	71.81
Average Monthly Benefit	\$1,912

Terminated Member Statistics

Average Age	38.24
Average Monthly Benefit	\$2,919
Average Remaining Employee Contributions	\$8,581

DROP Member Statistics

Average Age	52.17
Average Monthly Benefit	\$5,899
Payroll	\$18,289,646

Participant Reconciliation

	Active	Terminated Vested	Disabled	Retired	Beneficiaries	Totals
Prior Year	1,869	15	143	1,798	264	4,089
Active						
To Terminated Vested	(1)	1				
To Retired	(21)			21		
To Refund	(20)					(20)
To Due Refund	(17)	17 ¹				
To Death	(3)					(3)
Terminated Vested						
To Retired						
To Active	1	(1)				
Disabled						
To Death			(7)			(7)
Retired						
To Death				(24)		(24)
Survivor						
To Death					(15)	(15)
Additions	135	82 ¹			8	225
Removed		(1)				(1)
Current Year	1,943	113	136	1,795	257	4,244

¹The addition to the terminated vested count are terminated members who are due a refund of contributions.

Active Participant Schedule

Active participant information grouped based on age and service.

Age Group	Years of Service										Total	Average Pay
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & Up		
Under 25	39	104									143	\$44,671
25 to 29	39	328	23	3							393	53,875
30 to 34	16	213	152	79	1						461	68,068
35 to 39	8	61	83	116	37	1					306	78,174
40 to 44	3	21	49	60	110	36	1				280	87,788
45 to 49	3	5	16	47	85	65	19				240	93,860
50 to 54		2	14	11	32	26	13	1			99	94,529
55 to 59	1	1		4	1	3	6	2			18	106,237
60 to 64				1	1		1				3	86,363
65 to 69											0	0
70 & up											0	0
Total	109	735	337	321	267	131	40	3	0	0	1943	72,824

Plan Status

January 1, 1940, as restated effective May 23, 1985, and amended through the valuation date.

Eligibility for Participation

Police officers and fire fighters.

Accrual of Benefits

The accrued benefit is determined as follows:

For Police Officers who have reached Rule of 64 by 9/30/2010:

3% of Average Final Compensation for the first 15 years of Creditable Service plus 3.5% of Average Final Compensation after 15 years. Maximum of 100% of Average Final Compensation.

For all other Police Officers:

3% of Average Final Compensation for the first 15 years of Creditable Service plus 3.5% of Average Final Compensation after 15 years. Maximum of 100% of Average Final Compensation and the final benefit may not exceed the larger of the 9/30/2010 accrued benefit and \$100,000.

For Firefighters who have reached Rule of 64 by 9/30/2009 or Rule of 68 by 9/30/2010:

3% of Average Final Compensation for the first 15 years of Creditable Service plus 3.5% of Average Final Compensation after 15 years. Maximum of 100% of Average Final Compensation.

For all other Fire Fighters:

3% of Average Final Compensation for the first 15 years of Creditable Service plus 3.5% of Average Final Compensation after 15 years. Maximum of 100% of Average Final Compensation and the final benefit may not exceed the larger of the 9/30/2010 accrued benefit and \$100,000.

Benefits

Normal Retirement

Eligibility	Age plus Creditable Service equal to 64 (Rule of 64) on 9/30/2010 for police officers active 9/30/2010 and firefighters active 9/30/2009.
	Age plus Creditable Service equal to 68 (Rule of 68) on 9/30/2010 for fire fighters active 9/30/2010 and not eligible for Rule of 64 at 9/30/2009.
	Age plus Creditable Service equal to 70 (Rule of 70) with attainment of age 50 for Firefighters and age 49 for Police Officers and 10 years of Creditable Service for all members hired on or after 10/1/2010 and police officers and fire fighters who were not eligible for the Rule of 64 or the Rule of 68 on the specified dates above.
Benefit	Unreduced Accrued Benefit payable immediately.

Early Retirement

Eligibility	Completion of 20 years of Creditable Service.
Benefit	Accrued Benefit adjusted with actuarial equivalence for early commencement.

Late Retirement

Eligibility	Participation continues after normal retirement date.
Benefit	Accrued Benefit

Ordinary Death before Retirement

Eligibility	Participant with 3 years of Creditable Service who dies off duty.
Benefit	Between 3 and 10 years of Creditable Service: Lump sum benefit equal to 50% of Compensation received in year preceding death.
	After 10 years of Creditable Service and before eligibility for Early Service or Rule of 64 Retirement: Accrued benefit, deferred to earlier of police officer member's 49th and firefighter member's 50th birthday or Rule of 64 eligibility, payable for 10 years.

Beneficiary does not have to survive deferred period or 10 years' certain period.

If eligible for Service, Early Service, or Rule of 64 retirement, considered to have retired on the date of death. Surviving spouse would receive 40% of the member's monthly retirement allowance.

Accidental Death before Retirement

Eligibility	Member who dies during performance of duties.
Benefit	Pension of 50% of Average Final Compensation to spouse until death or remarriage. If there is no spouse, or if spouse dies or remarries before youngest child is 18, payable to child until attainment of age 18. If no spouse or no children under 18, benefit is payable to dependent parents.
	After 10 years of Creditable Service - Beneficiary receives benefit otherwise payable to member at early or normal retirement for a period of 10 years.

Termination Benefit

Eligibility	Fully vested after completion of 10 years of Creditable Service.
Benefit	Accrued Benefit payable at the member's Early or Normal Retirement Date. If the member terminates prior to 10 years of Creditable Service a refund of accumulated contributions with interest will be issued.

Ordinary Disability Benefit

Eligibility	Completion of 10 years of Creditable Service.
Benefit	90% of benefit rate times Average Final Compensation times Creditable Service, with a minimum benefit of 30% of Average Final Compensation. The normal form is a 10 year certain and life normal form.

Accidental Disability Benefit

Eligibility	Immediately upon permanent disability
Benefit	66 2/3% of Average Final Compensation, or 66 2/3% of Final Compensation, whichever is greater. The normal form is a 40% joint & survivor annuity, with a minimum of 10 years' certain and life.

Compensation

Earnable Compensation

An employee's base salary, including pick-up contributions, for all straight time hours worked, plus assignment pay and payments received for vacation and sick leave taken, jury duty, and death-in-family leave taken. Earnable compensation shall not include overtime pay; payments for accrued sick leave, accrued vacation leave, or accrued compensatory leave; holiday pay; premium pay for holidays worked; the value of any employment benefits or non-monetary entitlements; or any other form of remuneration.

Average Final Compensation

For members who retire or terminate employment with ten or more years of creditable service prior to 10/1/2010: the annual earnable compensation of a member during either the last one year or the highest year of membership service, whichever is greater.

For members who retire on or after 10/1/2010: the Average Final Compensation shall mean the average of the highest 5 years of service, to be phased in effective 9/30/2010 over the next 4 years as follows:

For members who retire between 10/1/2010 and 9/30/2011: the average of the highest 2 years of membership service

For members who retire between 10/1/2011 and 9/30/2012: the average of the highest 3 years of membership service

For members who retire between 10/1/2012 and 9/30/2013: the average of the highest 4 years of membership service

For members who retire on or after 10/1/2013: the average of the highest 5 years of membership service.

Provided, in no event shall the Average Final Compensation of any member who was employed as a police officer or fire fighter on 9/30/2010 and retires on or after 10/1/2010, be less than the highest year of membership service prior to 9/30/2010.

Creditable Service

For Vesting and Benefit Accrual

Service credited under Retirement System; military service (maximum of four years) during wartime for which Member makes contributions; maternity leave (maximum of 180 days for each leave) for which Member makes contributions; up to 5 years, without member contributions, if member was an employee before period of military service.

Accumulated leave balances may be transferred into system immediately prior to retirement to purchase up to 3 whole years of additional Creditable Service, on an actuarially equivalent basis.

457 balances of Firefighters may be transferred into System at retirement to purchase up to 3 whole years of additional Creditable Service for multiplier purposes.

Member Contributions

Police Officers:	7% (10% if hired on or after 10/1/2012)
Fire Fighters:	10%

DROP

Eligibility	Election must be made within 10 years after eligibility for normal retirement. Members eligible for forward DROP as of 1/1/2013 or vested as of 1/1/2010 remain eligible for forward DROP.
Benefit	Effective 1/1/2013 members may elect the BackDROP option (maximum of 7 years). Members receive a monthly benefit based on an earlier retirement date and a lump sum of past payments compounded at 3%/year.

COLA

Eligibility	Participant or Beneficiary
Benefit	Amount varies annually with the adjustment on January 1

Payment Forms

Normal Form

For Police Officers who have reached Rule of 64 by 9/30/2010 or Fire Fighters who reached Rule of 64 by 9/30/2009: Joint and 40% Contingent Survivor with a minimum 10 years Certain and Life

For Fire Fighters who have reached Rule of 68 by 9/30/2010: Joint and 40% Contingent Survivor with a minimum of 10 years Certain and Life

For all others:

Benefits based on service prior to 10/1/2010: Joint and 40% Contingent Survivor with minimum of 10 years Certain and Life

Benefits based on service after 9/30/2010: 10 years Certain and Life

Optional Forms

Option 1 – Cash refund annuity based on Present Value at retirement

Option 2 – Joint and 100% Contingent Annuity

Option 3 – Joint and 50% Contingent Annuity

Option 4 – Joint and Contingent Annuity approved by the Board

Option 5 – Determined by Board due to incapacity of member

Option 6 – Withdrawal of member contributions with interest and benefit that is ½ of normal level

Plan Provision Not Included

The COLA benefits and liabilities are not included in this report; these benefits are reported in a separate COLA report dated December 7, 2017. We are not aware of any other provisions not included in this report.

Adjustments Made for Subsequent Events

We are not aware of any event following the measurement date and prior to the date of this report that would materially impact the results.

Pension Stabilization Fund

Beginning October 1, 2008, any time the city's contributions to normal cost fall below 37% of valuation payroll, the difference will be deposited into the Pension Stabilization Fund to be used in subsequent years when the city's required contributions exceed 37%. No payment to this trust is required if the funded level of this trust exceeds 10% of the actuarial value of assets of the retirement system.

Changes Since Prior Report

None

Cost Method (CO)

Aggregate Cost Method.

Asset Valuation Method (CO)

20% Write-Up Method: Expected actuarial value of assets, adjusted by 20% of the difference between expected actuarial value and actual market value (net of pending transfers to the COLA Fund).

The result cannot be greater than 120% of market value or less than 80% of market value (net of pending COLA transfers).

Interest Rates (CO)

7.34% net of investment expenses

Support for the discount rate assumption has been provided in the experience study report dated December 2014

Annual Pay Increases (FE)

3.25% inflation and 1.5% for promotions and other increases plus salary merit scale below.

<u>Service</u>	<u>Police</u>	<u>Fire</u>
0-6	5.0%	5.0%
7	2.5%	5.0%
8-9	5.0%	5.0%
10-14	1.0%	0.0%
15-16	1.25%	2.5%
17-21	1.0%	1.0%
22+	0.0%	0.0%

There is no additional increase at retirement.

The annual pay increases are based on a study of actual experience for the plan during 2011-2014. See the experience study report dated December 2014.

Expense and/or Contingency Loading (FE)

\$2,128,469

Mortality Rates (CO)

Healthy FRS Healthy Mortality Special Risk table projected generationally with Scale BB
 Disabled FRS Disabled Mortality not projected

100% of the assumed deaths are expected to be ordinary deaths

The mortality table is prescribed by State law, following the assumptions used by the Florida Retirement System.

Retirement Rates (FE)

If eligible for Retirement, the following decrements apply, based on service.

<u>Years of Service</u>	<u>Police %</u>	<u>Fire %</u>
<20	0	0
20	10	10
21-24	3	3
25-29	40	5
30-34	50	25
35	100	25
36		25
37		100

All Members are assumed to elect a 5-year BackDROP when they reach five years following first retirement eligibility.

The assumed retirement rates are based on a study of actual experience for the plan during 2011-2014. See the experience study report dated December 2014.

Disability Rates (FE)

100% of the disabilities are expected to be accidental with the following probabilities. No recovery is assumed.

<u>Age</u>	<u>Rates</u>
35	0.285%
40	0.390%
45	0.800%
50	1.210%

The disability rates are based on a study of actual experience for the plan during 2011-2014. See the experience study report dated December 2014.

Withdrawal Rates (FE)

Based on Years of Creditable Service using the rates below

<u>Age</u>	<u><5</u>	<u>5+</u>
30	2.40%	1.92%
35	2.40%	1.92%
40	1.80%	1.44%
45	1.20%	0.96%
50	0.00%	0.00%

The withdrawal rates are based on a study of actual experience for the plan during 2011-2014. See the experience study report dated December 2014.

Marital Status and Ages

100% of Members are assumed to be married. Female spouses assumed to be 3 years younger than male spouses.

Compensated Absence Balance Transfers

No liabilities or costs are included for the provision to transfer compensated absence balances into FIPO to purchase additional creditable service, based on our understanding that assets will be transferred immediately prior to retirement to cover 100% of the liability for the additional service.

Withdrawal of Employee Contributions

It is assumed that employees do not withdraw their contribution balances upon employment termination or retirement.

COLA

COLA benefits are assumed to increase as indicated in the COLA table; these are documented in a separate COLA report. No increase to the table is assumed to occur.

Changes Since Prior Report

The interest rate assumption was reduced from 7.42% to 7.34%.

The administrative expense has increased to \$2,128,469 from the prior year.

FE indicates an assumption representing an estimate of future experience.

MO indicates an assumption representing an observation of estimates inherit to market data.

CO indicates an assumption representing a combination of an estimate of future experience and observations of market data.

The actuarial report also shows the necessary items required for plan reporting and the any state requirements.

- ✓ Market Value Reconciliation
- ✓ Membership and Benefits Cost-Of-Living Adjustment Account Summary
- ✓ Investment Results
- ✓ Florida State Requirements
 - Comparative Summary of Principal Valuation Results
 - Separation for Police & Fire
 - Comparison of payroll growth, salary increases and investment returns
 - Requirements under Florida Statute 112.664 and F.A.C. 60T-1.0035

Market Value Reconciliation

The amount of assets backing the pension promise is the most significant driver of volatility and future costs within a pension plan. The investment performance of the assets directly offsets the ultimate cost.

	October 1, 2017		
	Membership and Benefits Accounts	COLA I Account	COLA II Account
1. Market value – beginning of prior year	\$1,109,146,744	\$63,578,553	\$329,280,465
2. Book value – beginning of prior year	\$973,803,105	\$55,820,380	\$289,100,014
3. Income			
(a) City contributions	\$47,102,220	\$0	\$6,161,789
(b) Member contributions	13,206,378	0	0
(c) Other contributions	0	0	0
(d) Interest and dividends	21,116,904	1,015,253	5,565,382
(e) Net realized gains (losses)	70,449,100	3,399,249	16,805,269
(f) Securities lending income	537,277	25,730	141,388
(g) Rental and other income	255,372	12,325	67,411
(h) Income transfer	0	0	0
(i) Total	<u>\$152,667,251</u>	<u>\$4,452,557</u>	<u>\$28,741,239</u>
4. Disbursements			
(a) Benefit payments and refunds	126,492,923	\$133,538	\$24,748,915
(b) Custodial and investment expenses	3,850,715	184,631	1,017,295
(c) Administrative expense	2,058,797	0	0
(d) Other expense	0	0	0
(e) Securities lending fees	134,229	6,428	35,323
(f) Building depreciation	32,479	1,617	8,630
(g) Total	<u>\$132,569,143</u>	<u>\$326,214</u>	<u>\$25,810,163</u>
5. Book value – beginning of current year [(2)+(3i)-(4g)]	\$993,901,213	\$59,946,723	\$292,031,090
6. Net change in unrealized gains (losses)	\$1,821,194	(\$1,073,978)	\$21,441,956
7. Unrealized gains (losses)	\$137,164,833	\$6,684,195	\$61,622,407
8. Market value – beginning of current year [(1)+(3i)-(4g)+(6)]	\$1,131,066,046	\$66,630,918	\$353,653,497
9. Current year allocation to COLA II (discounted)	\$0	N/A	\$0
10. Net market value – beginning of current year	<u>\$1,131,066,046</u>	<u>\$66,630,918</u>	<u>\$353,653,497</u>

Membership and Benefits Cost-Of-Living Adjustment Account Summary

	September 30, 2017	
	<u>Market</u>	<u>Book</u>
1 Investments		
(a) Bill, bonds, notes	\$484,714,055	\$460,946,955
(b) Domestic stocks	341,395,992	285,789,729
(c) International stocks	259,622,073	198,432,954
(d) Private equity	139,235,059	127,519,663
(e) Money market fund and time deposit	11,029,757	11,581,422
(f) Mutual fund	269,485,322	215,740,100
(g) Real estate	1,786,284	1,786,284
(h) Securities lending adjustment	0	0
(i) Total investment	\$1,507,268,542	\$1,301,797,107
2 Cash	\$43,119,707	\$43,119,707
3 Receivables		
(a) City contributions	\$0	\$0
(b) Member contributions	0	0
(c) Accounts receivable	5,952	5,952
(d) Accrued interest and dividend	3,214,442	3,214,442
(e) Securities sold	620,106	620,106
(f) Total receivables	\$3,840,500	\$3,840,500
4 Payables:		
(a) Budget advance	\$0	\$0
(b) Accrual expense	399,988	399,988
(c) Transfer	0	0
(d) Tax withheld	7,205	7,205
(e) Accounts payable	338,790	338,790
(f) Securities purchased	2,132,305	2,132,305
(g) Total payables	\$2,878,288	\$2,878,288
5 Total [(1i)+(2)+(3f)-(4g)]	\$1,551,350,461	\$1,345,879,026
6 COLA I account	\$66,630,918	\$59,946,723
7 COLA II account	\$353,653,497	\$292,031,090
8 Current year COLA II transfer	\$0	\$0
9 Membership & benefits account [(5)-(6)-(7)-(8)]	\$1,131,066,046	\$993,901,213

Investment Results - Membership and Benefits Accounts

September 30, 2017

<u>Membership and Benefits Accounts</u>	<u>Dollar Return</u>	<u>Market Return</u>	<u>Book Return</u>
Interest	\$13,497,122	1.2%	1.4%
Dividends	7,619,782	0.7%	0.8%
Rental and Other Income, less Depreciation	222,893	0.0%	0.0%
Realized Gains	70,449,100	6.1%	7.6%
Securities Lending (Net)	403,048	0.0%	0.0%
Increase in Unrealized Gains	1,821,194	0.2%	N/A
Custodial and Investment Expenses	(3,850,715)	(0.3%)	(0.4%)
	\$90,162,424	8.2%	9.4%

Investment Results - COLA I and II Accounts

September 30, 2017

COLA I Account

	<u>Dollar Return</u>	<u>Market Return</u>	<u>Book Return</u>
Interest	\$648,748	1.0%	1.2%
Dividends	366,505	0.6%	0.7%
Rental and Other Income, less Depreciation	10,708	0.0%	0.0%
Realized Gains	3,399,249	5.4%	6.0%
Securities Lending (Net)	19,302	0.0%	0.0%
Increase in Unrealized Gains	(1,073,978)	(1.7%)	N/A
Custodial and Investment Expenses	(184,631)	(0.3%)	(0.3%)
	\$3,185,903	5.0%	7.6%

COLA II Account

	<u>Dollar Return</u>	<u>Market Return</u>	<u>Book Return</u>
Interest	\$3,557,102	1.1%	1.3%
Dividends	2,008,280	0.6%	0.7%
Rental and Other Income, less Depreciation	58,781	0.0%	0.0%
Realized Gains	16,805,269	5.3%	6.1%
Securities Lending (Net)	106,065	0.0%	0.0%
Increase in Unrealized Gains	21,441,956	6.7%	N/A
Custodial and Investment Expenses	(1,017,295)	(0.3%)	(0.4%)
	\$42,960,158	13.4%	7.7%

Information to Comply with Florida 60T-1.003(4)(i)

Comparative Summary of Principal Valuation Results

	10/1/2017 7.34% (assumption changes)	10/1/2017 7.42% (prior methods & assumptions)	10/1/2016 7.42%
Participant Data			
Active members	1,943	1,943	1,869
Total annual payroll	141,497,840	141,497,840	133,083,231
Members in DROP	129	129	191
DROP Payroll	\$18,289,646	\$18,289,646	\$20,702,301
Projected Total Payroll	\$159,787,486	\$159,787,486	\$153,785,532
Retired members and beneficiaries	1,923	1,923	1,871
Total annualized benefit	\$113,476,000	\$113,476,000	\$121,415,032
Disabled members receiving benefits	136	136	143
Total annualized benefit	\$3,120,659	\$3,120,659	\$3,214,574
Terminated vested members	113	113	15
Total annualized benefit	\$560,510	\$560,510	\$403,236
Assets			
Actuarial value of assets	\$1,161,585,161	\$1,161,585,161	\$1,150,653,520
Market value of assets	\$1,131,066,046	\$1,131,066,046	\$1,109,146,744

Information to Comply with Florida 60T-1.003(4)(i)

Comparative Summary of Principal Valuation Results (continued)

	10/1/2017 7.34% (assumption changes)	10/1/2017 7.42% (prior methods & assumptions)	10/1/2016 7.42%
Liabilities, present value of all future expected benefit payments			
Active members			
Retirement benefits	\$584,030,682	\$574,129,792	\$531,124,441
Vesting benefits	33,406,118	32,726,374	31,513,031
Disability benefits	74,196,482	73,143,138	70,880,719
Death benefits	25,871,816	25,415,780	24,275,385
Return of contribution	3,670,136	3,660,660	3,616,362
Total	<u>\$721,175,234</u>	<u>\$709,075,744</u>	<u>\$661,409,938</u>
Terminated vested members	5,333,777	5,280,520	2,905,971
Retired members and beneficiaries	1,318,787,233	1,309,679,036	1,309,422,320
Disabled members	<u>27,333,263</u>	<u>27,176,018</u>	<u>28,355,157</u>
Total	\$2,072,629,507	\$2,051,211,318	\$2,002,093,386
Liabilities due and unpaid	\$0	\$0	\$0
Actuarial accrued liability	N/A	N/A	N/A
Unfunded actuarial accrued liability	N/A	N/A	N/A

Information to Comply with Florida 60T-1.003(4)(i)

Comparative Summary of Principal Valuation Results (continued)

	10/1/2017 7.34% (assumption changes)	10/1/2017 7.42% (prior methods & assumptions)	10/1/2016 7.42%
Actuarial present value of accrued benefits			
Statement of actuarial present value of all accrued benefits			
Vested accrued benefits			
Inactive members and beneficiaries	\$1,351,454,273	\$1,342,135,574	\$1,340,683,448
Active members	272,600,025	268,895,016	274,796,357
Total value of all vested accrued benefits	<u>\$1,624,054,298</u>	<u>\$1,611,030,590</u>	<u>\$1,615,479,805</u>
Non-vested accrued benefits	25,311,006	25,040,862	18,027,036
Total actuarial present value of all accrued benefits	<u>\$1,649,365,304</u>	<u>\$1,636,071,452</u>	<u>\$1,633,506,841</u>
Statement of changes in total actuarial present value of all accrued benefits (ASC 960)			
Actuarial present value of accrued benefits, beginning of year	\$1,633,506,841	\$1,633,506,841	\$1,609,538,052
Increase (decrease) during year			
Benefits accumulated	\$12,460,248	\$12,460,248	\$12,578,198
Plan amendment	0	0	7,904,054
Changes in actuarial assumptions	13,293,852	0	13,938,565
Interest	116,597,286	116,597,286	114,861,765
Benefits paid	(126,492,923)	(126,492,923)	(125,313,793)
Other changes	0	0	0
Net increase (decrease)	<u>\$15,858,463</u>	<u>\$2,564,611</u>	<u>\$23,968,789</u>
Actuarial present value of accrued benefits, end of year	<u>\$1,649,365,304</u>	<u>\$1,636,071,452</u>	<u>\$1,633,506,841</u>

Information to Comply with Florida 60T-1.003(4)(i)

Comparative Summary of Principal Valuation Results (continued)

	10/1/2017 7.34% (assumption changes)	10/1/2017 7.42% (prior methods & assumptions)	10/1/2016 7.42%
Pension cost			
Normal Cost	68,623,567	67,547,585	\$62,475,043
Member contributions	12,593,307	12,593,307	\$11,883,439
Expected plan sponsor contribution	\$56,030,260	\$54,954,278	\$50,591,604
As % of payroll	39.60%	38.84%	38.02%
As % of Total Payroll	35.07%	34.39%	32.90%
Member Contributions as % of payroll	8.90%	8.90%	8.93%
Past contributions			
Required plan sponsor contribution	9/30/2017 \$47,102,220		9/30/2016 \$42,747,818
Required member contribution	\$13,206,378		\$12,082,805
Actual contributions made by:			
Plan's sponsor	\$47,102,220		\$42,747,818
Members	\$13,206,378		\$12,082,805
Other	\$0		\$0
Net actuarial gain (loss) (if applicable)	N/A	N/A	N/A
Other disclosures (where applicable)			
Present value of active member			
Future salaries at attained age	\$2,081,445,994	\$2,067,385,213	\$2,016,178,212
Future contributions at attained age	\$174,504,339	\$173,264,625	\$169,544,933

Information to Comply with Florida 60T-1.003(4)(i)

Hypothetical City Contribution Requirement for 2018/2019 Fiscal Year

	Police	Fire	Total
Unfunded actuarial accrued liability	\$0	\$0	\$0
Liabilities, present value of all future expected benefit payments			
Active members			
Retirement benefits	\$353,738,915	\$230,291,767	\$584,030,682
Vesting benefits	18,848,409	14,557,709	\$33,406,118
Disability benefits	43,929,009	30,267,473	\$74,196,482
Death benefits	12,990,024	12,881,792	\$25,871,816
Return of contribution	2,271,292	1,398,844	3,670,136
Total	\$431,777,649	\$289,397,585	\$721,175,234
Terminated vested members	4,306,506	1,027,271	5,333,777
Retired members and beneficiaries	731,531,542	587,255,691	1,318,787,233
Disabled members	23,843,397	3,489,866	27,333,263
Total	\$1,191,459,094	\$881,170,413	\$2,072,629,507
Entry age reserve			
Active	\$204,848,629	\$148,758,191	\$353,606,820
Inactive	759,681,445	591,772,828	1,351,454,273
Total	\$964,530,074	\$740,531,019	\$1,705,061,093
Actuarial asset value ¹	\$657,093,066	\$504,492,095	\$1,161,585,161

¹Allocated based on Entry Age Reserve

Information to Comply with Florida 60T-1.003(4)(i)

Hypothetical City Contribution Requirement for 2018/2019 Fiscal Year (continued)

	Police	Fire	Total
Normal cost			
Total present value of future benefits	\$1,191,459,094	\$881,170,413	\$2,072,629,507
Present value of future member contributions	(89,058,116)	(85,446,223)	(174,504,339)
Actuarial asset value	(657,093,066)	(504,492,095)	(1,161,585,161)
Present value of future normal costs	\$445,307,912	\$291,232,095	\$736,540,007
Present value of future payrolls	\$1,148,726,518	\$932,719,476	\$2,081,445,994
Administrative expense ¹	\$1,204,046	\$924,423	\$2,128,469
Current payroll	\$80,252,703	\$61,245,137	\$141,497,840
Interest rate	7.34%	7.34%	7.34%
Normal Cost	\$32,314,291	\$20,047,589	\$52,198,863
Interest to End of Year	\$2,371,869	\$1,471,493	\$3,831,397
Contribution Requirement at end of year	\$34,686,160	\$21,519,082	\$56,030,260
As a percentage of payroll	43.22%	35.14%	39.60%
Hypothetical Total			\$56,205,242

¹Allocated based on Entry Age Reserve

Information to Comply with Florida 60T-1.003(4) (i)

Historical Salary Increases and Asset Performance

September 30, 2017

Year Ending	Payroll Growth	Salary Growth	Expected Salary Growth	Asset Return (Market)	Asset Return (Actuarial)	Asset Return (Expected)
9/30/2017	6.32%	7.02%	7.85%	8.24%	6.76%	7.42%
9/30/2016	25.22%	10.46%	7.85%	8.42%	6.51%	7.42%
9/30/2015	13.42%	12.60%	7.79%	2.80%	6.18%	7.42%
9/30/2014	10.00%	1.38%	7.72%	8.60%	7.18%	7.50%
9/30/2013	3.70%	3.64%	7.77%	11.20%	6.95%	7.50%
9/30/2012	0.10%	(0.75%)	7.92%	17.40%	5.98%	7.50%
9/30/2011	2.50%	7.14%	7.48%	3.60%	3.98%	7.50%
9/30/2010	(34.40%)	(9.33%) ¹	7.51%	9.80%	4.48%	7.75%
9/30/2009	(5.50%)	6.35%	7.26%	(0.30%)	(1.31%)	7.75%
9/30/2008	24.80%	18.20%	7.17%	(14.30%)	3.65%	7.75%
Averages						
3-year				6.45%	6.48%	
5-year				7.82%	6.72%	
10-year	4.62%			5.21%	5.01%	
20-year				6.65%	6.13%	

¹Including impact of change in valuation pay definition

City of Miami Fire Fighters' and Police Officers' Retirement Trust
Actuarial Valuation as of October 1, 2017
Other Measurements

Information to Comply with Florida Statute 112.664 and Florida Administrative Code 60T-1.0035¹

October 1, 2017

	Valuation 7.42%	- 200 bp ² 5.34%	Funding Rate ² 7.34%	+ 200 bp ² 9.34%
Total pension liability				
Service Cost	\$23,964,356	\$23,964,356	\$23,964,356	\$23,964,356
Interest	133,359,088	133,359,088	133,359,088	133,359,088
Benefit changes		0	0	0
Difference between expected and actual experience	21,441,694	21,441,694	21,441,694	21,441,694
Changes in assumptions	0	405,741,675	13,054,284	(267,841,206)
Benefit payments	(157,037,907)	(157,037,907)	(157,037,907)	(157,037,907)
Contribution refunds	(772,000)	(772,000)	(772,000)	(772,000)
Net change in pension liability	\$20,955,231	\$426,696,906	\$34,009,515	(\$246,885,975)
Total pension liability, beginning of year	\$1,852,232,882	\$1,852,232,882	\$1,852,232,882	\$1,852,232,882
Total pension liability, end of year	\$1,873,188,113	\$2,278,929,788	\$1,886,242,397	\$1,605,346,907
Plan fiduciary net position				
Contributions - Employer	\$47,102,220	\$47,102,220	\$47,102,220	\$47,102,220
Contributions - State	0	0	0	0
Contributions - Member	13,206,378	13,206,378	13,206,378	13,206,378
Net investment income	104,345,081	104,345,081	104,345,081	104,345,081
Benefit payments	(157,037,907)	(157,037,907)	(157,037,907)	(157,037,907)
Contribution refunds	(772,000)	(772,000)	(772,000)	(772,000)
Administrative expense	(2,058,797)	(2,058,797)	(2,058,797)	(2,058,797)
Other	222,893	222,893	222,893	222,893
Net change in plan fiduciary net position	\$5,007,868	\$5,007,868	\$5,007,868	\$5,007,868
Plan fiduciary net position, beginning of year	\$1,307,239,482	\$1,307,239,482	\$1,307,239,482	\$1,307,239,482
Plan fiduciary net position, end of year	\$1,312,247,350	\$1,312,247,350	\$1,312,247,350	\$1,312,247,350
Net pension liability/(asset)	\$560,940,763	\$966,682,438	\$573,995,047	\$293,099,557
Funded ratio	70.05%	57.58%	69.57%	81.74%
Years that Assets support expected benefit payments	13	11	12	15
Estimated city contribution				
Annual dollar value	\$54,954,278	\$85,559,433	\$56,030,260	\$30,750,512
Percentage of payroll	38.84%	60.47%	39.60%	21.73%

¹Includes DROP assets and liabilities

²Based on valuation assumption with the following changes
 -interest rate (as noted)

Information to Comply with Florida Statute 112.664 and Florida Administrative Code 60T-1.0035¹

October 1, 2017

Sustainment of Expected Benefit Payments

Mortality
Interest

Valuation
7.42%

<u>Year</u>	<u>Market Value of Assets</u>	<u>Investment Return</u>	<u>Benefit Payments</u>
1	\$1,312,247,350	\$86,122,368	\$308,659,647 ¹
2	1,089,710,071	76,255,114	126,285,749
3	1,039,679,436	72,533,444	126,543,642
4	985,669,238	68,487,767	127,589,881
5	926,567,124	64,013,509	130,029,232
6	860,551,401	59,043,271	132,001,770
7	787,592,902	53,483,910	136,004,387
8	705,072,425	47,256,870	138,859,252
9	613,470,043	40,394,467	140,657,084
10	513,207,426	32,895,283	142,295,524
11	403,807,185	24,730,219	143,600,974
12	284,936,430	15,779,745	147,176,094
13	153,540,081	5,843,499	152,298,408
14	7,085,172		157,163,916

¹Benefit payments include the DROP balance at 9/30/2017

Information to Comply with Florida Statute 112.664 and Florida Administrative Code 60T-1.0035¹

October 1, 2017

Sustainment of Expected Benefit Payments

Mortality FRS Special Risk Generational with Scale BB
Interest 5.34%

<u>Year</u>	<u>Market Value of Assets</u>	<u>Investment Return</u>	<u>Benefit Payments</u>
1	\$1,312,247,350	\$61,939,973	\$308,659,647 ¹
2	1,065,527,676	53,571,199	126,285,749
3	992,813,126	49,681,446	126,543,642
4	915,950,930	45,549,433	127,589,881
5	833,910,482	41,104,190	130,029,232
6	744,985,440	36,303,611	132,001,770
7	649,287,281	31,087,849	136,004,387
8	544,370,743	25,410,072	138,859,252
9	430,921,563	19,304,508	140,657,084
10	309,568,987	12,781,103	142,295,524
11	180,054,566	5,830,631	143,600,974
12	42,284,223		147,176,094

¹Benefit payments include the DROP balance at 9/30/2017

Information to Comply with Florida Statute 112.664 and Florida Administrative Code 60T-1.0035¹

October 1, 2017

Sustainment of Expected Benefit Payments

Mortality FRS Special Risk Generational with Scale BB
Interest 7.34%

<u>Year</u>	<u>Market Value of Assets</u>	<u>Investment Return</u>	<u>Benefit Payments</u>
1	\$1,312,247,350	\$85,191,716	\$308,659,647 ¹
2	1,088,779,419	75,363,784	126,285,749
3	1,037,857,454	71,616,815	126,543,642
4	982,930,627	67,547,468	127,589,881
5	922,888,214	63,052,416	130,029,232
6	855,911,398	58,065,207	132,001,770
7	781,974,835	52,493,969	136,004,387
8	698,464,417	46,261,386	138,859,252
9	605,866,551	39,399,890	140,657,084
10	504,609,357	31,908,546	142,295,524
11	394,222,379	23,759,080	143,600,974
12	274,380,485	14,833,801	147,176,094
13	142,038,192		152,298,408

¹Benefit payments include the DROP balance at 9/30/2017

Information to Comply with Florida Statute 112.664 and Florida Administrative Code 60T-1.0035¹

October 1, 2017

Sustainment of Expected Benefit Payments

Mortality FRS Special Risk Generational with Scale BB
Interest 9.34%

<u>Year</u>	<u>Market Value of Assets</u>	<u>Investment Return</u>	<u>Benefit Payments</u>
1	\$1,312,247,350	\$108,471,217	\$308,659,647 ¹
2	1,112,058,920	98,100,388	126,285,749
3	1,083,873,559	95,456,100	126,543,642
4	1,052,786,017	92,504,755	127,589,881
5	1,017,700,891	89,116,429	130,029,232
6	976,788,088	85,205,112	132,001,770
7	929,991,430	80,651,554	136,004,387
8	874,638,597	75,351,253	138,859,252
9	811,130,598	69,337,521	140,657,084
10	739,811,035	62,601,466	142,295,524
11	660,116,977	55,098,437	143,600,974
12	571,614,440	46,669,069	147,176,094
13	471,107,415	37,047,839	152,298,408
14	355,856,846	26,061,288	157,163,916
15	224,754,218	13,654,940	160,698,100
16	77,711,058		164,932,884

¹Benefit payments include the DROP balance at 9/30/2017