

**City of Kansas City, Missouri  
Firefighters' Pension System**

**Actuarial Valuation  
as of May 1, 2013**

**Produced by **Cheiron****

**September 2013**

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September 12, 2013

Board of Pension Trustees  
 City of Kansas City, Missouri Firefighters' Pension System  
 12<sup>th</sup> Floor, City Hall  
 414 East 12<sup>th</sup> 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, 2013. 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- Required Accounting Disclosures (GASB)
- 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. Any other user of this report is not an intended user and is considered a third party.

In preparing our report, we relied without audit, on information (some oral and some written) supplied by KCFPS 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 Standard of Practice #23.

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



Board of Pension Trustees  
City of Kansas City, Missouri Firefighters' Pension System  
September 12, 2013

We hereby certify that, to the best of our knowledge, this report and its contents, which are work products of Cheiron, Inc., 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 report does not provide any legal services or advice.

This report was prepared solely for the Firefighters' Pension System for the purposes described herein, except that the plan auditor may rely on this report solely for the purpose of completing an audit related to the matters 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



Jacqueline King, ASA, MAAA  
Associate Actuary

**CITY OF KANSAS CITY, MISSOURI FIREFIGHTERS' PENSION SYSTEM  
ACTUARIAL VALUATION AS OF MAY 1, 2013**

**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 2014, and
- Information required by the Governmental Accounting Standards Board (GASB).

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, 2013 valuation represents Cheiron's seventh valuation performed for KCFPS and there have been no changes since the prior year. Therefore the assumptions, methodologies and plan provisions reflected in this valuation are the same as in the May 1, 2012 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, 2013 actuarial valuation are as follows:

- The actuarially determined City contribution rate increased from 25.64% as of May 1, 2012 to 27.73% as of May 1, 2013. The increase in contribution rate is primarily due to a lower than expected return on the Actuarial Value of Assets. The actual rate that the City is scheduled to use for the current year is 19.60% of payroll. We believe that such rate will need to be increased in the future in order to sustain the System over the long term.
- The FPS's unfunded actuarial liability increased from \$115 million on May 1, 2012 to \$129 million on May 1, 2013.
- The total payroll of active plan members decreased by 2.8% from the prior year's valuation. This caused part of the increase in the contribution rate since prior amortization amounts of the unfunded liability are expressed as a percentage of a lower payroll amount.
- The FPS's funding ratio, the ratio of assets over liabilities decreased from 78.5% as of May 1, 2012 to 76.4% as of May 1, 2013.

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- The primary factor in the decrease in the System's funded status was an overall actuarial loss of \$13.3 million.
  - During the year ended April 30, 2013, the System's assets returned 11.27% on a market value basis. The return on the actuarial asset value (i.e. incorporating asset smoothing) was 3.27% (as compared to 7.75% assumed). This resulted in an actuarial loss on investments of 18.5 million. In addition, the system experienced a loss of \$1.9 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 experience gain of \$7.1 million. The majority of this gain was from lower than expected salary growth.
  
- As of May 1, 2013 the market value of assets exceeds the actuarial value by \$13.1 million. The System will recognize this difference as deferred asset losses and gains are recognized over the next 4 years. As of May 1, 2013, the investment loss of the 2009 fiscal year has been fully recognized under the asset smoothing method which resulted in the market value of assets exceeding the actuarial value of assets for the first time since May 1, 2007 valuation.

This report does not reflect any changes in pension accounting requirements from newly issued GASB Statements Nos. 67 and 68. Statement No 67 will be effective for the plan year ending April 30, 2015. Statement No. 68 will be effective for the employer fiscal year ending April 30, 2016.

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  
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<b>Table I-1</b>			
<b>City of Kansas City, Missouri Firefighters' Pension System</b>			
<b>Summary of Principal Plan Results</b>			
<b>Valuation as of:</b>	<b>May 1, 2012</b>	<b>May 1, 2013</b>	<b>% Change</b>
<b><u>Participant Counts</u></b>			
Active Participants	944	934	(1.1%)
Non-duty Disabled Participants *	15	15	0.0%
Duty Disabled Participants *	72	69	(4.2%)
Retirees and Beneficiaries *	789	802	1.6%
Terminated Vested Participants	1	1	0.0%
Inactive Participants	8	12	50.0%
<b>Total</b>	<b>1,829</b>	<b>1,833</b>	<b>0.2%</b>
Annual Salaries of Active Members	\$ 60,062,558	\$ 58,356,072	(2.8%)
Annual Retirement Allowances for Retired Members and Beneficiaries	\$ 28,834,554	\$ 30,793,433	6.8%
<b><u>Assets and Liabilities</u></b>			
Actuarial Liability (AL)	\$ 535,215,109	\$ 547,787,899	2.3%
Actuarial Value of Assets	420,336,845	418,711,963	(0.4%)
Unfunded Actuarial Liability (UAL)	\$ 114,878,264	\$ 129,075,936	12.4%
Funding Ratio	78.5%	76.4%	
Present Value of Accrued Benefits (PVAB)	\$ 484,548,651	\$ 501,159,942	3.4%
Market Value of Assets	402,455,704	431,860,238	7.3%
Unfunded PVAB	\$ 82,092,947	\$ 69,299,704	(15.6%)
Accrued Benefit Funding Ratio	83.1%	86.2%	
<b><u>Contributions as a Percentage of Payroll</u></b>			
	<b>Fiscal Year 2013</b>	<b>Fiscal Year 2014</b>	
Normal Cost Contribution	13.24%	13.19%	
Unfunded Actuarial Liability Contribution	12.40%	14.54%	
Total Contribution	25.64%	27.73%	
Annual Required Contribution (GASB)	\$15,400,040	\$16,182,139	5.1%

\* Disabled participants that were eligible for normal retirement at the time of their disability are valued as Retirees. The number of such participants was 192 at May 1, 2012 and 209 at May 1, 2013.

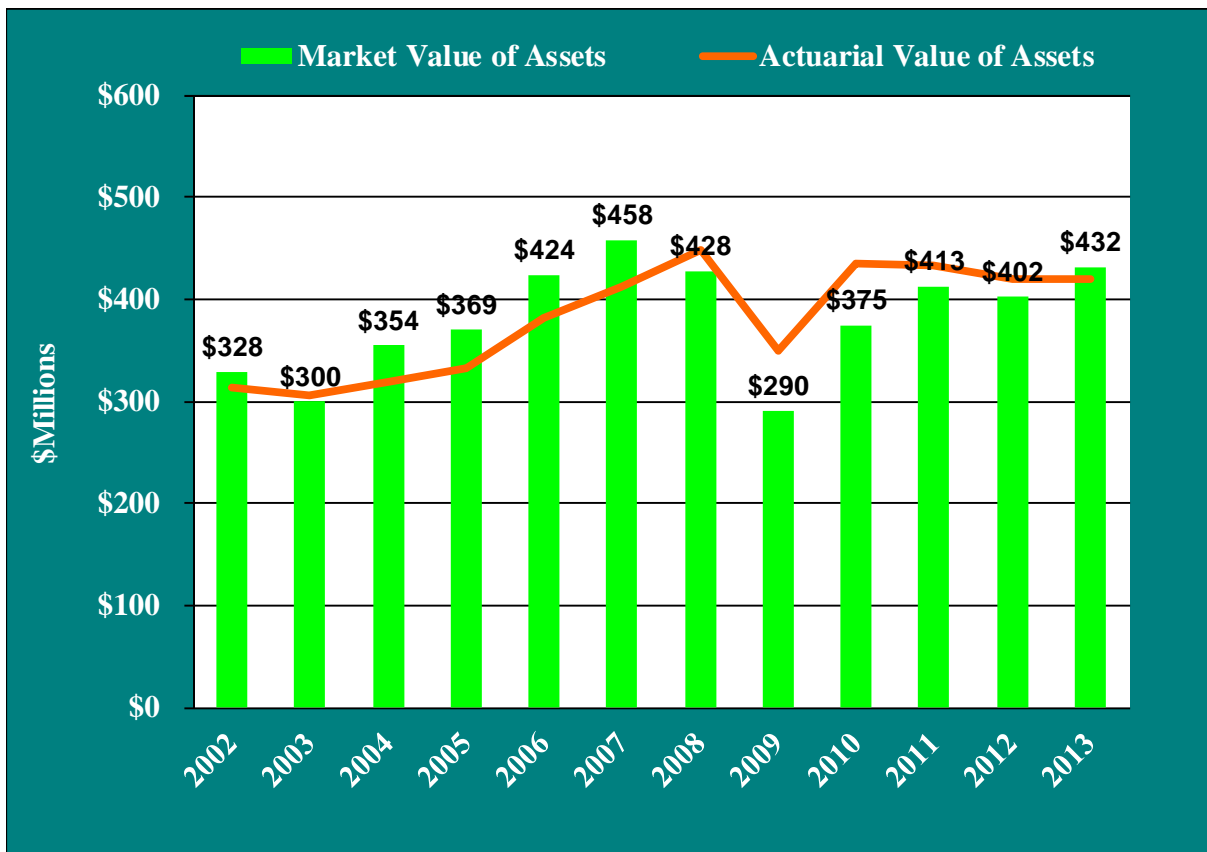
SECTION I  
BOARD SUMMARY

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 11.27% in 2013 compared to an assumed rate of 7.75%. 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. As can be seen in the graph, the actuarial value of assets (AVA) decreased slightly from 2012 to 2013 due to the continued recognition of the 2008, 2009 and 2012 losses. The numbers above the bars represent the value (in millions) of the market value of assets.



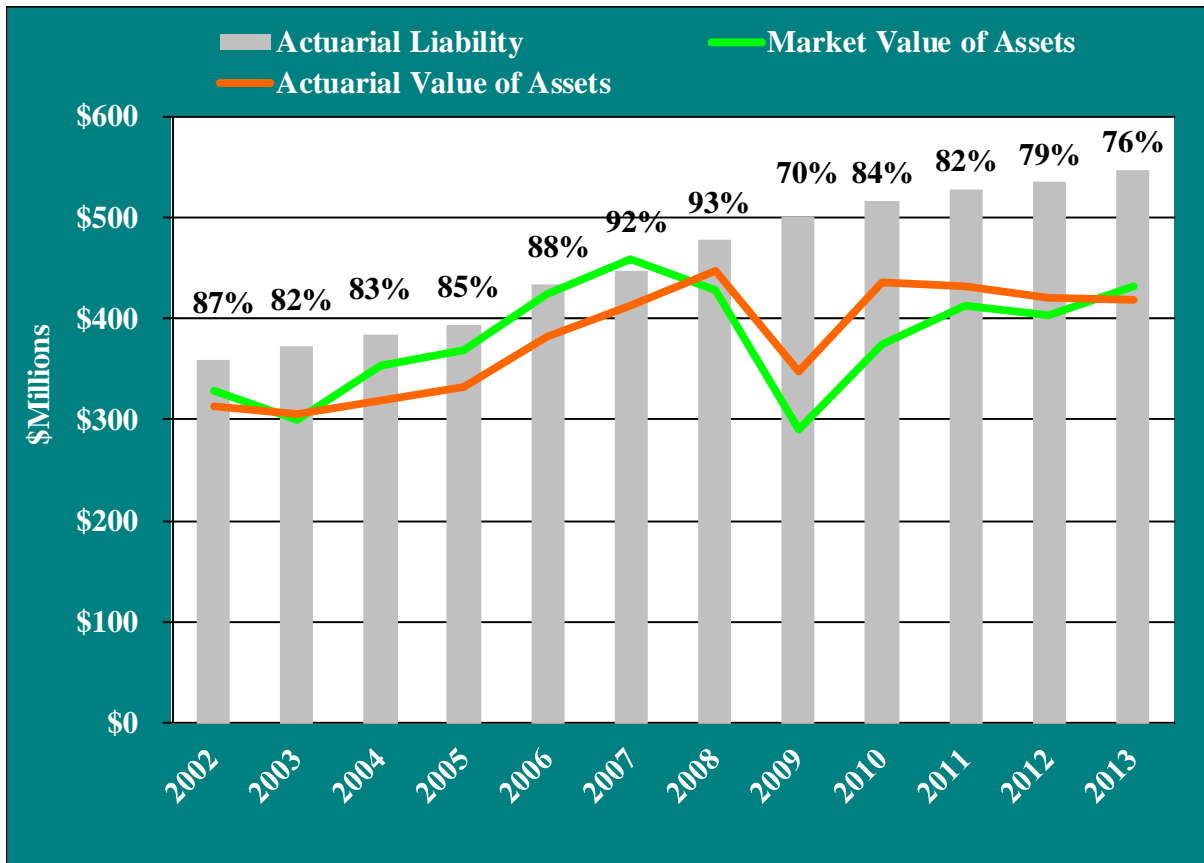


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Assets and Liabilities

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 decreasing over the past year to 76% due to the continued recognition of the prior market losses.

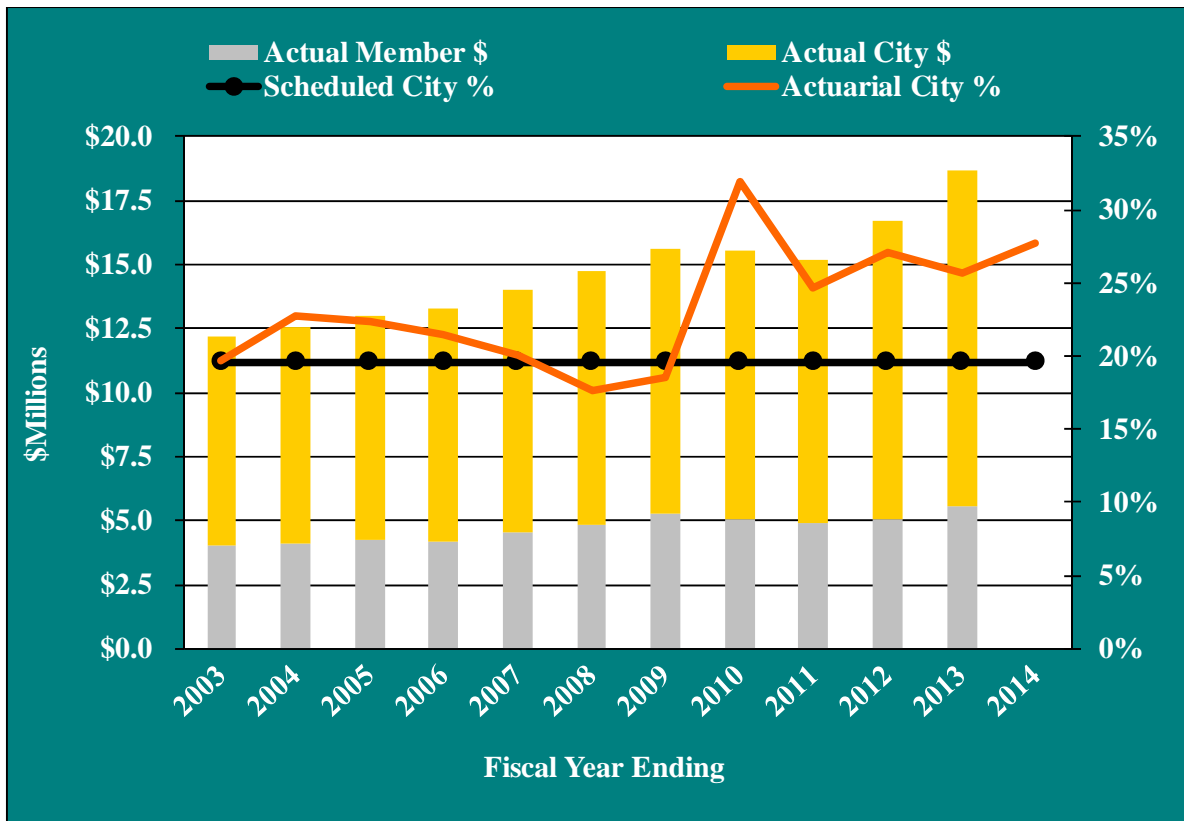


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**Contribution Rates**

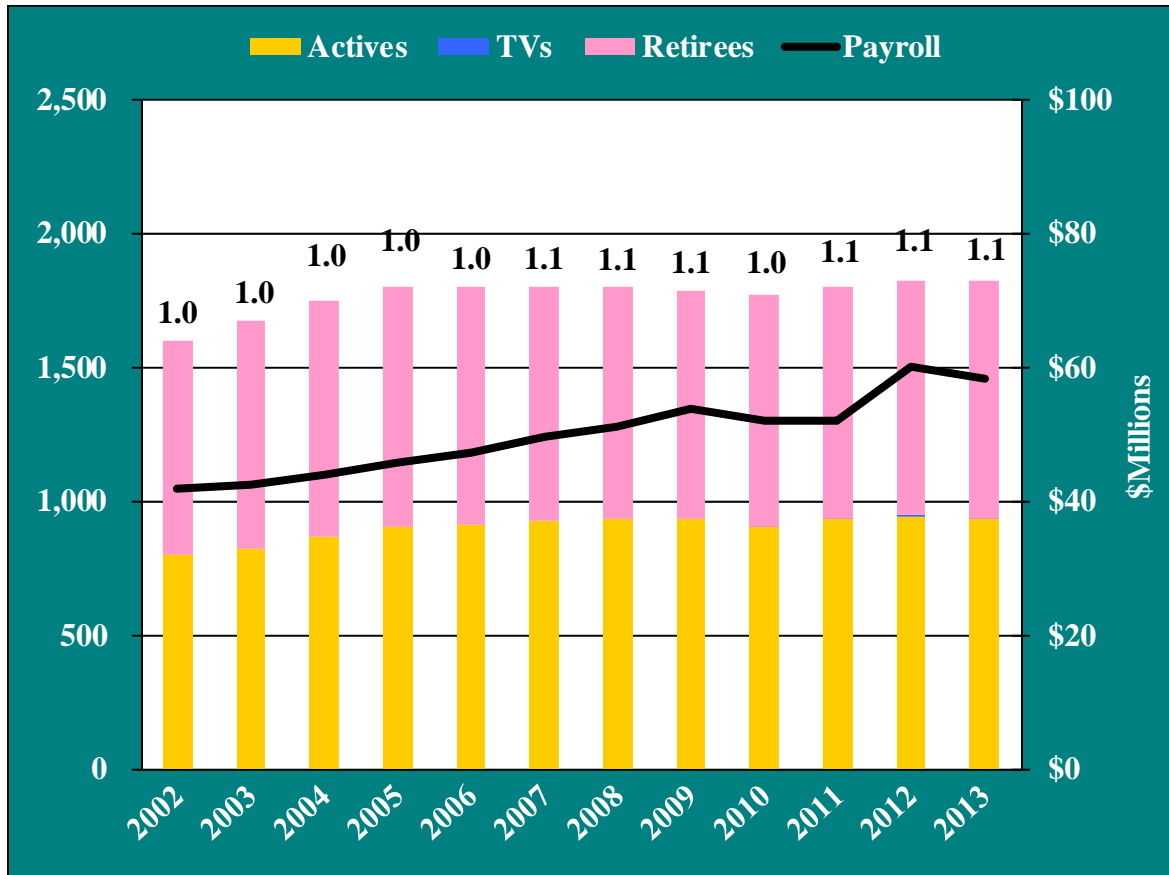
The stacked bars in this graph show the dollar amount of contributions made by the City and the members (depicted on the left hand scale) since Fiscal Year Ending 2002. The gold line shows the City's actuarial contribution rate as a percent of payroll (depicted on the right hand scale). The black line 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. The City contribution rate is currently scheduled to be 19.60% of payroll.



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**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 remains fairly consistent from 1.0 actives supporting each inactive member in 2002 to 1.1 actives supporting each inactive member today. The black line shows the total active participating payroll for each valuation year.

SECTION I  
 BOARD SUMMARY

**D. Future Expected Financial Trends**

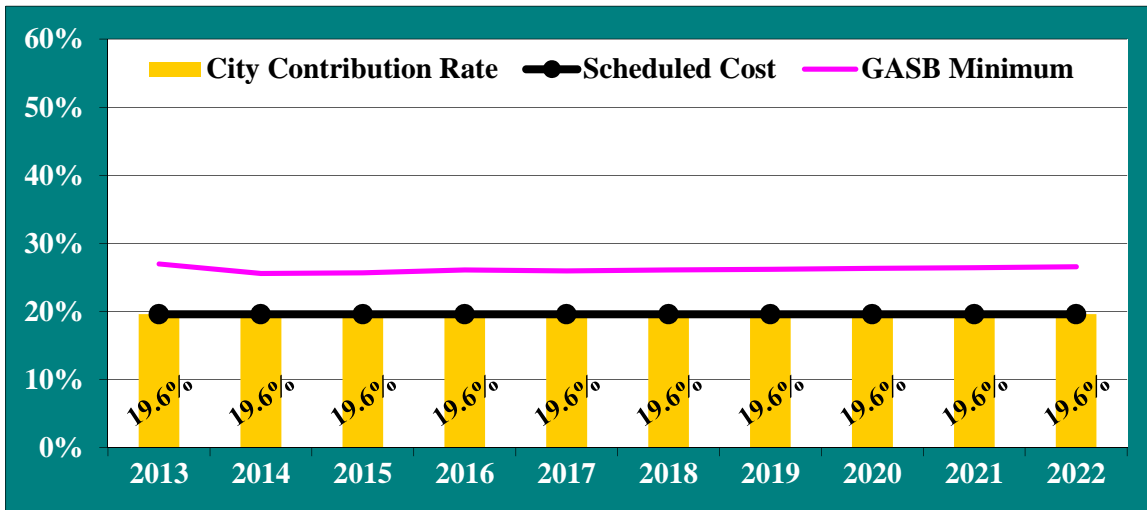
The analysis of projected financial trends is perhaps the most important component of this valuation. In this Section, we present the implications of the May 1, 2013 valuation results in terms of (1) the projected City's contributions and (2) projected System's funded status (ratio of assets over liabilities). For each projection set we assume three future different investment return scenarios: baseline returns of 7.75%, optimistic returns of 9.25%, and pessimistic returns of 6.25%. Finally, since the City has historically contributed on the basis of a "scheduled cost" of 19.60%, we also show the impact on these projections if the City were to contribute the actuarially computed rate that comes out of each valuation as described in Section IV. As can be seen in the charts that follow, the difference in the System's projected financial status, between paying the scheduled cost and the actuarially computed costs, are very dramatic.

**1. Contribution Rate Projections**

The first set of charts shows the City's scheduled cost (black line) which never changes, the GASB Minimum cost (pink line) which is Normal cost plus 30-year amortization of the UAL (shown for comparison purposes), and the actual City contribution rate (gold bars). The years shown in the charts are plan years beginning May 1<sup>st</sup>. (All projections of GASB Minimum are based upon the current GASB standards. See comments on page 2 regarding new GASB standards.)

a. Assuming the City always pays the scheduled cost:

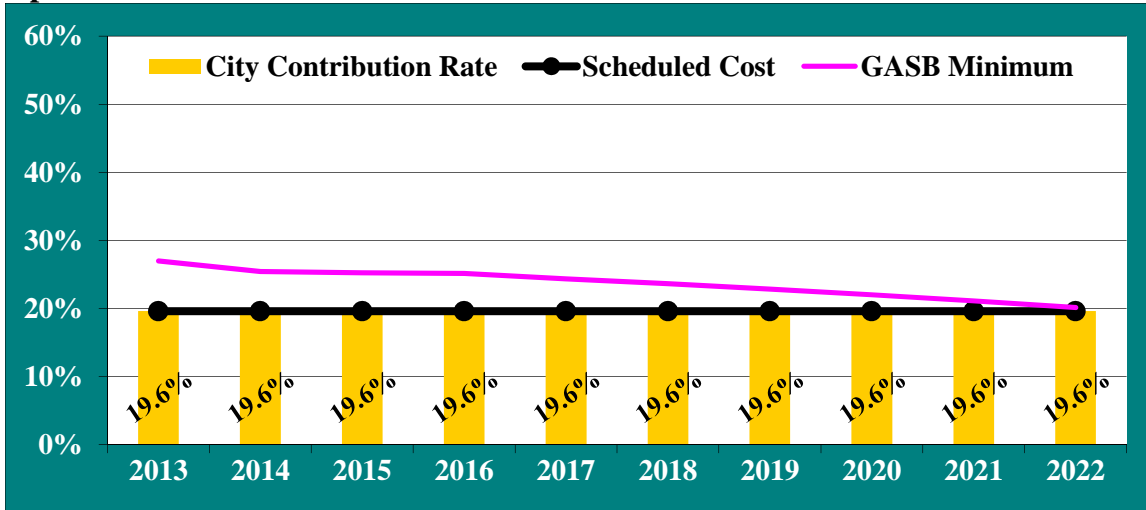
**Baseline Returns of 7.75%**



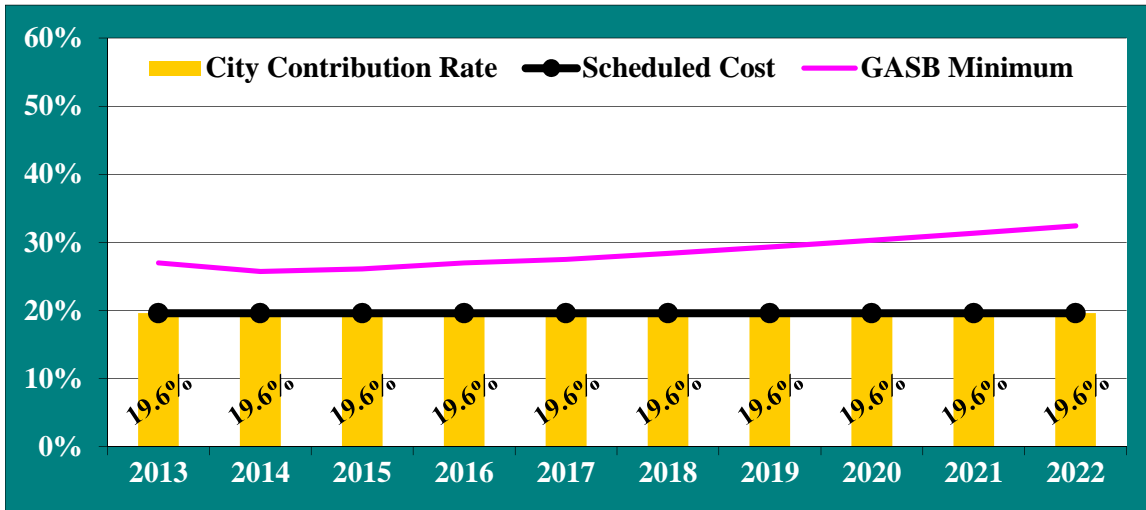
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Optimistic Returns of 9.25%



Pessimistic Returns of 6.25%

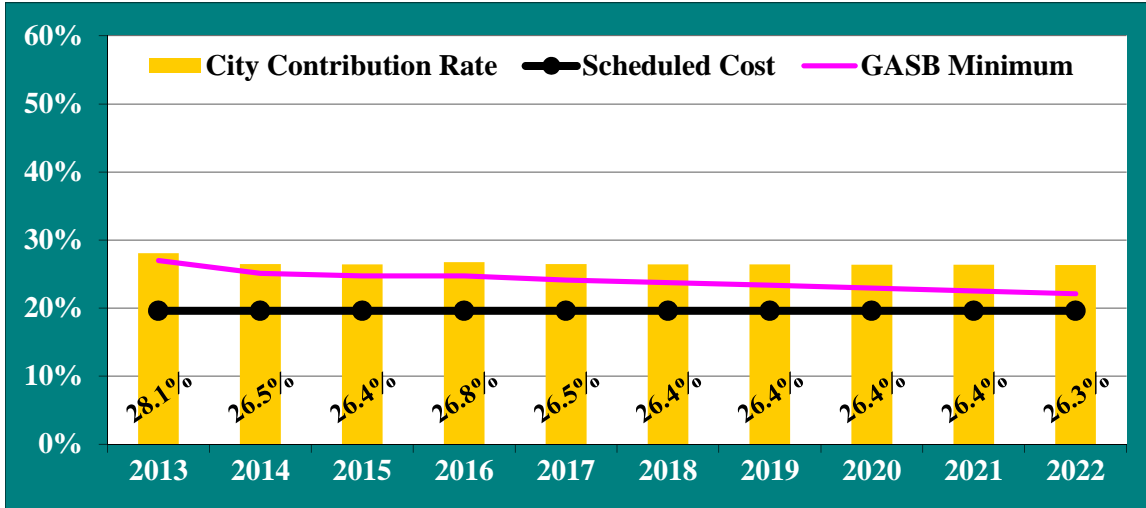


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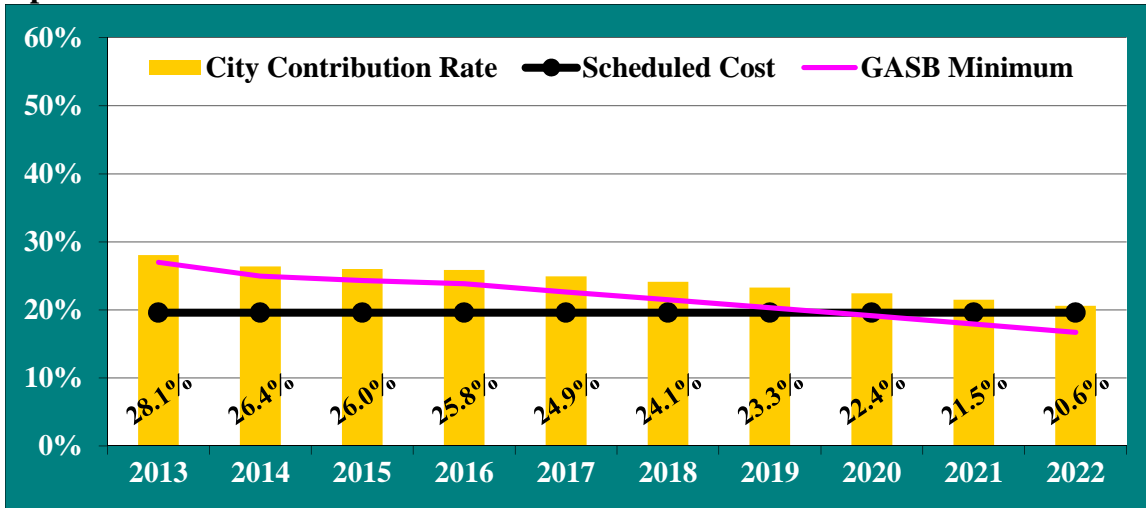
**SECTION I  
BOARD SUMMARY**

*b. Assuming the City always pays the actuarially computed contribution*

**Baseline Returns of 7.75%**



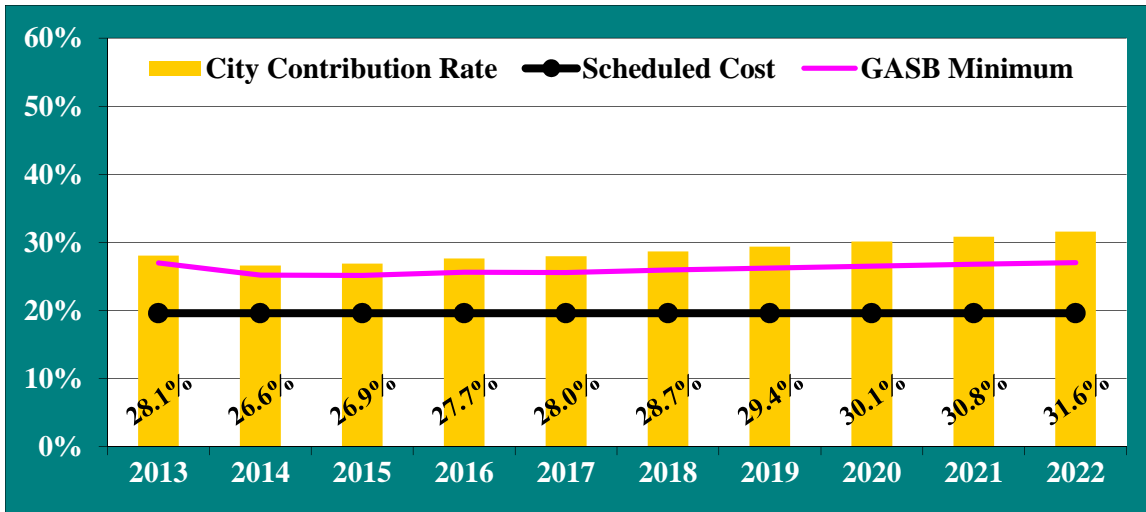
**Optimistic Returns of 9.25%**



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SECTION I  
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Pessimistic Returns of 6.25%



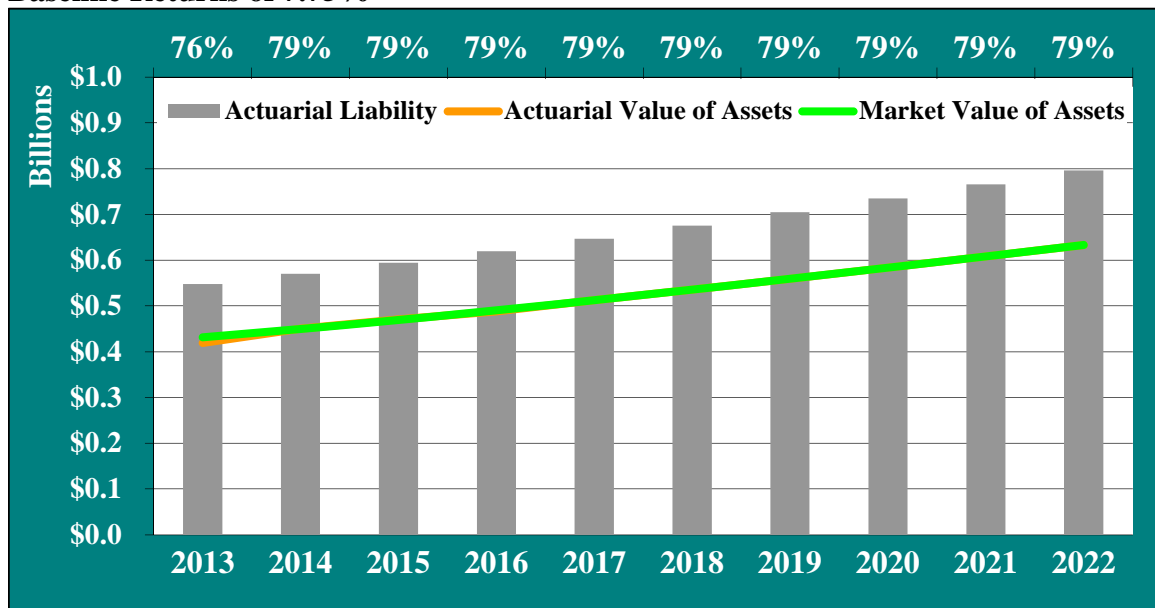
SECTION I  
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2. **Asset and Liability Projections:**

This next set of projection charts compare the market value of assets (green line) and the actuarial or smoothed value of assets (gold line) to the System's actuarial liabilities (gray bars). In addition at the top of each chart, we show 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<sup>st</sup>.

a. *Assuming the City always pays the scheduled cost*

**Baseline Returns of 7.75%**



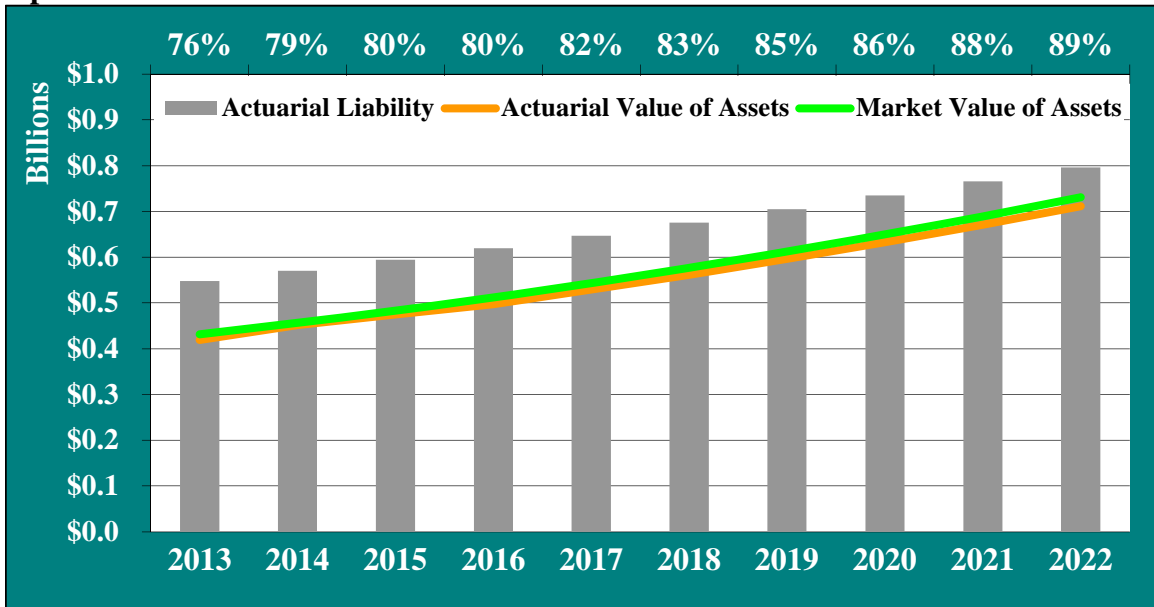
Under the assumption that the assets will earn the assumed rate of return of 7.75%, the funded ratio remains constant over the next 10 years. Contributions will need to be increased to sustain the fund over the long term, unless asset returns exceed the assumed rate.



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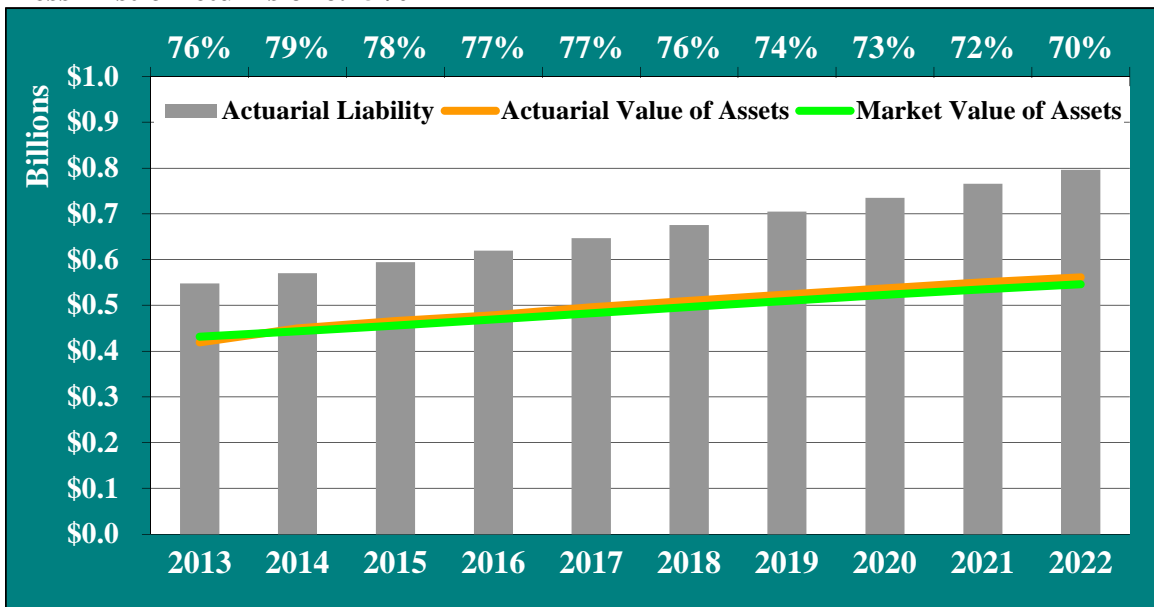
**SECTION I  
BOARD SUMMARY**

**Optimistic Returns of 9.25%**



If the assets earn 9.25% per year for the next 10 years (i.e., 1.5% above the assumed rate of return), the funded ratio will increase from 76% to 89%.

**Pessimistic Returns of 6.25%**



If the assets earn only 6.25% over the next 10 years (i.e., 1.5% below the assumed rate of return), the funded ratio would decline to 70% in that time period.

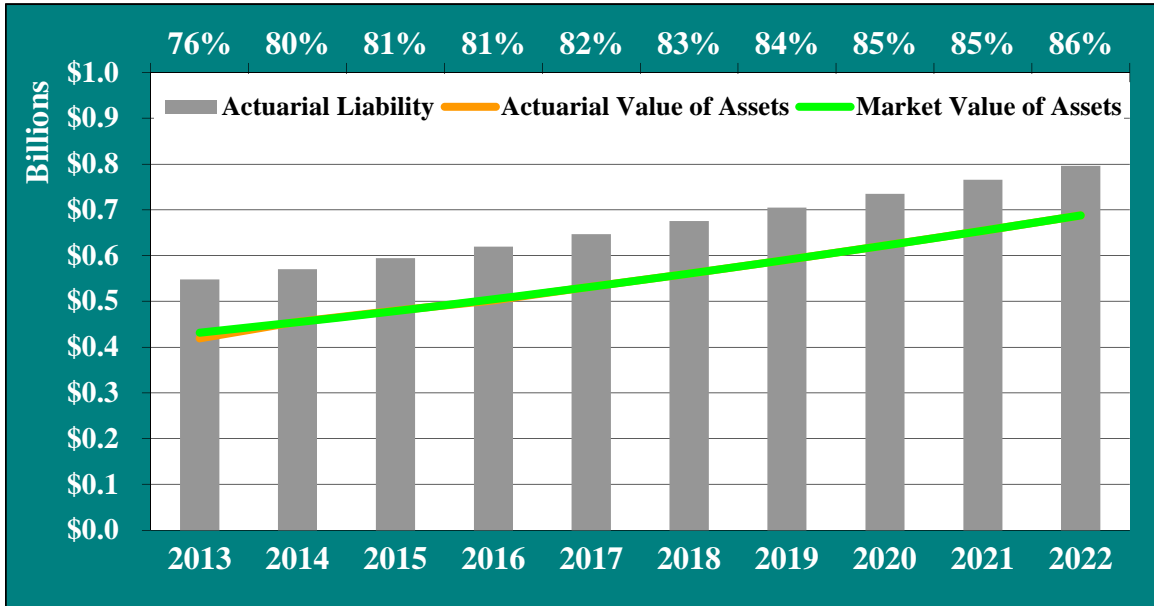
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*b. Assuming the City always pays the actuarially computed contribution*

If the City always pays the actuarially computed contribution, then the funded ratio would be expected to increase over the next 10 years as long as the asset return is at or above the assumed rate of 7.75%. However, for a return of 6.25% (i.e. 1.5% less than the assumed rate of return) the funded ratio would decrease over this time period. These observations are shown in the charts that follow.

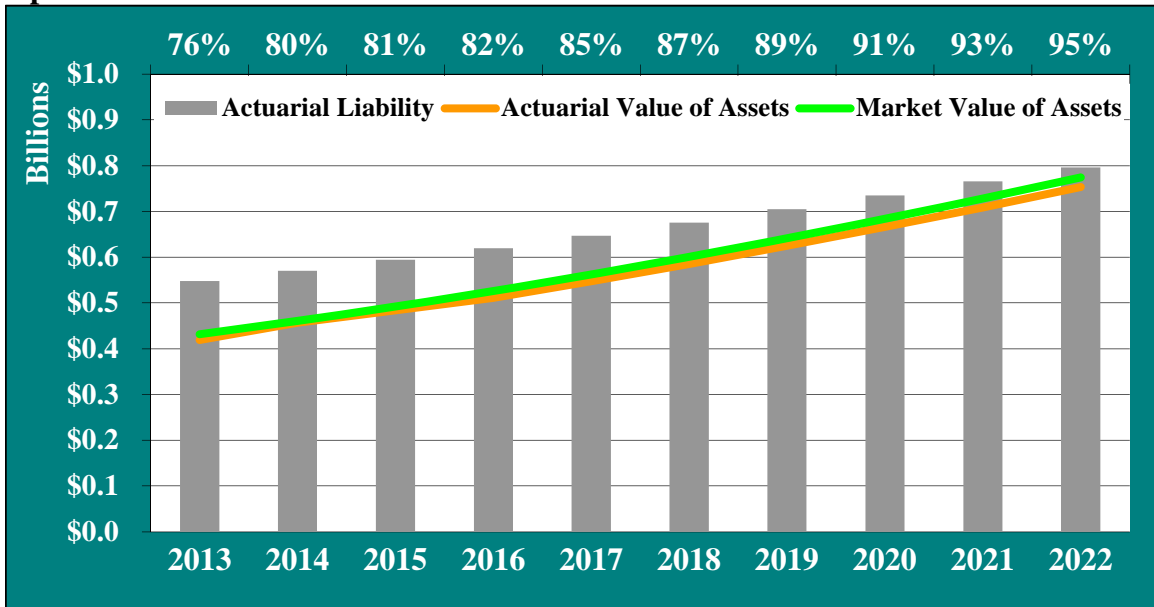
**Baseline Returns of 7.75%**



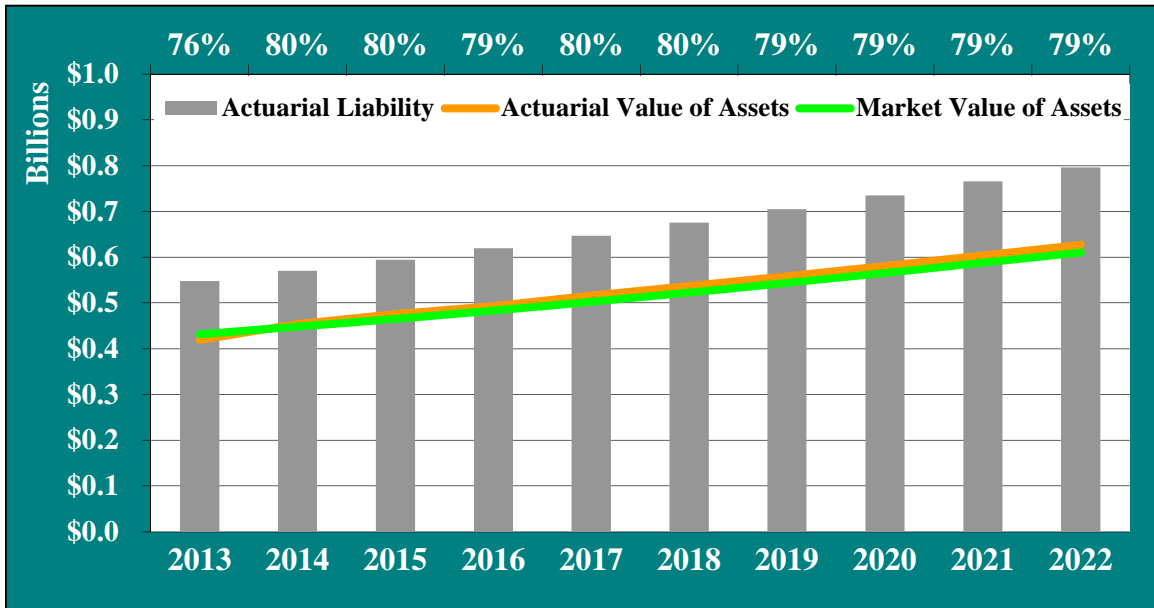
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**Optimistic Returns of 9.25%**



**Pessimistic Returns of 6.25%**



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**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 May 1, 2012 and May 1, 2013;
- 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, 2012 and April 30, 2013.

<b>Table II-1</b>			
<b>Statement of Assets at Market Value as of April 30,</b>			
<b>Assets</b>	<b>2012</b>	<b>2013</b>	<b>% Change</b>
Cash	\$ 12,006,159	\$ 10,323,698	(14.0%)
Stock and Collective Trusts	391,567,751	422,798,479	8.0%
Accounts Receivable	890,770	858,221	(3.7%)
Interest and Dividends Receivable	50,138	22,151	(55.8%)
Contributions Receivable	1,179,166	1,225,387	3.9%
Expenses Payable	(528,992)	(723,288)	36.7%
Purchase of Investments	(659,754)	(362,116)	(45.1%)
Health Assets	(2,049,534)	(2,282,294)	<u>11.4%</u>
<b>Market Value of Assets</b>	<u>\$ 402,455,704</u>	<u>\$ 431,860,238</u>	7.3%

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**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, 2012 and April 30, 2013.

<b>Table II-2</b>	
<b>Changes in Market Values</b>	
<b>Value of Assets – April 30, 2012</b>	<b>\$ 402,455,704</b>
<b><u>Additions</u></b>	
Member Contributions	\$ 5,576,812
Employer Contributions	13,120,169
Interest and Dividends	3,034,544
Investment Return	43,719,227
<b>Total Additions</b>	<b>\$ 65,450,752</b>
<b><u>Deductions</u></b>	
Benefit Payments	\$ (33,803,029)
Expenses	(2,243,189)
<b>Total Deductions</b>	<b>\$ (36,046,218)</b>
<b>Value of Assets – April 30, 2013</b>	<b>\$ 431,860,238</b>

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**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.

<b>Table II-3 Development of Actuarial Value of Assets</b>			
1. Actuarial Value of Assets at May 1, 2012			\$ 420,336,845
2. Employer and Employee Contributions			18,696,981
3. Benefit Payments			(33,803,029)
4. Net Cash Flow (2+3)			\$ (15,106,048)
5. Expected Value of investment return at 7.75%			32,001,668
6. Actual investment return on Market Value			44,510,582
7. Investment gain/(loss) for the year (6-5)			\$ 12,508,914
8. Investment gain/(loss) from current and prior years to be recognized in the plan year ending April 30, 2013			
Plan Year End	Total Gain/ (Loss)	Deferral Percentage	Deferred to Future Years
April 30, 2013	\$ 12,508,914	80%	\$ 10,007,131
April 30, 2012	(29,500,762)	60%	(17,700,457)
April 30, 2011	17,852,041	40%	7,140,816
April 30, 2010	68,503,925	20%	13,700,785
April 30, 2009	(161,966,630)	0%	0
Total	\$ (92,602,512)		\$ 13,148,275
9. Market Value of Assets for Year ending April 30, 2013			\$ 431,860,238
10. Preliminary Actuarial Value of Assets on May 1, 2013 (9 - 8 deferred)			418,711,963
11. 120% of MV, Upper Limit for Actuarial Value			\$ 518,232,286
12. 80% of MV, Lower Limit for Actuarial Value			345,488,190
13. Actuarial Value of Assets on May 1, 2013			\$ 418,711,963

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SECTION II  
ASSETS

Investment Performance

The market value of assets (MVA) returned 11.27% during 2013, which is higher than the assumed 7.75% return. A return of 3.27% on the actuarial value of assets (AVA) is primarily the result of the asset smoothing method, which includes the application of the corridor implemented in 2009, being utilized for the calculation of the actuarial value of assets.

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

<b>Fiscal Year Ending April 30,</b>	<b>Return on Market Value</b>	<b>Return on Actuarial Value</b>	<b>Assumed Return</b>
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%

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**SECTION II  
ASSETS**

**Projection of Plan's Future Cash Flows**

<b>Table II-5</b>				
<b>Projection of Plan's Expected Cash Flows (\$ thousands)</b>				
<b>Year</b>	<b>Expected</b>	<b>Expected</b>	<b>Expected</b>	<b>Net</b>
<b>Beginning</b>	<b>Benefit</b>	<b>Contributions*</b>	<b>Contributions*</b>	<b>Cash Flow</b>
<b>May 1,</b>	<b>Payments</b>			
2013	\$ (31,940)	\$ 17,011	\$	(14,929)
2014	(32,393)	17,521		(14,872)
2015	(33,178)	18,047		(15,131)
2016	(34,115)	18,588		(15,527)
2017	(35,342)	19,146		(16,196)
2018	(36,903)	19,720		(17,183)
2019	(38,734)	20,312		(18,422)
2020	(40,885)	20,921		(19,964)
2021	(43,137)	21,549		(21,588)
2022	(45,508)	22,195		(23,313)

\* Expected contributions include City contributions and Member contributions. For illustration purposes, we have assumed the City contribution rate will be based on the scheduled contribution rates and that payroll will increase at the actuarially assumed rate of 3.00% per year.



### 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, 2012 and May 1, 2013;
- 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 All 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 and GASB disclosures, 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, 2013

**SECTION III  
LIABILITIES**

**Table III-1**

**Liabilities Net (Surplus)/Unfunded**

**May 1, 2012**

**May 1, 2013**

**Present Value of Future Benefits**

Active Participant Benefits	\$ 366,025,661	\$ 354,835,519
Retiree and Inactive Benefits	311,907,404	333,764,257
<b>Present Value of Future Benefits (PVB)</b>	<b>\$ 677,933,065</b>	<b>\$ 688,599,776</b>

**Actuarial Liability**

Present Value of Future Benefits (PVB)	\$ 677,933,065	\$ 688,599,776
Present Value of Future Normal Costs (PVFNC)	142,717,956	140,811,877
<b>Actuarial Liability (AAL = PVB – PVFNC)</b>	<b>535,215,109</b>	<b>547,787,899</b>
Actuarial Value of Assets (AVA)	420,336,845	418,711,963
<b>Net (Surplus)/Unfunded (AL – AVA)</b>	<b>\$ 114,878,264</b>	<b>\$ 129,075,936</b>

**Present Value of Accrued Benefits**

Present Value of Future Benefits (PVB)	\$ 677,933,065	\$ 688,599,776
Present Value of Future Benefit Accruals (PVFBA)	193,384,414	187,439,834
<b>Present Value of Accrued Benefits (PVAB = PVB – PVFBA)</b>	<b>484,548,651</b>	<b>501,159,942</b>
Market Value of Assets (MVA)	402,455,704	431,860,238
<b>Net Unfunded/(Surplus)</b>	<b>\$ 82,092,947</b>	<b>\$ 69,299,704</b>

**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, 2012 and May 1, 2013.

<b>Table III-2</b>	
	<b>Actuarial Liability</b>
Liabilities May 1, 2012	\$ 535,215,109
Liabilities May 1, 2013	547,787,899
Liability Increase/(Decrease)	12,572,790
Change Due to:	
Plan Amendments	0
Assumption Changes	0
Actuarial (Gain)/Loss	(7,123,936)
Benefits Accumulated and Other Sources	19,696,726

**CITY OF KANSAS CITY, MISSOURI FIREFIGHTERS' PENSION SYSTEM  
ACTUARIAL VALUATION AS OF MAY 1, 2013**

**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.

<b>Table III-3 (Gain)/Loss by Source as of May 1, 2013</b>	
Turnover	\$ (836)
Retirement	856,040
Disability	(1,928,237)
Pre-retirement mortality	40,054
Post-retirement mortality	(2,129,175)
Salary increase more/(less) than expected for continuing actives	(6,313,427)
New entrants	177,830
Data Composition & Miscellaneous changes	2,173,815
<b>Total (Gain)/Loss</b>	<b>\$ (7,123,936)</b>

<b>Table III-4 Historical Liability (Gains)/losses (\$ Millions)</b>					
<b>Change due to:</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>
Turnover	\$0.3	\$0.1	\$0.7	\$0.3	\$0.0
Retirement	(\$2.6)	(\$3.6)	(\$3.5)	(\$1.8)	\$0.8
Disability	\$0.3	\$2.7	\$0.2	(\$1.6)	(\$1.9)
Pre-retirement mortality	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Post-retirement mortality	(\$1.1)	\$1.8	(\$1.5)	(\$0.7)	(\$2.1)
Salary Change	\$0.1	(\$6.9)	(\$7.6)	\$17.5	(\$6.3)
New entrants	\$0.5	\$0.0	\$0.5	\$0.6	\$0.2
Miscellaneous	<u>\$0.7</u>	<u>(\$2.0)</u>	<u>\$0.2</u>	<u>\$2.3</u>	<u>\$2.2</u>
<b>Total (Gain)/Loss</b>	<b>(\$1.8)</b>	<b>(\$7.9)</b>	<b>(\$11.0)</b>	<b>\$16.6</b>	<b>(\$7.1)</b>

**CITY OF KANSAS CITY, MISSOURI FIREFIGHTERS' PENSION SYSTEM  
ACTUARIAL VALUATION AS OF MAY 1, 2013**

**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 two primary components to the total contribution: the **normal cost rate (employee and employer)**, 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 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.

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.

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

<b>Table IV-1</b>		
<b>Employer Contribution Rate</b>		
	<b>FY ending 2013</b>	<b>FY ending 2014</b>
Entry Age Normal Cost Rate	13.24%	13.19%
Amortization Payment	12.40%	14.54%
Actuarially Determined Contribution	25.64%	27.73%

CITY OF KANSAS CITY, MISSOURI FIREFIGHTERS' PENSION SYSTEM  
ACTUARIAL VALUATION AS OF MAY 1, 2013

**SECTION IV  
CONTRIBUTIONS**

<b>Table IV -2</b>	
<b>Development of Plan Contribution Rate as of May 1, 2013</b>	
	<b>As % of Payroll*</b>
1. Normal Cost (Monthly):	
a. Total Normal Cost	22.74%
b. Expected Members Contribution	9.55%
c. Employer Paid Normal Cost (a) - (b)	13.19%
2. Amortization of Unfunded Liability (see Table IV-3 below)	27.73%
3. Total Employer Contribution Rate (1) + (2)	27.73%
4. Scheduled City Contributions (19.6% of payroll)	19.60%

\* Total payroll is \$58,356,072, and the annual required contribution for plan year ending April 30, 2013 is \$16,182,139 based on the total employer contribution rate.

<b>TABLE IV-3</b>							
<b>Unfunded Actuarial Liability Amortization Schedule</b>							
<b>Item</b>	<b>Date Created</b>	<b>Initial Years</b>	<b>Initial Balance</b>	<b>Remaining Years</b>	<b>Outstanding Balance</b>	<b>Amortization Payment</b>	<b>Amortization Factor</b>
Initial UAL	5/1/2008	30	\$ 31,525,386	25	\$ 33,016,582	\$ 2,226,533	14.829
(Gain)/Loss*	5/1/2009	30	119,805,172	26	124,662,443	8,214,990	15.175
(Gain)/Loss*	5/1/2010	30	(72,293,282)	27	(74,626,449)	(4,812,738)	15.506
(Gain)/Loss*	5/1/2011	30	14,027,641	28	14,345,506	906,654	15.822
(Gain)/Loss*	5/1/2012	30	50,231,264	29	50,826,769	3,152,056	16.125
Assumption Change	5/1/2012	30	(32,090,739)	29	(32,471,183)	(2,013,722)	16.125
(Gain)/Loss*	5/1/2013	30	13,322,268	30	13,322,268	811,635	16.414
<b>Total</b>					<b>\$ 129,075,936</b>	<b>\$ 8,485,408</b>	

\*Also included differences between the Annual Required Contribution and the actual contributions made.

**SECTION V**  
**ACCOUNTING STATEMENT INFORMATION**

Topic 960 of the Financial Accounting Standards Board requires the System to disclose certain information regarding its funded status. Statement No. 25 of the Governmental Accounting Standards Board (GASB) establishes standards for disclosure of pension information by public employee retirement systems (PERS) and governmental employers in notes to financial statements and supplementary information.

The Topic 960 disclosures provide a quasi “snap shot” view of how the System’s assets compare to its liabilities if contributions stopped and accrued benefit claims had to be satisfied. However, due to potential legal requirements and the possibility that alternative interest rates would have to be used to determine the liabilities, these values may not be a good indication of the amount of money it would take to buy the benefits for all members if the System were to terminate.

The GASB-25 actuarial liability is the same as the actuarial liability amount calculated for funding purposes.

Both the present value of accrued benefits (Topic 960) and the actuarial liability (GASB-25) are determined assuming that the System is on-going and participants continue to terminate employment, retire, etc., in accordance with the actuarial assumptions. Liabilities are discounted at the assumed valuation interest rate of 7.75% per annum.

Topic 960 specifies that a comparison of the present value of accrued (accumulated) benefits with the market value of the assets as of the valuation date must be provided. GASB Statement No. 25 requires the actuarial liability be compared with the actuarial value of assets for funding purposes. The relevant amounts as of May 1, 2013 are exhibited in Table V-1. Finally, Table V-2 reconciles the Topic 960 liabilities determined as of the prior valuation, May 1, 2012, to the liabilities as of May 1, 2013.

Tables V-3 through V-5 are exhibits to be used with the CAFR report. Table V-3 is the Note to Required Supplementary Information, Table V-4 is a history of gains and losses in actuarial liability, and Table V-5 is the Solvency Test which shows the portion of actuarial liability covered by assets.

Finally, Tables V-6 and V-7 are additional GASB supplemental exhibits. Table V-6 shows historical GASB Annual Required Contribution information, compared to what the City actually contributed. Table V-7 shows historical unfunded actuarial liability (UAL) information, funding ratios, and the UAL as a percent of payroll.

CITY OF KANSAS CITY, MISSOURI FIREFIGHTERS' PENSION SYSTEM  
ACTUARIAL VALUATION AS OF MAY 1, 2013

**SECTION V**  
**ACCOUNTING STATEMENT INFORMATION**

<b>Table V-1</b>		
<b>Accounting Statement Information</b>		
	<b>May 1, 2012</b>	<b>May 1, 2013</b>
<b>A. Topic 960 Basis</b>		
1. Present Value of Benefits Accrued to Date		
a. Members Currently Receiving Payments	\$ 311,482,455	\$ 333,255,278
b. Former Vested Members	424,949	508,979
d. Active Members	<u>172,641,247</u>	<u>167,395,685</u>
2. Total Present Value of Accrued Benefits (1a + 1b + 1c)	\$ 484,548,651	\$ 501,159,942
3. Assets at Market Value	<u>402,455,704</u>	<u>\$431,860,238</u>
4. Unfunded Present Value of Accrued Benefits (2 - 3)	\$ 82,092,947	\$ 69,299,704
5. Ratio of Assets to Present Value of Benefits (3 / 2)	83.1%	86.2%
<b>B. GASB No. 25 Basis</b>		
1. Actuarial Liabilities for retirees and beneficiaries	\$ 311,907,404	\$ 333,764,257
2. Actuarial Liabilities for current employees	<u>223,307,705</u>	<u>214,023,642</u>
3. Total Actuarial Liability (1 + 2)	\$ 535,215,109	\$ 547,787,899
4. Net Actuarial Assets available for benefits	<u>420,336,845</u>	<u>418,711,963</u>
5. Unfunded Actuarial Liability (3 - 4)	\$ 114,878,264	\$ 129,075,936



**CITY OF KANSAS CITY, MISSOURI FIREFIGHTERS' PENSION SYSTEM  
ACTUARIAL VALUATION AS OF MAY 1, 2013**

**SECTION V  
ACCOUNTING STATEMENT INFORMATION**

<b>Table V-2</b>	
<b>Statement of Changes in Total Actuarial Present Value of All Accrued Benefits</b>	
	<b>Accumulated Benefit Obligation</b>
Actuarial Present Value of Accrued Benefits as of April 30, 2012	\$ 484,548,651
Increase/(Decrease) During Years Attributable to:	
Passage of Time and Gains/Losses	\$ 36,965,240
Benefit Paid – FY 2013	(33,803,029)
Assumption Change	-
Benefits Accrued	13,449,080
Net Increase/(Decrease)	\$ 16,611,291
Actuarial Present Value of Accrued Benefits as of April 30, 2013	\$ 501,159,942

CITY OF KANSAS CITY, MISSOURI FIREFIGHTERS' PENSION SYSTEM  
ACTUARIAL VALUATION AS OF MAY 1, 2013

**SECTION V**  
**ACCOUNTING STATEMENT INFORMATION**

**Table V-3**  
**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, 2013
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 25.8 years
Asset valuation method	5-year smoothed market
Actuarial assumptions:	
Investment rate of return	7.75%
Projected salary increases	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 rate of employer contributions to the System is composed of the normal cost 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 funds accumulated as of the same date is the unfunded actuarial liability.

CITY OF KANSAS CITY, MISSOURI FIREFIGHTERS' PENSION SYSTEM  
ACTUARIAL VALUATION AS OF MAY 1, 2013

**SECTION V**  
**ACCOUNTING STATEMENT INFORMATION**

**Table V-4**

**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)*

<b>Type of Activity</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>
Investment Income <sup>1</sup>	\$ 12,418	\$ (121,621)	\$ 64,430	\$ (25,060)	\$ (33,605)	\$ (20,446)
Combined Liability Experience	<u>3,634</u>	<u>1,816</u>	<u>7,863</u>	<u>11,032</u>	<u>(16,627)</u>	<u>7,124</u>
Gain/(or loss) during Year from Financial Experience	\$ 16,052	\$ (119,805)	\$ 72,293	\$ (14,028)	\$ (50,232)	\$ (13,322)
Non-Recurring Gain/(or Loss) Items	<u>(13,468)</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>32,091</u>	<u>0</u>
Composite Gain/(or Loss) during Year	\$ 2,584	\$ (119,805)	\$ 72,293	\$ (14,028)	\$ (18,141)	\$ (13,322)

<sup>1</sup> Investment experience includes the differences in actual and recommended contributions

CITY OF KANSAS CITY, MISSOURI FIREFIGHTERS' PENSION SYSTEM  
ACTUARIAL VALUATION AS OF MAY 1, 2013

SECTION V  
ACCOUNTING STATEMENT INFORMATION

Table V-5 Solvency Test Aggregate Actuarial Liabilities for <i>(expressed in thousands)</i> Active							
Valuation Date May 1,	Active	Retirees & Beneficiaries	Member Employer	Actuarial Value of	Portion of Actuarial Liabilities Covered by Reported Assets		
	Member Contributions (1)		Financed Contributions (3)	Reported Assets	(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%

CITY OF KANSAS CITY, MISSOURI FIREFIGHTERS' PENSION SYSTEM  
ACTUARIAL VALUATION AS OF MAY 1, 2013

SECTION V  
ACCOUNTING STATEMENT INFORMATION

<b>Table V-6</b>				
<b>Supplementary Information Required by GASB - Schedule of City Contributions</b>				
<b>Plan Year Ended April 30</b>	<b>Annual Required Contributions*</b>	<b>Actual Contributions</b>	<b>Percentage Contributed</b>	
2005	\$ 9,808,923	\$ 8,743,431	89.1%	
2006	9,807,644	9,087,549	92.7%	
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	--	--	

*\*The annual required contribution for the plan years ended April 30, 2005 and beyond is based on the the actuarially computed contribution. The actuarially computed contribution for the current year is described in Section IV, Table IV-2.*

CITY OF KANSAS CITY, MISSOURI FIREFIGHTERS' PENSION SYSTEM  
ACTUARIAL VALUATION AS OF MAY 1, 2013

SECTION V  
ACCOUNTING STATEMENT INFORMATION

**Table V-7**  
**Supplementary Information Required by GASB - 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)
5/1/2004	\$318,841,561	\$384,247,836	\$65,406,275	82.98%	\$43,920,060	148.92%
5/1/2005	\$332,415,711	\$392,856,425	\$60,440,714	84.62%	\$45,700,578	132.25%
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%

\* Not less than zero.

CITY OF KANSAS CITY, MISSOURI FIREFIGHTERS' PENSION SYSTEM  
ACTUARIAL VALUATION AS OF MAY 1, 2013

**APPENDIX A**  
**MEMBERSHIP INFORMATION**

<b>Kansas City Firefighters' Pension System</b>			
<b>Table of Plan Coverage</b>			
	<b>5/1/2012</b>	<b>5/1/2013</b>	<b>% change</b>
<b>Active Members in Valuation</b>			
Number	944	934	-1.06%
Average Age	39.74	39.60	-0.35%
Average Service	13.71	13.47	-1.75%
Total Payroll	\$ 60,062,558	\$ 58,356,072	-2.84%
Average Anticipated Payroll	\$ 63,626	\$ 62,480	-1.80%
Account Balance	\$ 70,049,108	\$ 69,614,346	-0.62%
Eligible to Retire on:			
Normal Pension	89	76	-14.61%
Deferred Pension	<u>455</u>	<u>484</u>	6.37%
Total Active Vested Members	544	560	2.94%
<b>Vested Terminated Members</b>	1	1	0.00%
<b>Deaths During the Plan Year</b>	25	39	56.00%
<b>Pensioners:</b>			
Number in Pay Status*			
Retirees	561	576	2.67%
Duty Disabled Retirees	72	69	-4.17%
Non-duty Disabled Retirees	<u>15</u>	<u>15</u>	0.00%
<b>Total</b>	<b>648</b>	<b>660</b>	1.85%
Average Age	67.88	67.89	0.01%
Average Monthly Benefit	\$ 3,251	\$ 3,410	4.89%
<b>Beneficiaries in Pay Status**</b>	228	226	-0.88%
<b>Members Due Refunds</b>	8	12	50.00%
<b>New Disabilities</b>	3	1	-66.67%

\* 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, 2013

APPENDIX A  
MEMBERSHIP INFORMATION

**Kansas City Firefighters' Pension Plan Distribution of Active Members  
by Age and Service as of May 1, 2013**

COUNTS BY AGE/SERVICE

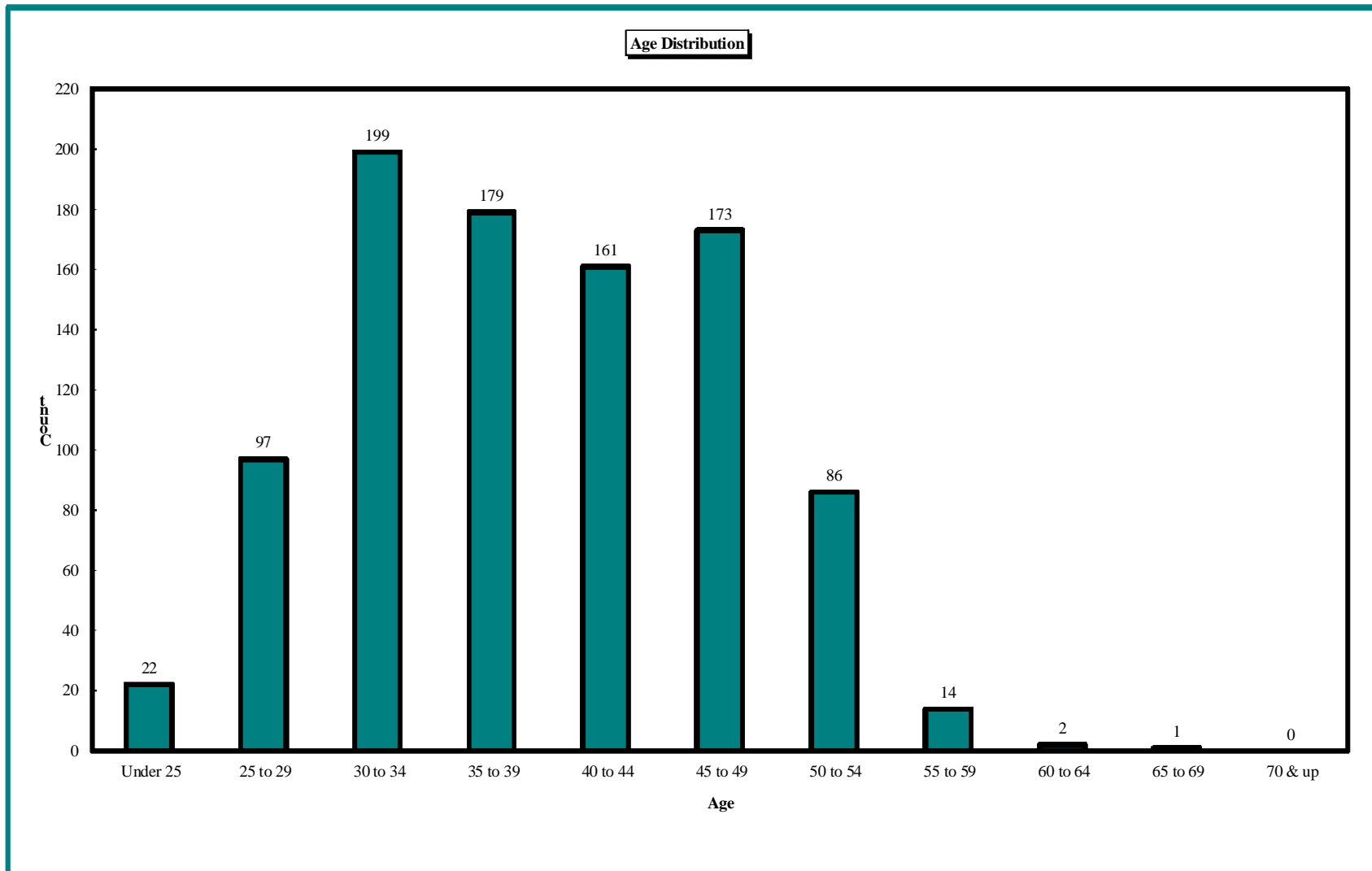
Age	Service										Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & up	
Under 25	10	12	0	0	0	0	0	0	0	0	22
25 to 29	18	47	32	0	0	0	0	0	0	0	97
30 to 34	5	42	114	38	0	0	0	0	0	0	199
35 to 39	0	5	81	56	36	1	0	0	0	0	179
40 to 44	0	0	5	54	69	33	0	0	0	0	161
45 to 49	0	0	1	19	54	72	27	0	0	0	173
50 to 54	0	0	2	4	9	37	31	2	1	0	86
55 to 59	0	0	0	1	0	0	5	2	6	0	14
60 to 64	0	0	0	0	1	0	0	0	1	0	2
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
<b>Total</b>	<b>33</b>	<b>106</b>	<b>235</b>	<b>172</b>	<b>169</b>	<b>143</b>	<b>63</b>	<b>4</b>	<b>8</b>	<b>1</b>	<b>934</b>



CITY OF KANSAS CITY, MISSOURI FIREFIGHTERS' PENSION SYSTEM  
ACTUARIAL VALUATION AS OF MAY 1, 2013

APPENDIX A  
MEMBERSHIP INFORMATION

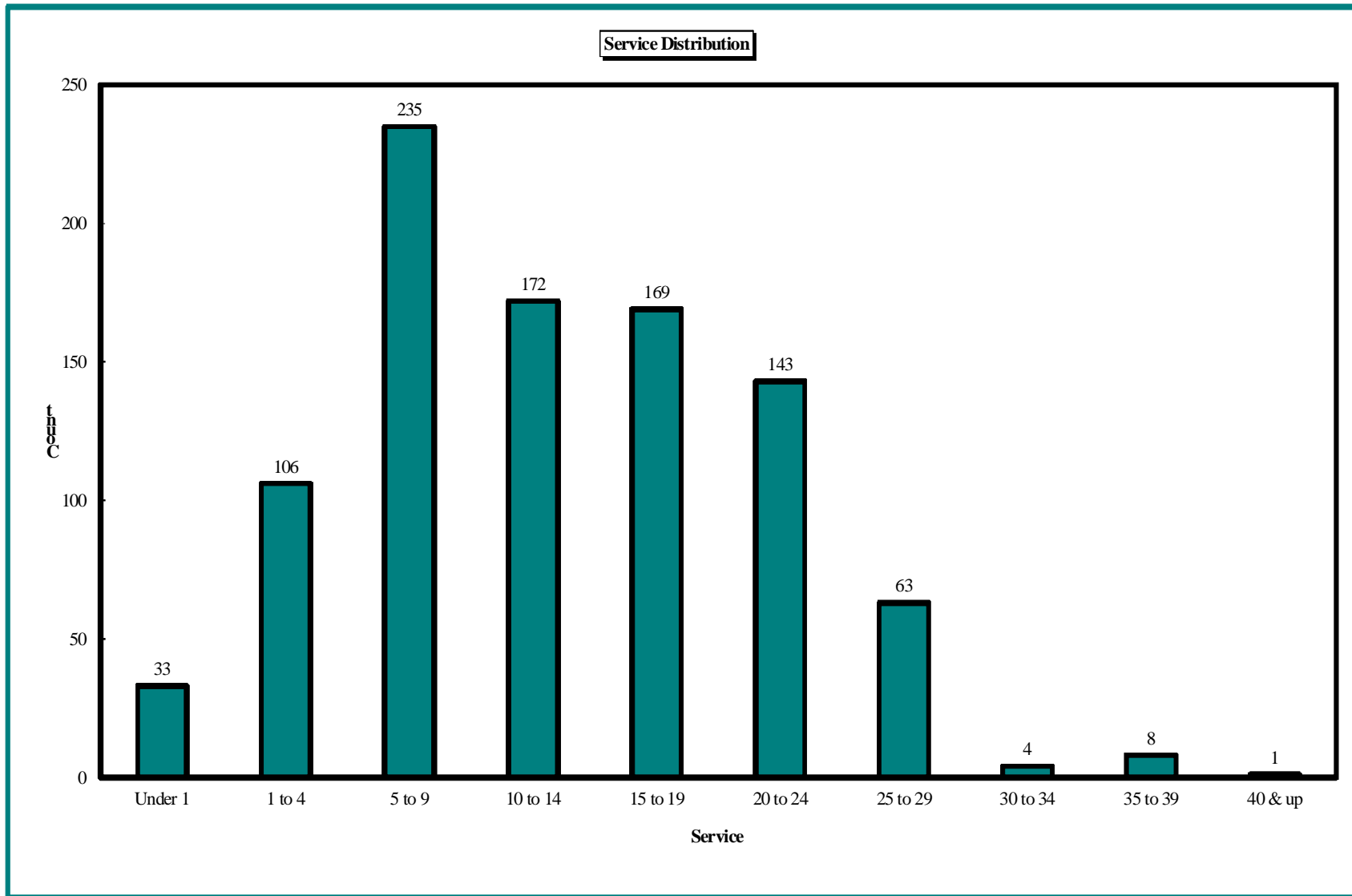
**Kansas City Firefighters' Pension Plan Distribution of Active Members  
by Age as of May 1, 2013**



CITY OF KANSAS CITY, MISSOURI FIREFIGHTERS' PENSION SYSTEM  
ACTUARIAL VALUATION AS OF MAY 1, 2013

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**Kansas City Firefighters' Pension Plan Distribution of Active Members  
by Service as of May 1, 2013**



CITY OF KANSAS CITY, MISSOURI FIREFIGHTERS' PENSION SYSTEM  
ACTUARIAL VALUATION AS OF MAY 1, 2013

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**Kansas City Firefighters' Pension Plan Distribution of Active Members  
by Age and Service as of May 1, 2013**

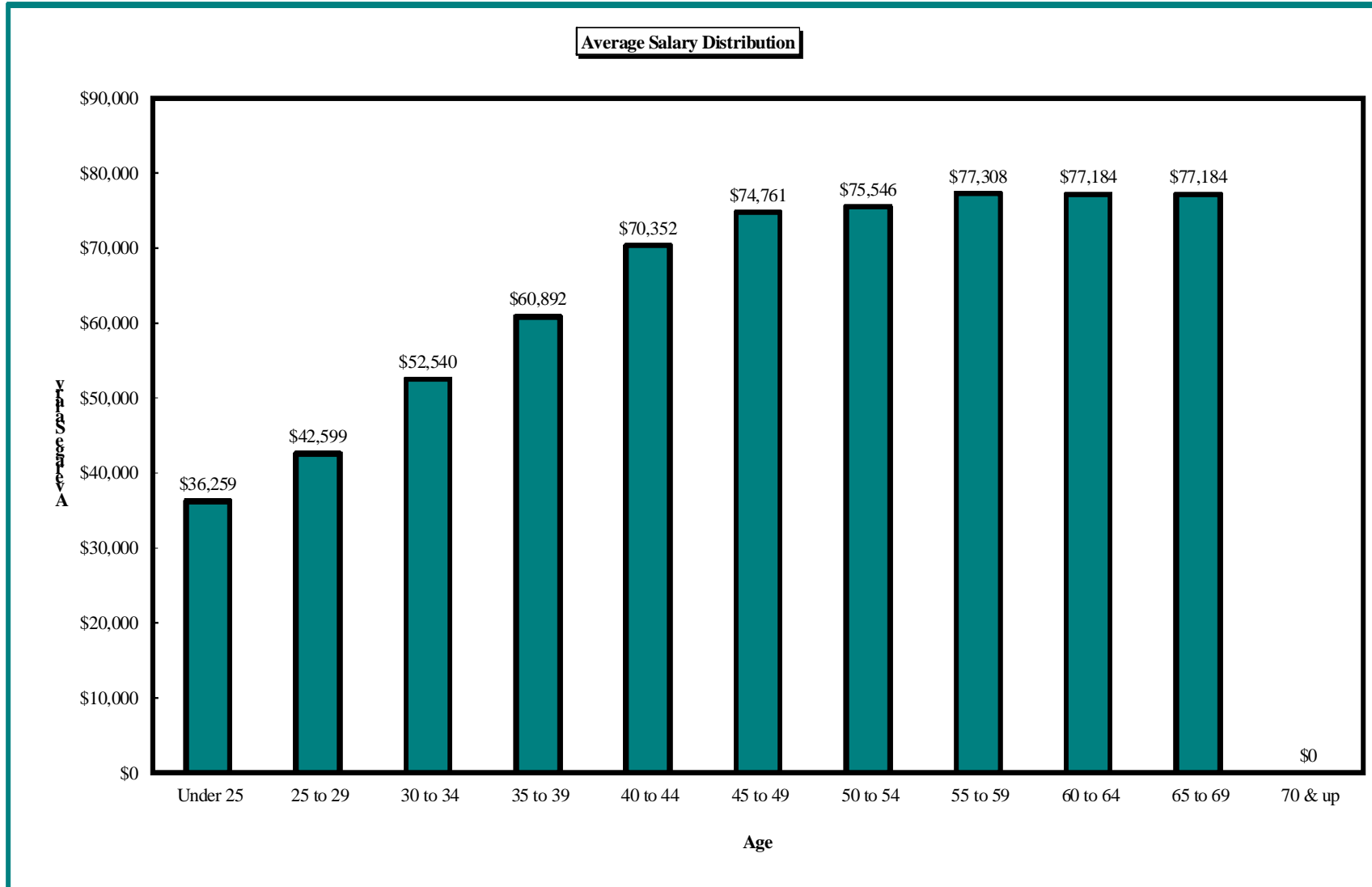
AVERAGE SALARY BY AGE/SERVICE

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	\$33,888	\$38,234	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$36,259
25 to 29	\$33,888	\$40,808	\$50,129	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$42,599
30 to 34	\$33,888	\$41,560	\$54,414	\$61,506	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$52,540
35 to 39	\$0	\$48,864	\$55,101	\$62,247	\$73,034	\$77,184	\$0	\$0	\$0	\$0	\$0	\$60,892
40 to 44	\$0	\$0	\$56,731	\$63,297	\$73,405	\$77,575	\$0	\$0	\$0	\$0	\$0	\$70,352
45 to 49	\$0	\$0	\$57,108	\$62,546	\$72,640	\$76,568	\$83,436	\$0	\$0	\$0	\$0	\$74,761
50 to 54	\$0	\$0	\$60,876	\$64,191	\$71,004	\$75,658	\$78,546	\$83,970	\$77,184	\$0	\$0	\$75,546
55 to 59	\$0	\$0	\$0	\$70,632	\$0	\$0	\$80,386	\$73,908	\$76,988	\$0	\$0	\$77,308
60 to 64	\$0	\$0	\$0	\$0	\$77,184	\$0	\$0	\$0	\$77,184	\$0	\$0	\$77,184
65 to 69	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$77,184	\$0	\$77,184
70 & up	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>Total</b>	\$33,888	\$41,195	\$54,183	\$62,540	\$72,976	\$76,569	\$80,788	\$78,939	\$77,037	\$77,184	\$0	\$62,480

CITY OF KANSAS CITY, MISSOURI FIREFIGHTERS' PENSION SYSTEM  
ACTUARIAL VALUATION AS OF MAY 1, 2013

APPENDIX A  
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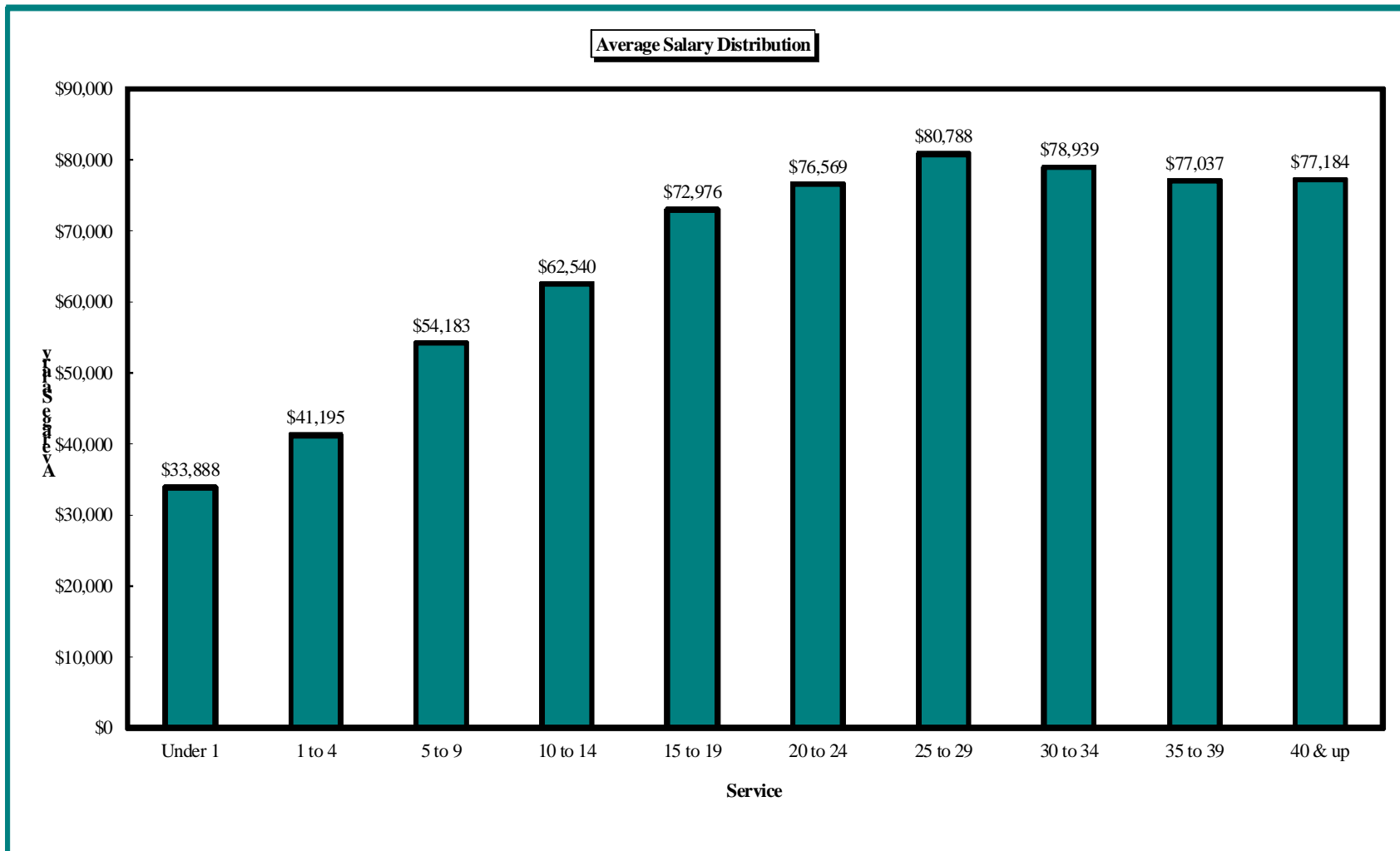
**Kansas City Firefighters' Pension Plan Distribution of Active Members  
by Age as of May 1, 2013**



CITY OF KANSAS CITY, MISSOURI FIREFIGHTERS' PENSION SYSTEM  
ACTUARIAL VALUATION AS OF MAY 1, 2013

APPENDIX A  
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**Kansas City Firefighters' Pension Plan Distribution of Active Members  
by Service as of May 1, 2013**



CITY OF KANSAS CITY, MISSOURI FIREFIGHTERS' PENSION SYSTEM  
ACTUARIAL VALUATION AS OF MAY 1, 2013

**APPENDIX A  
MEMBERSHIP INFORMATION**

Kansas City Firefighters' Pension System							
Pensions in Payment Status by Type and Monthly Amount							
Monthly Amount	Total	Normal	Early	Disability	Vested	Widows & QDROs	Children
<b>Total</b>	<b>886</b>	<b>557</b>	<b>1</b>	<b>84</b>	<b>18</b>	<b>219</b>	<b>7</b>
<b>Under \$500</b>	36	0	0	0	5	25	6
<b>\$500-1,000</b>	81	1	0	6	4	69	1
<b>1,000-1,500</b>	70	11	0	8	3	48	0
<b>1,500-2,000</b>	89	46	0	13	1	29	0
<b>2,000-2,500</b>	73	47	0	3	4	19	0
<b>2,500-3,000</b>	86	71	0	5	0	10	0
<b>3,000-3,500</b>	104	85	0	10	1	8	0
<b>3,500-4,000</b>	161	126	0	33	0	2	0
<b>4,000-4,500</b>	65	56	1	5	0	3	0
<b>4,500-5,000</b>	70	65	0	0	0	5	0
<b>5,000 &amp; over</b>	51	49	0	1	0	1	0

*During the year ended April 30, 2013 there were 51 new pensions awarded (38 Normal, 1 Disabled, and 12 Widows, QDROs, and Children)*

**CITY OF KANSAS CITY, MISSOURI FIREFIGHTERS' PENSION SYSTEM  
ACTUARIAL VALUATION AS OF MAY 1, 2013**

**APPENDIX A  
MEMBERSHIP INFORMATION**

**Kansas City Firefighters' Pension Plan Distribution of Retired Members  
and Survivors as of May 1, 2013**

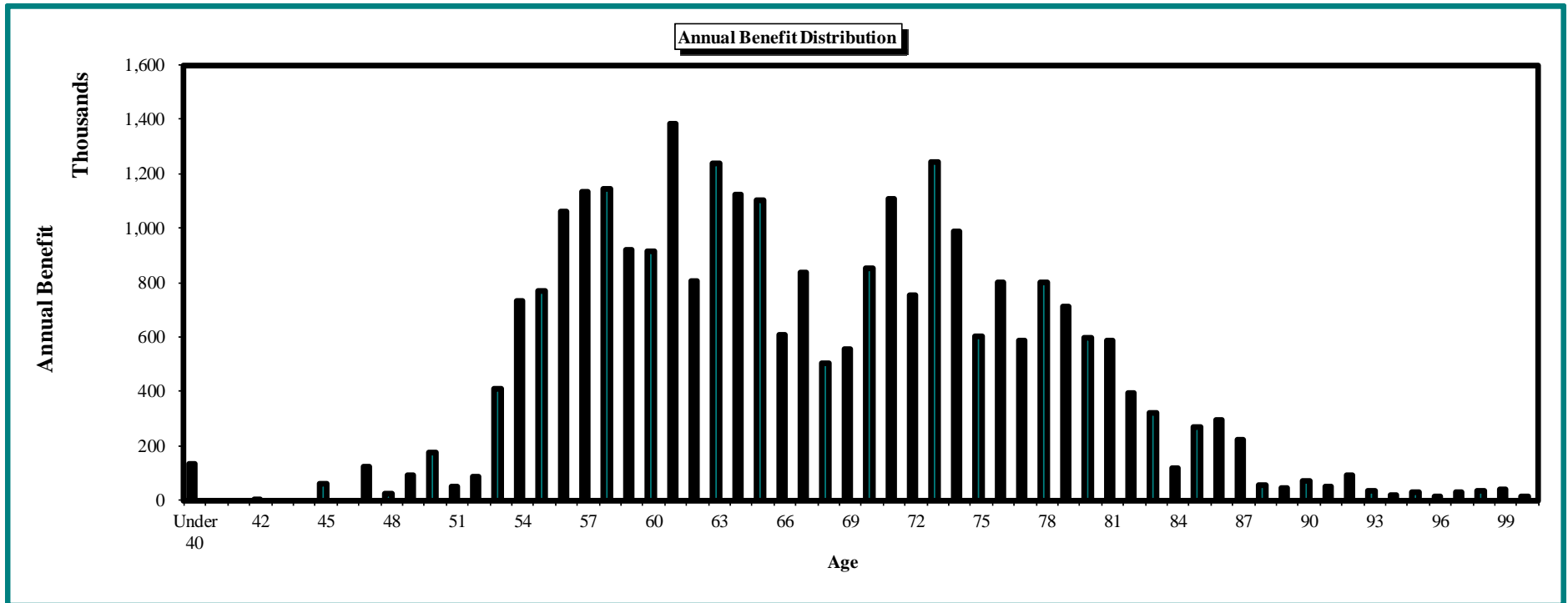
Age	Count	Annual Benefit	Age	Count	Annual Benefit
<25	9	\$34,500	73	31	\$1,243,300
25	0	\$0	74	30	\$989,533
26	1	\$5,517	75	20	\$601,583
27	0	\$0	76	27	\$802,495
28	2	\$32,173	77	20	\$588,251
29	1	\$7,211	78	27	\$800,094
30	2	\$12,655	79	25	\$714,254
31	0	\$0	80	23	\$595,994
32	0	\$0	81	25	\$588,504
33	0	\$0	82	17	\$396,559
34	0	\$0	83	14	\$322,391
35	0	\$0	84	8	\$119,658
36	0	\$0	85	19	\$272,090
37	0	\$0	86	16	\$294,365
38	1	\$41,523	87	10	\$221,179
39	0	\$0	88	5	\$56,984
40	0	\$0	89	4	\$47,145
41	0	\$0	90	4	\$74,195
42	1	\$3,493	91	3	\$50,905
43	0	\$0	92	6	\$90,579
44	0	\$0	93	4	\$33,872
45	1	\$62,048	94	2	\$22,043
46	0	\$0	95	2	\$30,012
47	3	\$126,274	96	1	\$15,861
48	1	\$25,175	97	2	\$32,193
49	2	\$90,561	98	1	\$33,031
50	4	\$176,648	99	1	\$41,418
51	1	\$49,301	100	2	\$14,637
52	3	\$86,428	101	0	\$0
53	8	\$410,784	102	2	\$45,534
54	16	\$734,841	103	2	\$77,626
55	18	\$772,045	104	0	\$0
56	21	\$1,059,466	105	0	\$0
57	25	\$1,133,353	106	0	\$0
58	24	\$1,145,236	107	0	\$0
59	21	\$918,405	108	0	\$0
60	19	\$914,783	109	0	\$0
61	27	\$1,384,115	110	0	\$0
62	18	\$804,635	111	0	\$0
63	29	\$1,237,072	112	0	\$0
64	24	\$1,122,511	113	0	\$0
65	24	\$1,104,564	114	0	\$0
66	17	\$607,567	115	0	\$0
67	23	\$835,604	116	0	\$0
68	15	\$504,506	117	0	\$0
69	17	\$554,607	118	0	\$0
70	23	\$852,024	119	0	\$0
71	28	\$1,105,733	120	0	\$0
72	20	\$751,805			
			Totals	802	\$27,923,448

The above counts include 192 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, 2013

APPENDIX A  
MEMBERSHIP INFORMATION

# Kansas City Firefighters' Pension Plan Distribution of Retired Members and Survivors as of May 1, 2013





**CITY OF KANSAS CITY, MISSOURI FIREFIGHTERS' PENSION SYSTEM  
ACTUARIAL VALUATION AS OF MAY 1, 2013**

**APPENDIX A  
MEMBERSHIP INFORMATION**

**Kansas City Firefighters' Pension Plan Distribution of Disabled Members  
as of May 1, 2013**

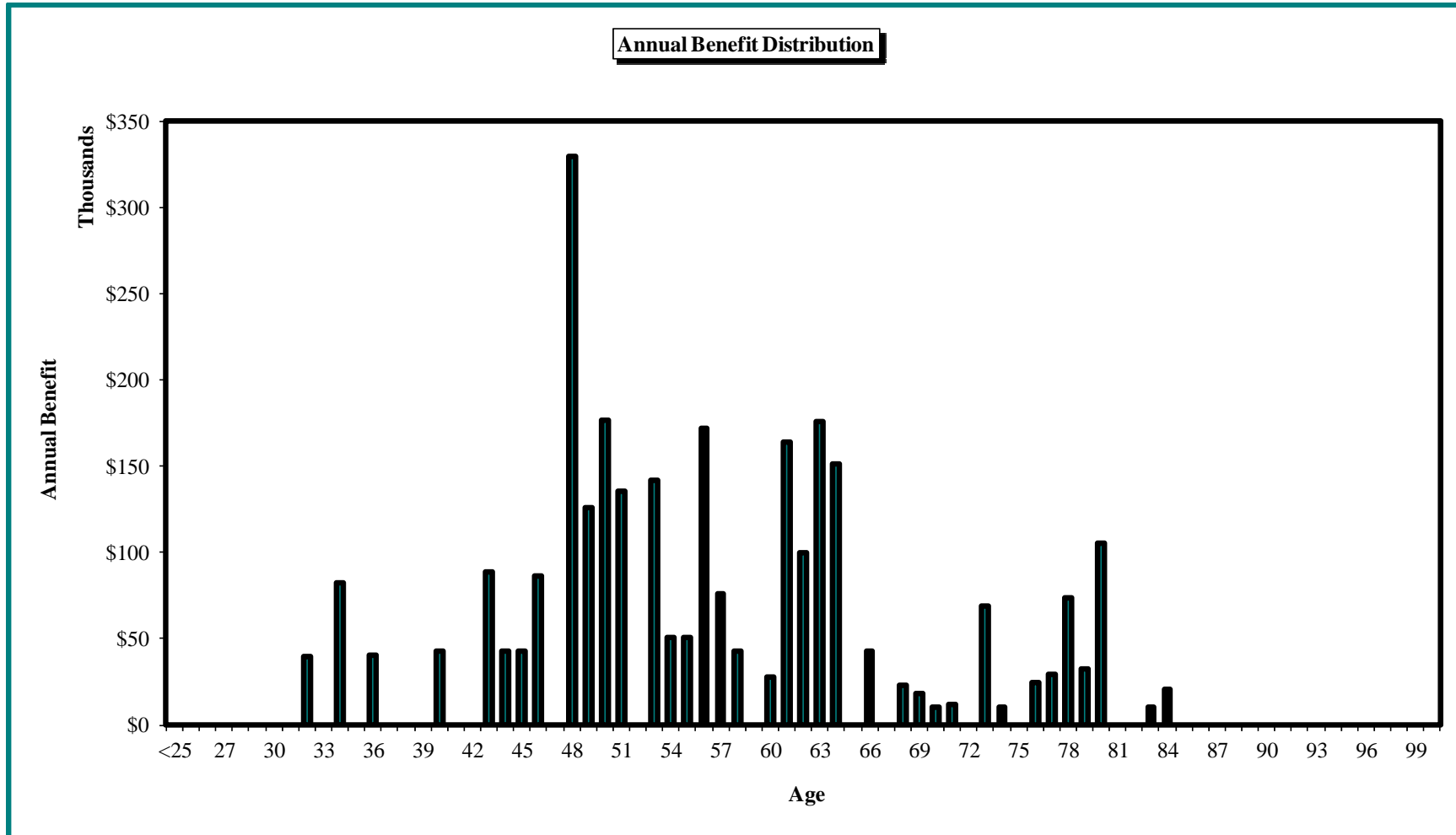
Age	Count	Annual Benefit	Age	Count	Annual Benefit
<25	0	\$0	73	3	\$69,090
25	0	\$0	74	1	\$9,934
26	0	\$0	75	0	\$0
27	0	\$0	76	1	\$24,545
28	0	\$0	77	2	\$29,280
29	0	\$0	78	4	\$73,375
30	0	\$0	79	2	\$32,819
31	0	\$0	80	5	\$105,588
32	1	\$39,693	81	0	\$0
33	0	\$0	82	0	\$0
34	2	\$82,199	83	1	\$10,142
35	0	\$0	84	1	\$20,710
36	1	\$40,521	85	0	\$0
37	0	\$0	86	0	\$0
38	0	\$0	87	0	\$0
39	0	\$0	88	0	\$0
40	1	\$42,530	89	0	\$0
41	0	\$0	90	0	\$0
42	0	\$0	91	0	\$0
43	2	\$88,960	92	0	\$0
44	1	\$43,050	93	0	\$0
45	1	\$42,918	94	0	\$0
46	2	\$86,382	95	0	\$0
47	0	\$0	96	0	\$0
48	7	\$329,767	97	0	\$0
49	3	\$126,108	98	0	\$0
50	4	\$176,999	99	0	\$0
51	3	\$135,380	100	0	\$0
52	0	\$0	101	0	\$0
53	3	\$141,639	102	0	\$0
54	1	\$50,658	103	0	\$0
55	1	\$50,415	104	0	\$0
56	5	\$171,990	105	0	\$0
57	2	\$76,482	106	0	\$0
58	1	\$42,597	107	0	\$0
59	0	\$0	108	0	\$0
60	1	\$27,915	109	0	\$0
61	4	\$164,147	110	0	\$0
62	3	\$100,214	111	0	\$0
63	6	\$176,248	112	0	\$0
64	4	\$151,594	113	0	\$0
65	0	\$0	114	0	\$0
66	1	\$43,050	115	0	\$0
67	0	\$0	116	0	\$0
68	1	\$23,195	117	0	\$0
69	1	\$17,989	118	0	\$0
70	1	\$10,099	119	0	\$0
71	1	\$11,762	120	0	\$0
72	0	\$0			
			Totals	84	\$2,869,984

The above counts exclude 192 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, 2013

APPENDIX A  
MEMBERSHIP INFORMATION

**Kansas City Firefighters' Pension Plan Distribution of Disabled Members  
as of May 1, 2013**



**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.

<b>Age</b>	<b>Healthy Mortality (sample rates)</b>	
	<b>Male</b>	<b>Female</b>
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.

<b>Age</b>	<b>Disabled Mortality (sample rates)</b>	
	<b>Male</b>	<b>Female</b>
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%

**CITY OF KANSAS CITY, MISSOURI FIREFIGHTERS' PENSION SYSTEM  
ACTUARIAL VALUATION AS OF MAY 1, 2013**

**APPENDIX B  
ACTUARIAL ASSUMPTIONS AND METHODS**

**2. Disability and Withdrawal Rates**

<b>Rates before Retirement (sample rates)</b>		
<b>Age</b>	<b>Disability*</b>	<b>Withdrawal</b>
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.*

**3. Percentage of Disability Retirements that are Duty Related**

<b>Disability Retirement Rates (Duty Related)</b>	
<b>Age</b>	<b>Annual Rate (%)</b>
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

CITY OF KANSAS CITY, MISSOURI FIREFIGHTERS' PENSION SYSTEM  
ACTUARIAL VALUATION AS OF MAY 1, 2013

APPENDIX B  
ACTUARIAL ASSUMPTIONS AND METHODS

**4. Retirement Rates for Active Employees**

Rates of Active Employees	
Years of Service	Rate (%)
25	5.00%
26	5.00
27	5.00
28	5.00
29	10.00
30	15.00
31	35.00
32	35.00
33	35.00
34	35.00
35 years, or age 65 if earlier	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**

7.75% net of investment fees and administrative expenses, including inflation at 2.50%

CITY OF KANSAS CITY, MISSOURI FIREFIGHTERS' PENSION SYSTEM  
ACTUARIAL VALUATION AS OF MAY 1, 2013

**APPENDIX B**  
**ACTUARIAL ASSUMPTIONS AND METHODS**

**11. 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.

<b>Age</b>	<b>Rate (%)</b>
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%

**12. Change in Assumptions**

None

**APPENDIX B**  
**ACTUARIAL ASSUMPTIONS AND METHODS**

**B. 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)**

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.

**4. Changes in Methods**

None

**APPENDIX C**  
**SUMMARY OF PLAN PROVISIONS**

**1. Plan Year**

May 1 through April 30

**2. Membership**

All Firefighters 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 contribute 9.55% of base salary. The City currently contributes 19.6% of payroll.

Interest on Employee Contributions: 3.0% per year.

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.

**5. Normal Retirement**

Eligibility requirements: 25 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.



**APPENDIX C**  
**SUMMARY OF PLAN PROVISIONS**

**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, 2013 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.

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.

**9. Withdrawal (Refund) Benefits**

Age Requirement: None.

Service Requirement: Less than 10 years of creditable service.

**APPENDIX C**  
**SUMMARY OF PLAN PROVISIONS**

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 is guaranteed. If there is no surviving spouse or dependent children, or if the spouse remarries, the accumulated contributions or the unpaid balance thereof shall be paid to the City or to a named beneficiary.

**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,

**APPENDIX C**  
**SUMMARY OF PLAN PROVISIONS**

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 is guaranteed. If there is no surviving spouse or dependent children, or if the surviving spouse is no longer eligible to receive payments because of remarriage, the accumulated contributions or the unpaid balance thereof shall be paid to the City or to a named beneficiary.

**12. Post-Retirement Death Benefit**

Age Requirement: None.

Service Requirement: None.

Amount: If married, 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 contribution are guaranteed. In addition, a lump-sum funeral benefit of \$2,000 is paid.

**13. Cost-of-Living Adjustment (COLA)**

A maximum increase of 3% of the original pension (prior to election of option) will be made annually. This does not apply to funeral benefits. Members must retire on or before January 1<sup>st</sup>, 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:

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

**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.

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**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. 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.

**12. Unfunded Actuarial Liability**

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

**13. 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.

**14. Funded Percentage**

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

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**15. 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.

**16. Investment Return Assumption**

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