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Firefighters' Retirement Plan of the City of St. Louis Retirement Program

Actuarial Valuation Report as of October 1, 2015

Produced by Cheiron

January 2016

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LETTER OF TRANSMITTAL

January 21, 2016

Board of Pension Trustees
Firefighters' Retirement Plan of the City of St. Louis
1114 Market Street, Suite 900
St. Louis, Missouri 63101

Dear Members of the Board:

At your request, we have conducted an actuarial valuation of the Firefighters' Retirement Plan of the City of St. Louis as of October 1, 2015. The valuation is organized as follows:

- In Section I **Board Summary,** we describe the purpose of an actuarial valuation and summarize the key results found in this valuation.

- The **Main Body** of the report presents details on the Plan's:

  - Section II - Assets
  - Section III - Liabilities
  - Section IV - Contributions
  - Section V - Accounting Statement Information

- In the **Appendices,** we conclude our report with detailed information describing the Plan's membership (Appendix A), actuarial assumptions and methods employed (Appendix B), and a summary of pertinent plan provisions (Appendix C).

The results of this report rely on future Plan experience conforming to the underlying assumptions. To the extent that actual Plan experience deviates from the underlying assumptions, the results will vary accordingly.

The purpose of this report is to present the annual actuarial valuation of the Firefighters' Retirement Plan of the City of St. Louis. This report is for the use of the Board and its auditors in preparing financial reports in accordance with applicable law and accounting requirements. The report does not include calculations under GASB Statements No. 67 and No. 68 which are provided in a separate report.

In preparing our report, we relied without audit, on information supplied by the Firefighters' Retirement Plan of the City of St. Louis staff. This information includes, but is not limited to, plan provisions, employee data, and financial information. We performed an informal examination of the obvious characteristics of the data for reasonableness and consistency in accordance with Actuarial Standards of Practice #23.

To the best of our knowledge, this report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices which are consistent with the Code of Professional Conduct and applicable Actuarial Standards of Practice as set out by the Actuarial Standards Board. Furthermore, as credentialed actuaries, we meet the Qualification

Standards of the American Academy of Actuaries to render the opinion contained in this report. This report does not address any contractual or legal issues. We are not attorneys and our firm does not provide any legal services or advice.

This actuarial report was prepared solely for the Firefighters' Retirement Plan of the City of St. Louis for the purposes described herein. This valuation report is not intended to benefit any third party, and Cheiron assumes no duty or liability to any such party.

Sincerely,
Cheiron

Stephen McElhaney, FSA, FCA, MAAA
Principal Consulting Actuary

Janet Cranna, FSA, FCA, MAAA
Principal Consulting Actuary

SECTION I – BOARD SUMMARY

The primary purpose of the actuarial valuation and this report is to measure, describe and identify as of the valuation date:

- The financial condition of the Plan,
- Expected trends in the financial progress of the Plan,
- The City's contributions for Fiscal Year ending 2016, and
- Information recommended by the Government Finance Officers Association (GFOA).

In the balance of this Board Summary we present (A) the basis upon which this year's valuation was completed, (B) the key findings of this valuation including a summary of all key financial results, and (C) the projected financial outlook for the Plan.

A. Valuation Basis

Effective February 1, 2013, benefit accruals under the Firemen's Retirement System of St. Louis ("FRS") were frozen. The actuarial valuation for the FRS is prepared by Gabriel Roeder Smith & Company ("GRS"). The Firefighters' Retirement Plan of the City of St. Louis ("FRP") was established as of that date to provide retirement, disability, and death benefits for service rendered after the effective date. Years of service accrued under the FRS counts toward benefit accruals under the FRP, but benefits attributable to such service are offset by the benefits payable by the FRS. Under the FRP, the Plan provisions for Participants who were active as of February 1, 2013 ("Grandfathered Participants") are substantially the same as the plan provisions for the FRS, with some exceptions as detailed in Appendix C. This October 1, 2015 valuation represents Cheiron's second valuation performed for the Firefighters' Retirement Plan of the City of St. Louis.

B. Key Findings of this Valuation

The key results of the October 1, 2015 actuarial valuation are as follows:

- The actuarially determined City contribution increased from $7.4 million payable as of September 30, 2015 to $9.1 million payable as of September 30, 2016.
- The unfunded actuarial liability increased from $38 million on October 1, 2014 to $63 million on October 1, 2015.
- The Plan's funding ratio, the ratio of actuarial asset value over liabilities decreased from 34.4% as of October 1, 2014 to 33.7% as of October 1, 2015.
- The factors in the decline in the Plan's funded status were an actuarial experience loss of $0.9 million and programming changes of $22.0 million.

    - During the year ended September 30, 2015, the Plan's assets lost 4.02% (net of investment expenses) on a market value basis, but due to smoothing of prior investment gains and losses, the return on the actuarial asset value was 4.83% (as compared to 7.625% assumed). This resulted in an actuarial loss on investments of $0.6 million.

SECTION I – BOARD SUMMARY

- On the liability side, the Plan experienced an actuarial experience loss of $0.3 million. The largest individual component of this loss is $1.2 million loss due to salary increases being higher than expected for continuing active participants.

- Programming changes were made to more accurately reflect certain plan benefits which resulted in an increase in the actuarial liability of $22.0 million.

- A settlement with the City of St. Louis and FRS provided for additional sick leave benefits for plan members, and this increased the actuarial liability by $0.8 million, but this increase was funded by a transfer from FRS of $1.1 million.

SECTION I – BOARD SUMMARY

Following is Table I-1 which summarizes all the key results of the valuation with respect to the Plan's membership, assets and liabilities, and contributions. The results are presented and compared for both the current and prior plan year.

Table I-1
Firefighters' Retirement Plan of the City of St. Louis
Summary of Principle Results

Valuation as of:	**October 1, 2014**	**October 1, 2015**	**% change**
Participant Counts			
Active Participants[1]	626	607	(3.04%)
Disabled Participants	1	4	300.00%
Retirees and Beneficiaries	21	33	57.14%
Terminated Vested Participants	26	2	(92.31%)
Total	**674**	**646**	**(4.15%)**
Total Pensionable Payroll (as of 9/30) of Active Members	$ 34,938,772	$ 35,531,194	1.70%
Total Anunal Retirement Allowances for Inpay Participants and Beneficiaries	$ 61,789	$ 228,679	270.10%
Assets and Liabilities			
Actuarial Liability (AL)	$ 58,535,952	$ 94,712,110	61.80%
Actuarial Value of Assets (AVA)	20,154,746	31,940,730	58.48%
Unfunded Actuarial Liability (UAL)	$ 38,381,206	$ 62,771,380	63.55%
Funded Ratio (AVA basis)	34.4%	33.7%	
Market Value of Assets (MVA)	$ 19,872,328	$ 29,775,598	49.83%
Funded Ratio (MVA basis)	33.9%	31.4%	
Contributions (End of Year)	**Fiscal Year 2015**	**Fiscal Year 2016**	
Employer Normal Cost	$ 4,729,698	$ 4,671,727	(1.23%)
City UAL	2,493,594	4,153,691	66.57%
Administrative Expense	212,343	322,589	51.92%
Total Contribution for City	$ 7,435,635	$ 9,148,007	23.03%
Expected Valuation Payroll	$ 34,351,937	$ 34,978,346	1.82%
Actuarially Determined Contribution as a Percentage of Payroll	21.65%	26.15%	

1 Includes 52 FRP Only Members as of October 1, 2014 and 50 FRP Only Members as of October 1, 2015

SECTION I – BOARD SUMMARY

C. Future Expected Financial Trends

The analysis of projected financial trends is perhaps the most important component of this valuation. The charts in this section show the expected progress of the City's funding status over the next 20 years, measured in terms of the expected employer contribution rates, the total dollar amounts of contributions, and the funded ratio, assuming that the Plan is ongoing.

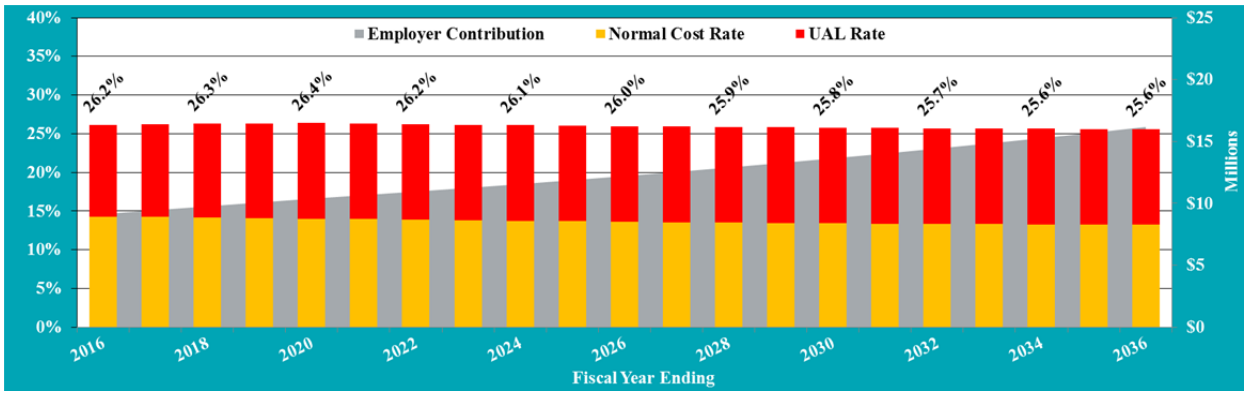
For each projection set, we assume three different future investment return scenarios: baseline returns of 7.625%, optimistic returns of 9.125%, and pessimistic returns of 6.125%. The projections assume there will be no future gains or losses on the liability. These projections also assume that all of the valuation assumptions are exactly met, including the long-term rate of return assumed for each scenario, with covered payroll increasing by the inflation assumption of 3.00% per year in all three scenarios.

1. Contribution Rate Projections

The first set of charts show the City's projected actuarially determined employer contribution rates (red/gold bars) and the projected dollar amount of employer contributions (the gray shaded area) over the 20-year period shown, based on three different rate of return levels with all other valuation assumptions being exactly met. The contribution rates are read using the left-hand axis and the dollars are read using the right-hand axis.

Baseline returns of 7.625%

The first chart below shows that the actuarially determined employer contribution rate will slowly decline from 26.2% to 25.6% of pay and the total dollar contribution steadily increases to $16.2 by FYE 2036 under the baseline scenario where the rate of return is exactly met. The expected decrease in contribution rate is due to Grandfathered Participants (who contribute 8% of pay) being replaced by new Plan Participants (who will contribute at 9% of pay).

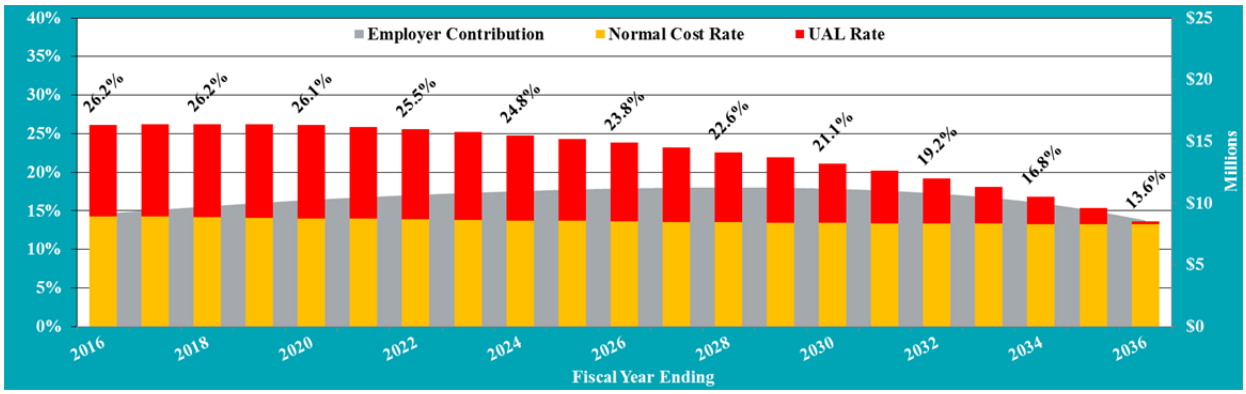


The charts on the next page show the projection if the rate of return assumption is +/- 1.50% than the assumed 7.625% rate of return in each year of the projection.

SECTION I – BOARD SUMMARY

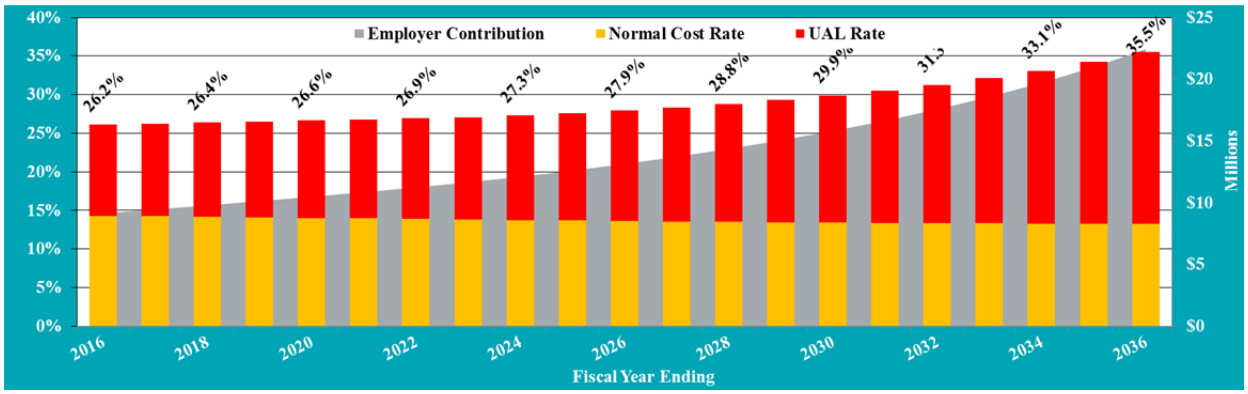
Optimistic returns of 9.125%

If the Plan earns 1.50% greater than the assumed rate in each year of the projection, the actuarially determined contribution rate will steadily decrease to about 13.6%, and the total dollar contribution decreases to $8.6 by FYE 2036.



Pessimistic returns 6.125%

If the Plan earns 1.50% less than the assumed rate in each year of the projection, the actuarially determined contribution rate will steadily increase to about 35.5%, and the total dollar contribution increases to $22.4 by FYE 2036.



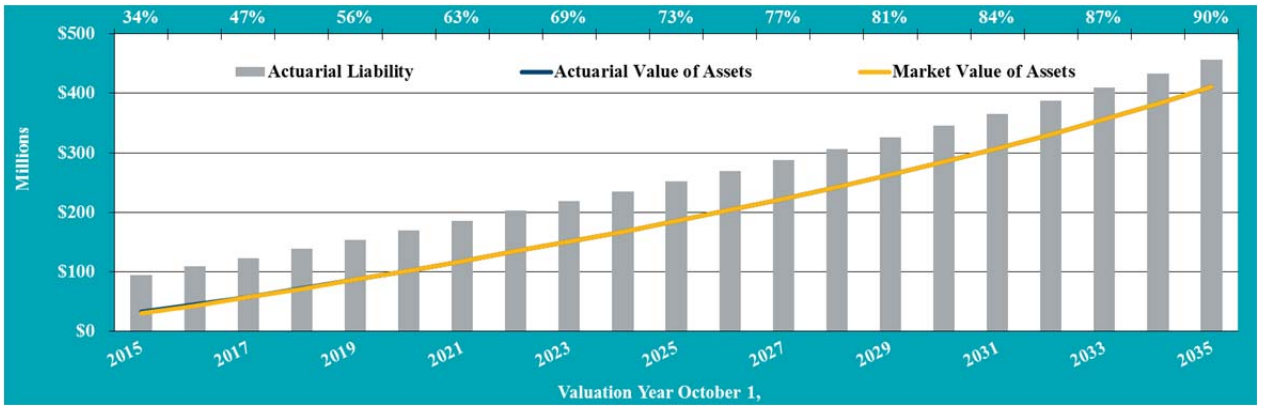
SECTION I – BOARD SUMMARY

2. Asset and Liability Projections

This next set of projection charts compare the market value of assets (gold line) and the actuarial or smoothed value of assets (blue line) to the Plan's actuarial liabilities (gray bars). In addition, at the top of each chart, we show the Plan's funded ratio on an actuarial value of assets basis (ratio of actuarial value of assets to actuarial liabilities). The years shown in the chart signify the valuation date as of October 1 of the labelled year.

Baseline 7.625% return

The first chart below shows that if all actuarial assumptions, including the rate of return assumption, are exactly met, the Plan's funded ratio on an actuarial value of assets basis, shown along the top of the graph, is projected to improve from the current level of 34% to 90% by the 2035 valuation.

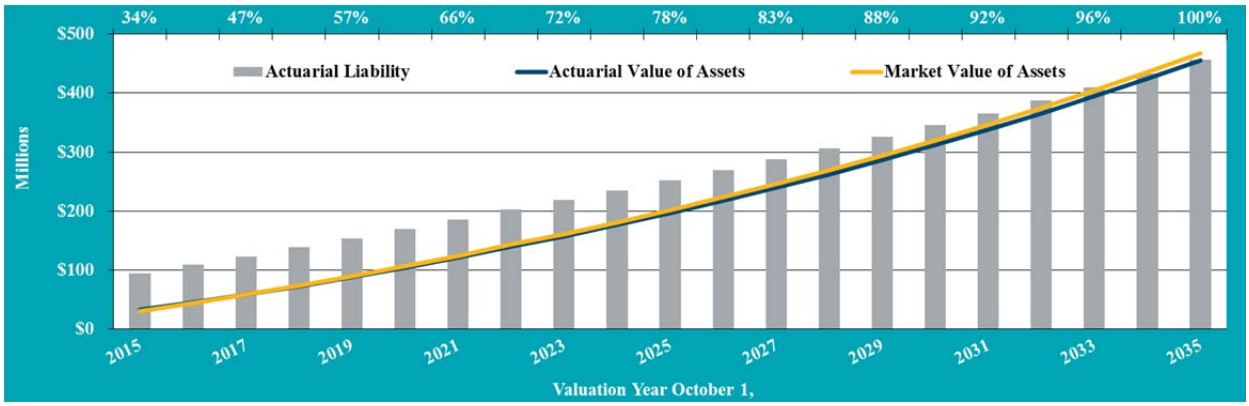


The charts on the next page show the projection if the rate of return assumption is +/- 1.50% than the assumed 7.625% rate of return in each year of the projection.

SECTION I – BOARD SUMMARY

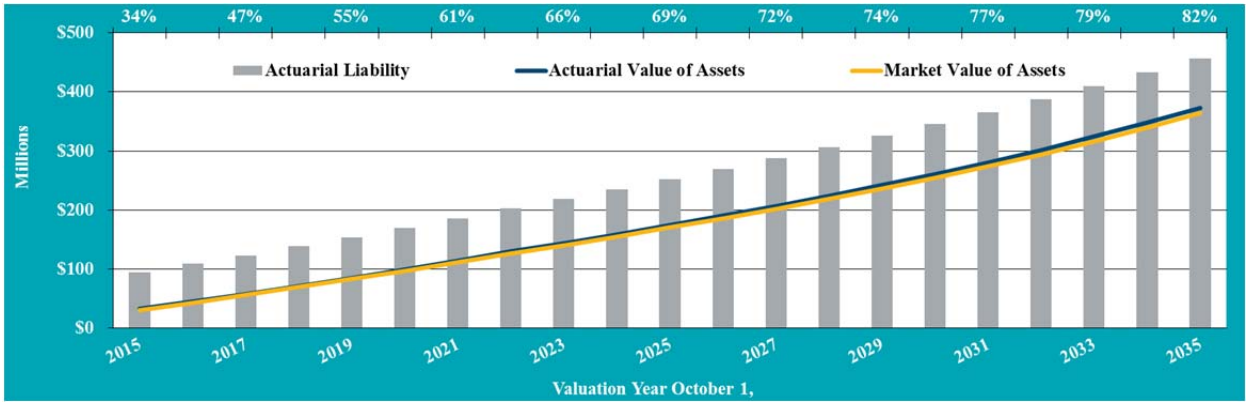
Optimistic Returns of 9.125%

If the Plan earns 1.50% greater than the assumed rate of return in each year of the projection, with all other assumptions being exactly met, the funded ratio is projected to increase to 100% by the 2035 valuation.



Pessimistic Returns of 6.125%

If the Plan earns 1.50% less than the assumed rate of return in each year of the projection, with all other assumptions being exactly met, the funded ratio is projected to increase to 82% by the 2035 valuation.



SECTION II – ASSETS

Pension Plan assets play a key role in the financial operation of the Plan and in the decisions the Trustees may make with respect to future deployment of those assets. The level of assets, the allocation of assets among asset classes, and the methodology used to measure assets will likely impact benefit levels, employer contributions, and the ultimate security of Participants' benefits.

In this section, we present detailed information on the Plan assets including:

- **Disclosure** of the Plan assets as of October 1, 2014 and October 1, 2015;
- Statement of the **changes** in market values during the year;
- Development of the **Actuarial Value of Assets**;
- An assessment of **investment performance**; and
- A projection of the Plan's expected **cash flows** for the next ten years.

Disclosure

There are two types of asset values disclosed in this valuation, the market value of assets and the actuarial value of assets. The market value represents a "snap-shot" or "cash-out" value which provides the principal basis for measuring financial performance from one year to the next. Market values, however, can fluctuate widely with corresponding swings in the marketplace. As a result, market values are usually not as suitable for long-range planning as are the actuarial value of assets which reflect smoothing of annual investment returns.

Table II-1 below discloses and compares each asset value as of September 30, 2014 and September 30, 2015.

Table II-1
Statement of Assets at Market Value as of September 30,

Assets	2014	2015	% Change
Cash	$ 97,691	$ 64,977	(33.49%)
Receivables	65,504	1,325,093	1922.92%
Short-Term Investments	9,177,532	3,612,901	(60.63%)
Fixed Income	4,193,826	5,782,782	37.89%
Common Stock	6,182,912	22,266,628	260.13%
Pension Admin System	181,800	163,620	(10.00%)
Total Assets	$ 19,899,265	$ 33,216,001	66.92%
Deferred Outflows of Resources	$ 0	$ 35,644	N/A
Liabilities			
Unsettled Investment Transactions	$ 0	$ 3,401,908	N/A
Accounts Payable and Other Liabilities	26,937	71,948	167.10%
Total Liabilities	$ 26,937	$ 3,473,856	12796.22%
Deferred Inflows of Resources	$ 0	$ 2,191	N/A
Market Value of Assets	**$ 19,872,328**	**$ 29,775,598**	**49.83%**

SECTION II – ASSETS

Changes in Market Value

Table II-2 below shows the components of change between the market value of assets as of September 30, 2014 and September 30, 2015.

Table II-2
Changes in Market Values

Value of Assets --September 30, 2014 [1]			**$**	**19,859,333**
Additions				
Payments from Members	$	2,829,213		
Employer Contributions		7,435,635		
Transfer In [2]		1,070,749		
Interest and Dividends		443,152		
Investment Return		(1,265,164)		
Total Additions	**$**	**10,513,585**		
Deductions				
Investment Expenses	$	21,046		
Benefit Payments and Refunds		263,081		
Administrative Expenses		313,193		
Total Deductions	**$**	**597,320**		
Value of Assets --September 30, 2015			**$**	**29,775,598**

1 Revised Value of Assets at September 30, 2014 based on audited financials.

2 Sick leave settlement received from FRS on October 2, 2015.

SECTION II – ASSETS

Actuarial Value of Assets

The next table, Table II-3, shows how the actuarial value of assets is developed. The actuarial value of assets method was initialized at market value as of October 1, 2013.

The actuarial value of assets represents a "smoothed" value developed by the actuary to reduce, or eliminate, erratic results which could develop from short-term fluctuations in the market value of assets. For this Plan, the actuarial value has been calculated by taking the market value of assets less 80% of the investment gain (loss) during the preceding year, less 60% of the investment gain (loss) during the second preceding year, less 40% of the investment gain (loss) during the third preceding year, and less 20% of the investment gain (loss) in the fourth preceding year. The investment gain (loss) is calculated by taking the difference between the expected value of assets based on an expected return of 7.625% and the actual value of assets. If the actuarial value of assets is less than 80% or more than 120% of the market value, an adjustment is made to the actuarial value to bring the value within this corridor. The tables below illustrate the calculation of actuarial value of assets for the October 1, 2015 valuation.

Table II-3
Development of Actuarial Value of Assets

Market Value of Assets at September 30, 2014		$ 19,859,333
Employer Contributions		7,435,635
Payments from Participants		2,829,213
Transfer In		1,070,749
Benefit Payments and Refunds		(263,081)
Administrative Expenses		(313,193)
Expected Return at 7.625%		1,598,590
Expected Value at September 30, 2015		$ 32,217,246
Actual Value at September 30, 2015		29,775,598
Investment Gain/(Loss)		$ (2,441,648)
	Total Gain/(Loss)	**Excluded Portion**
Exclude 0% of 2011 Gain/(Loss)	$ 0	$ 0
Exclude 20% of 2012 Gain/(Loss)	0	0
Exclude 40% of 2013 Gain/(Loss)	0	0
Exclude 60% of 2014 Gain/(Loss)	(353,023)	(211,814)
Exclude 80% of 2015 Gain/(Loss)	(2,441,648)	(1,953,318)
Total Excluded Gain/(Loss) for AVA Calculation		$ (2,165,132)
Market Value of Assets at September 30, 2015		$ 29,775,598
Total Gain/(Loss) Excluded		(2,165,132)
Actuarial Value of Assets at September 30, 2015		$ 31,940,730

SECTION II – ASSETS

Investment Performance

The market value of assets (MVA) lost 4.02% (net of investment expenses) during the plan year ending September 30, 2015, which is less than the assumed 7.625% return. A return of 4.83% was experienced on the actuarial value of assets (AVA), resulting in an actuarial loss for the year. For the previous plan year ending September 30, 2014, the returns were a negative 2.64% (net of investment and administrative expenses) on MVA and 1.34% on AVA.

Projection of Plan's Future Cash Flows

Table II-4
Projection of System's Expected Cash Flows

Year Beginning October 1,	Benefit Payments	Administrative Expenses	Contributions	Net Cash Flow
2015	$ 935,410	$ 322,589	$ 11,906,449	$ 10,648,451
2016	1,373,153	332,266	12,311,793	10,606,374
2017	2,201,691	342,234	12,727,336	10,183,410
2018	3,186,340	352,501	13,153,240	9,614,398
2019	4,401,443	363,077	13,584,626	8,820,107
2020	5,068,245	373,969	13,991,213	8,548,999
2021	6,187,129	385,188	14,409,959	7,837,642
2022	8,672,263	396,744	14,840,929	5,771,923
2023	9,142,088	408,646	15,285,040	5,734,305
2024	9,880,795	420,905	15,742,665	5,440,965

The contributions shown above reflect both City and Participant contributions. Expected City contributions assume contribution rates as shown in the baseline projection graph on page 4 and that payroll will increase at the actuarially assumed rate of 3.0% per year. Expected benefit payments are projected for the closed group valued at October 1, 2015. Projecting any farther than ten years using a closed-group would not yield reliable predictions due to the omission of new hires. The net cash flow shown above excludes investment income.

SECTION III – LIABILITIES

In this section, we present detailed information on the Plan liabilities including:

- **Disclosure** of the Plan liabilities as of October 1, 2014 and October 1, 2015, and
- Statement of **changes** in these liabilities during the year.

Disclosure

Several types of liabilities are calculated and presented in this report. Each type is distinguished by the people ultimately using the figures and the purpose for which they are using them.

- **Present Value of Future Benefits:** Used for measuring all future Plan obligations, represents the amount of money needed today to fully fund all benefits of the Plan both earned as of the valuation date and those to be earned in the future by current Plan Participants, under the current Plan provisions.

- **Actuarial Liability:** Used for funding calculations, this liability is calculated as of the valuation date as the present value of benefits allocated to service prior to that date using the entry age normal funding method.

These liability amounts are not appropriate for measuring a settlement of the Plan's liabilities either by purchase of annuities or payment of lump sums.

Table III-1, which follows, discloses each of these liabilities for the current and prior valuations.

SECTION III – LIABILITIES

Table III-1
Liabilities/Net (Surplus)/Unfunded

	October 1, 2014	October 1, 2015
Present Value of Future Benefits		
Active Participant Benefits	$ 114,915,294	$ 144,497,167
Retiree, Disabled and Beneficiaries Benefits	1,038,811	4,505,296
Terminated Vested	70,569	9,701
Present Value of Future Benefits (PVB)	**$ 116,024,674**	**$ 149,012,164**
Actuarial Liability		
Active Participant Benefits	$ 57,426,572	$ 90,197,113
Retiree, Disabled and Beneficiaries Benefits	1,038,811	4,505,296
Terminated Vested	70,569	9,701
Actuarial Liability (AL)	**$ 58,535,952**	**$ 94,712,110**
Actuarial Value of Assets (AVA)	$ 20,154,746	$ 31,940,730
Net (Surplus)/Unfunded (AL-AVA)	**$ 38,381,206**	**$ 62,771,380**

SECTION III – LIABILITIES

Changes in Liabilities

Each of the Liabilities disclosed in the prior table are expected to change at each valuation. The components of that change, depending upon which liability is analyzed, can include:

- New hires since the last valuation
- Benefits accrued since the last valuation
- Plan amendments changing benefits
- Passage of time which adds interest to the prior liability
- Benefits paid to retirees since the last valuation
- Participants retiring, terminating, or dying at rates different than expected
- A change in actuarial or investment assumptions
- A change in the actuarial funding method

Unfunded liabilities will change because of all of the above, and also due to changes in Plan assets resulting from:

- Employer contributions different than expected
- Investment earnings different than expected
- A change in the method used to measure plan assets

In each valuation, we report on those elements of change which are of particular significance, potentially affecting the long-term financial outlook of the Plan. Below, we present key changes in liabilities since the last valuation.

In the table that follows, we show the components of change in the actuarial liability between October 1, 2014 and October 1, 2015.

Table III-2
Changes in Actuarial Liability

Liabilities as of October 1, 2014	$	58,535,952
Liabilities as of October 1, 2015		94,712,110
Liability Increase (Decrease)		36,176,158
Change Due to:		
Benefit Changes		764,002
Assumption Changes		0
Programming/Coding Changes		21,950,341
Experience (Gain)/Loss		296,531
Benefits Accumulated and Other Sources		13,165,284

SECTION III – LIABILITIES

In addition, we breakdown the change in actuarial liability further by showing the total actuarial (gain)/loss by source, as shown in Table III-3 below.

Table III-3 (Gain)/Loss by Source as of October 1, 2015		
Disabilities fewer than expected	$	(1,589,000)
Salary increase higher than expected for continuing actives		1,187,000
Retirements fewer than expected		626,000
Withdrawals fewer than expected		316,000
Deaths		(10,000)
Data composition and other changes		(233,000)
Experience (Gain)/Loss	$	297,000

SECTION IV – CONTRIBUTIONS

In the process of evaluating the financial condition of any pension plan, the actuary analyzes the assets and liabilities to determine what level (if any) of contributions is needed to properly maintain the funding status of the Plan. Typically, the actuarial process will use a funding technique that will result in a pattern of contributions that are both stable and predictable.

For this Plan, the funding method employed is the **Entry Age Normal (EAN) Actuarial Cost Method**. Under this funding method, a normal cost rate is determined as a level percentage of pay for each active Participant. The normal cost rate times payroll equals the total normal cost for each Participant. The EAN actuarial liability is the difference between the present value of future benefits and the present value of future normal costs. The difference between this EAN actuarial liability and the actuarial value of assets is the unfunded actuarial liability (UAL).

The UAL is amortized over a 30-year closed period that began February 1, 2013, as a level percent of pay, assuming a 3% annual payroll growth.

Administrative expenses are assumed to be equal to last year's administrative expenses increased for inflation.

Table IV-1 below presents and compares the employer contribution rates and contribution amounts for the Plan for this valuation and the prior one.

Table IV-1
Employer Contributions

	Fiscal Year Ending 2015	Fiscal Year Ending 2016
Total Entry Age Normal Cost	$ 7,554,248	$ 7,533,403
Expected Employee Contributions	(2,824,550)	(2,861,676)
Employer (Net) Normal Cost	$ 4,729,698	$ 4,671,727
UAL Amortization Payment for the City	$ 2,493,594	$ 4,153,691
Administrative Expenses	212,343	322,589
Actuarially Determined Contribution	$ 7,435,635	$ 9,148,007
Expected Valuation Payroll	$ 34,351,937	$ 34,978,346
Actuarially Determined Contribution as a Percentage of Payroll	21.65%	26.15%

SECTION IV – CONTRIBUTIONS

Table IV-2 shows the detailed calculation of the current year UAL amortization rates for the City.

Table IV-2
Amortization Schedule as of October 1, 2015

	UAL Amount	Remaining Period	Amount (EOY)	Applicable Payroll	UAL Rate
UAL Amortization Payment for City	$ 62,771,380	27.33	$ 4,153,691	$ 34,978,346	11.88%

SECTION V – ACCOUNTING STATEMENT INFORMATION

GFOA Recommended Information

The Government Finance Officers Association (GFOA) maintains a checklist of items to be included in a public retirement plan's Comprehensive Annual Financial Report (CAFR) in order to receive recognition for excellence in financial reporting. Although the Firefighters' Retirement Plan does not issue a CAFR under GFOA guidelines, we have included certain schedules in this section for possible inclusion within the Plan's audited financial statements.

We have prepared the following exhibits:

- Table V-1: Analysis of Financial Experience
- Table V-2: Solvency Test
- Table V-3: Schedule of Funding Progress

Table V-1
Analysis of Financial Experience[1]
Gain and Loss in Unfunded Actuarial Liability During Years Ended September 30
Resulting from Differences Between Assumed Experience and Actual Experience

Type of Activity	Gain (or Loss) for Year ending September 30, 2014	Gain (or Loss) for Year ending September 30, 2015
Investment Income	$ (70,605)	$ (594,454)
Combined Liability Experience	7,440,838	(296,531)
Gain (or Loss) During Year from Financial Experience	$ 7,370,233	$ (890,985)
Non-Recurring Gain (or Loss) Items	6,494,050	(22,714,343)
Composite Gain (or Loss) During Year	$ 13,864,283	$ (23,605,328)

[1] We will build to the required 6 years of disclosure information.

SECTION V – ACCOUNTING STATEMENT INFORMATION

Table V-2
Solvency Test[1]
Aggregate Actuarial Liabilities for

Valuation Date October 1,	Active Participant Contributions (1)	Retirees & Beneficiaries (2)	Active Participant Employer Financed Contributions (3)	Actuarial Value of Reported Assets	Portion of Actuarial Liabilities Covered by Reported Assets (1)	(2)	(3)
2015	$ 7,084,392	$ 4,505,296	$ 83,122,422	$ 31,940,730	100%	100%	24%
2014	4,400,350	1,109,380	53,026,222	20,154,746	100%	100%	28%
2013	1,631,088	182,293	57,941,868	1,504,817	92%	0%	0%

[1] We will build to the required 10 years of disclosure information.

Table V-3
Schedule of Funding Progress

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Liability (b)	Unfunded Actuarial Liability (b) - (a)	Funded Ratio (a) / (b)	Covered Payroll (c)	Percentage of Covered Payroll [(b) - (a)] / (c)
10/1/2015	$ 31,940,730	$ 94,712,110	$ 62,771,380	33.72%	$ 35,531,194	176.67%
10/1/2014	20,154,746	58,535,952	38,381,206	34.43%	34,938,772	109.85%
10/1/2013	1,504,817	59,755,249	58,250,432	2.52%	34,978,665	166.53%

APPENDIX A – MEMBERSHIP INFORMATION

Table A-1
Table of Plan Coverage

	October 1, 2014	October 1, 2015	% change
Active Participants in Valuation			
Number			
FRP Only	52	50	(3.8%)
FRP with Frozen FRS Benefit	574	557	(3.0%)
Total	626	607	(3.0%)
Average Age	45.6	46.4	1.9%
Average Service	16.1	16.9	5.0%
Total Pensionable Payroll (as of 9/30)	$ 34,938,772	$ 35,531,194	1.7%
Average Total Pensionable Payroll	$ 55,813	$ 58,536	4.9%
DROP Participants in Valuation (included in Active Participants)			
Number			
FRP DROP Account	15	26	73.3%
FRS DROP Account Only (prior to 2/1/13)	47	35	(25.5%)
Total	62	61	(1.6%)
Average Age	52.0	52.9	1.7%
Average Service	25.4	25.4	0.2%
Total FRP DROP Account Balances	$ 12,938	$ 81,946	533.4%
Average FRP DROP Account Balances	$ 863	$ 3,152	265.4%
Vested Terminated Participants			
Number	26	2	(92.3%)
Total Account Balances	$ 70,569	$ 9,701	(86.3%)
Pensioners			
Number in Pay Status			
Retirees	21	31	47.6%
Disableds	1	4	300.0%
Total	22	35	59.1%
Average Age - Retirees	55.2	55.7	0.9%
Average Monthly Benefit - Retirees	$ 99	$ 153	54.6%
Average Age - Disableds	35.3	45.4	28.5%
Average Monthly Benefit - Disabled	$ 3,070	$ 2,957	(3.7%)
Beneficiaries in Pay Status			
Number	0	2	N/A
Average Monthly Benefit	N/A	$ 1,243	N/A

APPENDIX A – MEMBERSHIP INFORMATION

Table A-2
Pensions in Payment Status by Type and Monthly Amount

Monthly Amount	Total	Retirees	Disability	Beneficiaries
Total	**37**	**31**	**4**	**2**
Under $500	29	28	0	1
$500-1,000	3	3	0	0
1,000-1,500	0	0	0	0
1,500-2,000	0	0	0	0
2,000-2,500	2	0	1	1
2,500-3,000	0	0	0	0
3,000-3,500	2	0	2	0
3,500-4,000	1	0	1	0
4,000-4,500	0	0	0	0
4,500-5,000	0	0	0	0
5,000 & over	0	0	0	0

APPENDIX A – MEMBERSHIP INFORMATION

Table A-3
Participant Status Reconciliation

	Actives	DROP	Terminated Vested[1]	Retired	Disabled	Beneficiaries	Total
1. October 1, 2014 valuation	**564**	**62**	**26**	**21**	**1**	**0**	**674**
2. Additions							
a. New entrants	0						0
b. Total	0						0
3. Reductions							
a. Terminated - not vested (Refund paid)	(2)						(2)
b. Retired - No FRP Benefit		(2)					(2)
c. Deaths without beneficiary							0
d. Total	(2)	(2)					(4)
4. Changes in status							
a. Enter DROP	(11)	11					0
b. Return from DROP	7	(7)					0
c. Terminated - not vested (Refund not paid)	(1)		1				0
d. Retired	(7)	(3)		10			0
e. Disabled	(3)				3		0
f. Died with beneficiary	(1)					2	1
g. Data corrections			(25)				(25)
h. Total	(16)	1	(24)	10	3	2	(24)
5. October 1, 2015 valuation	**546**	**61**	**2**	**31**	**4**	**2**	**646**

[1] Includes participants who have yet to receive a refund of contributions.

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

A. Actuarial Assumptions

1. Mortality Rates:

Pre-Retirement:	85% of the healthy post-retirement rates. Mortality rates for duty-related deaths cease at age 50.
Healthy Post-Retirement:	RP-2000 Combined Healthy Mortality Table projected to 2015 using Scale AA
Disabled Post-Retirement:	120% of the healthy post-retirement rates

Mortality improvement: The mortality tables for pre-retirement and post-retirement projected to 2015 using scale AA reasonably reflect the projected mortality experience of the Plan as of the measurement date. Based on the most recent experience review of FRS performed by GRS, this table provides a margin for near-term mortality improvements. We have not independently reviewed this data but this conclusion by the actuary of FRS appears to be reasonable. This assumption will be reviewed during the next experience study.

2. Mortality and Disability Rates before Retirement:

Sample rates are as follows:

	Mortality (%)*		Disability (%)**
Age	Male	Female	Total
20	0.0220	0.0128	0.5
25	0.0275	0.0143	0.5
30	0.0350	0.0193	0.5
35	0.0610	0.0342	1.0
40	0.0813	0.0478	1.5
45	0.1053	0.0750	2.0
50	0.1384	0.1102	2.0
55	0.2310	0.2047	3.5
60	0.4503	0.3986	3.5

* Rates shown are for ordinary death. Accidental death rates are the same as for ordinary death up to age 50 and are 0% for ages 50 and above.

** Percentage of Type of Disability

Ordinary	60%
Accidental (unable to work as a firefighter)	32%
Accidental (unable to work in any occupation)	8%

3. Withdrawal Rates before Retirement:

Years of Service	Withdrawal Rate (%)
0	7.50
1	4.00
2-7	2.25
8-13	1.25
14-19	0.50
20 or more	0.00

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

4. Retirement Rates:

Years of Service	Retirement Rate (%)*
20-29	5.0
30-34	15.0
35 or more	100.0

*100% retirement is assumed at age 65

5. Retirement Age for Inactive Vested Participants

For Participants who terminate employment with 10 or more years of creditable service, commencement of benefits at age 62 is assumed.

6. DROP Participants

Grandfathered Participants are assumed to enter the DROP program upon attaining 28 Years of Service. Grandfathered Participants with more than 28 Years of Service on the valuation date are assumed to enter the DROP the following year. Participants who enter the DROP are assumed to retire at the same retirement rates during the DROP period. Participants are assumed to return to active status after completing 5 Years of Service in the DROP if entered DROP with less than 30 Years of Service or exited DROP under age 65.

7. Unknown Data for Participants

Same as those exhibited by Participants with similar known characteristics. If not specified, Participants are assumed to be male.

8. Sick Leave

It is assumed that the sick leave balance yields a 15% increase in the retirement benefit and a lump sum equal to 60.3% of the accumulated sick leave balance (assumed to be twice the annual pension benefit the Participant is eligible to receive prior to sick leave adjustments, prorated by the amount of service earned as of February 1, 2013 to the service projected to be earned at retirement).

9. Percent Married

100%.

10. Age of Spouse

Females (or males) are three years younger (or older) than their spouses.

11. Net Investment Return

7.625% per year, net of investment expenses.

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

12. Salary Increases

Years of Service	Salary Increase (%)
0 - 4	5.50
5 - 9	5.00
10 - 14	3.75
15 or more	3.35

13. Payroll Growth

3.0% per year.

14. Increases in Consumer Price Index

3.0% per year.

15. Cost-of-Living Adjustment

Assumed to follow Plan provisions – 0% to 5% depending on age/years of service and type of retirement, but no greater than the 3% assumed annual CPI increase.

16. Plan Administrative Expenses

All administrative expenses are paid from the fund. An amount is added to the actuarially determined contribution equal to the prior year's administrative expenses increased by the assumed inflation rate.

17. Widow Assumption

Will work as a special consultant for the Board of Trustees. Assume no children under age eighteen.

18. Changes in actuarial assumptions since last valuation

None.

19. Rationale for Assumptions

The actuarial assumptions were adopted by the Board based on recommendations from the prior actuary from an experience study covering plan experience for the Firemen's Retirement System during the period October 1, 2005 through September 30, 2010. These assumptions have been checked annually against the sources of liability gains and losses. While we consider these assumptions to be reasonable, we have not yet performed our own actuarial experience study on the assumptions. An experience study will be performed once a sufficient amount of recent data has been accumulated.

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

B. Actuarial Methods

1. Actuarial Value of Assets

The actuarial value has been calculated by taking the market value of assets less 80% of the investment gain (loss) during the preceding year, less 60% of the investment gain (loss) during the second preceding year, less 40% of the investment gain (loss) during the third preceding year, and less 20% of the investment gain (loss) in the fourth preceding year.

The investment gain (loss) is calculated by taking the difference between the expected value of assets based on an expected return of 7.625% and the actual value of assets. If the actuarial value of assets is less than 80% or more than 120% of the market value, an adjustment is made to the actuarial value to bring the value within this corridor.

2. Actuarial Cost Method

The cost method for the valuation of liabilities used for this valuation is the Entry Age Normal (EAN) method. Under this funding method, a normal cost rate is determined as a level percentage of pay for each active Participant. The normal cost rate times payroll equals the total normal cost for each Participant. The normal cost contributions (Employer and Participant) will pay for projected benefits at retirement for each active Participant.

The actuarial liability is the difference between the present value of future benefits and the present value of future normal costs. The difference between this actuarial liability and the actuarial value of assets is the unfunded actuarial liability (UAL).

The portion of the actuarial liability in excess of Plan assets, the UAL, is amortized to develop an additional cost that is added to each year's employer normal cost. Under this cost method, actuarial gains and losses are directly reflected in the size of the unfunded actuarial liability. The amortization method is described below.

3. Amortization Method

The amortization method is to divide the total unfunded actuarial liability of the Plan over the 30-year closed period that began February 1, 2013, as a level percentage of payroll, assuming a 3% annual payroll growth.

4. Changes in Actuarial Methods since last valuation

None.

APPENDIX C – SUMMARY OF PLAN PROVISIONS

1. Plan Year

October 1 through September 30.

2. Average Final Compensation

The Average Final Compensation of the Participant during his last five years of covered employment. For a Grandfathered Participant, the final average compensation shall be based on the last two years of covered employment based on 365 days in a year. Compensation means the regular rate of annual compensation that a Participant would earn on the basis of the stated compensation for his rank or position.

3. Normal Retirement

Age Requirement:	Age 55
Service Requirement:	20 Years of Service
Amount:	2% of Average Final Compensation for the first 25 Years of Service plus 2.5% (5% for Grandfathered Participants) of Average Final Compensation in excess of 25 Years of Service, to a maximum of 75% of Average Final Compensation. The benefit is offset by any benefits payable from the FRS. In addition to the pension, the Participant will receive a refund of contributions without interest made before February 1, 2013 (the "Effective Date"). Grandfathered Participants will receive a refund of all contributions without interest provided they have 20 Years of Service as of the Effective Date.

4. Early Retirement

Age Requirement	Prior to 55
Service Requirement:	20 Years of Service
Amount:	Calculated as for Normal Retirement based on Average Final Compensation and Years of Service at termination. For participants who entered the Plan after the Effective Date and Grandfathered participants with less than 20 Years of Service as of the Effective Date, the portion of the benefit based on Years of Service after the Effective Date is actuarially reduced from age 55 to the pension commencement date. For Grandfathered Participants with 20 or more Years of Service as of the Effective Date, the entire benefit is unreduced at any age.

APPENDIX C – SUMMARY OF PLAN PROVISIONS

The benefit is offset by any benefits payable from the FRS.

In addition to the pension, the participant will receive a refund of contributions without interest made before the Effective Date. Grandfathered Participants will receive a refund of all contributions without interest provided they have 20 Years of Service as of the Effective Date.

5. Ordinary Disability

Age Requirement	None
Service Requirement	5 Years of Service
Amount	The benefit for a disability not incurred in the line of duty that prevents work in any occupation is the greater of 1) 90% of the pension benefit accrued to date or 2) 25% of the Average Final Compensation. The disability benefit incurred after the Effective Date will be paid by the Firefighters' Retirement Plan based on all Years of Service, including Years of Service incurred prior to the Effective Date. In addition to the disability pension, the Participant will receive a refund of contributions without interest made before the Effective Date. Grandfathered Participants will receive a refund of all contributions without interest provided they have 20 Years of Service as of the Effective Date.

6. Accidental Disability

Age Requirement	None
Service Requirement	None
Amount	The benefit for a disability incurred in the line of duty that prevents work in any occupation is 75% of the Average Final Compensation. The benefit for a disability incurred in the line of duty that prevents work as a firefighter, but not other gainful employment, is 25% of the Average Final Compensation plus 2.75% of Average Final Compensation for each Year of Service in excess of 10 Years of Service, up to 25 Years of Service. For a Participant with at least 25 Years of Service, the benefit is 75% of Average Final Compensation.

APPENDIX C – SUMMARY OF PLAN PROVISIONS

The entire disability benefit incurred after the Effective Date will be paid by the Firefighters' Retirement Plan based on all Years of Service, including Years of Service incurred prior to the Effective Date.

In addition to the disability pension, the participant will receive a refund of contributions without interest made before the Effective Date. Grandfathered Participants will receive a refund of all contributions without interest provided they have 20 Years of Service as of the Effective Date.

7. DROP (Deferred Retirement Option Plan)

A Grandfathered Participant with 20 or more Years of Service may elect to enter the DROP program and defer retirement for up to five years while continuing active employment. The benefit payments the Participant would have received during that period are deposited into the DROP accumulation and earn interest at a rate equal to the percentage rate of return of the Trust Fund's investment portfolio for that year. The benefit payments deposited into the DROP accumulation increase each year by the Cost-of-Living Adjustment (COLA) specified in #14.

After five years or termination from the DROP plan, the Participant may retire or return to regular active service. Upon termination of employment, the Participant can choose to receive a lump sum of the DROP accumulation with interest earned or paid over a period not to exceed 10 years. If the Participant dies prior to termination of employment, the DROP account is paid as a lump sum to the Participant's beneficiary or estate. The beneficiary may waive the DROP and have all years of DROP service reinstated as Years of Service. Years of Service while in the DROP program are not included in the Years of Service used to calculate the Participant's final benefit amount.

8. Terminated Vested Pension (if Refund of Contributions is not elected)

Age Requirement:	None
Service Requirement:	10 Years of Service (after the Effective Date - no service or accrued benefits in FRS)
Amount:	Service pension accrued. Benefit commences at age 62 in lieu of a refund of contributions.

9. Refund of Contributions Due to Termination

Age Requirement:	None
Service Requirement:	Less than 20 Years of Service
Amount:	100% of contributions with interest in lieu of a deferred or early benefit.

APPENDIX C – SUMMARY OF PLAN PROVISIONS

10. Pre- and Post-Retirement Death Benefit

Age Requirement: None

Service Requirement: None

Amount: *Payable to Widow Under Ordinary Death* - The greater of 1) 25% of the Average Final Compensation (or 50% of Average Final Compensation if widow is hired as a special consultant) or 2) $2,400 annually.

Payable to Widow Under Accidental Death - 50% of Average Final Compensation or 62.5% of Average Final Compensation if Accidental Death occurred at the scene of a fire.

Payable to Children - 10% of Average Final Compensation per child for up to three unmarried dependent children under age eighteen.

If Accidental Death and the Participant had over 20 Years of Service at the Effective Date, then in addition to the pension, a refund of contributions without interest is made.

The entire pre-retirement death benefit incurred after the Effective Date will be paid by the Firefighters' Retirement Plan based on all Years of Service, including Years of Service prior to the Effective Date.

11. Lump-sum Death Benefit

Age Requirement: None

Service Requirement: None

Amount: $2,000 payable upon the death of an active or retired Participant.

12. Sick Leave

Unused sick leave accrued prior to February 1, 2013 can be used to increase the credited service to calculate the Participant's final retirement benefit.

13. Participant Contributions

New Members and Grandfathered Participants with less than 20 Years of Service as of the Effective Date: Contributions are 9% of pensionable wages.

For Grandfathered Participants with 20 or more Years of Service as of the Effective Date: Contributions are 8% of pensionable wages.

In DROP: Contributions are 1% of pensionable wages.

APPENDIX C – SUMMARY OF PLAN PROVISIONS

14. Cost-of-Living Adjustment (COLA)

For Grandfathered Participants: For retirements before attaining 25 Years of Service, the COLA is 1.5% per year up to age 60 and 5% per year after 60. For retirements after attaining 25 Years of Service but before attaining 30 years of service, the COLA is 2.25% per year up to age 60 and 5% per years after 60. For retirements after attaining 30 Years of Service, the COLA is 3% per year up to age 60 and 5% per year after 60. For retirements after ago 60, the COLA is 5% per year. The maximum aggregate increase after age 60 for Grandfathered Participants is 25%.

For disabilities incurred in the line of duty in response to an emergency call that prevents work in any occupation, the COLA is 3% per year up to age 60 and 5% per year after 60, with a 25% maximum applied past age 60.

For participants who entered the Plan after the Effective Date or for disabilities other than those incurred in the line of duty in response to an emergency call that prevents work in any occupation: 3% per year up to a maximum of 25%.

COLAs are increased at each October 1, with the first increase following the Participant's date of retirement. All COLAs are subject to an upper limit of the Consumer Price Index (CPI) for the calendar year prior to the year the COLA is awarded.

15. Years of Service

Uninterrupted years and partial years from the first date of participation in the Plan (or FRS if earlier) to the date of retirement or termination of employment.

16. Participation

Immediate upon employment.

17. Grandfathered Participants

A Participant who was employed on the day before the Effective Date and whose benefit accrued under the FRS was frozen as of the Effective Date.

18. Effective Date

February 1, 2013.

19. Changes Since Last Valuation

Sick Leave – Unused sick leave accrued prior to February 1, 2013 (previously September 26, 2010) can be used to increase the credited service.

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