



City of Kansas City, Missouri Firefighters' Pension System

Actuarial Valuation as of May 1, 2015

Produced by Cheiron

September 2015

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September 18, 2015

Board of Pension Trustees
City of Kansas City, Missouri Firefighters' Pension System
12th Floor, City Hall
414 East 12th Street
Kansas City, MO 64106

Dear Members of the Board:

At your request, we have conducted an actuarial valuation of the City of Kansas City, Missouri Firefighters' Pension System (KCFPS) as of May 1, 2015. The valuation is organized as follows:

- In Section I of the **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 System's:
 - Section II - Assets
 - Section III - Liabilities
 - Section IV - Contributions
 - Section V - Financial Statement Information
- In the **Appendices**, we conclude our report with detailed information describing System membership (Appendix A), actuarial assumptions and methods employed (Appendix B), a summary of pertinent plan provisions (Appendix C), and a glossary of terms (Appendix D).

The purpose of this report is to present the annual actuarial valuation of the City of Kansas City, Missouri Firefighters' Pension System. This report is for the use of the Firefighters' Pension Board and its auditors in preparing financial reports in accordance with applicable law and accounting requirements.

In preparing our report, we relied on information (some oral and some written) supplied by KCFPS staff. This information includes, but is not limited to, the plan provisions, employee data, and unaudited financial information. We performed an informal examination of the obvious characteristics of the data for reasonableness and consistency in accordance with Actuarial Standard of Practice #23.

Future valuation reports may differ significantly from the current results presented in this report due to such factors as the following: plan experience differing from that anticipated by the assumptions; changes in assumptions; and changes in plan provisions or applicable law.

Board of Pension Trustees
City of Kansas City, Missouri Firefighters' Pension System
September 18, 2015

We hereby certify that, 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 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 opinions 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 report was prepared for the Firefighters' Pension System for the purposes described herein and for the use by the plan auditor in completing an audit related to the matters herein. Other users of this valuation report are not intended users as defined in the Actuarial Standards of Practice, and Cheiron assumes no duty or liability to such other users.

Sincerely,
Cheiron



Stephen McElhaney, FSA, FCA, EA, MAAA
Principal Consulting Actuary



Jacqueline King, ASA, EA, MAAA
Associate 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 System,
- Past and expected trends in the financial progress of the System,
- The City's contributions for Fiscal Year 2016, and
- Information required for the System's financial statement.

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, (C) an examination of the historical trends, and (D) the projected financial outlook for the System.

A. Valuation Basis

This May 1, 2015 valuation represents Cheiron's ninth valuation performed for KCFPS. Effective with this valuation the actuarially determined contribution rate has been increased by 0.35% to cover the System's expected administrative expenses. Other than this change there have been no changes in assumptions, methodologies and plan provisions since the May 1, 2014 valuation. The data, methods, assumptions and plan provisions that serve as the basis for this valuation are all summarized in the appendices.

B. Key Findings of this Valuation

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

- We have calculated the City's contribution rate on two bases:
 - The actuarially determined City contribution rate under the Board's funding policy increased from 27.91% as of May 1, 2014 to 28.21% as of May 1, 2015. The actual rate that the City is scheduled to use for the current year is 27.91% of payroll, which is the actuarially determined Board contribution rate for the prior year, for the period from May 1, 2015 to June 30, 2015, and 30.01% for the period from July 1, 2015 to April 30, 2016.
 - Under the City ordinance, the City's budgeted contribution rate for the year beginning May 1, 2016 will be based upon a 30-year closed amortization from May 1, 2014, for the entire amount of unfunded actuarial liability. This rate is 26.82% as of May 1, 2015.
- The FPS's unfunded actuarial liability decreased from \$131 million on May 1, 2014 to \$127 million on May 1, 2015.
- The FPS's funding ratio, the ratio of assets over liabilities, increased from 77.6% as of May 1, 2014 to 78.9% as of May 1, 2015.

SECTION I
BOARD SUMMARY

- The primary factor in the increase in the System's funded status was an overall actuarial gain of \$4.6 million.
 - During the year ended April 30, 2015, the System's assets returned 7.16% on a market value basis. The return on the actuarial asset value (i.e. incorporating asset smoothing) was 8.12% (as compared to 7.50% assumed). This resulted in an actuarial gain on investments of \$2.7 million. In addition, the system experienced a gain of \$0.3 million due to the difference between actual and recommended contributions as a result of payroll and timing differences.
 - On the liability side, the System experienced an actuarial gain of \$1.6 million.
- As of May 1, 2015 the market value of assets exceeded the actuarial value by \$6.7 million. The System will recognize this difference as deferred asset losses and gains over the next 4 years.

This report does not include disclosures required by GASB Statements No. 67 and 68. Statement No. 67 is effective for the plan year ending April 30, 2015. Statement No. 68 will be effective for the employer fiscal year ending April 30, 2016. Please refer to the separate report issued by Cheiron for accounting and financial disclosure information under GASB Statements No. 67 and No 68.

On the following page is Table I-1 which summarizes all the key results of the valuation with respect to System membership, assets and liabilities, and contributions. The results are presented and compared for both the current and prior plan years.

CITY OF KANSAS CITY, MISSOURI FIREFIGHTERS' PENSION SYSTEM
ACTUARIAL VALUATION AS OF MAY 1, 2015

**SECTION I
BOARD SUMMARY**

**Table I-1
City of Kansas City, Missouri Firefighters' Pension System
Summary of Principal Plan Results**

Valuation as of:	May 1, 2014	May 1, 2015	% Change
<u>Participant Counts</u>			
Active Participants	931	928	(0.3%)
Non-duty Disabled Participants *	16	16	0.0%
Duty Disabled Participants *	71	73	2.8%
Retirees and Beneficiaries *	800	814	1.8%
Terminated Vested Participants	1	1	0.0%
Inactive Participants	<u>2</u>	<u>2</u>	0.0%
Total	1,821	1,834	0.7%
Annual Salaries of Active Members	\$ 59,410,476	\$ 59,294,555	(0.2%)
Annual Retirement Allowances for Retired Members and Beneficiaries	\$ 31,786,387	\$ 33,545,987	5.5%
<u>Assets and Liabilities</u>			
Actuarial Liability (AL)	\$ 583,167,922	\$ 603,417,753	3.5%
Actuarial Value of Assets	<u>452,378,238</u>	<u>476,356,399</u>	5.3%
Unfunded Actuarial Liability (UAL)	\$ 130,789,684	\$ 127,061,354	(2.9%)
Funding Ratio	77.6%	78.9%	
Present Value of Accrued Benefits (PVAB)	\$ 540,539,401	\$ 560,819,170	3.8%
Market Value of Assets	<u>462,585,466</u>	<u>483,017,711</u>	4.4%
Unfunded PVAB	\$ 77,953,935	\$ 77,801,459	(0.2%)
Accrued Benefit Funding Ratio	85.6%	86.1%	
<u>Contributions as a Percentage of Payroll under Board's Funding Policy</u>			
	Fiscal Year 2015	Fiscal Year 2016	
Normal Cost Contribution	13.59%	13.55%	
Administrative Expense Rate	0.00%	0.35%	
Unfunded Actuarial Liability Contribution	<u>14.32%</u>	<u>14.31%</u>	
Total Contribution	27.91%	28.21%	
Actuarially Determined Contribution (GASB)	\$16,581,464	\$16,726,994	0.9%

* Disabled participants that were eligible for normal retirement at the time of their disability are valued as Retirees. The number of such participants was 211 at May 1, 2014 and 238 at May 1, 2015.

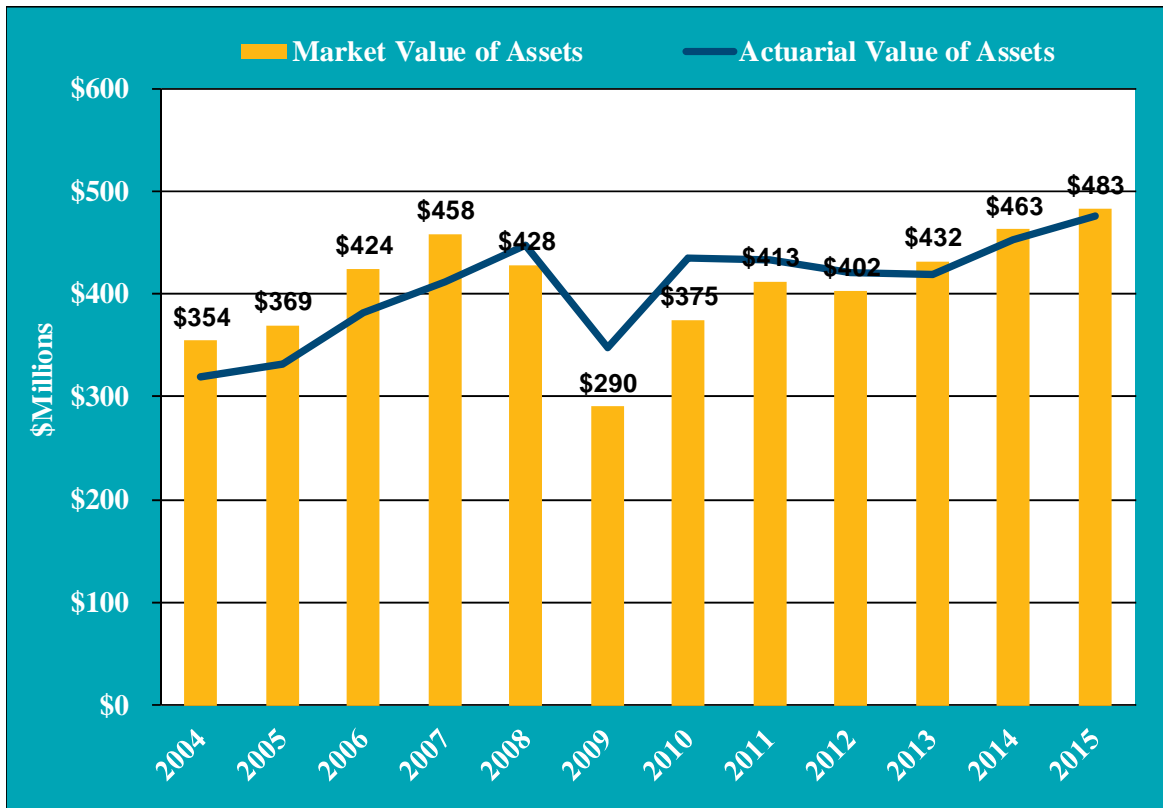
**SECTION I
BOARD SUMMARY**

C. Historical Trends

Despite the fact that for most retirement systems the greatest attention is given to the current valuation results and in particular the size of the current unfunded actuarial liability and the City's contribution, it is important to remember that each valuation is merely a snapshot in the long-term progress of a pension fund. It is more important to judge a current year's valuation result relative to historical trends, as well as trends expected into the future.

System Assets

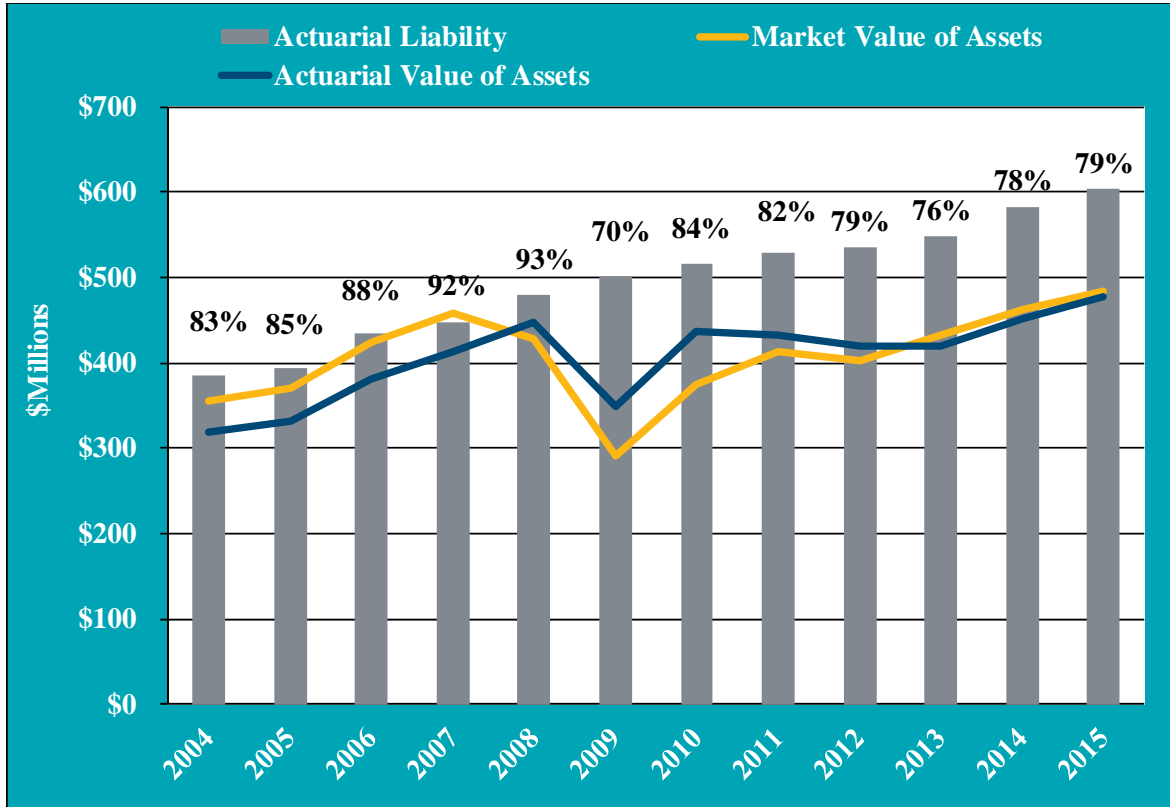
The market value of assets (MVA) returned 7.16% in 2015 compared to an assumed rate of 7.50%. With the asset smoothing method in place, the actuarial value of assets has tracked a slightly smoother path through the volatility of the market value of assets. The numbers above the bars represent the value (in millions) of the market value of assets. As can be seen in the graph, the actuarial value of assets (AVA) also increased from 2014 to 2015 returning 8.12% due to recent market gains.



**SECTION I
 BOARD SUMMARY**

Assets and Liabilities

The chart below compares the market value of assets, the actuarial value of assets, and the actuarial liabilities, as well as the funded ratio (actuarial value of assets / actuarial liability), sometimes referred to as the benefit security ratio. This chart shows the System's funding ratio increased over the past year to 79%.



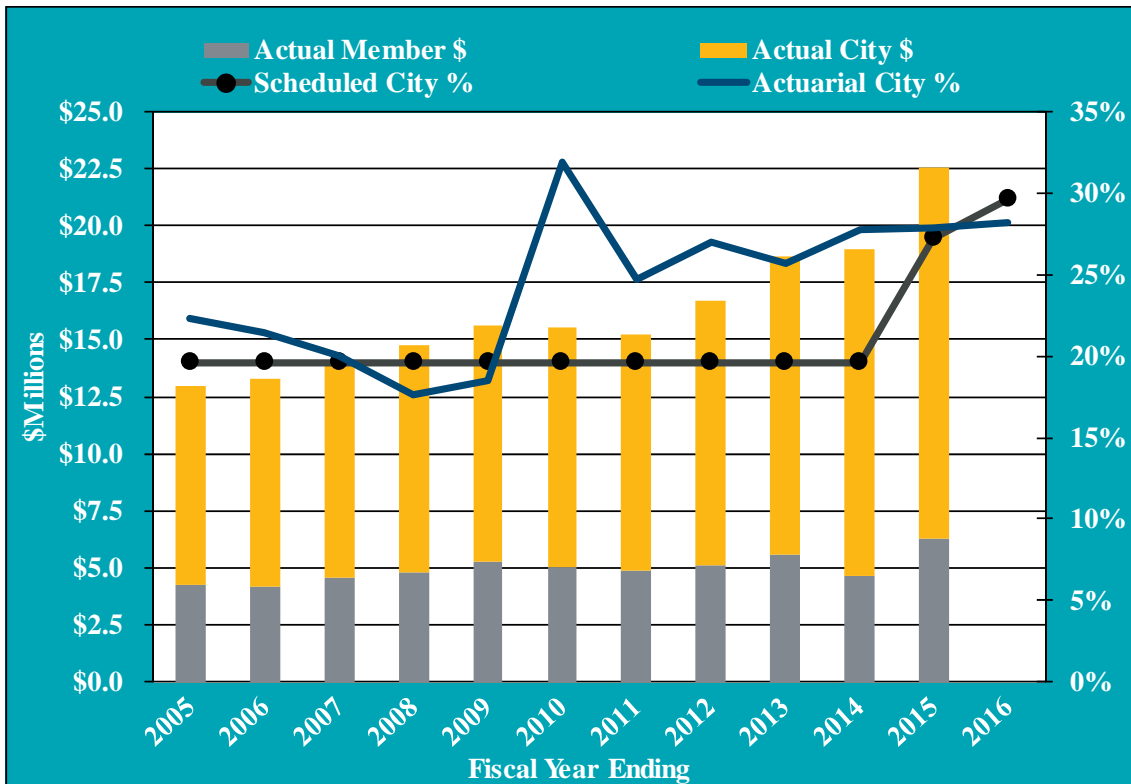
**SECTION I
 BOARD SUMMARY**

Contribution Rates

The stacked bars in this graph show the dollar amount of contributions made by the City and the members (depicted on the left hand scale) since Fiscal Year Ending 2005. The blue line shows the City's actuarial contribution rate under the Board's funding policy as a percent of payroll (depicted on the right hand scale). The black line shows the City's scheduled contribution rate as a percent of payroll (depicted on the right hand scale).

The member contribution rate is set by City law at 9.55% of payroll prior to April 20, 2014, and 10.55% of payroll effective April 20, 2014.

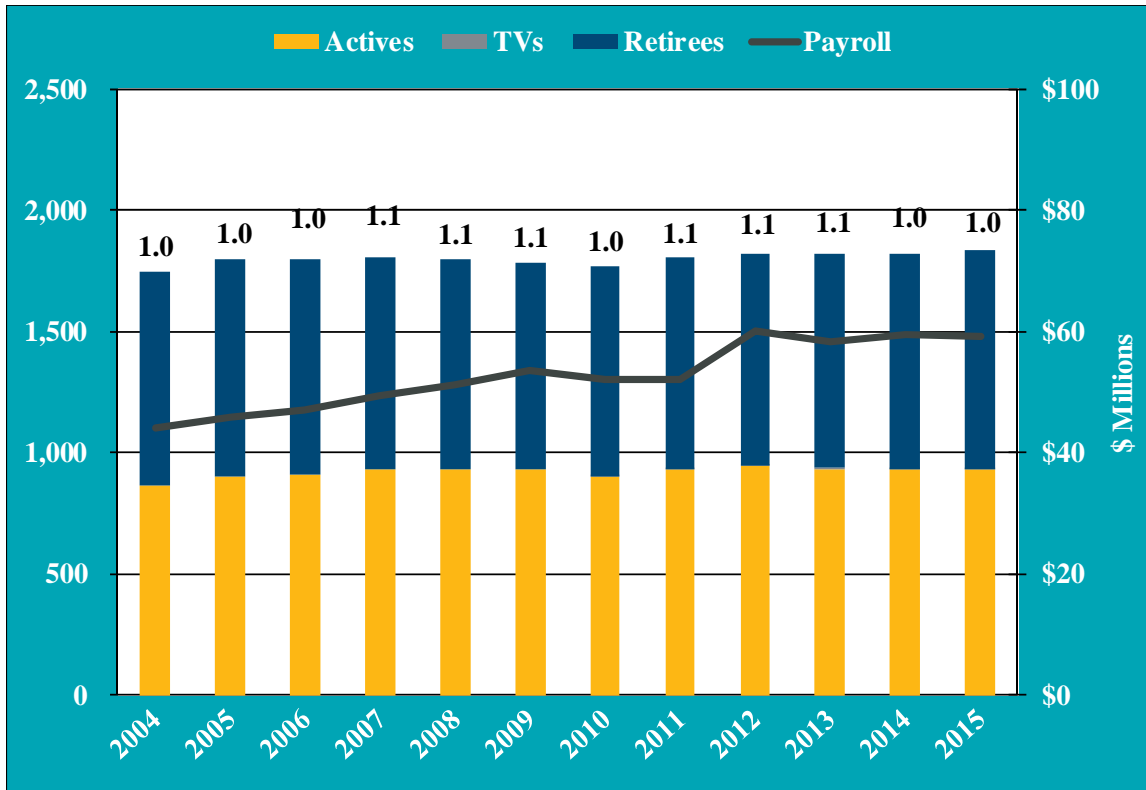
For Fiscal Years Ending 2014 and earlier, the City contribution rate was scheduled to be 19.60% of payroll. For Fiscal Years Ending 2015 and later, the scheduled City contribution rate is the actuarial contribution rate, determined under the City's funding policy, in the prior year's actuarial valuation. For the Fiscal Year Ending 2016, the City is contributing 27.91% of payroll from May 1, 2015 to June 30, 2015, and 30.01% from July 1, 2015 to April 30, 2016.



**SECTION I
 BOARD SUMMARY**

Participant Trends

This chart provides a measure for the maturity in the System, by comparing the ratio of active members to inactive members (retirees and terminated-vesteds). The System's active-to-inactive ratio remained fairly consistent over the last 10 years. The black line shows the total active participating payroll for each valuation year.



**SECTION I
BOARD SUMMARY**

D. Future Expected Financial Trends

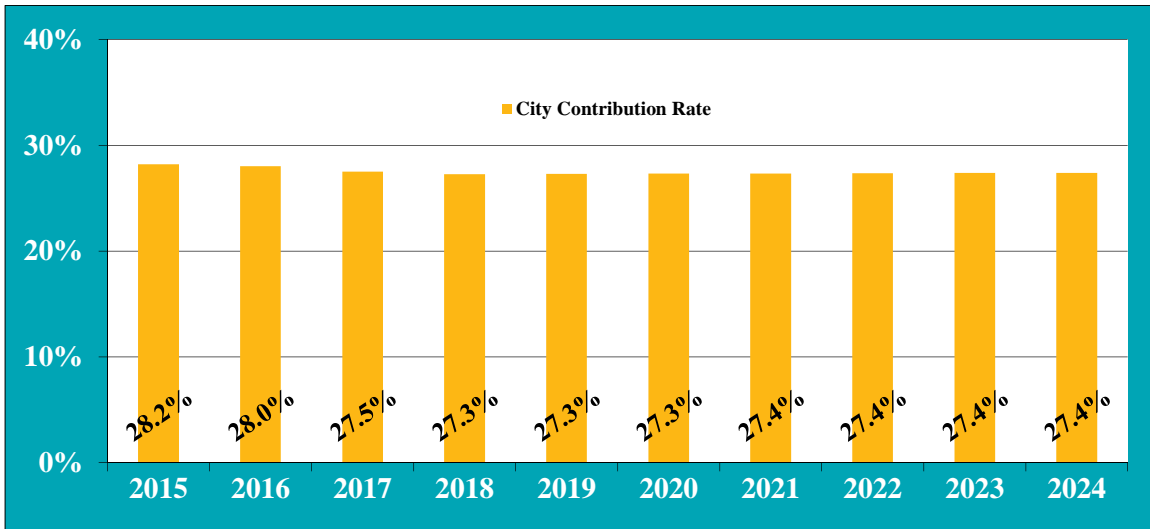
The analysis of projected financial trends is perhaps the most important component of this valuation. In this Section, we present the implications of the May 1, 2015 valuation results in terms of (1) the projected City's contributions and (2) projected System's funded status (ratio of assets over liabilities). For each projection set we assume three different future investment return scenarios: baseline returns of 7.50%, optimistic returns of 9.00%, and pessimistic returns of 6.00%. The projections assume that the City makes contributions equal to the prior year's actuarially determined contribution rate under the Board's funding policy.

1. Contribution Rate Projections (Board Funding Policy)

The first set of charts shows the expected City contribution rate. The years shown in the charts are plan years beginning May 1.

Baseline Returns of 7.50%

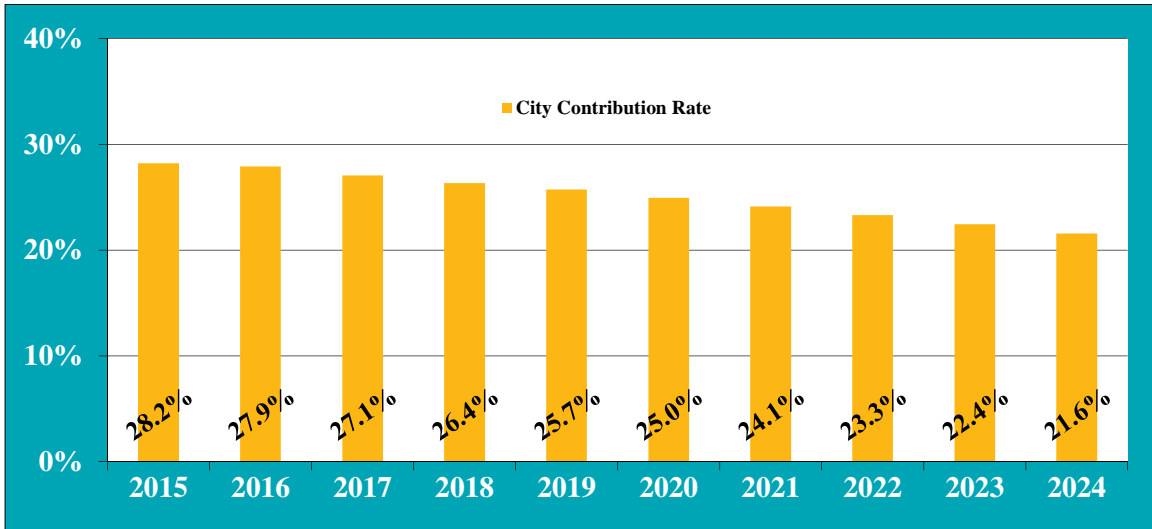
If the fund earns the assumed investment rate of 7.5% on market value, the contribution rate will gradually decrease over the next 4 years then remain fairly constant.



**SECTION I
BOARD SUMMARY**

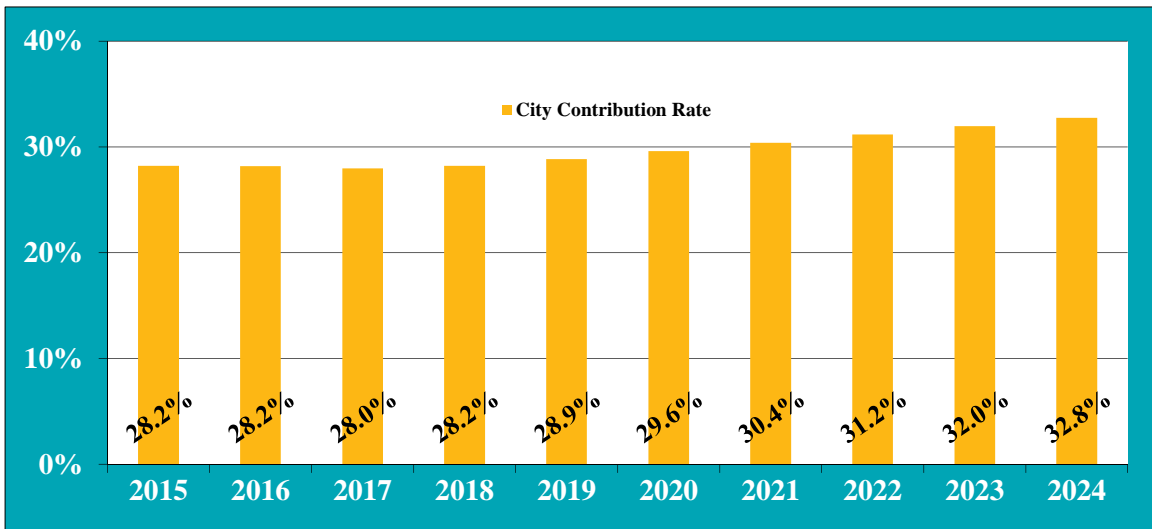
Optimistic Returns of 9.00%

If the fund earns 1.50% greater than the assumed rate, the contribution rate will decrease over the next 10 years.



Pessimistic Returns of 6.00%

If the fund earns 1.50% less than the assumed rate, the contribution rate will decrease for 2 years, then gradually increase over the next 7 years.



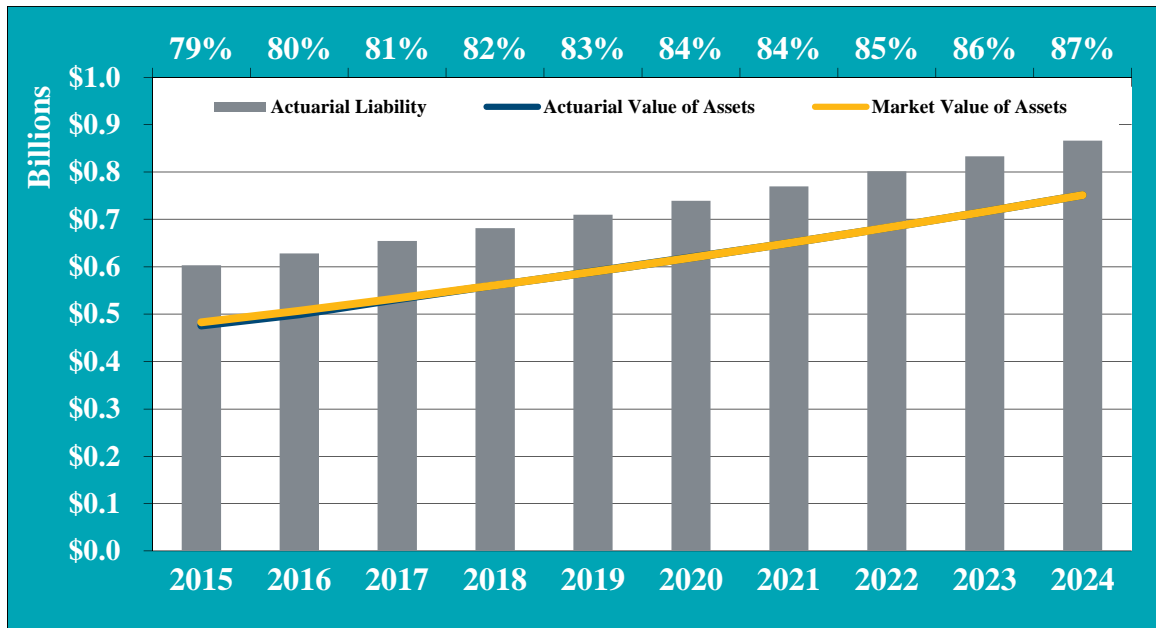
**SECTION I
 BOARD SUMMARY**

2. Asset and Liability Projections (Board Funding Policy)

This next set of projection charts compares the market value of assets (gold line) and the actuarial or smoothed value of assets (blue line) to the System's actuarial liabilities (gray bars). The top of each chart also portrays the System's funded ratio (ratio of actuarial value of assets to actuarial liabilities). The years shown in the charts are plan years beginning May 1.

Baseline Returns of 7.50%

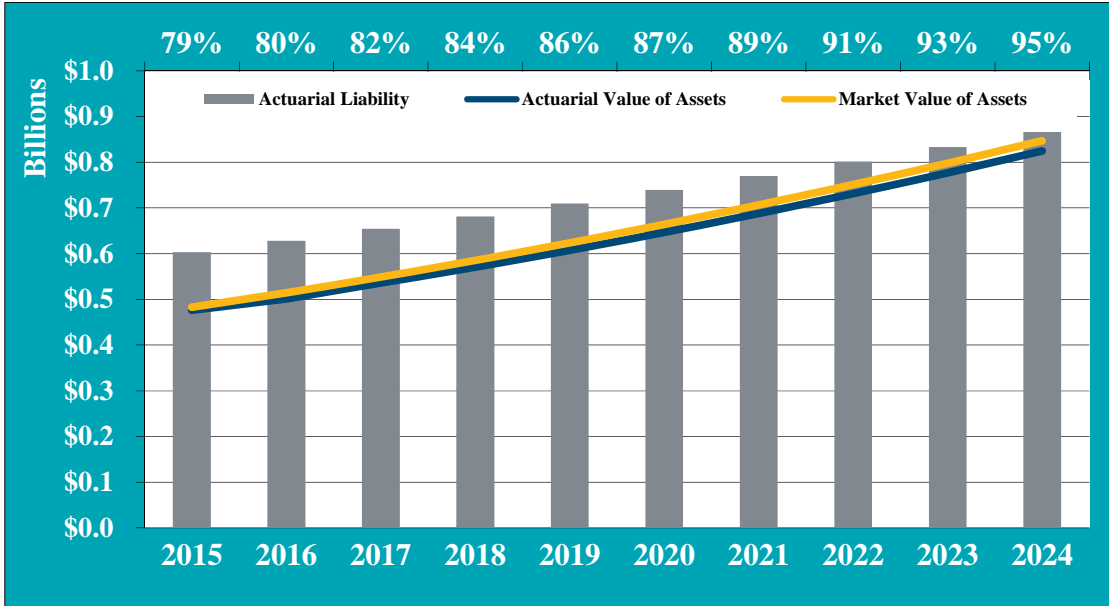
If the fund earns the assumed investment rate of 7.5% and the City continues to contribute the current scheduled contribution rate equal to the prior year's actuarially determined contribution rate, the funded ratio will increase gradually to 87% over the next 10 years.



**SECTION I
 BOARD SUMMARY**

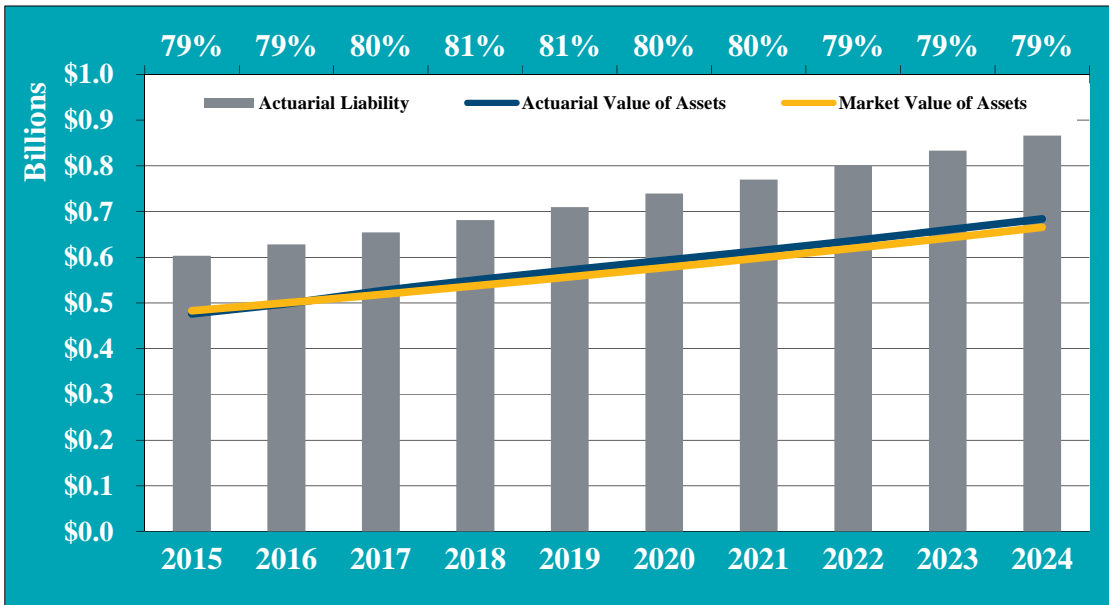
Optimistic Returns of 9.00%

If the fund earns 1.50% greater than the assumed rate of return, the funded ratio will increase to 95% over the next 10 years.



Pessimistic Returns of 6.00%

If the fund earns 1.50% less than the assumed rate of return, the funded ratio will increase gradually to 81%, then decrease to 79% over the next 10 years.



SECTION I
BOARD SUMMARY

3. 30 Year Projections Based on City Contribution Policy:

The chart on the following page shows a 30-year cost projection under a 30-year closed amortization policy beginning May 1, 2014 which is the current City contribution policy. For the purpose of these projections, it has been assumed that the active population remains constant and the fund earns the assumed return of 7.5% per year on market value.

CITY OF KANSAS CITY, MISSOURI FIREFIGHTERS' PENSION SYSTEM
ACTUARIAL VALUATION AS OF MAY 1, 2015

**SECTION I
BOARD SUMMARY**

City of Kansas City, Missouri Firefighters' Pension System
Projection Based on April 30, 2015 Actuarial Valuation
30-Year Closed Amortization
Interest at 7.50%
Amounts in thousands

Valuation as of April 30, (1)	Employer Contribution Rate (2)	Member Contribution Rate (3)	Compensation at Valuation (4)	Employer Contribution (5)	Actuarial Accrued Liability (AAL) (6)	Actuarial Value of Assets (AVA) (7)	Unfunded AAL (8)	UAL Amortization Payment Rate (9)	Normal Cost Rate (10)	Administrative Expense Rate (11)	Employer ARC (12)	Dollar Amount of ARC (13)	Funded Ratio Using AVA (14)
2015	29.66%	10.55%	\$ 59,295	\$ 17,849	\$ 603,418	\$ 476,356	\$ 127,061	12.92%	13.55%	0.35%	26.81%	\$ 15,899	78.9%
2016	26.74%	10.55%	\$ 61,073	\$ 16,574	\$ 627,993	\$ 499,310	\$ 128,683	13.21%	13.56%	0.35%	27.12%	\$ 16,562	79.5%
2017	26.77%	10.55%	\$ 62,906	\$ 17,091	\$ 654,079	\$ 529,870	\$ 124,208	12.62%	13.56%	0.35%	26.53%	\$ 16,690	81.0%
2018	26.18%	10.55%	\$ 64,793	\$ 17,215	\$ 681,455	\$ 559,037	\$ 122,418	12.32%	13.57%	0.35%	26.25%	\$ 17,006	82.0%
2019	25.90%	10.55%	\$ 66,737	\$ 17,542	\$ 709,966	\$ 586,596	\$ 123,370	12.32%	13.59%	0.35%	26.26%	\$ 17,524	82.6%
2020	25.91%	10.55%	\$ 68,739	\$ 18,075	\$ 739,486	\$ 615,514	\$ 123,971	12.30%	13.60%	0.35%	26.25%	\$ 18,047	83.2%
2021	25.90%	10.55%	\$ 70,801	\$ 18,610	\$ 769,898	\$ 645,526	\$ 124,372	12.28%	13.62%	0.35%	26.25%	\$ 18,587	83.8%
2022	25.90%	10.55%	\$ 72,925	\$ 19,169	\$ 801,173	\$ 676,623	\$ 124,551	12.26%	13.64%	0.35%	26.25%	\$ 19,143	84.5%
2023	25.90%	10.55%	\$ 75,113	\$ 19,744	\$ 833,231	\$ 708,747	\$ 124,484	12.24%	13.66%	0.35%	26.25%	\$ 19,717	85.1%
2024	25.90%	10.55%	\$ 77,366	\$ 20,336	\$ 866,302	\$ 742,155	\$ 124,147	12.22%	13.68%	0.35%	26.25%	\$ 20,306	85.7%
2025	25.90%	10.55%	\$ 79,687	\$ 20,946	\$ 900,167	\$ 776,655	\$ 123,512	12.19%	13.70%	0.35%	26.25%	\$ 20,914	86.3%
2026	25.90%	10.55%	\$ 82,078	\$ 21,575	\$ 934,790	\$ 812,240	\$ 122,550	12.17%	13.72%	0.35%	26.24%	\$ 21,541	86.9%
2027	25.89%	10.55%	\$ 84,540	\$ 22,213	\$ 970,074	\$ 848,845	\$ 121,229	12.15%	13.75%	0.35%	26.24%	\$ 22,186	87.5%
2028	25.89%	10.55%	\$ 87,076	\$ 22,880	\$ 1,006,211	\$ 886,696	\$ 119,515	12.12%	13.77%	0.35%	26.24%	\$ 22,848	88.1%
2029	25.89%	10.55%	\$ 89,688	\$ 23,566	\$ 1,043,182	\$ 925,811	\$ 117,371	12.10%	13.79%	0.35%	26.23%	\$ 23,529	88.7%
2030	25.88%	10.55%	\$ 92,379	\$ 24,264	\$ 1,081,027	\$ 966,270	\$ 114,758	12.07%	13.81%	0.35%	26.23%	\$ 24,230	89.4%
2031	25.88%	10.55%	\$ 95,150	\$ 24,992	\$ 1,119,939	\$ 1,008,306	\$ 111,633	12.04%	13.83%	0.35%	26.22%	\$ 24,948	90.0%
2032	25.87%	10.55%	\$ 98,005	\$ 25,731	\$ 1,159,982	\$ 1,052,032	\$ 107,950	12.01%	13.85%	0.35%	26.21%	\$ 25,686	90.7%
2033	25.86%	10.55%	\$ 100,945	\$ 26,493	\$ 1,201,474	\$ 1,097,813	\$ 103,661	11.98%	13.87%	0.35%	26.19%	\$ 26,442	91.4%
2034	25.84%	10.55%	\$ 103,973	\$ 27,267	\$ 1,243,851	\$ 1,145,137	\$ 98,714	11.94%	13.89%	0.35%	26.18%	\$ 27,222	92.1%
2035	25.83%	10.55%	\$ 107,093	\$ 28,074	\$ 1,287,091	\$ 1,194,038	\$ 93,053	11.90%	13.91%	0.35%	26.17%	\$ 28,022	92.8%
2036	25.82%	10.55%	\$ 110,305	\$ 28,905	\$ 1,331,021	\$ 1,244,403	\$ 86,617	11.86%	13.94%	0.35%	26.15%	\$ 28,842	93.5%
2037	25.80%	10.55%	\$ 113,614	\$ 29,749	\$ 1,375,837	\$ 1,296,491	\$ 79,346	11.81%	13.96%	0.35%	26.12%	\$ 29,679	94.2%
2038	25.77%	10.55%	\$ 117,023	\$ 30,606	\$ 1,421,936	\$ 1,350,764	\$ 71,172	11.76%	13.98%	0.35%	26.09%	\$ 30,531	95.0%
2039	25.74%	10.55%	\$ 120,534	\$ 31,487	\$ 1,469,920	\$ 1,407,894	\$ 62,027	11.70%	13.99%	0.35%	26.04%	\$ 31,392	95.8%
2040	25.69%	10.55%	\$ 124,150	\$ 32,369	\$ 1,520,051	\$ 1,468,211	\$ 51,840	11.62%	14.01%	0.35%	25.98%	\$ 32,259	96.6%
2041	25.63%	10.55%	\$ 127,874	\$ 33,262	\$ 1,573,121	\$ 1,532,577	\$ 40,543	11.52%	14.02%	0.35%	25.90%	\$ 33,118	97.4%
2042	25.55%	10.55%	\$ 131,710	\$ 34,153	\$ 1,629,945	\$ 1,601,868	\$ 28,077	11.38%	14.03%	0.35%	25.76%	\$ 33,935	98.3%
2043	25.41%	10.55%	\$ 135,662	\$ 34,985	\$ 1,690,623	\$ 1,676,214	\$ 14,409	11.10%	14.04%	0.35%	25.50%	\$ 34,592	99.1%
2044	25.15%	10.55%	\$ 139,732	\$ 35,666	\$ 1,755,783	\$ 1,756,144	\$ (362)	-0.27%	14.05%	0.35%	14.13%	\$ 19,749	100.0%
2045	13.78%	10.55%	\$ 143,923	\$ 20,128	\$ 1,826,039	\$ 1,826,030	\$ 9	0.01%	14.06%	0.35%	14.42%	\$ 20,753	100.0%

Projections assume a constant population and no actuarial gains and losses



SECTION II ASSETS

Pension System assets play a key role in the financial operation of the System 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, City contributions, and the ultimate security of participants' benefits.

In this section, we present detailed information on the System's assets including:

- **Disclosure** of the System's assets as of April 30, 2014 and April 30, 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 System's expected **cash flow** for the next ten years.

Disclosure

There are two types of asset values disclosed in the valuation, the market value of assets and the actuarial value of assets. The market value represents "snap-shot" or "cash-out" values which provide 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 year-to-year budgeting 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 April 30, 2014 and April 30, 2015.

Table II-1			
Statement of Assets at Market Value as of April 30,			
Assets	2014	2015	% Change
Cash	\$ 14,838,258	\$ 14,557,917	(1.9%)
Stock and Collective Trusts	450,303,286	471,594,618	4.7%
Accounts Receivable	544,635	662,427	21.6%
Interest and Dividends Receivable	49,875	33,166	(33.5%)
Contributions Receivable	745,078	850,552	14.2%
Expenses Payable	(639,660)	(891,958)	39.4%
Purchase of Investments	(625,445)	(810,197)	29.5%
Health Assets	(2,630,561)	(2,978,814)	13.2%
Market Value of Assets	\$ 462,585,466	\$ 483,017,711	4.4%

**SECTION II
 ASSETS**

Changes in Market Value

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

Table II-2	
Changes in Market Values	
Value of Assets – April 30, 2014	\$ 462,585,466
<u>Additions</u>	
Member Contributions	\$ 6,258,482
Employer Contributions	16,258,533
Interest and Dividends	3,050,545
Investment Return	<u>32,720,502</u>
Total Additions	\$ 58,288,062
<u>Deductions</u>	
Benefit Payments	\$ (34,761,116)
Expenses	<u>(3,094,701)</u>
Total Deductions	\$ (37,855,817)
Value of Assets – April 30, 2015	\$ 483,017,711

**SECTION II
ASSETS**

Actuarial Value of Assets

The next table, Table II-3, shows how the actuarial value of assets is developed.

A preliminary actuarial value of assets is calculated as the sum of the beginning of the year actuarial value of assets, the net new money and the expected return on an actuarial basis. The gains and losses over the last 4 years are recognized over the next 5-year period. The gain or loss of each year is the excess of market value of assets over the preliminary value of assets, minus the sum of the unrecognized gains and losses from each of the 4 years. Finally, an adjustment is made so that the final actuarial value of assets is at least 80% but no more than 120% of the market value.

Table II-3 Development of Actuarial Value of Assets			
1. Actuarial Value of Assets at May 1, 2014			\$ 452,378,238
2. Employer and Employee Contributions			22,517,015
3. Benefit Payments			(34,761,116)
4. Net Cash Flow (2+3)			\$ (12,244,101)
5. Expected Value of investment return at 7.50%			33,477,515
6. Actual investment return on Market Value			32,676,346
7. Investment gain/(loss) for the year (6-5)			\$ (801,169)
8. Investment gain/(loss) from current and prior years to be recognized in the plan year ending April 30, 2015			
	Total Gain/ (Loss)	Deferral Percentage	Deferred to Future Years
Plan Year End			
April 30, 2015	\$ (801,169)	80%	\$ (640,935)
April 30, 2014	13,664,721	60%	8,198,833
April 30, 2013	12,508,914	40%	5,003,566
April 30, 2012	(29,500,762)	20%	(5,900,152)
April 30, 2011	17,852,041	0%	0
Total	\$ 13,723,745		\$ 6,661,312
9. Market Value of Assets for Year ending April 30, 2015			\$ 483,017,711
10. Preliminary Actuarial Value of Assets on May 1, 2015 (9 - 8 deferred)			476,356,399
11. 120% of MV, Upper Limit for Actuarial Value			\$ 579,621,253
12. 80% of MV, Lower Limit for Actuarial Value			386,414,169
13. Actuarial Value of Assets on May 1, 2015			\$ 476,356,399

**SECTION II
 ASSETS**

Investment Performance

The market value of assets (MVA) returned 7.16% during the plan year ending 2015, which is lower than the assumed 7.50% return. The actuarial value of assets (AVA) returned 8.12% during the plan year ending 2015.

The following table shows a history of the annual asset returns.

Table II-4 Historical Asset Returns			
Fiscal Year Ending April 30,	Return on Market Value	Return on Actuarial Value	Assumed Return
2006	17.64%	17.97%	8.00%
2007	10.58%	10.86%	8.00%
2008	-4.50%	11.05%	7.75%
2009	-30.19%	-20.15%	7.75%
2010	33.37%	28.48%	7.75%
2011	13.88%	2.42%	7.75%
2012	0.86%	0.33%	7.75%
2013	11.27%	3.27%	7.75%
2014	10.73%	11.79%	7.75%
2015	7.16%	8.12%	7.50%

**SECTION II
 ASSETS**

Projection of Plan's Future Cash Flows

Table II-5 Projection of Plan's Expected Cash Flows (\$ thousands)				
Year Beginning May 1,	Benefits and Expenses	Expected Contributions*	Net Cash Flow	
2015	\$ (34,659)	\$ 23,200	\$ (11,459)	
2016	(35,426)	23,921	(11,505)	
2017	(36,528)	24,309	(12,219)	
2018	(37,889)	24,882	(13,007)	
2019	(39,471)	25,648	(13,823)	
2020	(41,254)	26,428	(14,826)	
2021	(43,147)	27,234	(15,913)	
2022	(45,197)	28,065	(17,132)	
2023	(47,100)	28,922	(18,178)	
2024	(49,302)	29,805	(19,497)	

* Expected contributions include City contributions and Member contributions. City contributions are projected under the Board's funding policy assuming future market value returns of 7.5% as shown in the graph on page 8.

SECTION III LIABILITIES

In this section, we present detailed information on the System's liabilities including:

- **Disclosure** of the System's liabilities at May 1, 2014 and May 1, 2015;
- 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 System obligations, represents the amount of money needed today to fully pay off all benefits of the System 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 taking the present value of benefits and subtracting the present value of future member contributions and future employer normal costs under an acceptable actuarial funding method. This method is referred to as the **Entry Age Normal** funding method.
- **Present Value of Accrued Benefits:** Used for communicating the current level of liabilities, this liability represents the total amount of money needed today to fully pay off the current accrued obligations of the System, assuming no future accruals of benefits. These liabilities are also required for accounting purposes (Topic 960) and used to assess whether the System can meet its current benefit commitments.

Table III-1 which follows, discloses each of these liabilities for the current and prior valuations. With respect to each disclosure, a subtraction of the appropriate value of plan assets yields, for each respective type, a **net surplus** or an **unfunded liability**.

CITY OF KANSAS CITY, MISSOURI FIREFIGHTERS' PENSION SYSTEM
ACTUARIAL VALUATION AS OF MAY 1, 2015

**SECTION III
LIABILITIES**

Table III-1		
Liabilities Net (Surplus)/Unfunded		
	May 1, 2014	May 1, 2015
<u>Present Value of Future Benefits</u>		
Active Participant Benefits	\$ 387,177,749	\$ 388,150,726
Retiree and Inactive Benefits	346,492,674	363,895,539
Present Value of Future Benefits (PVB)	\$ 733,670,423	\$ 752,046,265
<u>Actuarial Liability</u>		
Present Value of Future Benefits (PVB)	\$ 733,670,423	\$ 752,046,265
Present Value of Future Normal Costs (PVFNC)	150,502,501	148,628,512
Actuarial Liability (AL = PVB – PVFNC)	583,167,922	603,417,753
Actuarial Value of Assets (AVA)	452,378,238	476,356,399
Net (Surplus)/Unfunded (AL – AVA)	\$ 130,789,684	\$ 127,061,354
<u>Present Value of Accrued Benefits</u>		
Present Value of Future Benefits (PVB)	\$ 733,670,423	\$ 752,046,265
Present Value of Future Benefit Accruals (PVFBA)	193,131,022	191,227,095
Present Value of Accrued Benefits (PVAB = PVB – PVFBA)	540,539,401	560,819,170
Market Value of Assets (MVA)	462,585,466	483,017,711
Net Unfunded/(Surplus)	\$ 77,953,935	\$ 77,801,459

**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 increasing 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 system assets resulting from:

- Employer contributions different than expected
- Investment earnings different than expected
- A change in the method used to measure system 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 System. 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 May 1, 2014 and May 1, 2015.

Table III-2	
	Actuarial Liability
Liabilities May 1, 2014	\$ 583,167,922
Liabilities May 1, 2015	603,417,753
Liability Increase/(Decrease)	20,249,831
Change Due to:	
Plan Changes	0
Assumption Changes	0
Actuarial (Gain)/Loss	(1,569,538)
Benefits Accumulated and Other Sources	21,819,369

CITY OF KANSAS CITY, MISSOURI FIREFIGHTERS' PENSION SYSTEM
ACTUARIAL VALUATION AS OF MAY 1, 2015

**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. A history of the (gain)/loss by source is shown in Table III-4 below.

Table III-3 (Gain)/Loss by Source as of May 1, 2015	
Turnover	\$ (52,589)
Retirement	2,077,006
Disability	(570,117)
Pre-retirement mortality	(413,772)
Post-retirement mortality	1,761,655
Salary increase more/(less) than expected for continuing actives	(5,444,408)
New entrants	166,047
Data Composition & Miscellaneous changes	906,640
Total (Gain)/Loss	\$ (1,569,538)

Table III-4 Historical Liability (Gains)/Losses (\$ Millions)					
Change due to:	2011	2012	2013	2014	2015
Turnover	\$ 0.7	\$ 0.3	\$ 0.0	\$ 0.1	\$ (0.1)
Retirement	(3.5)	(1.8)	0.8	0.1	2.1
Disability	0.2	(1.6)	(1.9)	(1.0)	(0.6)
Pre-retirement mortality	0.0	0.0	0.0	0.0	(0.4)
Post-retirement mortality	(1.5)	(0.7)	(2.1)	2.6	1.7
Salary change	(7.6)	17.5	(6.3)	(5.4)	(5.4)
New entrants	0.5	0.6	0.2	0.2	0.2
Miscellaneous	0.2	2.3	2.2	2.0	0.9
Total (Gain)/Loss	\$ (11.0)	\$ 16.6	\$ (7.1)	\$ (1.4)	\$ (1.6)

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 System. 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 System, the funding method employed is the **Entry Age Actuarial Cost Method**. Under this method, there are three primary components to the total contribution: the **normal cost rate (employee and employer)**, the **administrative expense rate**, and the **unfunded actuarial liability rate** (UAL rate). The normal cost rate is determined by taking the value, as of entry age into the System, of each member's projected future benefits. This value is then divided by the value, also at entry age, of each member's expected future salary. The normal cost rate is multiplied by current salary to determine each member's normal cost rate. Finally, the total normal cost rate is reduced by the member contribution rate to produce the employer normal cost rate. The difference between the Entry Age actuarial liability and the actuarial value of assets is the unfunded actuarial liability. Effective May 1, 2015, an expected **administrative expense rate** is added to the total actuarially determined contribution.

Contributions are calculated on two bases:

- Under the Board's funding policy for calculating the Actuarially Determined Contribution, the unfunded actuarial liability is amortized using a 30-year layered amortization method – level percent of pay. Under the layered approach, the May 1, 2008 unfunded actuarial liability is written down over a 30-year period and all future changes to the unfunded actuarial liability establish new 30-year amortization periods. Payroll is expected to increase 3.0% per year.
- Under the City ordinance, the City's contributions will be based upon a 30-year closed amortization of the entire unfunded liability from May 1, 2014 as a level percent of pay. Payroll is expected to increase 3.0% per year.

CITY OF KANSAS CITY, MISSOURI FIREFIGHTERS' PENSION SYSTEM
ACTUARIAL VALUATION AS OF MAY 1, 2015

**SECTION IV
CONTRIBUTIONS**

Table IV-1 below presents and compares the employer contribution rates for the System for this valuation and the prior one using both the current Board funding policy amortization method and using a 30-year closed amortization method.

Table IV-1		
Employer Contribution Rate		
	May 1, 2014	May 1, 2015
<u>Current Board Funding Policy</u>		
Entry Age Normal Cost Rate	13.59%	13.55%
Administrative Expense Rate	0.00%	0.35%
Amortization Payment	14.32%	14.31%
Actuarially Determined Contribution	27.91%	28.21%
<u>30-Year Closed Amortization Method</u>		
Entry Age Normal Cost Rate	13.59%	13.55%
Administrative Expense Rate	0.00%	0.35%
Amortization Payment	13.05%	12.92%
Actuarially Determined Contribution	26.64%	26.82%

**SECTION IV
 CONTRIBUTIONS**

Table IV-2 below presents the May 1, 2015 employer contribution rates for the System. The employer contribution rate is based on the amortization schedule shown in Table IV-3. The employer contribution rates are then compared to what the City is expected to contribute for the current plan year. The current expected City contribution rate for all employees for the year ending April 30, 2016 is 27.91% of payroll from May 1, 2015 to June 30, 2015, and 30.01% for the period from July 1, 2015 to April 30, 2016, which equates to a weighted average of 29.66% for the year.

Table IV -2	
Development of Plan Contribution Rate	
as of May 1, 2015	
	As % of Payroll*
1. Normal Cost (Monthly):	
a. Total Normal Cost	24.10%
b. Administrative Expense	0.35%
c. Expected Members Contribution	10.55%
d. Employer Paid Normal Cost (a) + (b) - (c)	13.90%
2. Amortization of Unfunded Liability <i>(see Table IV-3 below)</i>	14.31%
3. Total Employer Contribution Rate (1) + (2)	28.21%
4. Scheduled City Contributions (Prior Year's ADC)**	29.66%

* Total payroll is \$59,294,555, and the Actuarially Determined Contribution for plan year ending April 30, 2015 is \$16,726,994 based on the total employer contribution rate.

** Determined in the May 1, 2014 valuation.

CITY OF KANSAS CITY, MISSOURI FIREFIGHTERS' PENSION SYSTEM
ACTUARIAL VALUATION AS OF MAY 1, 2015

**SECTION IV
CONTRIBUTIONS**

Under Board funding policy, for purposes of calculating the Actuarially Determined Contribution under GASB, the Unfunded Actuarial Liability is amortized in accordance with the schedule below:

Initial unfunded actuarial liability (as of May 1, 2008) 30 years
Changes to the UAL on and after May 1, 2009 30 years

TABLE IV-3							
Unfunded Actuarial Liability Amortization Schedule							
Item	Date Created	Initial Years	Initial Balance	Remaining Years	Outstanding Balance	Amortization Payment	Amortization Factor
Initial UAL	5/1/2008	30	\$ 31,525,386	23	\$ 33,337,842	\$ 2,281,328	14.613
(Gain)/Loss*	5/1/2009	30	119,805,172	24	126,284,165	\$ 8,430,857	14.979
(Gain)/Loss*	5/1/2010	30	(72,293,282)	25	(75,821,522)	\$ (4,946,292)	15.329
(Gain)/Loss*	5/1/2011	30	14,027,641	26	14,614,857	\$ 932,994	15.664
(Gain)/Loss*	5/1/2012	30	50,231,264	27	51,910,433	\$ 3,247,260	15.986
Assumption Change	5/1/2012	30	(32,090,739)	27	(33,163,493)	\$ (2,074,544)	15.986
(Gain)/Loss*	5/1/2013	30	13,322,268	28	13,637,617	\$ 836,976	16.294
(Gain)/Loss*	5/1/2014	30	(15,478,970)	29	(15,676,146)	\$ (944,971)	16.589
Assumption Change	5/1/2014	30	16,120,179	29	16,325,523	\$ 984,116	16.589
Plan Amendment	5/1/2014	30	212,181	29	214,884	\$ 12,953	16.589
(Gain)/Loss*	5/1/2015	30	(4,602,806)	30	(4,602,806)	(272,811)	16.872
Total					\$ 127,061,354	\$ 8,487,867	

*Also included differences between the Actuarially Determined Contribution and the actual contributions made.

Under the City ordinance, Amortization payments are calculated using a 30-year closed amortization method. The amortization payment as of May 1, 2015 is shown in the table below.

TABLE IV-4			
Unfunded Actuarial Liability Amortization Schedule			
UAL	Remaining Years *	Amortization Payment	Amortization Factor
\$127,061,354	29	\$7,659,363	16.589

*30-year closed amortization period began 5/1/2014

SECTION V
FINANCIAL STATEMENT INFORMATION

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

Tables V-1 through V-5 are exhibits which could be used with the CAFR report. Table V-1 is the Note to Required Supplementary Information, Table V-2 is a history of gains and losses in actuarial liability, Table V-3 is the Solvency Test which shows the portion of actuarial liability covered by assets, Table V-4 shows historical Actuarially Determined Contribution information, compared to what the City actually contributed, and Table V-5 is the Schedule of Funding Progress.

SECTION V
FINANCIAL STATEMENT INFORMATION

Table V-1
Note To Required Supplementary Information

The information presented in the required supplementary schedules was determined as part of the actuarial valuation at the date indicated. Additional information as of the latest actuarial valuation follows.

Valuation date	May 1, 2015
Actuarial cost method	Entry age
Amortization method	30-year layered amortization, level percent of pay for changes to the UAL on or after 5/1/2008
Remaining amortization period for the UAL	Weighted average of 24.0 years
Asset valuation method	5-year smoothed market
Actuarial assumptions:	
Investment rate of return	7.50%
Projected salary increases	Ranges from 8.0% to 3.0%
Cost-of-living adjustments	3.0% simple
Inflation	2.5%

The actuarial assumptions used have been based upon recommendations by the actuary and adopted by the System's Board of Trustees. The most recent actuarial experience study was performed for the period May 1, 2007 through April 30, 2011.

The rate of employer actuarially determined contributions to the System is composed of the normal cost, expected administrative expenses, and an amortization of the unfunded actuarial liability. The normal cost is a level percent of payroll cost which, along with member contributions, will pay for projected benefits at retirement for the average plan participant. The actuarial liability is that portion of the present value of projected benefits that will not be paid by future employer normal costs or member contributions. The difference between this liability and the actuarial value of assets as of the same date is the unfunded actuarial liability.

CITY OF KANSAS CITY, MISSOURI FIREFIGHTERS' PENSION SYSTEM
 ACTUARIAL VALUATION AS OF MAY 1, 2015

SECTION V
FINANCIAL STATEMENT INFORMATION

Table V-2
Analysis Of Financial Experience
Gain and Loss in Actuarial Liability During Years Ended April 30
Resulting from Differences Between Assumed Experience and Actual Experience
Gain (or Loss) for Year ending April 30,
(expressed in thousands)

Type of Activity	2009	2010	2011	2012	2013	2014	2015
Investment Income ¹	\$ (121,621)	\$ 64,430	\$ (25,060)	\$ (33,605)	\$ (20,446)	\$ 14,074	\$ 3,033
Combined Liability Experience	<u>1,816</u>	<u>7,863</u>	<u>11,032</u>	<u>(16,627)</u>	<u>7,124</u>	<u>1,405</u>	<u>1,570</u>
Gain/(or Loss) during Year from Financial Experience	\$ (119,805)	\$ 72,293	\$ (14,028)	\$ (50,232)	\$ (13,322)	\$ 15,479	\$ 4,603
Non-Recurring Gain/(or Loss) Items	<u>0</u>	<u>0</u>	<u>0</u>	<u>32,091</u>	<u>0</u>	<u>(16,332)</u>	<u>0</u>
Composite Gain/(or Loss) during Year	\$ (119,805)	\$ 72,293	\$ (14,028)	\$ (18,141)	\$ (13,322)	\$ (853)	\$ 4,603

¹ Investment experience includes the differences in actual and recommended contributions

CITY OF KANSAS CITY, MISSOURI FIREFIGHTERS' PENSION SYSTEM
ACTUARIAL VALUATION AS OF MAY 1, 2015

SECTION V
FINANCIAL STATEMENT INFORMATION

Table V-3 Solvency Test Aggregate Actuarial Liabilities for <i>(expressed in thousands)</i>							
Valuation Date May 1,	Active		Active Member Employer	Actuarial Value of Reported Assets	Portion of Actuarial Liabilities Covered by Reported Assets		
	Member Contributions (1)	Retirees & Beneficiaries (2)	Financed Contributions (3)		(1)	(2)	(3)
2007	\$52,254	\$268,352	\$127,333	\$412,408	100%	100%	72%
2008	\$55,234	\$281,002	\$142,499	\$447,209	100%	100%	78%
2009	\$59,927	\$284,711	\$155,555	\$348,489	100%	100%	2%
2010	\$57,842	\$297,377	\$161,381	\$435,428	100%	100%	50%
2011	\$66,618	\$309,207	\$152,656	\$432,541	100%	100%	37%
2012	\$70,049	\$311,907	\$153,259	\$420,337	100%	100%	25%
2013	\$69,614	\$333,764	\$144,410	\$418,712	100%	100%	11%
2014	\$75,288	\$346,493	\$161,387	\$452,378	100%	100%	19%
2015	\$78,243	\$363,896	\$161,279	\$476,356	100%	100%	21%

CITY OF KANSAS CITY, MISSOURI FIREFIGHTERS' PENSION SYSTEM
 ACTUARIAL VALUATION AS OF MAY 1, 2015

SECTION V
FINANCIAL STATEMENT INFORMATION

Table V-4 Schedule of City Contributions			
Plan Year Ended April 30	Actuarially Determined Contribution	Actual Contribution	Percentage Contributed
2007	\$9,419,485 *	\$9,466,685	100.5%
2008	\$8,734,919 *	\$9,937,683	113.8%
2009	\$9,476,409 *	\$10,319,886	108.9%
2010	\$17,123,835 *	\$10,465,322	61.1%
2011	\$12,827,773 *	\$10,297,638	80.3%
2012	\$14,045,886 *	\$11,603,818	82.6%
2013	\$15,400,040 *	\$13,120,169	85.2%
2014	\$16,182,139 *	\$14,344,958	88.6%
2015	\$16,182,139 **	\$16,258,533	100.5%
2016	\$16,581,464 **	--	--

**The actuarially determined contribution for the plan years ended April 30, 2007 through April 30, 2014 is based on the actuarially computed contribution for the valuation year.*

***For plan years ended April 30, 2015 and later, the actuarially determined contribution is based on the calculation for the prior valuation year using estimated valuation payroll. The actuarially computed contribution for the current valuation year is described in Section IV, Table IV-2.*

CITY OF KANSAS CITY, MISSOURI FIREFIGHTERS' PENSION SYSTEM
ACTUARIAL VALUATION AS OF MAY 1, 2015

SECTION V
FINANCIAL STATEMENT INFORMATION

Table V-5
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)	UAL as a Percentage of Covered Payroll* [(b) - (a)] / (c)
5/1/2006	\$381,404,249	\$434,033,285	\$52,629,036	87.87%	\$47,022,072	111.92%
5/1/2007	\$412,407,949	\$447,939,116	\$35,531,167	92.07%	\$49,420,823	71.90%
5/1/2008	\$447,209,064	\$478,734,450	\$31,525,386	93.41%	\$51,168,515	61.61%
5/1/2009	\$348,489,209	\$500,193,509	\$151,704,300	69.67%	\$53,612,509	282.96%
5/1/2010	\$435,427,953	\$516,599,916	\$81,171,963	84.29%	\$51,934,305	156.30%
5/1/2011	\$432,540,955	\$528,481,037	\$95,940,082	81.85%	\$51,983,293	184.56%
5/1/2012	\$420,336,845	\$535,215,109	\$114,878,264	78.54%	\$60,062,558	191.26%
5/1/2013	\$418,711,963	\$547,787,899	\$129,075,936	76.44%	\$58,356,072	221.19%
5/1/2014	\$452,378,238	\$583,167,922	\$130,789,684	77.57%	\$59,410,476	220.15%
5/1/2015	\$476,356,399	\$603,417,753	\$127,061,354	78.94%	\$59,294,555	214.29%

* Not less than zero.

CITY OF KANSAS CITY, MISSOURI FIREFIGHTERS' PENSION SYSTEM
ACTUARIAL VALUATION AS OF MAY 1, 2015

APPENDIX A
MEMBERSHIP INFORMATION

Kansas City Firefighters' Pension System			
Table of Plan Coverage			
	5/1/2014	5/1/2015	% change
Active Members in Valuation			
<u>Tier 1</u>			
Number	931	904	-2.90%
Average Age	40.32	40.83	1.26%
Average Service	14.17	14.66	3.46%
Total Payroll	\$ 59,410,476	\$ 58,443,381	-1.63%
Average Anticipated Payroll	\$ 63,814	\$ 64,650	1.31%
Account Balance	\$ 75,287,899	\$ 78,207,258	3.88%
Eligible to Retire on:			
Normal Pension	112	105	-6.25%
Deferred Pension	<u>519</u>	<u>558</u>	7.51%
Total Active Vested Members	631	663	5.07%
<u>Tier 2</u>			
Number	N/A	24	N/A
Average Age	N/A	25.84	N/A
Average Service	N/A	0.44	N/A
Total Payroll	N/A	\$ 851,174	N/A
Average Anticipated Payroll	N/A	\$ 35,466	N/A
Account Balance	N/A	\$ 35,916	N/A
Eligible to Retire on:			
Normal Pension	N/A	0	N/A
Deferred Pension	N/A	<u>0</u>	N/A
Total Active Vested Members	N/A	0	N/A
<u>Total</u>			
Number	931	928	-0.32%
Average Age	40.32	40.44	0.30%
Average Service	14.17	14.30	0.92%
Total Payroll	\$ 59,410,476	\$ 59,294,555	-0.20%
Average Anticipated Payroll	\$ 63,814	\$ 63,895	0.13%
Account Balance	\$ 75,287,899	\$ 78,243,174	3.93%
Eligible to Retire on:			
Normal Pension	112	105	-6.25%
Deferred Pension	<u>519</u>	<u>558</u>	7.51%
Total Active Vested Members	631	663	5.07%

CITY OF KANSAS CITY, MISSOURI FIREFIGHTERS' PENSION SYSTEM
ACTUARIAL VALUATION AS OF MAY 1, 2015

APPENDIX A
MEMBERSHIP INFORMATION

Kansas City Firefighters' Pension System Table of Plan Coverage (cont.)			
	5/1/2014	5/1/2015	% change
Vested Terminated Members	1	1	0.00%
Deaths During the Plan Year	21	25	19.05%
Pensioners:			
Number in Pay Status*			
Retirees	576	586	1.74%
Duty Disabled Retirees	71	73	2.82%
Non-duty Disabled Retirees	<u>16</u>	<u>16</u>	0.00%
Total	663	675	1.81%
Average Age	68.34	68.36	0.02%
Average Monthly Benefit	\$ 3,504	\$ 3,630	3.61%
Beneficiaries in Pay Status**	224	228	1.79%
Members Due Refunds	2	2	0.00%
New Disabilities	2	5	150.00%

* Disabled participants that were eligible for normal retirement at the time of their disability are valued as Retirees

**Widows, QDROs, and Children

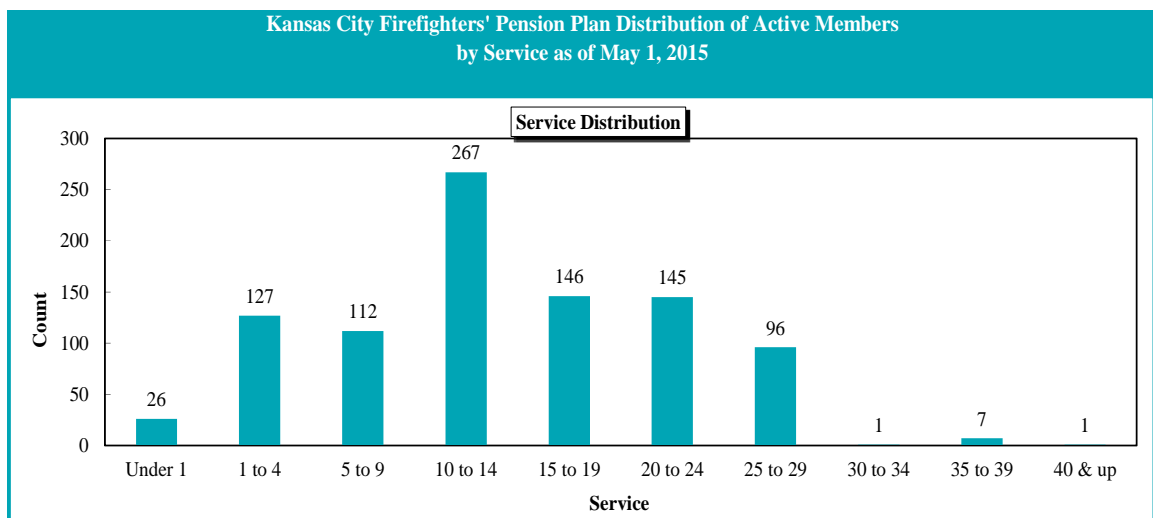
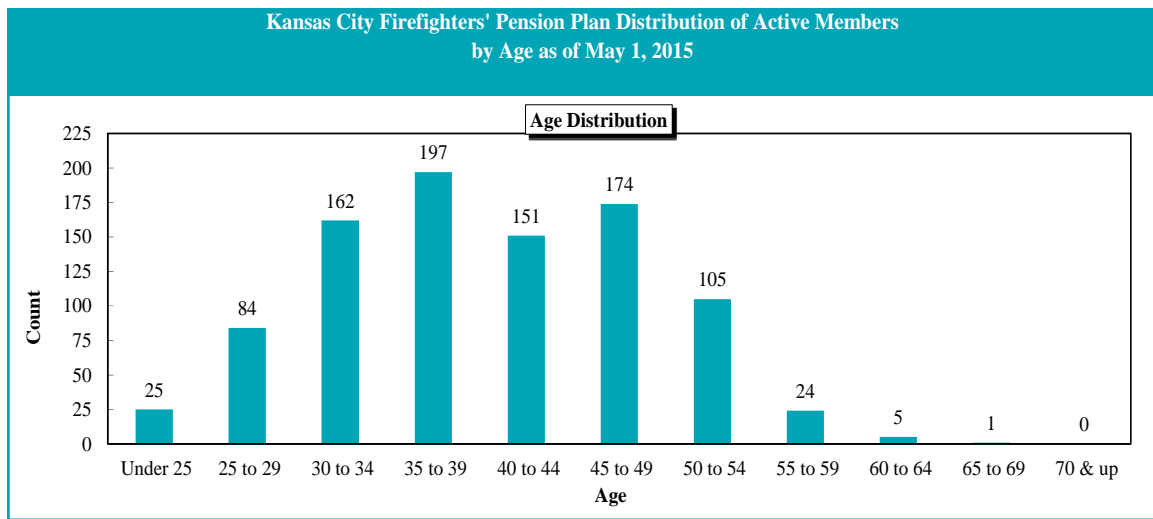
CITY OF KANSAS CITY, MISSOURI FIREFIGHTERS' PENSION SYSTEM
ACTUARIAL VALUATION AS OF MAY 1, 2015

APPENDIX A
MEMBERSHIP INFORMATION

**Kansas City Firefighters' Pension Plan Distribution of Active Members
by Age and Service as of May 1, 2015**

COUNTS BY AGE/SERVICE

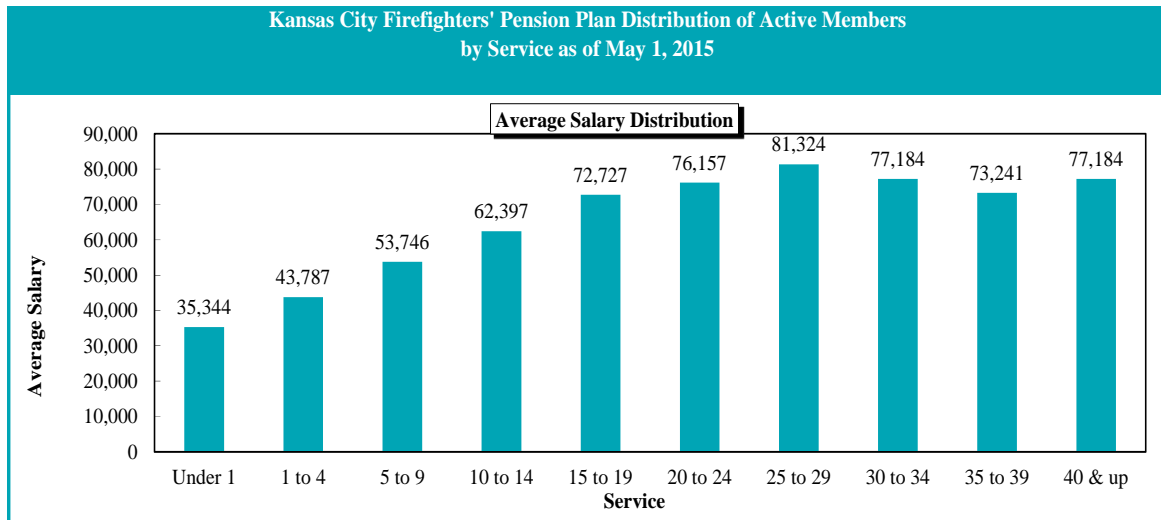
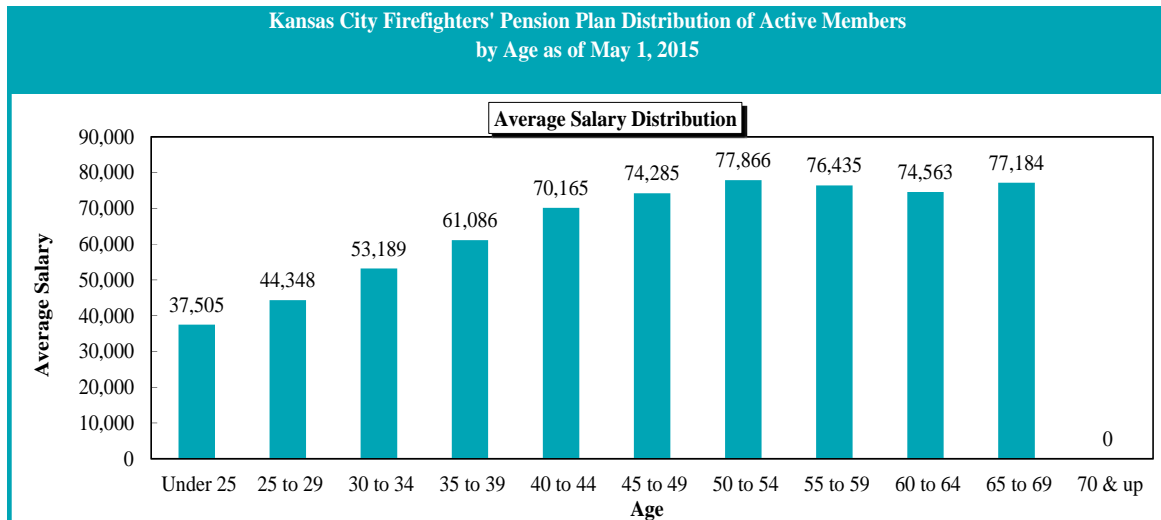
Age	Service										Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & up	
Under 25	14	11	0	0	0	0	0	0	0	0	25
25 to 29	8	56	20	0	0	0	0	0	0	0	84
30 to 34	3	53	53	53	0	0	0	0	0	0	162
35 to 39	1	7	38	128	23	0	0	0	0	0	197
40 to 44	0	0	1	53	62	35	0	0	0	0	151
45 to 49	0	0	0	30	45	68	30	1	0	0	174
50 to 54	0	0	0	3	13	41	48	0	0	0	105
55 to 59	0	0	0	0	2	0	18	0	4	0	24
60 to 64	0	0	0	0	1	1	0	0	3	0	5
65 to 69	0	0	0	0	0	0	0	0	0	1	1
70 & up	0	0	0	0	0	0	0	0	0	0	0
Total	26	127	112	267	146	145	96	1	7	1	928



CITY OF KANSAS CITY, MISSOURI FIREFIGHTERS' PENSION SYSTEM
ACTUARIAL VALUATION AS OF MAY 1, 2015

APPENDIX A
MEMBERSHIP INFORMATION

Kansas City Firefighters' Pension Plan Distribution of Active Members by Age and Service as of May 1, 2015											
AVERAGE SALARY BY AGE/SERVICE											
Age	Service										Total
	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	35,060	40,617	0	0	0	0	0	0	0	0	37,505
25 to 29	35,229	43,286	50,971	0	0	0	0	0	0	0	44,348
30 to 34	33,888	44,264	53,960	62,437	0	0	0	0	0	0	53,189
35 to 39	44,616	49,168	54,868	61,618	72,744	0	0	0	0	0	61,086
40 to 44	0	0	55,236	63,260	72,402	77,087	0	0	0	0	70,165
45 to 49	0	0	0	64,043	73,400	76,108	81,625	77,184	0	0	74,285
50 to 54	0	0	0	63,248	72,609	75,418	82,295	0	0	0	77,866
55 to 59	0	0	0	0	69,264	0	78,235	0	71,922	0	76,435
60 to 64	0	0	0	0	70,632	77,184	0	0	75,000	0	74,563
65 to 69	0	0	0	0	0	0	0	0	0	77,184	77,184
70 & up	0	0	0	0	0	0	0	0	0	0	0
Total	35,344	43,787	53,746	62,397	72,727	76,157	81,324	77,184	73,241	77,184	63,895



CITY OF KANSAS CITY, MISSOURI FIREFIGHTERS' PENSION SYSTEM
 ACTUARIAL VALUATION AS OF MAY 1, 2015

APPENDIX A
MEMBERSHIP INFORMATION

Kansas City Firefighters' Pension System							Widows, QDROs & Children
Pensions in Payment Status by Type and Monthly Amount							
as of May 1, 2015							
Monthly Amount	Total	Normal	Early	Vested	Disability		
Total	903	584	1	1	89		228
Under \$500	28	4	0	0	0		24
\$500-1,000	79	6	0	0	5		68
1,000-1,500	64	12	0	0	7		45
1,500-2,000	88	38	0	0	15		35
2,000-2,500	66	40	0	0	3		23
2,500-3,000	75	58	0	1	4		12
3,000-3,500	77	66	0	0	4		7
3,500-4,000	182	138	0	0	40		4
4,000-4,500	89	76	1	0	9		3
4,500-5,000	66	60	0	0	1		5
5,000 & over	89	86	0	0	1		2

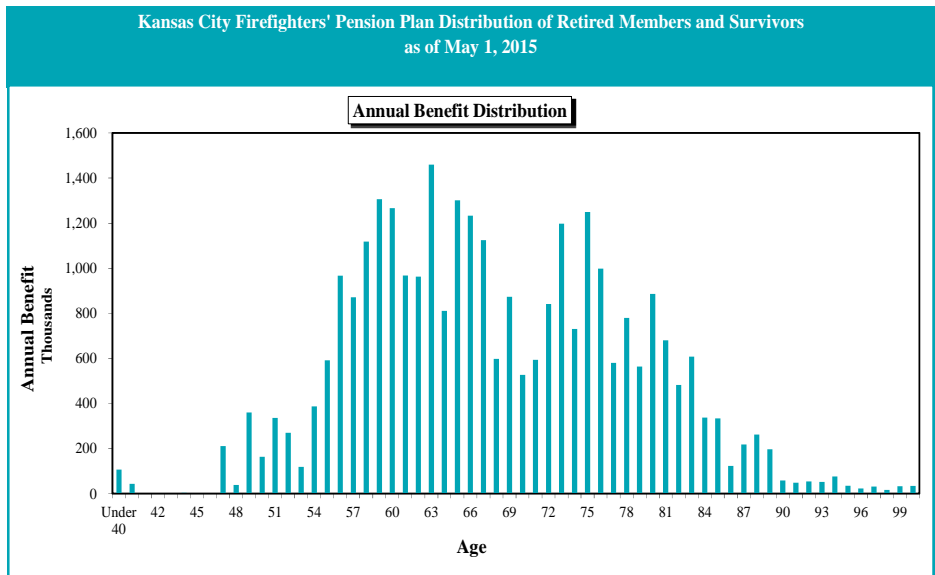
During the year ended April 30, 2015 there were 42 new pensions awarded (26 Normal, 5 Disabled, and 11 Widows, QDROs, and Children)

CITY OF KANSAS CITY, MISSOURI FIREFIGHTERS' PENSION SYSTEM
ACTUARIAL VALUATION AS OF MAY 1, 2015

APPENDIX A
MEMBERSHIP INFORMATION

Kansas City Firefighters' Pension Plan Distribution of Retired Members and Survivors as of May 1, 2015								
Age	Count	Annual Benefit	Age	Count	Annual Benefit	Age	Count	Annual Benefit
<25	7	\$47,155	57	20	\$871,208	89	7	\$196,680
25	0	0	58	21	1,117,897	90	5	58,409
26	0	0	59	27	1,305,597	91	4	48,258
27	0	0	60	25	1,266,127	92	3	53,730
28	1	5,625	61	21	967,461	93	3	52,218
29	0	0	62	19	962,836	94	4	75,807
30	2	33,246	63	27	1,460,009	95	4	34,994
31	1	7,211	64	17	810,238	96	2	22,644
32	2	12,957	65	29	1,301,609	97	2	30,887
33	0	0	66	26	1,233,253	98	1	16,435
34	0	0	67	23	1,124,604	99	2	33,232
35	0	0	68	16	598,113	100	1	34,152
36	0	0	69	23	873,145	101	1	42,817
37	0	0	70	15	526,635	102	2	15,087
38	0	0	71	18	593,485	103	0	0
39	0	0	72	22	841,693	104	2	47,458
40	1	43,532	73	30	1,197,578	105	2	80,878
41	0	0	74	18	730,998	106	0	0
42	0	0	75	30	1,249,345	107	0	0
43	0	0	76	28	997,839	108	0	0
44	1	3,691	77	19	580,213	109	0	0
45	0	0	78	26	779,457	110	0	0
46	0	0	79	18	563,621	111	0	0
47	4	211,518	80	29	886,113	112	0	0
48	1	38,077	81	23	679,936	113	0	0
49	8	359,787	82	18	482,071	114	0	0
50	4	163,361	83	25	608,400	115	0	0
51	8	335,304	84	14	337,781	116	0	0
52	6	269,906	85	14	334,222	117	0	0
53	3	118,320	86	8	122,931	118	0	0
54	10	386,537	87	16	218,176	119	0	0
55	12	591,565	88	14	261,870	120	0	0
56	19	966,765						
Totals							814	\$30,322,704

The above counts include 238 persons who elected disability retirement after becoming eligible for normal retirement.

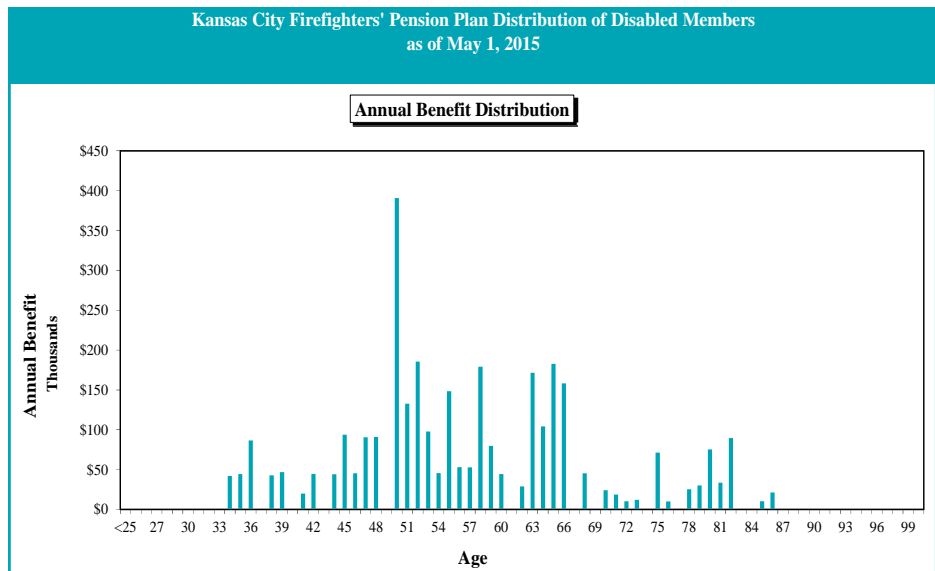


CITY OF KANSAS CITY, MISSOURI FIREFIGHTERS' PENSION SYSTEM
ACTUARIAL VALUATION AS OF MAY 1, 2015

APPENDIX A
MEMBERSHIP INFORMATION

Kansas City Firefighters' Pension Plan Distribution of Disabled Members as of May 1, 2015								
Age	Count	Annual Benefit	Age	Count	Annual Benefit	Age	Count	Annual Benefit
<25	0	\$0	57	1	\$52,689	89	0	\$0
25	0	0	58	5	179,013	90	0	0
26	0	0	59	2	79,642	91	0	0
27	0	0	60	1	44,436	92	0	0
28	0	0	61	0	0	93	0	0
29	0	0	62	1	28,835	94	0	0
30	0	0	63	4	171,416	95	0	0
31	0	0	64	3	104,178	96	0	0
32	0	0	65	6	182,846	97	0	0
33	0	0	66	4	158,233	98	0	0
34	1	41,999	67	0	0	99	0	0
35	1	44,458	68	1	45,356	100	0	0
36	2	86,554	69	0	0	101	0	0
37	0	0	70	1	23,871	102	0	0
38	1	42,530	71	1	18,470	103	0	0
39	1	46,794	72	1	10,256	104	0	0
40	0	0	73	1	12,048	105	0	0
41	1	19,870	74	0	0	106	0	0
42	1	44,540	75	3	71,273	107	0	0
43	0	0	76	1	10,088	108	0	0
44	1	44,145	77	0	0	109	0	0
45	2	93,787	78	1	25,290	110	0	0
46	1	45,356	79	2	30,057	111	0	0
47	2	90,579	80	4	75,405	112	0	0
48	2	91,010	81	2	33,669	113	0	0
49	0	0	82	4	89,440	114	0	0
50	8	390,624	83	0	0	115	0	0
51	3	132,606	84	0	0	116	0	0
52	4	185,486	85	1	10,315	117	0	0
53	2	97,772	86	1	21,281	118	0	0
54	1	45,469	87	0	0	119	0	0
55	3	148,542	88	0	0	120	0	0
56	1	53,052						
Totals							89	\$3,223,280

The above counts exclude 238 persons who elected disability retirement after becoming eligible for normal retirement.



CITY OF KANSAS CITY, MISSOURI FIREFIGHTERS' PENSION SYSTEM
ACTUARIAL VALUATION AS OF MAY 1, 2015

APPENDIX A
MEMBERSHIP INFORMATION

Kansas City Firefighters' Pension System Change in Plan Membership							
Tier 1							
	Vested						Total
	Actives	Terminations	Refund Due	Disabilities	Retirees	Beneficiaries*	
May 1, 2014	931	1	2	87	576	224	1,821
New Entrants	0	0	0	0	0	0	0
Rehires	0	0	0	0	0	0	0
Vested Terminations	0	0	0	0	0	0	0
Terminated with Refund Due	(2)	0	2	0	0	0	0
Return of Contributions	(2)	0	(2)	0	0	0	(4)
Disabilities	(5)	0	0	5	0	0	0
Retirements	(26)	0	0	0	26	0	0
Deaths	(1)	0	0	(2)	(16)	(6)	(25)
New Survivor	0	0	0	0	0	11	11
Benefit Ceased	0	0	0	0	0	(4)	(4)
Miscellaneous Adjustments	9	0	0	(1)	0	3	11
May 1, 2015	904	1	2	89	586	228	1,810
Tier 2							
	Vested						Total
	Actives	Terminations	Refund Due	Disabilities	Retirees	Beneficiaries*	
May 1, 2014	0	0	0	0	0	0	0
New Entrants	24	0	0	0	0	0	24
Rehires	0	0	0	0	0	0	0
Vested Terminations	0	0	0	0	0	0	0
Terminated with Refund Due	0	0	0	0	0	0	0
Return of Contributions	0	0	0	0	0	0	0
Disabilities	0	0	0	0	0	0	0
Retirements	0	0	0	0	0	0	0
Deaths	0	0	0	0	0	0	0
New Survivor	0	0	0	0	0	0	0
Benefit Ceased	0	0	0	0	0	0	0
Miscellaneous Adjustments	0	0	0	0	0	0	0
May 1, 2015	24	0	0	0	0	0	24
Total							
	Vested						Total
	Actives	Terminations	Refund Due	Disabilities	Retirees	Beneficiaries*	
May 1, 2014	931	1	2	87	576	224	1,821
New Entrants	24	0	0	0	0	0	24
Rehires	0	0	0	0	0	0	0
Vested Terminations	0	0	0	0	0	0	0
Terminated with Refund Due	(2)	0	2	0	0	0	0
Return of Contributions	(2)	0	(2)	0	0	0	(4)
Disabilities	(5)	0	0	5	0	0	0
Retirements	(26)	0	0	0	26	0	0
Deaths	(1)	0	0	(2)	(16)	(6)	(25)
New Survivor	0	0	0	0	0	11	11
Benefit Ceased	0	0	0	0	0	(4)	(4)
Miscellaneous Adjustments	9	0	0	(1)	0	3	11
May 1, 2015	928	1	2	89	586	228	1,834

*Widows, QDROs, and Children

**APPENDIX B
 ACTUARIAL ASSUMPTIONS AND METHODS**

A. Actuarial Assumptions

1. Mortality Rates

Healthy: RP-2000 Combined Mortality Table set forward one year for males and females with 5% of deaths assumed to be Duty related.

The most recent experience study covering the period 2007-2011 showed that there was approximately a 10% margin in these rates to provide for future improvement in mortality.

Age	Healthy Mortality (sample rates)	
	Male	Female
20	0.04%	0.02%
25	0.04%	0.02%
30	0.05%	0.03%
35	0.08%	0.05%
40	0.11%	0.08%
45	0.16%	0.12%
50	0.24%	0.19%
55	0.42%	0.31%
60	0.77%	0.58%

Disabled: RP-2000 Combined Mortality Table set forward three years for males and females.

The most recent experience study covering the period 2007-2011 showed that there were sufficient margins in these rates to provide for potential future improvement in mortality.

Age	Disabled Mortality (sample rates)	
	Male	Female
20	0.04%	0.02%
25	0.04%	0.02%
30	0.06%	0.04%
35	0.10%	0.06%
40	0.13%	0.09%
45	0.19%	0.14%
50	0.29%	0.22%
55	0.53%	0.39%
60	1.00%	0.76%

APPENDIX B
ACTUARIAL ASSUMPTIONS AND METHODS

2. Disability and Withdrawal Rates

Rates before Retirement (sample rates)		
Age	Disability*	Withdrawal
20 - 24	0.01%	1.50%
25 - 29	0.20%	1.50%
30 - 34	0.20%	1.25%
35 - 39	0.35%	0.50%
40 - 44	0.75%	0.50%
45 - 49	1.00%	0.50%
50 - 54	2.00%	0.20%
55 - 59	7.00%	---
60 - 64	10.00%	---
65 and up	---	---

* Disability rates are set to zero once 25 years of service is earned for Tier 1 members and 27 years of service is earned for Tier 2.

3. Percentage of Disability Retirements that are Duty Related

Disability Retirement Rates (Duty Related)	
Age	Annual Rate (%)
20 - 24	95.0%
25 - 29	95.0
30 - 34	95.0
35 - 39	95.0
40 - 44	80.0
45 - 49	80.0
50 - 54	80.0
55 - 59	80.0
60 and up	80.0

APPENDIX B
ACTUARIAL ASSUMPTIONS AND METHODS

4. Retirement Rates for Active Employees

Years of Service	Rates of Active Employees	
	Tier 1	Tier 2
25	5.00%	---
26	5.00	---
27	5.00	5.00%
28	5.00	5.00
29	10.00	10.00
30	15.00	15.00
31	35.00	35.00
32	35.00	35.00
33	35.00	35.00
34	35.00	35.00
35 years, or age 65 if earlier	100.00	100.00

5. Retirement Age for Inactive Vested Members

50

6. Unknown Data for Members

Same as those exhibited by members with similar known characteristics

7. Percent Married

85% of active participants

8. Age of Spouse

Females three years younger than males

9. Eligible Children

None

10. Net Investment Return

7.50% net of investment fees, including inflation at 2.50%

APPENDIX B
ACTUARIAL ASSUMPTIONS AND METHODS

11. Administrative Expenses

0.35% of payroll is added to the normal cost of the system for expected administrative expenses.

12. Salary Increase

Total Wage Growth: 3.00%, including inflation at 2.50%. Total assumed salary increase including step and promotional increases are based upon age and shown in the table below.

Age	Rate (%)
Less than 25	8.0%
25 – 29	8.0%
30 – 34	6.0%
35 - 39	5.0%
40 – 44	4.0%
45 – 49	3.5%
50 – 54	3.5%
55 – 59	3.5%
60 – 64	3.5%
65 and up	3.0%

13. Interest on Employee Contributions

3.00% per year, compounded annually.

14. Change in Assumptions

An administrative expense assumption of 0.35% of payroll was added. Retirement rates added for Tier 2.

APPENDIX B
ACTUARIAL ASSUMPTIONS AND METHODS

B. Rationale for Assumptions

1. Economic Assumptions

The investment return assumption of 7.50% was selected based upon an analysis that included (a) capital market assumptions provided by the investment consultant, (b) the asset allocation of the fund, and (c) investment return assumptions of other public retirement systems.

The inflation assumption of 2.5% was selected based upon an analysis that included (a) input from the investment consultant, (b) historical inflation as measured by the Consumer Price Index, and (c) implied inflation in long term government bonds.

The long term wage growth assumption of 3.0% was based upon the inflation assumption of 2.5% plus a real wage growth assumption of 0.5% which was derived from an analysis of historical increases in Social Security Average earnings.

2. Demographic Assumptions

The demographic assumptions are based upon the most recent experience study covering the period 2007-2011.

APPENDIX B
ACTUARIAL ASSUMPTIONS AND METHODS

C. Actuarial Methods

1. Funding Method

Entry Age Normal Actuarial Cost Method: Entry age is the age at the time the participant commenced employment. Normal cost and actuarial liability are calculated on an individual basis and are allocated by salary, with normal cost determined as if the current benefit accrual rate had always been in effect.

2. Actuarial Value of Assets

A preliminary actuarial value of assets is calculated as the sum of the beginning of the year actuarial value of assets, the net new money and the expected return on an actuarial basis. The gains and losses over the last 4 years are recognized over the next 5-year period. The gain or loss of each year is the excess of market value of assets over the preliminary value of assets, minus the sum of the unrecognized gains and losses from each of the 4 years. Finally, an adjustment is made so that the final actuarial value of assets is at least 80% but no more than 120% of the market value.

3. Amortization of Unfunded Actuarial Liability/(Surplus)

Board Funding Policy: 30-year layered amortization method – level percent of pay. Under the layered approach, the May 1, 2008 unfunded actuarial liability is written down over a 30-year period and all future changes to the unfunded actuarial liability establish new 30-year amortization periods. Payroll is expected to increase 3.0% per year.

City Contribution Policy: Under the Ordinance, the City's contribution will be based on a closed 30-year amortization period from May 1, 2014, level percent of pay. Payroll is expected to increase 3.0% per year.

4. Changes in Methods

None.

APPENDIX C
SUMMARY OF PLAN PROVISIONS

1. Plan Year

May 1 through April 30.

2. Membership

Tier 1: All Firefighters hired prior to April 20, 2014 become members as a condition of employment.

Tier 2: All Firefighters hired on or after April 20, 2014 become members as a condition of employment.

Membership begins on the first day of employment.

3. Creditable Service

Total creditable service is defined as the sum of the service as a Firefighter after becoming a member after July 1, 1953, plus any service earned prior to July 1, 1953, if continuous.

4. Contributions

Pension System: Members contributed 9.55% of base salary prior to April 20, 2014. Effective April 20, 2014, the member contribution rate increased to 10.55%. For the year beginning May 1, 2015, the City is contributing 27.91% of payroll, which is the actuarially determined Board contribution rate for the prior year, for the period from May 1, 2015 to June 30, 2015, and 30.01% for the period from July 1, 2015 to April 30, 2016. Future City contributions will be determined through the City's budgeting process.

Interest on Employee Contributions: Determined by the Board of Trustees, not to exceed 3.00%, compounded annually.

Health Insurance Subsidy: Effective January 1, 2001, the City contribution is 2% of base salary and the employee contribution is 1% of base salary.

Contributions and benefits for the Health Insurance Subsidy are separately accounted for under the Plan. The assets, liabilities, contributions, and benefits of the Health Insurance Subsidy are excluded from this valuation.

APPENDIX C
SUMMARY OF PLAN PROVISIONS

5. Normal Retirement

Eligibility requirements: Tier 1: 25 years of service.
Tier 2: 27 years of service

Amount: The base pension is 2.5% of average final compensation per year of creditable service to a maximum of 80%. Average final compensation is defined as the average of the two highest years of base compensation in the last ten years. The minimum retirement benefit is \$600 per month.

6. Duty Disability Benefit

Age Requirement: None.

Service Requirement: None.

Amount: The pension is 62.5% of average final compensation at disability with a minimum 62.5% of the current maximum salary payable to the rank of a firefighter. The current maximum monthly salary as of May 1, 2015 is \$5,886.

7. Non-duty Disability

Age Requirement: Less than 65.

Service Requirement: 10 years of service.

Amount: The pension is 25% of the average final compensation plus 2.5% of average final compensation per year of creditable service in excess of 10 years, not to exceed 80% of average final compensation, with a minimum of \$600 per month.

8. Vesting

Age Requirement: None.

Service Requirement: 10 years of service.

Amount: 2.5% of average final compensation per year of creditable service, not to exceed 62.5% of average final compensation, payable at age 50.

APPENDIX C
SUMMARY OF PLAN PROVISIONS

If the employee dies in a deferred status, before age 50, the beneficiary receives a lump-sum equal to member contributions with interest. If such death occurs after age 50, the widow and children receive the same benefits as for pre-retirement non-duty death, but reduced by the ratio of the member's service to 25 years if in Tier 1, and 27 years if in Tier 2.

9. Withdrawal (Refund) Benefits

Age Requirement: None.

Service Requirement: Less than 10 years of creditable service.

Amount: If an employee terminates before becoming eligible for a deferred pension, he or she receives a return of member contributions with interest. This benefit is reduced by a service charge of 10%, 8%, 6%, 4% or 2% if employee withdraws with less than one year, two years, three years, four years, or five years of employment respectively.

10. Pre-Retirement Duty Death Benefits

Age Requirement: None.

Service Requirement: None.

Funeral Benefit A lump-sum payment of \$2,000.

Surviving Spouse Benefit: 100% of the accrued pension is paid with a minimum of 62.5% of the average final compensation for a period of ten years. The surviving spouse's benefit for spouses of active firefighters eligible for a service pension is 100% of the regular pension reduced for the election of optional 100% joint and survivor coverage. The minimum benefit is \$275 per month.

Child's Benefit: If there is no surviving spouse or the spouse dies or remarries, the spouse's benefit is divided equally to the children and paid until age 18 (or 21 if a student). If a surviving spouse exists, \$100 per month is paid until age 18 (or age 21 if a student).

Return of Contribution: A return of accumulated contributions and interest is guaranteed. If there is no surviving spouse or dependent children the accumulated contributions and interest or the unpaid balance thereof shall be paid to the Estate or to a named beneficiary.

APPENDIX C
SUMMARY OF PLAN PROVISIONS

11. Pre-Retirement Non-duty Death Benefits

Age Requirement:	None.
Service Requirement:	None.
Funeral Benefit:	A lump-sum payment of \$2,000.
Surviving Spouse Benefit:	50% of the accrued pension is paid with a minimum of 25% of average final compensation payable for the life of the surviving spouse. The surviving spouse's benefit for active firefighters eligible for a service pension is 100% of the regular pension, reduced for the election of optional 100% joint and survivor coverage. The minimum benefit is \$275 per month.
Child's Benefit:	If no surviving spouse or the spouse dies, the spouse's benefit is divided equally to the children and paid until age 18 (or 21 if a student). If a surviving spouse exists, \$100 per month is paid until age 18 (or 21 if a student).
Return of Contributions:	A return of accumulated contributions and interest is guaranteed. If there is no surviving spouse or dependent children the accumulated contributions and interest or the unpaid balance thereof shall be paid to the Estate or to a named beneficiary.

12. Post-Retirement Death Benefit

Age Requirement:	None.
Service Requirement:	None.
Amount:	If married to the same person at retirement and death, pension benefits are paid in the form of a Joint and 50% Survivor annuity or in any other available optional form elected by the member and spouse in an actuarially equivalent amount, not less than 25% of the retiree's final average compensation per month. The minimum benefit is \$275. Payments equal to the amount of the member's accumulated contributions and interest are guaranteed. In addition, a lump-sum funeral benefit of \$2,000 is paid.

APPENDIX C
SUMMARY OF PLAN PROVISIONS

13. Cost-of-Living Adjustment (COLA)

Tier 1: An increase of 3.00% of the original pension will be made annually. This does not apply to funeral benefits.

Tier 2: COLA will only be payable if the prior year's funding ratio is greater than or equal to 80% and will be equal to the percentage increase in the consumer price index, up to a maximum of 2.50%, payable at the 27th anniversary of date of hire.

Members must retire on or before January 1, in order to receive a COLA in the next year.

14. Changes since Last Valuation

None.

**APPENDIX D
GLOSSARY OF TERMS**

1. Actuarial Assumptions

Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disability, and retirement; changes in compensation; inflation; rates of investment earnings, and asset appreciation or depreciation; and other relevant items.

2. Actuarial Cost Method

A procedure for determining the Actuarial Present Value of pension plan benefits and expenses and for developing an allocation of such value to each year of service, usually in the form of a Normal Cost and an Actuarial Liability.

3. Actuarial Gain/(Loss)

A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions during the period between two Actuarial Valuation dates, as determined in accordance with a particular Actuarial Cost Method.

4. Actuarial Liability

The portion of the Actuarial Present Value of Projected Benefits which will not be paid by future Normal Costs. It represents the value of the past Normal Costs with interest to the valuation date.

5. Actuarial Present Value (Present Value)

The value as of a given date of a future amount or series of payments. The Actuarial Present Value discounts the payments to the given date at the assumed investment return and includes the probability of the payment being made. As a simple example: assume you owe \$100 to a friend one year from now. Also, assume there is a 1% probability of your friend dying over the next year, in which case you won't be obligated to pay him. If the assumed investment return is 10%, the actuarial present value is:

$$\begin{array}{ccccccc} \frac{\text{Amount}}{\text{Payment}} & & \frac{\text{Probability of}}{\text{Payment}} & & \frac{1}{(1+\text{Investment Return})} & & \\ \$100 & \times & (1 - .01) & \times & 1/(1+.1) & = & \$90 \end{array}$$

6. Actuarial Valuation

The determination, as of a specified date, of the Normal Cost, Actuarial Liability, Actuarial Value of Assets, and related Actuarial Present Values for a pension plan.

**APPENDIX D
GLOSSARY OF TERMS**

7. Actuarial Value of Assets

The value of cash, investments and other property belonging to a pension plan as used by the actuary for the purpose of an Actuarial Valuation. The purpose of an Actuarial Value of Assets is to smooth out fluctuations in market values. This way long-term costs are not distorted by short-term fluctuations in the market.

8. Actuarially Equivalent

Of equal Actuarial Present Value, determined as of a given date with each value based on the same set of Actuarial Assumptions.

9. Amortization Payment

The portion of the pension plan contribution which is designed to pay interest and principal on the Unfunded Actuarial Liability in order to pay for that liability in a given number of years.

10. Entry Age Normal Actuarial Cost Method

A method under which the Actuarial Present Value of the Projected Benefits of each individual included in an Actuarial Valuation is allocated on a level basis over the earnings of the individual between entry age and assumed exit ages.

11. Funded Percentage

The ratio of the Actuarial Value of Assets to the Actuarial Liabilities.

12. Investment Return Assumption

The assumed interest rate used for projecting dollar related values in the future.

13. Mortality Table

A set of percentages which estimate the probability of death at a particular point in time. Typically, the rates are annual and based on age and sex.

14. Normal Cost

That portion of the Actuarial Present Value of pension plan benefits and expenses which is allocated to a valuation year by the Actuarial Cost Method.

APPENDIX D
GLOSSARY OF TERMS

15. Projected Benefits

Those pension plan benefit amounts which are expected to be paid in the future under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age and increases in future compensation and service credits.

16. Unfunded Actuarial Liability

The excess of the Actuarial Liability over the Actuarial Value of Assets.