

***Police Retirement System  
of Kansas City, Missouri***

***Actuarial Valuation Report  
as of April 30, 2008***



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September 19, 2008

The Board of Trustees  
Police Retirement System of Kansas City, Missouri  
1328 Agnes Street  
Kansas City, MO 64127

Dear Members of the Board:

At your request, we have performed an annual actuarial valuation of the Police Retirement System of Kansas City, Missouri as of April 30, 2008 for determining the actuarial contribution rate for fiscal year 2010. The major findings of the valuation are contained in this report. This report reflects the benefit provisions in effect as of April 30, 2008, including changes passed by the 2008 Missouri legislature (which became effective August 2008). There was one change in the state statutes governing the Plan since the last valuation: a member must be in active service in order to be eligible for either a duty related or non-duty related disability retirement benefit. This had no impact on the valuation results. There was no change in the actuarial methods from the prior valuation. This report reflects the new actuarial assumptions adopted by the Board in February 2008, as a result of the Experience Study.

In preparing this report, we relied, without audit, on information (some oral and some written) supplied by the System's staff. This information includes, but is not limited to, plan provisions, member data and financial information. In our examination of these data, we have found them to be reasonably consistent and comparable with data used for other purposes. Since the valuation results are dependent on the integrity of the data supplied, the results can be expected to differ if the underlying data is incomplete or missing. It should be noted that if any data or other information is inaccurate or incomplete, our calculations may need to be revised.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted principles and practices which are consistent with the Actuarial Standards of Practice promulgated by the Actuarial Standards Board (ASB) and the applicable Guides to Professional Conduct, amplifying Opinions and Supporting Recommendations of American Academy of Actuaries.

We further certify that all costs, liabilities, rates of interest and other factors for the System have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of the System and reasonable expectations of future experience); and which, in combination, offer our best estimate of anticipated experience under the

Plan. Nevertheless, the emerging costs will vary from those presented in this report to the extent actual experience differs from that projected by the actuarial assumptions. The Board of Trustees has the final decision regarding the appropriateness of the assumptions and adopted them as outlined in Appendix C.

Actuarial computations presented in this report are for purposes of determining the actuarial contribution rates for funding the System. Actuarial computations under GASB Statement No. 25 and 27 are for purposes of fulfilling financial accounting requirements. The computations prepared for these two purposes may differ as disclosed in our report. The calculations in the enclosed report have been made on a basis consistent with our understanding of the System's funding requirements and goals, and of GASB Statements No. 25 and 27. Determinations for purposes other than these requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.

Milliman's work product was prepared exclusively for the Police Retirement System of Kansas City, Missouri for a specific and limited purpose. It is a complex, technical analysis that assumes a high level of knowledge concerning the Police Retirement System of Kansas City, Missouri operations, and used data from the Police Retirement System of Kansas City, Missouri, which Milliman has not audited. It is not for the use or benefit of any third party for any purpose. Any third party recipient of Milliman's work product who desires professional guidance should not rely upon Milliman's work product, but should engage professionals for advice appropriate to its own specific needs.

We would like to express our appreciation to the System's staff, who gave substantial assistance in supplying the data on which this report is based.

We herewith submit the following report and look forward to discussing it with you.

I, Patrice A. Beckham, F.S.A. am a member of the American Academy of Actuaries and a Fellow of the Society of Actuaries, and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

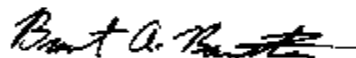
I, Brent A. Banister, F.S.A. am a member of the American Academy of Actuaries and a Fellow of the Society of Actuaries, and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Respectfully Submitted,

MILLIMAN, Inc.



Patrice A. Beckham, F.S.A.  
Consulting Actuary



Brent A. Banister, F.S.A.  
Consulting Actuary

# SECTION 1

## BOARD SUMMARY

### OVERVIEW

This report presents the results of the April 30, 2008 actuarial valuation of the Police Retirement System of Kansas City, Missouri. The primary purposes of performing a valuation are to:

- determine the employer contribution rates required to fund the System on an actuarial basis,
- disclose asset and liability measures as of the valuation date,
- determine the experience of the System since the last valuation date, and
- analyze and report on trends in System contributions, assets, and liabilities over the past several years.

There was one change in the state statutes governing the Plan since the last valuation: a member must be in active service to be eligible for either a duty related or non-duty related disability retirement benefit. This provision, which was effective August 2008, had no material impact on the valuation results. There was no change in the actuarial methods used in the valuation. However, there was a change in the set of actuarial assumptions used in the April 30, 2008 actuarial valuation. The Board of Trustees adopted a new set of assumptions in February 2008 following completion of a five-year Experience Study. The changes, recommended by Milliman and adopted by the Board, include:

- Change the mortality table to a more recent table, the RP-2000 Table. Scale AA is used to project mortality improvements in future years.
- Adjust the retirement rates to better fit observed experience.
- Increase the probability of disability for active members.
- Decrease the termination of employment rates.
- Change from an age-based to a service-based salary increase assumption.
- Assume that all vested terminating members will elect a deferred benefit.

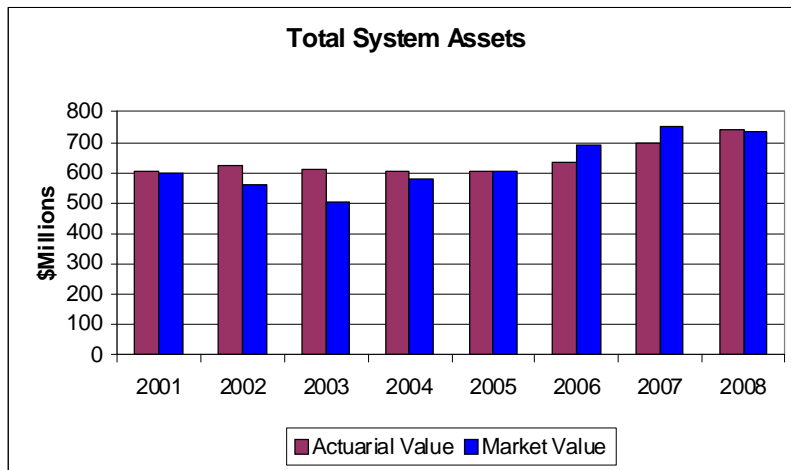
The valuation results provide a “snapshot” view of the System’s financial condition on April 30, 2008. The unfunded actuarial accrued liability from the last valuation decreased by approximately \$1 million. A detailed analysis of the change in the unfunded actuarial accrued liability from April 30, 2007 to April 30, 2008 is shown on page 3.

### ASSETS

As of April 30, 2008, the System had total funds, when measured on a market value basis, of \$734 million. This was a decrease of \$21 million from the April 30, 2007 figure of \$755 million. The market value of assets is not used directly in the calculation of the actuarial contribution rate. An asset valuation method which smoothes the effect of market fluctuations is used to determine the value of assets used in the valuation, called the “actuarial value of assets”. Differences between the actual return on the market value of assets and the assumed return on the actuarial value of assets are phased-in over a closed four year period. See Table 3 on page 12 for a detailed development of the actuarial value of assets. The components of the change in the market and actuarial value of assets for the Retirement System (in millions) are set forth in the following table.

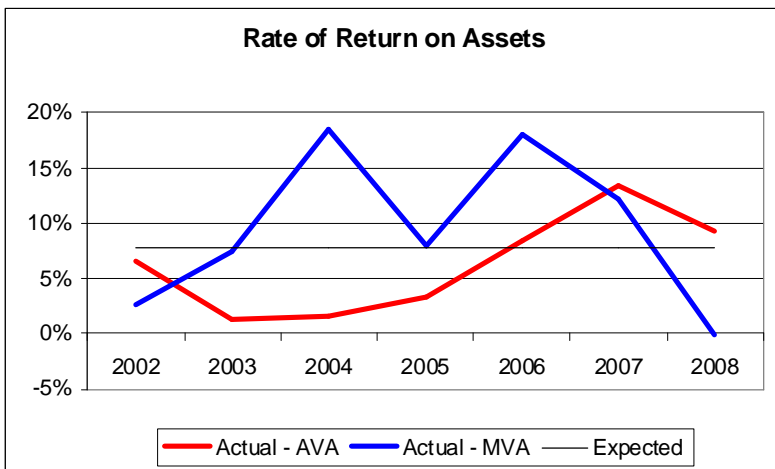
	Market Value (\$M)	Actuarial Value (\$M)
Assets, April 30, 2007	\$755.1	\$698.1
<ul style="list-style-type: none"> <li>• City and Member Contributions</li> <li>• Benefit Payments and Refunds</li> <li>• Administrative Expenses</li> <li>• Investment Income (net of expenses)</li> </ul>	24.2 (43.4) (0.6) (0.9)	24.2 (43.4) (0.6) 63.8
Assets, April 30, 2008	\$734.4	\$742.1

The annualized dollar-weighted rate of return, measured on the actuarial value of assets, was 9.3% and, measured on the market value of assets, was approximately (0.1)%. The actuarial value of assets as of April 30, 2008 was \$742 million, which includes an actuarial gain of about \$10 million resulting from the phase-in of investment returns from the current and preceding three years.



*The actuarial value of assets has been both above and below the market value during this period. This is to be expected when using an asset smoothing method.*

Note: Results for years before 2007 were prepared by the prior actuary.



*Rates of return on the market value of assets have been very volatile. The return on the actuarial value of assets has lagged the 7.75% assumption as the investment losses from the early part of the decade are recognized.*

Note: Results for years before 2007 were prepared by the prior actuary.

Due to the asset smoothing method, there is about an \$8 million difference between the actuarial value and the market value of assets. This deferred investment loss will flow through the asset smoothing process in the next three years and decrease the System's funded ratio, absent favorable investment experience to offset the losses.

## LIABILITIES

The actuarial accrued liability is that portion of the present value of future benefits that will not be paid by future employer normal costs or member contributions. The difference between this liability and the asset value at the same date is referred to as the unfunded actuarial accrued liability (UAAL), or (surplus) if the asset value exceeds the actuarial accrued liability. The unfunded actuarial accrued liability will be reduced if the employer's contributions exceed the employer's normal cost for the year, after allowing for interest earned on the previous balance of the unfunded actuarial accrued liability. Benefit improvements, experience gains and losses, and changes in actuarial assumptions and procedures will also impact the total actuarial accrued liability and the unfunded portion thereof.

The Actuarial Accrued Liability and Unfunded Actuarial Accrued Liability for the System as of April 30, 2008 are:

Actuarial Accrued Liability	\$850,763,745
Actuarial Value of Assets	742,060,223
Unfunded Actuarial Accrued Liability/(Surplus)	108,703,522

Between April 30, 2007 and April 30, 2008, the change in the unfunded actuarial accrued liability for the System was as follows (in millions):

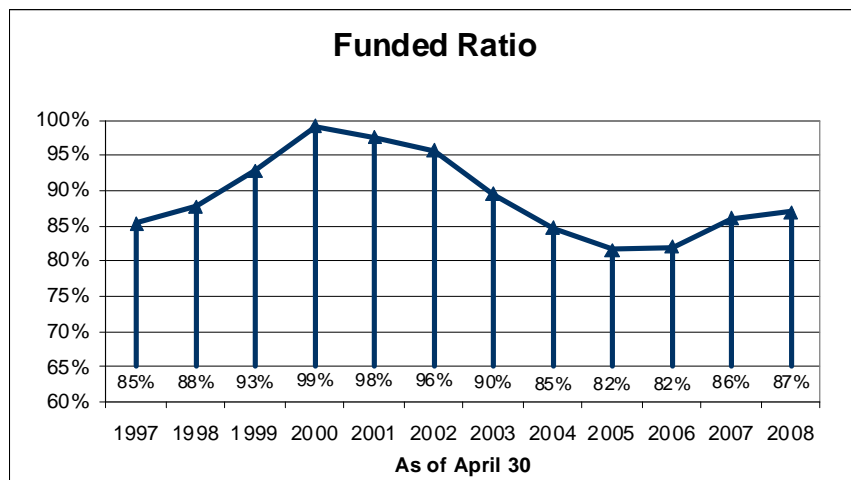
	\$(M)*
UAAL, April 30, 2007	109.8
+ Normal cost for year	21.5
+ Assumed investment return for year	10.2
- Actual contributions (member + City)	24.2
- Assumed investment return on contributions	0.9
= Expected UAAL, April 30, 2008	116.3
+ Change from amendments	0.0
+ Change from assumption change	1.2
= Expected UAAL after changes	117.5
Actual UAAL, April 30, 2008	108.7
Experience gain/(loss) (Expected UAAL – Actual UAAL)	8.8

*\*May not add due to rounding*

The experience gain for the last plan year of \$8.8 million was the result of an actuarial gain of \$10.4 million on System assets (actuarial value) and an actuarial loss of \$1.6 million on System liabilities.

Analysis of the unfunded actuarial accrued liability strictly as a dollar amount can be misleading. Another way to evaluate the unfunded actuarial accrued liability and the progress made in its funding is to track the funded status, the ratio of the actuarial value of assets to the actuarial accrued liability. This information for recent years is shown below (in millions). Historical information is shown in the graph following the chart.

	4/30/04	4/30/05	4/30/06	4/30/07	4/30/08
Actuarial Value of Assets (\$M)	\$603.4	\$604.6	\$635.6	\$698.1	\$742.1
Actuarial Accrued Liability (\$M)	\$712.3	\$741.0	\$775.3	\$807.9	\$850.8
Funded Ratio (Assets/Liability)	85%	82%	82%	86%	87%



*Over the past decade, the investment return has had a significant impact on the funded status of the Retirement System. There have been both dramatic improvements and declines.*

Note: Results for years before 2007 were prepared by the prior actuary.

As mentioned earlier in this report, due to the asset smoothing method there is about \$8 million difference between the actuarial and market value of assets. This deferred investment experience will flow through the asset smoothing method over the next three years, absent favorable investment experience to offset it. The System's funded status will continue to be heavily dependent on investment returns.

## CONTRIBUTION RATES

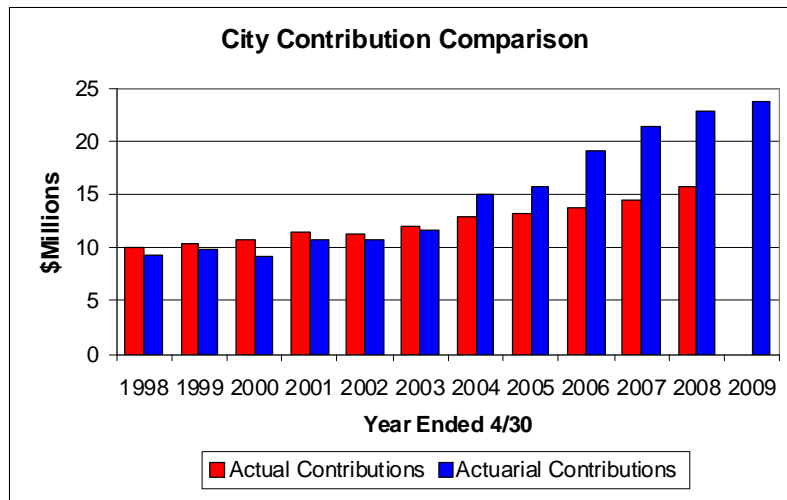
Generally, contributions to the System consist of:

- a "normal cost" for the portion of projected liabilities allocated to service of members during the year following the valuation date, by the actuarial cost method,
- an "unfunded actuarial accrued liability or (surplus) contribution" for the excess of the portion of projected liabilities allocated to service to date over the actuarial value of assets.

Contribution rates are computed with the objective of developing costs that are level as a percentage of covered payroll. The contribution rate for fiscal year 2010 is computed based on the April 30, 2008 actuarial valuation.



The graph below shows the actuarial contribution rate for the City compared to the amount actually received in the year. The funding policy contribution equals the System's normal cost, budgeted expenses and an amortization of the unfunded actuarial accrued liability.



Note: Results for years before 2007 were prepared by the prior actuary.

## COMMENTS

As of April 30, 2008, the actuarial accrued liability was \$851 million and the actuarial value of assets was \$742 million, resulting in a funded ratio of 87%. The funded ratio remained steady from its level of 86% in 2007. A small gain from investment experience on the actuarial value of assets increased the funded ratio from 86% to 87%.

Based on the current valuation results and the System's funding policy for amortizing the unfunded actuarial accrued liability, the actuarial contribution rate for the employer decreased. The employer contribution rate in the April 30, 2007 valuation for fiscal year 2009 was 29.04% and the comparable rate from the April 30, 2008 valuation for fiscal year 2010 is 26.22%. There was an overall actuarial gain from actual experience that was more favorable than projected by the actuarial assumptions. In addition, the actuarial gain from the prior year is first reflected in the 2009 – 2010 contribution rate. The System experienced a rate of return on the market value of assets of about 0% for the plan year ending April 30, 2008. Combined with the other deferred investment experience, the return on the actuarial value of assets for the year was approximately 9%. This resulted in an actuarial gain on assets of about \$10 million. The asset smoothing method used to develop the actuarial value of assets smoothes gains and losses over a four-year period. The actuarial value of assets currently exceeds the market value of assets by about 1%.

The actuarial gain from investment experience was somewhat offset by the shortfall between the actual contributions to the System and the actuarial contribution rate. The actuarial contribution rate for the City for fiscal year end April 30, 2008 was 29.00%. The City actually contributed at a rate of 19.70% of covered payroll. This difference between the actual and actuarial contribution rate increased the unfunded actuarial accrued liability by about \$7.5 million. To the extent the System does not have investment returns above the assumed rate of 7.75% or other favorable experience sufficient to offset the contribution shortfall, the unfunded actuarial accrued liability will increase. The long term financial health of the System is dependent on the systematic funding of the Plan, based on the results of the actuarial valuations. Assuming all actuarial assumptions are met in the future, the funded status of the System is expected to decline and the actuarial contribution rate to increase if the City does not contribute at the actuarial contribution rate.

The longer it takes for the City's contributions to increase to the actuarial rate, the higher the ultimate contribution rate will be.

Based on the Board's policy, an ad hoc cost of living adjustment may be granted if the definition of "actuarial soundness", which requires at least one of the three following conditions, is met:

- (1) The plan's funded ratio (actuarial value of assets/actuarial accrued liability) measured in accordance with GASB 25, rounded to the nearest whole percentage, is 75% or greater.
- (2) For each of the three most recently completed plan years, the plan has received a combination of employer and employee contributions that in total are, rounded to the nearest whole percentage, 90% or greater of the plan's required contributions (defined to be the sum of the Annual Required Contribution as defined by GASB Statement 25 and any required employee contributions).
- (3) For at least three out of the last five completed plan years, the plan has received employer contributions that equal or exceed the plan's Annual Required Contribution as defined by GASB Statement 25.

Based upon the results of the April 30, 2008 valuation, the System satisfies the Board's policy to grant an ad hoc COLA. We have not reviewed any legal aspects related to granting the ad hoc COLA. We are not attorneys and cannot give legal advice on such issues. We suggest that you review this policy with your legal counsel.

Although the City made contributions in excess of the actuarial rate in the first part of the last decade, the actual contribution made by the City in the last five years has been significantly lower than the actuarial contribution rate. The long term financial health of this retirement system is heavily dependent on two key items: (1) investment returns and (2) contributions to the System. To the extent the City continues to contribute below the actuarial contribution rate the funding of the System can be expected to decline. If the funded status declines it may impact whether the ad hoc COLA can be paid and whether the current benefit structure can be sustained over the long term. We recommend the City develop a plan to increase the contribution rate to the System. If the move to the full actuarial contribution rate cannot be accomplished with one change, a plan to systematically increase the actual contribution rate in future years until it reaches the actuarial rate may be a reasonable alternative.

We conclude this Board Summary with the following exhibit which compares the principal results of the current and prior actuarial valuation.

## SUMMARY OF PRINCIPAL RESULTS

<b>1. PARTICIPANT DATA</b>	<u>4/30/2007</u>	<u>4/30/2008</u>	<u>%</u>
	<u>Valuation</u>	<u>Valuation</u>	<u>Change</u>
Number of:			
Active Members	1,391	1,433	3.0 %
Retired Members and Beneficiaries	1,189	1,188	(0.1) %
Inactive Members	12	12	0.0 %
Total Members	2,592	2,633	1.6 %
Annual Projected Salaries of Active Members	\$ 80,111,515	\$ 86,700,836	8.2 %
Annual Retirement Payments for Retired Members and Beneficiaries*	\$ 35,867,167	\$ 37,132,050	3.5 %
	<small>*Does not include supplemental benefits</small>		
 <b>2. ASSETS AND LIABILITIES</b>			
Total Actuarial Accrued Liability	\$ 807,902,176	\$ 850,763,745	5.3 %
Market Value of Assets	755,107,136	734,379,847	(2.7) %
Actuarial Value of Assets	698,078,688	742,060,223	6.3 %
Unfunded Actuarial Accrued Liability/(Surplus)	\$ 109,823,488	\$ 108,703,522	(1.0) %
 <b>3. EMPLOYER CONTRIBUTION RATES AS A PERCENT OF PAYROLL</b>			
Normal Cost	26.77 %	26.23 %	(2.0) %
Member Financed	10.55 %	10.55 %	0.0 %
Employer Normal Cost	16.22 %	15.68 %	(3.3) %
Amortization of Unfunded Actuarial Accrued Liability or (Surplus)	12.82 %	10.54 %	(17.8) %
Employer Contribution Rate	29.04 %	26.22 %	(9.7) %

## SECTION 2

### SCOPE OF THE REPORT

This report presents the actuarial valuation of the Police Retirement System of Kansas City, Missouri as of April 30, 2008. This valuation was prepared at the request of the System's Board of Trustees.

There was no change in the actuarial methods from the prior valuation. The report reflects the new actuarial assumptions adopted by the Board in February 2008, as a result of the Experience Study.

Please pay particular attention to our cover letter, where the guidelines employed in the preparation of this report are outlined. We also comment on the sources and reliability of both the data and the actuarial assumptions upon which our findings are based. Those comments are the basis for our certification that this report is complete and accurate to the best of our knowledge and belief.

A summary of the findings which result from this valuation is presented in the previous section. Section 3 describes the assets and investment experience of the System. Sections 4 and 5 describe how the obligations of the System are to be met under the actuarial cost method in use. Section 6 includes the information required for the financial reporting standards established by the Governmental Accounting Standards Board (GASB).

This report includes several appendices:

- Appendix A Schedules of valuation data classified by various categories of members.
- Appendix B A summary of the current benefit structure, as determined by the provisions of governing law on April 30, 2008, including changes passed by the 2008 Missouri legislature (which became effective August 2008).
- Appendix C A summary of the actuarial methods and assumptions used to estimate liabilities and determine contribution rates.
- Appendix D A glossary of actuarial terms.

## SECTION 3

### ASSETS

In many respects, an actuarial valuation can be thought of as an inventory process. The inventory is taken as of the actuarial valuation date, which for this valuation is April 30, 2008. On that date, the assets available for the payment of benefits are appraised. The assets are compared with the liabilities of the System, which are generally in excess of assets. The actuarial process then leads to a method of determining the contributions needed by members and the employer in the future to balance the System assets and liabilities.

#### **Market Value of Assets**

The current market value represents the “snapshot” or “cash-out” value of System assets as of the valuation date. In addition, the market value of assets provides a basis for measuring investment performance from time to time. Table 1 is a comparison, at market values, of System assets as of April 30, 2008, and April 30, 2007, in total and by investment category. Table 2 summarizes the change in the market value of assets from April 30, 2007 to April 30, 2008.

#### **Actuarial Value of Assets**

Neither the market value of assets, representing a “cash-out” value of System assets, nor the book values of assets, representing the cost of investments, may be the best measure of the System’s ongoing ability to meet its obligations.

To arrive at a suitable value for the actuarial valuation, a technique for determining the actuarial value of assets is used which dampens swings in the market value while still indirectly recognizing market values. Under this methodology, the difference between the actual investment return on the market value of assets and assumed investment return on the actuarial value of assets is phased-in over a four year period. The actuarial value is constrained to fall within a corridor of 80% to 120% of market value. Table 3 shows the development of the actuarial value of assets (AVA) as of the current valuation date.

**TABLE 1**  
**POLICE RETIREMENT SYSTEM OF KANSAS CITY, MISSOURI**  
**STATEMENT OF NET PLAN ASSETS AT MARKET VALUE**

	<b>Market Value</b>	
	<b>April 30, 2008</b>	<b>April 30, 2007</b>
Cash & Equivalents	\$20,155,203	\$18,738,938
Receivables	2,620,117	3,950,087
Stocks:		
Common & Preferred Corporate	319,894,828	390,802,776
Foreign	129,362,589	110,345,083
Bonds:		
U.S. Government	67,338,382	104,004,347
Corporate	107,127,340	71,476,347
Municipal/Provincial	201,392	599,680
Asset Backed Securities	0	5,505,726
Real Estate	27,000,650	19,797,473
Mortgages	53,039,605	27,966,068
Private Equity	8,509,218	3,090,808
Building and Other Property Used in Plan Operations	5,323	4,866
Total Assets	\$735,254,647	\$756,282,199
Accounts Payable	(874,800)	(1,175,063)
Net Assets Available for Benefits	\$734,379,847	\$755,107,136

**TABLE 2**  
**POLICE RETIREMENT SYSTEM OF KANSAS CITY, MISSOURI**  
**STATEMENT OF CHANGES IN NET ASSETS**  
**DURING YEAR ENDED APRIL 30, 2008**

(Market Value)

1. Market Value of Assets as of April 30, 2007		\$	755,107,136
2. Contributions:			
a. Members		\$	8,459,762
b. City			15,747,111
c. Miscellaneous			0
d. Total		\$	<u>24,206,873</u>
	[2(a) + 2(b) + 2(c)]		
3. Investment Income			
a. Interest and Dividends		\$	21,626,366
b. Net Securities Lending Income			695,519
c. Investment Expenses			(3,536,861)
d. Net Appreciation in Fair Value			<u>(19,696,880)</u>
e. Net Investment Income		\$	(911,856)
	[3(a) + 3(b) + 3(c) + 3(d)]		
4. Deductions			
a. Refunds of Member Contributions		\$	621,174
b. Benefits Paid:			
(1) Retirement Benefits			41,982,997
(2) Death Benefits			29,000
(3) Partial Lump Sums			790,587
c. Administrative Expenses			<u>598,548</u>
d. Total		\$	<u>44,022,306</u>
	[4(a) + 4(b) + 4(c)]		
5. Net Change [2(d) + 3(e) - 4(d)]		\$	(20,727,289)
6. Market Value of Assets as of April 30, 2008		\$	734,379,847
	(1) + (5)		

**TABLE 3**  
**POLICE RETIREMENT SYSTEM OF KANSAS CITY, MISSOURI**  
**DEVELOPMENT OF ACTUARIAL VALUE OF ASSETS**

Valuation Date April 30,	2006	2007	2008	2009	2010	2011
A. Actuarial Value Beginning of Year	\$ 604,560,607	\$ 635,621,582	\$ 698,078,688			
B. Market Value End of Year	692,539,940	755,107,136	734,379,847			
C. Market Value Beginning of Year	604,107,701	692,539,940	755,107,136			
D. Non-Investment Net Cash Flow	(19,195,028)	(21,162,927)	(19,815,433)			
E. Investment Return:						
E1. Market Total: B – C - D	107,627,267	83,730,123	(911,856)			
E2. Assumed Rate	7.75%	7.75%	7.75%			
E3. Amount for Immediate Recognition	46,118,892	48,455,911	53,347,577			
E4. Amount for Phased-in Recognition	61,508,375	35,274,212	(54,259,433)			
F. Phased-in Recognition of Investment Return:						
F1. Current Year: 0.25 x E4	15,377,094	8,818,553	(13,564,858)			
F2. First Prior Year	(181,398)	15,377,094	8,818,553	\$ (13,564,858)		
F3. Second Prior Year	11,149,873	(181,398)	15,377,094	8,818,553	\$ (13,564,858)	
F4. Third Prior Year	<u>(22,208,458)</u>	<u>11,149,873</u>	<u>(181,398)</u>	<u>15,377,094</u>	<u>8,818,553</u>	<u>\$ (13,564,858)</u>
F5. Total Recognized Phased-in	\$ 4,137,111	\$ 35,164,122	\$ 10,449,391	\$ 10,630,789	\$ (4,746,305)	\$ (13,564,858)
G. Actuarial Value End of Year: A + D + E3 + F5	635,621,582	698,078,688	742,060,223			
H. Difference Between Actuarial & Market Value	\$ (56,918,358)	\$ (57,028,448)	\$ 7,680,376			
I. Rate of Return on Actuarial Value of Assets	8.4%	13.4%	9.3%			
J. Market Rate of Return	18.1%	12.3%	-0.1%			
K. Ratio of Actuarial Value to Market Value*	91.8%	92.4%	101.0%			

*\*Effective with the 2004 valuation, the actuarial value of assets is constrained to fall within a corridor of 80% to 120% of market value*



## SECTION 4

### SYSTEM LIABILITIES

In the previous section, an actuarial valuation was compared with an inventory process, and an analysis was given of the inventory of assets of the System as of the valuation date, April 30, 2008. In this section, the discussion will focus on the commitments (future benefit payments) of the System, which are referred to as its liabilities.

Table 4 contains an analysis of the actuarial present value of all future benefits (PVFB) for contributing members, inactive members, retirees and their beneficiaries.

The liabilities summarized in Table 4 include the actuarial present value of all future benefits expected to be paid with respect to each member. For an active member, this value includes the measurement of both benefits already earned and future benefits to be earned. For all members, active and retired, the value extends over benefits earnable and payable for the rest of their lives and for the lives of the surviving beneficiaries.

All liabilities reflect the benefit provisions in place as of April 30, 2008, with one exception. Liabilities reflect a 3% annual cost of living adjustment (COLA) in future years, even though the COLA is not part of the statutory benefit structure. The Board has discretion to grant the COLA and expects to grant it in future years.

#### **Actuarial Accrued Liability**

A fundamental principle in financing the liabilities of a retirement program is that the cost of its benefits should be related to the period in which benefits are earned, rather than to the period of benefit distribution. An actuarial cost method is a mathematical technique that allocates the present value of future benefits into annual costs. In order to do this allocation, it is necessary for the funding method to “breakdown” the present value of future benefits into two components:

- (1) that which is attributable to the past and
- (2) that which is attributable to the future.

Actuarial terminology calls the part attributable to the past the “past service liability” or the “actuarial accrued liability”. The portion allocated to the future is known as the present value of future normal costs, with the specific piece of it allocated to the current year being called the “normal cost”. Table 5 contains the calculation of actuarial accrued liability for the System. The Entry Age Normal actuarial cost method is used to develop the actuarial accrued liability.

**TABLE 4**

**POLICE RETIREMENT SYSTEM OF KANSAS CITY, MISSOURI**

**PRESENT VALUE OF FUTURE BENEFITS (PVFB)**

**AS OF APRIL 30, 2008**

1. Active employees		
a. Retirement Benefit	\$	450,880,436
b. Pre-Retirement Death Benefit		6,466,250
c. Withdrawal Benefit		20,864,630
d. Disability Benefit		57,461,723
e. Supplemental Benefit		27,388,104
f. Total	\$	<u>563,061,143</u>
2. Inactive Vested Members		
a. Retirement Benefit	\$	2,315,112
b. Supplemental Benefit		420,889
c. Total	\$	<u>2,736,001</u>
3. Inactive Nonvested Members	\$	0
4. In Pay Members		
a. Retirees	\$	344,688,130
b. Disabled Members		65,610,026
c. Beneficiaries		43,026,602
d. Supplemental Benefit		58,246,999
e. Total	\$	<u>511,571,757</u>
5. Total Present Value of Future Benefits		
(1f) + (2c) + (3) + (4e)	\$	1,077,368,901

**TABLE 5**

**POLICE RETIREMENT SYSTEM OF KANSAS CITY, MISSOURI**

**ACTUARIAL ACCRUED LIABILITY  
AS OF APRIL 30, 2008**

1. Active employees	
a. Present Value of Future Benefits	\$ 563,061,143
b. Present Value of Future Normal Costs	226,605,156
c. Actuarial Accrued Liability (1a) - (1b)	<u>\$ 336,455,987</u>
2. Inactive Vested Members	\$ 2,736,001
3. Inactive Nonvested Members	\$ 0
4. In Pay Members	
a. Retirees	\$ 344,688,130
b. Disabled Members	65,610,026
c. Beneficiaries	43,026,602
d. Supplemental Benefit	58,246,999
e. Total	<u>\$ 511,571,757</u>
5. Total Actuarial Accrued Liability (1c) + (2) + (3) + (4e)	\$ 850,763,745
6. Actuarial Value of Assets	\$ 742,060,223
7. Unfunded Actuarial Accrued Liability (5) - (6)	\$ 108,703,522

**TABLE 6**

**POLICE RETIREMENT SYSTEM OF KANSAS CITY, MISSOURI**

**AMORTIZATION SCHEDULE FOR THE UNFUNDED ACTUARIAL ACCRUED LIABILITY**

<u>Base</u>	<u>Date Created</u>	<u>Last Payment</u>	<u>Balances</u>		<u>2008/2009 Amortization</u>	<u>2009/2010 Amortization</u>
			<u>Initial</u>	<u>Outstanding</u>		
5/1/1998 Base	5/1/1998	FY 2022	\$ 60,092,542	\$ 62,516,348	\$ 5,612,095	\$ 6,024,061
5/1/1999 Base	5/1/1999	FY 2023	(23,794,584)	(25,022,933)	(2,126,505)	(2,287,272)
5/1/2000 Base	5/1/2000	FY 2024	(15,860,433)	(16,786,552)	(1,356,397)	(1,461,890)
5/1/2001 Base	5/1/2001	FY 2025	(6,685,610)	(7,094,268)	(547,137)	(590,867)
5/1/2002 Base	5/1/2002	FY 2026	12,470,529	13,222,067	976,616	1,056,746
5/1/2003 Base	5/1/2003	FY 2027	43,654,725	46,108,894	3,271,556	3,546,855
5/1/2004 Base	5/1/2004	FY 2029	36,731,553	41,343,644	2,728,126	2,968,970
5/1/2005 Base	5/1/2005	FY 2030	24,225,252	26,683,876	1,703,833	1,857,711
5/1/2006 Base	5/1/2006	FY 2031	391,606	441,627	6,457	31,312
5/1/2007 Base	5/1/2007	FY 2032	(30,886,670)	(31,204,183)	(2,089,666)	(2,039,147)
5/1/2008 Base	5/1/2008	FY 2033	(1,504,998)	(1,504,998)	472,840	(136,952)
<b>Total Unfunded Actuarial Accrued Liability</b>				\$ 108,703,522	\$ 8,651,818	\$ 8,969,527
Expected Contribution Shortfall in FY2009						
	5/1/2008		7,819,124	7,819,124	0	531,508
<b>Total Amortization Payment Including Shortfall</b>					\$ 8,651,818	\$ 9,501,035
<b>Equivalent Single Amortization Period</b>					17.08	

*Note: Years prior to 2007 are from prior actuary's report.*

**TABLE 7**

**POLICE RETIREMENT SYSTEM OF KANSAS CITY, MISSOURI  
DERIVATION OF SYSTEM EXPERIENCE GAIN/(LOSS)**

	(\$M)	
	<u>Year Ended 4/30/2008</u>	<u>Year Ended 4/30/2007</u>
(1) UAAL* at start of year	109.8	139.7
(2) + Normal cost for year	21.5	19.6
(3) + Assumed investment return on (1) & (2)	10.2	12.3
(4) - Actual contributions (member + city)	24.2	22.3
(5) - Assumed investment return on (4)	0.9	0.9
(6) = Expected UAAL at end of year (1) + (2) + (3) - (4) - (5)	116.3	148.4
(7) + Increase (decr.) from replication of 2006 valuation	0.0	3.5
(8) + Increase (decr.) from assumption change	1.2	0.0
(9) = Expected UAAL after changes (6) + (7) + (8)	117.5	151.9
(10) = Actual UAAL at year end	108.7	109.8
(11) = Experience gain (loss) (9) – (10)	8.8	42.1
(12) = Percent of beginning of year AAL	1.1%	5.4%

\* *Unfunded Actuarial Accrued Liability/(Surplus)*

<u>Year Ended April 30</u>	<u>Actuarial Gain/(Loss) As % of Actuarial Accrued Liability</u>
2003	(6.5%)
2004	(5.1%)
2005	(3.1%)
2006	0.5%
2007	5.4%
2008	1.1%

**TABLE 8**  
**POLICE RETIREMENT SYSTEM OF KANSAS CITY, MISSOURI**  
**GAIN/(LOSS) ANALYSIS BY SOURCE**

Source of Gain/(Loss)	Gain/(Loss) (\$M)
Retiree Mortality	(1.7)
Withdrawal	(1.3)
Retirement	1.4
Death	0.1
Disability	(0.4)
Salary	0.6
New actives	<u>(0.3)</u>
 Total Liability Gain/(Loss)	 (1.6)
 Asset Gain/(Loss)	 10.4
 Total Gain/(Loss)	 8.8

**TABLE 9****POLICE RETIREMENT SYSTEM OF KANSAS CITY, MISSOURI****PROJECTED BENEFIT PAYMENTS**

The chart below shows estimated benefits expected to be paid over the next twenty years, based on the assumptions used in this valuation. The “Actives” column shows benefits expected to be paid to members currently active on April 30, 2008. The “Retirees” column shows benefits expected to be paid to all other members. This includes those who, as of April 30, 2008, are receiving benefit payments or who terminated employment and are entitled to a deferred vested benefit. No future members are reflected.

**Retirement, Survivor, Withdrawal and Supplemental Benefits**

<b>Year Ending April 30</b>	<b>Actives</b>	<b>Retirees</b>	<b>Total</b>
2009	\$ 1,584,000	\$ 42,817,000	\$ 44,401,000
2010	3,246,000	43,305,000	46,551,000
2011	5,023,000	43,733,000	48,756,000
2012	6,813,000	44,074,000	50,887,000
2013	8,839,000	44,375,000	53,214,000
2014	11,293,000	44,604,000	55,897,000
2015	13,945,000	44,748,000	58,693,000
2016	17,060,000	44,793,000	61,853,000
2017	20,371,000	44,824,000	65,195,000
2018	23,780,000	44,753,000	68,533,000
2019	27,350,000	44,563,000	71,913,000
2020	31,111,000	44,363,000	75,474,000
2021	35,271,000	44,004,000	79,275,000
2022	39,537,000	43,552,000	83,089,000
2023	44,509,000	43,061,000	87,570,000
2024	50,005,000	42,395,000	92,400,000
2025	55,629,000	41,633,000	97,262,000
2026	61,874,000	40,762,000	102,636,000
2027	68,321,000	39,783,000	108,104,000
2028	74,783,000	38,695,000	113,478,000

## SECTION 5

### EMPLOYER CONTRIBUTIONS

The previous two sections were devoted to a discussion of the assets and liabilities of the System. A comparison of Tables 3 and 4 indicates that current assets fall short of meeting the present value of future benefits (total liability). This is expected in all but a completely closed fund, where no further contributions are anticipated. In an active system, there will almost always be a difference between the actuarial value of assets and total liabilities. This deficiency has to be made up by future contributions and investment returns. An actuarial valuation sets out a schedule of future contributions that will deal with this deficiency in an orderly fashion.

The method used to determine the incidence of the contributions in various years is called the actuarial cost method. Under an actuarial cost method, the contributions required to meet the difference between current assets and current liabilities are allocated each year between two elements: (1) the normal cost rate and (2) the unfunded actuarial accrued liability contribution rate.

The term “fully funded” is often applied to a system in which contributions at the normal cost rate are sufficient to pay for the benefits of existing employees as well as for those of new employees. More often than not, systems are not fully funded, either because of past benefit improvements that have not been completely funded or because of actuarial deficiencies that have occurred because experience has not been as favorable as anticipated. Under these circumstances, an unfunded actuarial accrued liability (UAAL) exists. Likewise, when the actuarial value of assets is greater than the actuarial accrued liability, a surplus exists.

#### Description of Contribution Rate Components

The Entry Age Normal (EAN) actuarial cost method is used for the valuation. Under that method, the normal cost for each year from entry age to assumed exit age is a constant percentage of the member's year by year projected compensation. The portion of the present value of future benefits not provided by the present value of future normal costs is the actuarial accrued liability. The unfunded actuarial accrued liability/(surplus) represents the difference between the actuarial accrued liability and the actuarial value of assets as of the valuation date. The unfunded actuarial accrued liability is calculated each year and reflects experience gains/losses.

In general, contributions are computed in accordance with a level percent-of-payroll funding objective. The contribution rate based on the April 30, 2008 actuarial valuation will be used to determine actuarial required employer contribution rate to the Police Retirement System of Kansas City, Missouri for fiscal year end 2010. In this context, the term “contribution rate” means the percentage, which is applied to a particular active member payroll to determine the actual employer contribution amount (i.e., in dollars) for the group.

As of April 30, 2008, the actuarial accrued liability was greater than the valuation assets so an unfunded actuarial accrued liability (UAAL) exists. The Board elected to amortize the UAAL as a level percent of payroll over a closed initial period of 24 years beginning in 1998. A new amortization base is established each valuation date with a 24 year amortization period. Effective with the 2008 valuation, active member payroll is assumed to increase 4.0% per year (previously 4.5%).



## **Contribution Rate Summary**

In Table 10, the amortization payment related to the unfunded actuarial accrued liability/(surplus), as of April 30, 2008, is developed. Table 11 develops the actuarial contribution rate for the System. A historical summary of the actual and actuarial contribution rates for the City is shown in Table 12.

The contribution rates shown in this report are based on the actuarial assumptions and cost methods described in Appendix C.

**TABLE 10**

**POLICE RETIREMENT SYSTEM OF KANSAS CITY, MISSOURI**

**APRIL 30, 2008 VALUATION**

**DERIVATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY  
CONTRIBUTION RATE**

1. Actuarial Accrued Liability	\$ 850,763,745
2. Actuarial Value of Assets	\$ 742,060,223
3. Unfunded Actuarial Accrued Liability/(Surplus)	\$ 108,703,522
4. Amortization Payment Including Expected Shortfall	\$ 9,501,035
5. Total Projected Payroll for FY 2010	\$ 90,168,869
6. Amortization Payment as a Percent of Payroll	10.54%

**TABLE 11**  
**POLICE RETIREMENT SYSTEM OF KANSAS CITY, MISSOURI**  
**EMPLOYER CONTRIBUTION RATES**

	<b>Valuation Date</b>	
	<b>4/30/2008</b>	<b>4/30/2007</b>
Normal Cost		
Service pensions	18.54 %	20.10 %
Pre-retirement death pensions	0.54 %	0.67 %
Disability pensions	3.85 %	2.63 %
Termination benefits	1.94 %	2.10 %
Supplemental retirement benefit	0.96 %	0.87 %
Administrative expenses	0.40 %	0.40 %
Total Normal Cost	26.23 %	26.77 %
Total UAAL Amortization Payment	10.54 %	12.82 %
Total Actuarial Contribution Rate	36.77 %	39.59 %
Member Portion	10.55 %	10.55 %
City Portion	26.22 %	29.04 %

**TABLE 12**  
**POLICE RETIREMENT SYSTEM OF KANSAS CITY, MISSOURI**  
**COMPUTED AND ACTUAL CITY CONTRIBUTIONS COMPARATIVE STATEMENT**

Fiscal Year Beginning <u>May 1</u>	Valuation Date <u>April 30</u>	Projected Annual <u>Payroll</u>	Fiscal Year Contributions					
			As a % of Projected Pay			\$ Contributions		
			<u>Annual Required Contribution</u>	<u>Reported FY City Contribution</u>	<u>Annual Required Contribution</u>	<u>Projected FY City Contribution</u>	<u>Actual Dollar Contribution</u>	
1997	1997	\$48,173,740	19.42 %	20.60 %	\$9,355,956	\$9,923,790	\$9,978,462	
1998	1998	49,872,090	19.81	20.60	9,880,286	10,273,651	10,318,583	
1999	1999	51,963,858	17.65	20.60	9,172,029	10,704,555	10,789,963	
2000	2000	57,791,028	18.66	20.60	10,785,784	11,904,952	11,392,871	
2001	2001	57,505,238	18.85	19.70	10,837,294	11,328,532	11,312,754	
2002	2002	59,228,848	19.55	19.70	11,579,240	11,668,083	12,017,801	
2003	2003	65,234,614	23.12	19.70	15,082,243	12,851,219	-	
2003*	2003*	65,234,614	23.14	19.70	15,095,290	12,851,219	12,817,176	
2004	2003	68,170,172	23.14	19.70	15,774,578	13,429,524	13,297,605	
2005	2004	72,325,478	26.26	19.70	18,992,671	14,248,119	13,729,225	
2006	2005	73,794,574	29.06	19.70	21,444,703	14,537,531	14,526,734	
2007	2006	78,446,156	29.00	19.70	22,749,385	15,453,893	15,747,111	
2008	2007	83,716,533	29.04	19.70	24,311,281	16,492,157		
2009	2008	90,168,869	26.22		23,642,278			

*\*After changes in actuarial assumptions or methods.*

*Note: For years prior to 2007, information is shown from the prior actuary's report.*

## SECTION 6

### ACCOUNTING INFORMATION

The actuarial accrued liability is a measure intended to help the reader assess (i) a retirement system's funded status on a going concern basis, and (ii) progress being made toward accumulating the assets needed to pay benefits as due. Allocation of the actuarial present value of projected benefits between past and future service was based on service using the Entry Age Normal actuarial cost method. Assumptions, including projected pay increases, were the same as used to determine the System's level percent of payroll annual required contribution between entry age and assumed exit age. Entry age was established by subtracting credited service from current age on the valuation date.

The preceding methods comply with the financial reporting standards established by the Governmental Accounting Standards Board.

The Entry Age Normal actuarial accrued liability was determined as part of an actuarial valuation of the plan as of April 30, 2008. The actuarial assumptions used in determining the actuarial accrued liability can be found in Appendix C.

**TABLE 13**

**POLICE RETIREMENT SYSTEM OF KANSAS CITY, MISSOURI**

**REQUIRED SUPPLEMENTARY INFORMATION  
SCHEDULE OF FUNDING PROGRESS**

<b>Actuarial Valuation Date</b>	<b>Actuarial Value of Assets (a)</b>	<b>Actuarial Accrued Liability (AAL) (b)</b>	<b>Unfunded (UAAL) (b)-(a)</b>	<b>Funded Ratio (a)/(b)</b>	<b>Active Member Covered Payroll** (c)</b>	<b>Unfunded AAL as a Percentage of Active Member Covered Payroll ((b-a)/c)</b>
4/30/1997	\$388,984,781	\$456,218,854	\$67,234,073	85%	\$48,173,740	140%
4/30/1998	433,090,523	493,183,065	60,092,542	88%	49,872,090	120%
4/30/1999	484,396,958	521,600,003	37,203,045	93%	51,963,858	72%
4/30/2000	584,514,972	589,566,248	5,051,276	99%	57,791,028	9%
4/30/2001	600,051,893	615,291,156	15,239,263	98%	57,505,238	27%
4/30/2002	620,948,986	648,632,789	27,683,803	96%	56,678,323	49%
4/30/2003*	611,246,928	682,690,968	71,444,040	90%	62,425,468	114%
4/30/2004	603,418,620	712,273,616	108,854,996	85%	66,230,606	164%
4/30/2005	604,560,607	741,001,020	136,440,413	82%	67,575,902	202%
4/30/2006	635,621,582	775,271,985	139,650,403	82%	71,835,495	194%
4/30/2007	698,078,688	807,902,176	109,823,488	86%	80,111,515	137%
4/30/2008	742,060,223	850,763,745	108,703,522	87%	86,700,836	125%

\* *After changes in actuarial assumptions or methods.*

\*\* *For valuation years 2001 and prior, and 2007 and later, valuation payroll includes projected increases for year following valuation. For valuation years 2002 through 2006, valuation payroll is payroll reported in data after annualization of pays for new hires.*

*Note Results for years prior to 2007 were taken from the prior actuary's report.*

Analysis of the dollar amounts of actuarial value of assets, actuarial accrued liability, or unfunded actuarial accrued liability in isolation can be misleading. Expressing the actuarial value of assets as a percentage of the actuarial accrued liability provides one indication of the System's funded status on a going-concern basis. Analysis of this percentage over time indicates whether the System is becoming financially stronger or weaker. Generally, the greater this percentage, the stronger the plan's funding. The unfunded actuarial accrued liability and annual covered payroll are both affected by inflation. Expressing the unfunded actuarial accrued liability as a percentage of covered payroll approximately adjusts for the effects of inflation and aids analysis of the progress being made in accumulating sufficient assets to pay benefits when due. Generally, the smaller this percentage, the stronger the plan's funding.

**TABLE 13 (continued)**

**POLICE RETIREMENT SYSTEM OF KANSAS CITY, MISSOURI**

**GASB STATEMENTS NO. 25 AND NO. 27  
REQUIRED SUPPLEMENTARY INFORMATION**

**Notes to Required Supplementary Information  
Summary of Actuarial Methods and Assumptions**

Valuation date	April 30, 2008
Actuarial cost method	Individual entry age
Amortization method for unfunded actuarial accrued liabilities	Level percent closed
Equivalent single amortization period	17 years
Asset valuation method	4-year smoothed market
Actuarial assumptions:	
Investment rate of return	7.75%
Projected salary increases including wage inflation at 4.0%	4.25% to 9.75%
Cost-of-living adjustments	3.0% simple

Membership of the plan consisted of the following at April 30, 2008, the date of the latest actuarial valuation:

Retirees and beneficiaries receiving benefits	1,188
Terminated plan members entitled to but not yet receiving benefits	12
Active plan members	<u>1,433</u>
Total	2,633

**TABLE 14**

**POLICE RETIREMENT SYSTEM OF KANSAS CITY, MISSOURI**  
**REQUIRED SUPPLEMENTARY INFORMATION**  
**SCHEDULE OF EMPLOYER CONTRIBUTIONS**

<b>Fiscal Year Ending April 30</b>	<b>Annual Required Contribution</b>	<b>Percent Contribution</b>
1996	\$9,013,550	105%
1997	8,716,539	112%
1998	9,355,956	107%
1999	9,880,286	104%
2000	9,172,029	118%
2001	10,785,784	106%
2002	10,837,294	104%
2003	11,579,240	104%
2004*	15,095,290	85%
2005	15,774,578	84%
2006	18,992,671	72%
2007	21,444,703	68%
2008	22,749,385	69%

*\*After change in actuarial assumptions or methods.*

*Note For years prior to 2007, information shown is from the prior actuary's report.*



**TABLE 15**  
**POLICE RETIREMENT SYSTEM OF KANSAS CITY, MISSOURI**  
**DEVELOPMENT OF ANNUAL PENSION COST AND NET PENSION OBLIGATION**  
**UNDER GASB STATEMENT NUMBER 27**

<b>Fiscal Year End</b>	<b>Annual Required Contribution (ARC) (a)</b>	<b>Interest on NPO (b)</b>	<b>ARC Adjustment (c)</b>	<b>Annual Pension Cost (APC) (d)=(a)+(b)-(c)</b>	<b>Annual Actual Contribution (e)</b>	<b>Change in NPO (f)=(d)-(e)</b>	<b>Net Pension Obligation (NPO) at End of Year (g)=sum of (f)</b>
1998	\$9,355,956	(\$759,648)	(\$491,915)	\$9,088,223	\$9,978,462	(\$890,239)	(\$10,692,143)
1999	9,880,286	(828,641)	(619,583)	9,671,228	10,318,583	(647,355)	(11,339,498)
2000	9,172,029	(878,811)	(657,096)	8,950,314	10,789,963	(1,839,649)	(13,179,147)
2001	10,785,784	(1,021,384)	(763,699)	10,528,099	11,392,871	(864,772)	(14,043,919)
2002	10,837,294	(1,088,404)	(813,810)	10,562,700	11,312,754	(750,054)	(14,793,973)
2003	11,579,240	(1,146,533)	(889,665)	11,322,372	12,017,801	(695,429)	(15,489,402)
2004	15,095,290	(1,200,429)	(931,486)	14,826,347	12,817,176	2,009,171	(13,480,231)
2005	15,774,578	(1,044,718)	(810,661)	15,540,521	13,297,605	2,242,916	(11,237,315)
2006	18,992,671	(870,892)	(675,778)	18,797,557	13,729,225	5,068,332	(6,168,983)
2007	21,444,703	(478,096)	(370,984)	21,337,591	14,526,734	6,810,857	641,874
2008	22,749,385	49,745	38,609	22,760,521	15,747,111	7,013,410	7,655,284
2009	24,311,281	593,285	460,473	24,444,093			

*Note: Results for years prior to FY2008 were prepared by the prior actuary.*

**TABLE 16**  
**POLICE RETIREMENT SYSTEM OF KANSAS CITY, MISSOURI**  
**SOLVENCY TEST**

Valuation Date	Entry Age Actuarial Accrued Liabilities			Valuation Assets	Portion of Actuarial Accrued Liabilities Covered by Reported Assets		
	(1)	(2)	(3)		(1)	(2)	(3)
	Active Member Contributions	Retirants and Beneficiaries	Active Members (Employer Financed Portion)				
<u>April 30</u>							
2002	\$41,661,164	\$424,565,985	\$182,405,640	\$620,948,986	100 %	100 %	85 %
2003*	46,015,271	436,805,624	199,870,073	611,246,928	100	100	64
2004	50,340,747	448,521,694	213,411,175	603,418,620	100	100	49
2005	55,220,395	460,235,649	225,544,976	604,560,607	100	100	40
2006	59,717,930	476,677,326	238,876,729	635,621,582	100	100	42
2007	64,314,276	487,633,976	255,953,924	698,078,688	100	100	57
2008	70,012,081	511,571,757	269,179,907	742,060,223	100	100	60

*\*After changes in actuarial assumptions or methods.*

*Note: Results for years before 2007 were prepared by the prior actuary.*

**APPENDIX A**

**SUMMARY OF MEMBERSHIP DATA**

**MEMBER DATA RECONCILIATION**

April 30, 2007 to April 30, 2008

*The number of members included in the valuation, as summarized in the table below, is in accordance with the data submitted by the System for members as of the valuation date*

	<b>Active Participants</b>	<b>Retirees</b>	<b>Disableds</b>	<b>Beneficiaries</b>	<b>Terminated Vested</b>	<b>Total</b>
Members as of 04/30/07	1,391	792	166	231	12	2,592
New Members	+88	0	0	+24	0	+112
Rehires	+2	0	0	0	-1	+1
Terminations						
Refunded	-25	0	0	0	0	-25
Deferred Vested	-3	0	0	0	+3	0
Retirements						
Service	-12	+13	0	0	-1	0
Disability	-7	-1	+9	0	-1	0
Deaths						
Cashed Out/Payments Ended	0	0	0	-6	0	-6
With Beneficiary	-1	-15	-5	0	0	-21
Without Beneficiary	0	-7	-1	-12	0	-20
Data Adjustments	0	0	0	0	0	0
<b>Members as of 04/30/08</b>	<b>1,433</b>	<b>782</b>	<b>169</b>	<b>237</b>	<b>12</b>	<b>2,633</b>

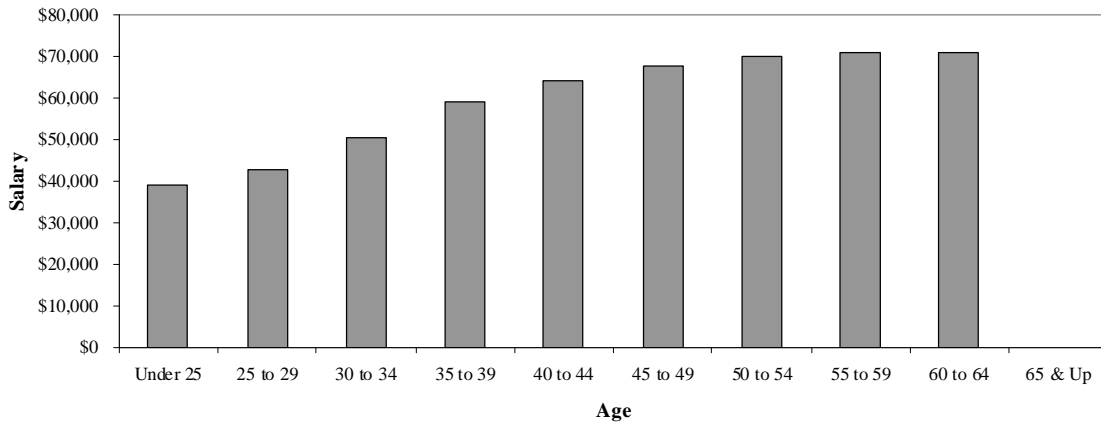
**APPENDIX A (continued)**

**POLICE RETIREMENT SYSTEM OF KANSAS CITY, MISSOURI  
SUMMARY OF ACTIVE MEMBERS  
as of April 30, 2008**

Age	Number			Annual Reported Compensation*		
	Male	Female	Total	Male	Female	Total
Under 25	44	8	52	\$ 1,713,871	\$ 318,269	\$ 2,032,141
25 to 29	192	27	219	8,180,041	1,148,656	9,328,697
30 to 34	215	38	253	10,759,468	1,955,559	12,715,027
35 to 39	304	46	350	18,004,137	2,627,107	20,631,244
40 to 44	242	30	272	15,499,326	1,917,099	17,416,425
45 to 49	130	26	156	8,796,095	1,723,064	10,519,159
50 to 54	79	18	97	5,441,249	1,333,224	6,774,473
55 to 59	25	4	29	1,790,082	265,483	2,055,565
60 to 64	3	2	5	184,562	168,285	352,847
65 & Up	0	0	0	-	-	-
<b>Total</b>	<b>1,234</b>	<b>199</b>	<b>1,433</b>	<b>\$ 70,368,832</b>	<b>\$ 11,456,745</b>	<b>\$ 81,825,577</b>

\*Compensation reported in the valuation data for the prior plan year with annualization of pay for new hires.

**Average Salary by Age**



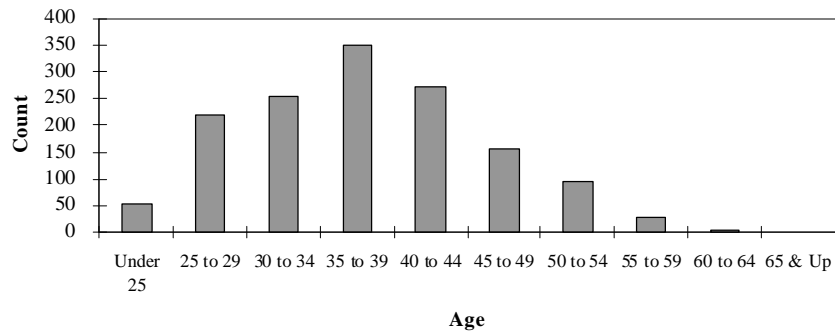
Average age: 37.7  
 Average service: 11.0  
 Average salary: \$57,101

**APPENDIX A (continued)**

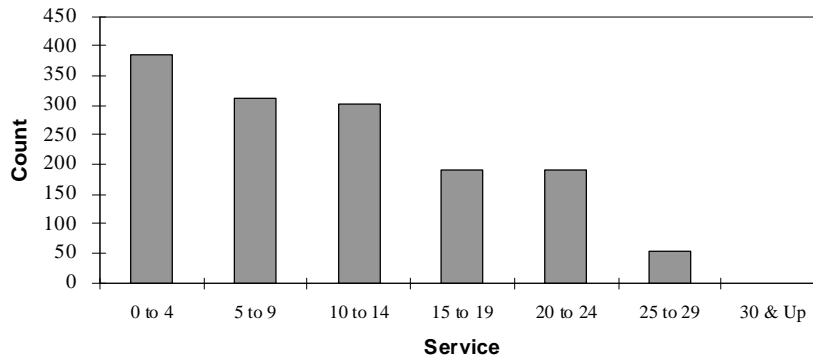
**POLICE RETIREMENT SYSTEM OF KANSAS CITY, MISSOURI  
DISTRIBUTION OF ACTIVE MEMBERS  
as of April 30, 2008**

Age	Years of Service							Total
	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up	
Under 25	52	0	0	0	0	0	0	52
25 to 29	181	38	0	0	0	0	0	219
30 to 34	84	139	30	0	0	0	0	253
35 to 39	47	104	171	28	0	0	0	350
40 to 44	14	26	78	110	44	0	0	272
45 to 49	4	4	15	36	88	9	0	156
50 to 54	1	2	4	13	45	32	0	97
55 to 59	1	0	2	2	15	9	0	29
60 to 64	0	0	1	1	0	3	0	5
65 & Up	0	0	0	0	0	0	0	0
<b>Total</b>	<b>384</b>	<b>313</b>	<b>301</b>	<b>190</b>	<b>192</b>	<b>53</b>	<b>0</b>	<b>1,433</b>

**Age Distribution**



**Service Distribution**

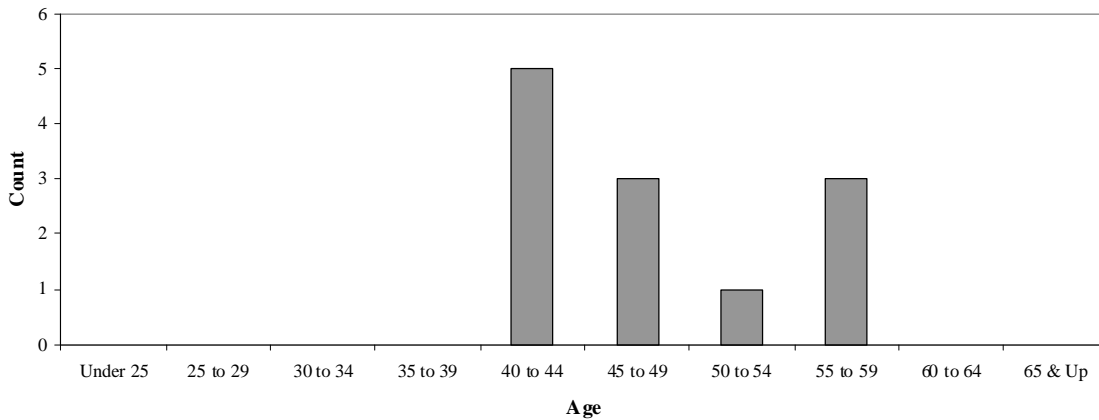


**APPENDIX A (continued)**

**POLICE RETIREMENT SYSTEM OF KANSAS CITY, MISSOURI  
SUMMARY OF DEFERRED VESTED MEMBERS  
as of April 30, 2008**

Age	Number			Current Monthly Benefit at Retirement		
	Male	Female	Total	Male	Female	Total
Under 25	0	0	0	\$ -	\$ -	\$ -
25 to 29	0	0	0	-	-	-
30 to 34	0	0	0	-	-	-
35 to 39	0	0	0	-	-	-
40 to 44	2	3	5	4,621	6,700	11,321
45 to 49	2	1	3	3,745	2,099	5,844
50 to 54	1	0	1	1,982	-	1,982
55 to 59	3	0	3	3,990	-	3,990
60 to 64	0	0	0	-	-	-
65 & Up	0	0	0	-	-	-
<b>Total</b>	<b>8</b>	<b>4</b>	<b>12</b>	<b>\$ 14,337</b>	<b>\$ 8,799</b>	<b>\$ 23,136</b>

**Age Distribution**



**APPENDIX A (continued)**

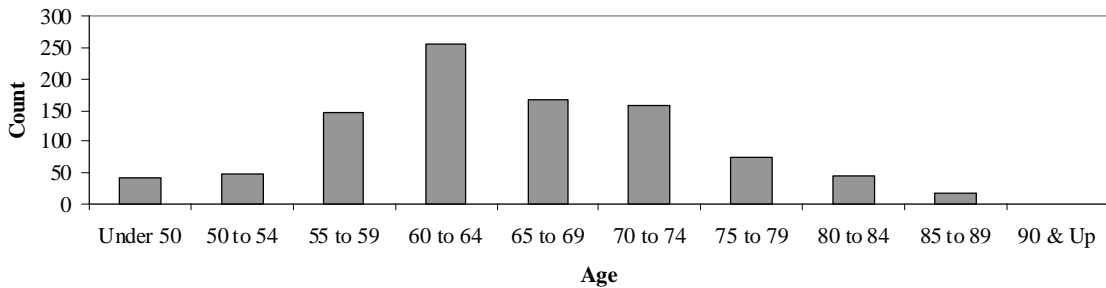
**POLICE RETIREMENT SYSTEM OF KANSAS CITY, MISSOURI  
SUMMARY OF RETIRED MEMBERS  
as of April 30, 2008**

**Healthy & Disabled Retirees**

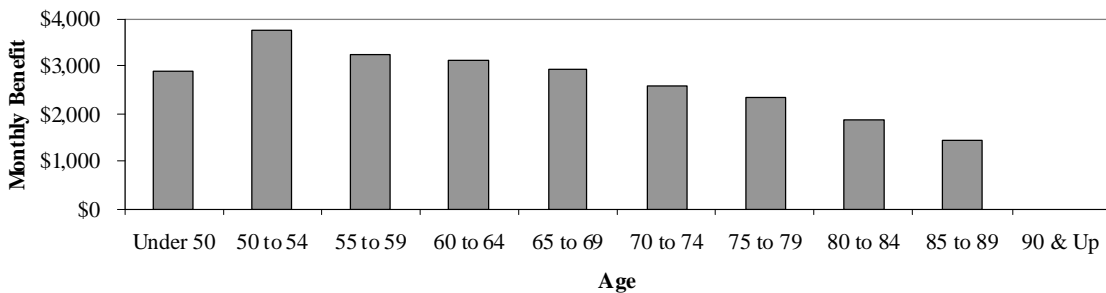
Age	Number			Monthly Benefit*		
	Male	Female	Total	Male	Female	Total
Under 50	30	10	40	\$ 85,751	\$ 29,337	\$ 115,087
50 to 54	32	14	46	126,703	45,230	171,933
55 to 59	126	21	147	412,930	65,286	478,215
60 to 64	249	7	256	776,769	22,298	799,067
65 to 69	167	1	168	489,644	3,263	492,907
70 to 74	157	1	158	405,883	2,548	408,431
75 to 79	75	0	75	174,436	-	174,436
80 to 84	45	0	45	83,713	-	83,713
85 to 89	15	1	16	21,831	1,383	23,214
90 & Up	0	0	0	-	-	-
<b>Total</b>	<b>896</b>	<b>55</b>	<b>951</b>	<b>\$ 2,577,659</b>	<b>\$ 169,344</b>	<b>\$ 2,747,002</b>

\*Does not include supplemental benefits

**Age Distribution**



**Average Benefit**



**APPENDIX A (continued)**

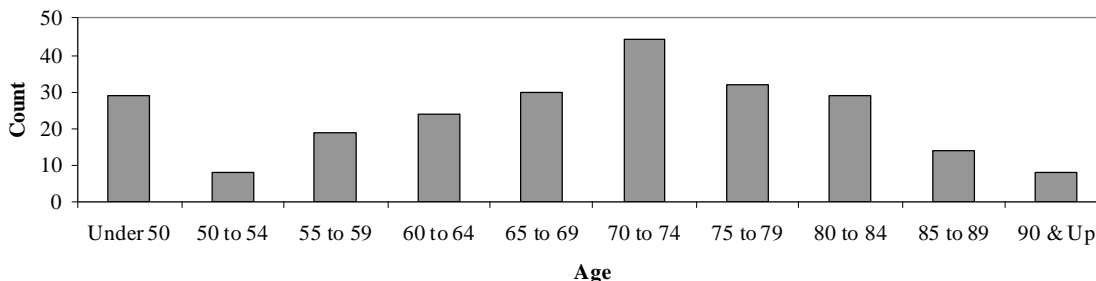
**POLICE RETIREMENT SYSTEM OF KANSAS CITY, MISSOURI  
SUMMARY OF RETIRED MEMBERS  
as of April 30, 2008**

**Beneficiaries**

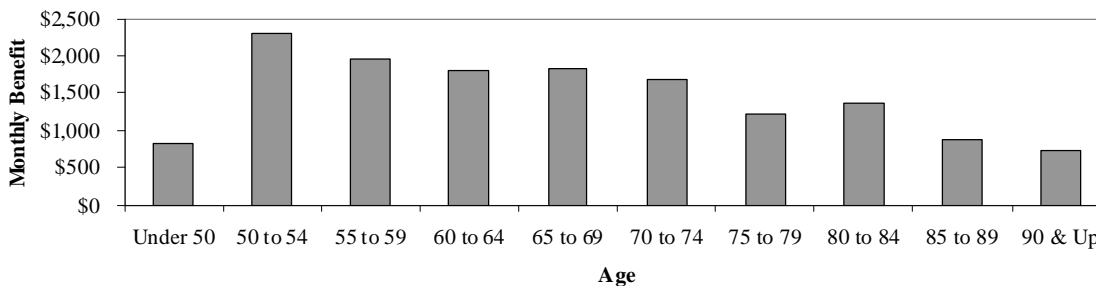
Age	Number			Monthly Benefit*		
	Male	Female	Total	Male	Female	Total
Under 50	11	18	29	\$ 4,069	\$ 19,853	\$ 23,922
50 to 54	1	7	8	600	17,757	18,357
55 to 59	0	19	19	-	36,984	36,984
60 to 64	1	23	24	1,445	41,746	43,190
65 to 69	0	30	30	-	54,663	54,663
70 to 74	0	44	44	-	73,605	73,605
75 to 79	0	32	32	-	39,116	39,116
80 to 84	0	29	29	-	39,536	39,536
85 to 89	0	14	14	-	12,187	12,187
90 & Up	0	8	8	-	5,776	5,776
<b>Total</b>	<b>13</b>	<b>224</b>	<b>237</b>	<b>\$ 6,113</b>	<b>\$ 341,222</b>	<b>\$ 347,335</b>

\*Does not include supplemental benefits

**Age Distribution**



**Average Benefit**





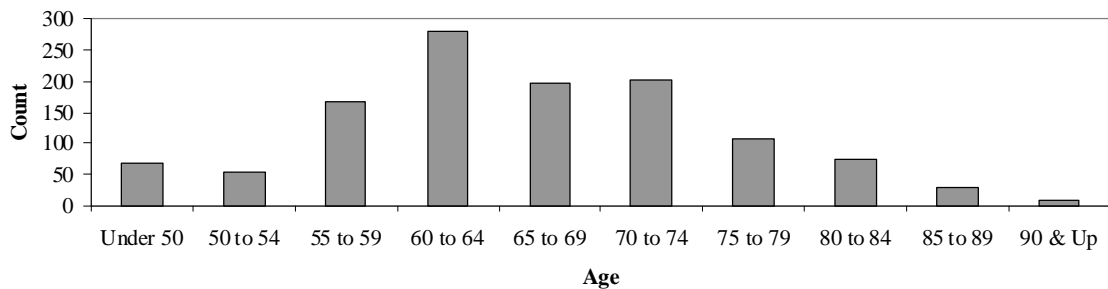
**APPENDIX A (continued)**  
**POLICE RETIREMENT SYSTEM OF KANSAS CITY, MISSOURI**  
**SUMMARY OF RETIRED MEMBERS**  
**as of April 30, 2008**

**Combined Retirees & Beneficiaries**

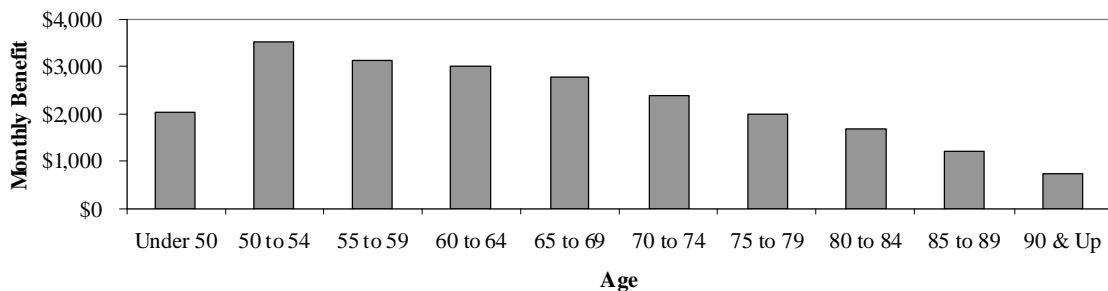
Age	Number			Monthly Benefit*		
	Male	Female	Total	Male	Female	Total
Under 50	41	28	69	\$ 89,819	\$ 49,190	\$ 139,009
50 to 54	33	21	54	127,303	62,987	190,290
55 to 59	126	40	166	412,930	102,269	515,199
60 to 64	250	30	280	778,214	64,043	842,257
65 to 69	167	31	198	489,644	57,925	547,569
70 to 74	157	45	202	405,883	76,153	482,036
75 to 79	75	32	107	174,436	39,116	213,552
80 to 84	45	29	74	83,713	39,536	123,249
85 to 89	15	15	30	21,831	13,570	35,401
90 & Up	0	8	8	-	5,776	5,776
<b>Total</b>	<b>909</b>	<b>279</b>	<b>1,188</b>	<b>\$ 2,583,772</b>	<b>\$ 510,566</b>	<b>\$ 3,094,338</b>

\*Does not include supplemental benefits

**Age Distribution**



**Average Benefit**



## APPENDIX B

### POLICE RETIREMENT SYSTEM OF KANSAS CITY, MISSOURI

#### SUMMARY OF BENEFIT PROVISIONS

##### **Membership**

All police officers who serve as law enforcement officers for compensation. Does not include police commissioners, reserve officers or civilian employees.

##### **Service Retirement**

***Eligibility*** – Age 60 with 10 or more years of service or 25 years of service, without regard to age. Members must retire at the completion of 30 years of creditable service, or after attaining age 60, whichever occurs first. The Board of Police Commissioners may, however, with the recommendation of the Chief of Police, permit a member to continue in service until age 65, at which time the member must retire.

***Amount of Pension*** – For a member retiring prior to August 28, 2000, benefit equal to 2.0% of Final Compensation times years of creditable service, subject to a maximum benefit of 60% of Final Compensation.

For a member retiring on or after August 28, 2000, benefit equal to 2.5% of Final Compensation times years of creditable service, subject to a maximum benefit of 75% of Final Compensation.

***Final Compensation*** – Average annual compensation during the two years of service with the highest salary, whether consecutive or otherwise, or during the entire period of service if less than two years. No compensation for service after the thirtieth full year of membership service shall be included.

##### **Deferred Retirement (Vested Termination)**

***Eligibility*** – 15 years of creditable service.

***Amount of Pension*** – Computed as service retirement but based upon service, Final Compensation and benefit formula in effect at termination. Benefit begins at age 55, (unreduced).

##### **Duty Disability**

***Eligibility*** – Effective August 2008, payable to an active member, as the exclusive result of an accident or disease occurring in the line of duty, who has become permanently unable to perform the full and unrestricted duties of a police officer as established by the Board of Police Commissioners.

***Amount of Pension*** – 75% of Final Compensation payable for the remainder of the officer's life, or as long as the permanent disability continues. The pension may be subject to offset or reduction by amounts paid or payable under any Workers' Compensation law.

## APPENDIX B (continued)

### **Non-Duty Disability**

**Eligibility** – Effective August 2008, payable to an active member who has 10 years of service who has become permanently unable to perform the full and unrestricted duties of a police officer as established by the Board of Police Commissioners. Disability is not exclusively caused by the actual performance of official duties.

**Amount of Pension** – 2.5% of Final Compensation multiplied by years of creditable service payable for the officer's lifetime or as long as the permanent disability continues.

### **Non-Duty Death in Service**

**Eligibility** – Death while an active Police Officer but not resulting from the performance of duties as a police officer; no service requirement.

**Amount of Pension** – 40% of Final Compensation payable to surviving spouse, if any, for their lifetime. If there is no surviving spouse, payable to qualified child or children in equal shares until age 18.

Children: \$600 annually for each child under age 18 years, if any, until the child reaches age 18 or age 21 if a full time student or if mentally or physically incapacitated from earning wages until incapacity no longer exists.

**Funeral Benefit** – of \$1,000 is payable upon the death of the active member.

### **Duty Death in Service**

**Eligibility** – Payable to surviving spouse, if any, or if no surviving spouse, to children under age 21 or children over age 21 if mentally or physically incapacitated. Death resulting from performance of duty as a Police Officer; no service requirement.

**Amount of Pension** – In addition to benefits payable under non-duty death, a lump sum of \$50,000.

### **Death After Retirement**

**Eligibility** – Payable to a surviving spouse, if any, upon the death of a retired member. Benefit is payable until death of surviving spouse.

**Amount of Pension** – Spouse's pension equals 80% of the straight life pension the deceased retirant was receiving. The 80% benefit amount calculated under this provision is in addition to the Supplemental Retirement Benefit.

**Funeral Benefit** – of \$1,000 is payable upon the death of the retired member.

## APPENDIX B (continued)

### **Non-Vested Termination**

***Eligibility*** – termination of employment and no pension is or will become payable.

***Amount of Benefit*** – refund of member's contributions without interest.

### **Minimum Pension Benefit**

***Eligibility*** – Any member who retired entitled to a pension benefit and who either has at least 25 years of creditable service or is retired as a result of an injury or illness occurring in the line of duty or course of employment. A surviving spouse qualifies for the minimum monthly benefit if the officer had at least 25 years of creditable service or was retired or died as a result of an injury or illness occurring in the line of duty or course of employment.

***Amount of Benefit*** – Minimum monthly benefit of not less than \$600 in combined pension benefit and cost-of-living adjustments. The minimum monthly pension benefit is in addition to the Supplemental Retirement Benefit.

### **Post-Retirement Benefit Increases**

Dependent on the actuarial condition of the System, a member may receive during each year, in addition to the officer's base pension, a cost of living adjustment in an amount not to exceed 3% of the officer's base pension. Base pension is the pension computed under the provisions of the law at the date of retirement, without regard to the cost of living adjustment. The cost of living adjustment also applies to benefits being paid to a surviving spouse. The adjustment is normally effective with the May 31<sup>st</sup> benefit payment.

The liabilities in this report assume a 3% ad hoc COLA will be granted in each future year.

### **Member Contributions**

10.55% of base pay. No contributions are required for members after they retire or complete 30 years of service.

### **Supplemental Retirement Benefit**

Current and future retired and disabled members and their surviving spouses are eligible to receive \$420 per month in addition to pension benefits.

### **Optional Form of Benefit Payment**

Members retiring with at least 26 or more years of service may elect to take a portion of their benefit as a lump-sum distribution (PLOP). Members electing PLOP will receive an actuarially reduced monthly benefit for their lifetime.

## APPENDIX C

### POLICE RETIREMENT SYSTEM OF KANSAS CITY, MISSOURI

#### ACTUARIAL COST METHOD AND ASSUMPTIONS

##### Actuarial Cost Method

The actuarial cost method is a procedure for allocating the actuarial present value of pension benefits and expenses to time periods. The method used for the valuation is known as the Entry Age Normal actuarial cost method, and has the following characteristics.

- (i) The annual normal costs for each individual active member are sufficient to accumulate the value of the member's pension at time of retirement.
- (ii) Each annual normal cost is a constant percentage of the member's year-by-year projected covered compensation.

The Entry Age Normal actuarial cost method allocates the actuarial present value of each member's projected benefits on a level basis over the member's assumed pensionable compensation rates between the entry age of the member and the assumed exit ages.

The portion of the actuarial present value allocated to the valuation year is called the normal cost. The portion of the actuarial present value not provided for by the actuarial present value of future normal costs is called actuarial accrued liability. Deducting actuarial assets from the actuarial accrued liability determines the unfunded actuarial accrued liability or (surplus). The difference in the actual and expected UAAL is set up as a separate base each year, which is amortized over a closed 24 year period.

##### Asset Valuation Method

The difference between the actual investment return on the market value of assets and assumed investment return on the actuarial value of assets is phased-in equally over a four year period. The resulting actuarial value of assets is constrained to fall within a corridor of 80% to 120% of market value.

##### Actuarial Assumptions

The assumptions and the methods comply with the requirements of Statement No. 25 of the Governmental Accounting Standards Board. The April 30, 2008 actuarial valuation includes assumptions and methods resulting from the experience study covering the 5-year period from May 1, 2002 to April 30, 2007.

**APPENDIX C (continued)**  
**ECONOMIC ASSUMPTIONS**

**Investment return:** 7.75% per year, compounded annually.

**Pay increase assumption:** Rates for sample ages are shown below.

<b>Annual Rate of Pay Increase for Sample Ages</b>			
<b><u>Years Of Service</u></b>	<b><u>General Wage Growth</u></b>	<b><u>Merit and Longevity</u></b>	<b><u>Total</u></b>
0	4.0%	5.75%	9.75%
1	4.0%	5.50%	9.50%
2	4.0%	4.50%	8.50%
3	4.0%	4.00%	8.00%
4	4.0%	4.00%	8.00%
5	4.0%	4.00%	8.00%
10	4.0%	3.50%	7.50%
15	4.0%	0.00%	4.00%
20	4.0%	0.00%	4.00%
25	4.0%	0.00%	4.00%

**Price inflation:** 3.0% per year, compounded annually.

**Active member payroll:** 4.0% per year, compounded annually.

**Mortality Tables:**

- Healthy Retirees: RP-2000 Healthy Annuitant Table using Scale AA to model future mortality improvement.
- Disabled Retirees: RP-2000 Healthy Annuitant Table set forward 5 years using Scale AA to model future mortality improvement.
- Actives: RP-2000 Employee Table using Scale AA to model future mortality improvement.

**Rates of termination from active membership:**

<b>% of Active Members Terminating within Next Year</b>		
<b><u>Sample Ages</u></b>	<b><u>Male</u></b>	<b><u>Female</u></b>
25	5.8%	6.3%
30	3.8%	5.0%
35	2.4%	3.5%
40	1.6%	1.6%
45	1.1%	0.5%
50	0.6%	0.0%

## APPENDIX C (continued)

The rates do not apply to members eligible to retire and do not include separation on account of death or disability. All vested members are assumed to leave their contributions with the System and receive a deferred benefit.

### *Rates of Disability:*

<u>Sample Ages</u>	<u>% of Active Members Becoming Disabled Within Next Year</u>	
	<u>Male</u>	<u>Female</u>
30	0.062%	0.134%
35	0.312%	0.672%
40	0.416%	0.896%
45	0.437%	0.941%
50	0.759%	1.635%
55	1.456%	3.136%
60	2.579%	5.555%

It is assumed that 55% of disabilities will be duty related.

### *Rates of Retirement:*

<u>Active Members Retiring Within Next Year</u>	
<u>Years of Service</u>	<u>Percent Retiring</u>
25	25%
26	25%
27	25%
28	25%
29	55%
30	100%

Deferred vested members are assumed to retire at age 55.

## APPENDIX C (continued)

### Miscellaneous and Technical Assumptions

<b><i>Marriage Assumption:</i></b>	85% of males and 55% of females are assumed to be married for purposes of death-in-service benefits and death-after-retirement benefits. Males are assumed to be 3 years older than their spouses. Actual reported data is utilized for retirees and beneficiaries.
<b><i>Pay Increase Timing:</i></b>	Assumed to occur at the start of the fiscal year.
<b><i>Pay Annualization:</i></b>	Reported pays for members with less than 1 year of service were annualized for valuation purposes.
<b><i>Decrement Timing:</i></b>	Decrements of all types are assumed to occur mid-year.
<b><i>Eligibility Testing:</i></b>	Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year at the start of the year in which the decrement is assumed to occur.
<b><i>Benefit Service:</i></b>	Service calculated to the nearest month, as of the decrement date, is used to determine the amount of benefit payable.
<b><i>Child Beneficiaries:</i></b>	None assumed.
<b><i>Other:</i></b>	Turnover decrement does not operate during retirement eligibility.
<b><i>Form of Payment:</i></b>	The assumed normal form of payment is a 80% joint and survivor annuity, if married. Otherwise, a single life annuity.
<b><i>Administrative Expense:</i></b>	0.40% of payroll each year. Administrative expenses beyond this allocation and all investment expenses are assumed to be funded by investment return in excess of the actuarial assumed rate of return.
<b><i>Cost of Living Adjustment:</i></b>	It was assumed the Retirement Board will grant the full 3% cost of living adjustment each year.



## APPENDIX D

### GLOSSARY OF TERMS

<b>Actuarial Accrued Liability</b>	The difference between the actuarial present value of system benefits and the actuarial value of future normal costs. Also referred to as “accrued liability” or “actuarial liability.”
<b>Actuarial Assumptions</b>	Estimates of future experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and salary increases. Decrement assumptions (rates of mortality, disability, turnover and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (salary increases and investment income) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation.
<b>Accrued Service</b>	Service credited under the system which was rendered before the date of the actuarial valuation.
<b>Actuarial Equivalent</b>	A single amount or series of amounts of equal actuarial value to another single amount or series of amounts, computed on the basis of appropriate assumptions.
<b>Actuarial Cost Method</b>	A mathematical budgeting procedure for allocating the dollar amount of the actuarial present value of retirement system benefit between future normal cost and actuarial accrued liability. Sometimes referred to as the “actuarial funding method.”
<b>Experience Gain (Loss)</b>	The difference between actual experience and actuarial assumptions anticipated experience during the period between two actuarial valuation dates.
<b>Actuarial Present Value</b>	The amount of funds currently required to provide a payment or series of payments in the future. It is determined by discounting future payments at predetermined rates of interest and by probabilities of payment.
<b>Amortization</b>	Paying off an interest-discounted amount with periodic payments of interest and principal, as opposed to paying off with lump sum payment.
<b>Normal Cost</b>	The actuarial present value of retirement system benefits allocated to the current year by the actuarial cost method.

## APPENDIX D (continued)

**Unfunded Actuarial Accrued Liability** The difference between actuarial accrued liability and the valuation assets.

Most retirement systems have an unfunded actuarial accrued liability. They arise each time new benefits are added and each time an actuarial loss is realized.

The existence of unfunded actuarial accrued liability is not in itself bad, any more than a mortgage on a house is bad. Unfunded actuarial accrued liability does not represent a debt that is payable today. What is important is the ability to amortize the unfunded actuarial accrued liability and the trend in its amount.