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Civilian Employees' Retirement System of the Police Department of Kansas City, Missouri

Actuarial Valuation Report
as of April 30, 2017

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September 15, 2017

The Board of Trustees
Civilian Employees' Retirement System
of the Police Department of Kansas City, Missouri
9701 Marion Park Drive, B
Kansas City, MO 64137

Dear Members of the Board:

At your request, we have performed the annual actuarial valuation of the Civilian Employees' Retirement System of the Police Department of Kansas City, Missouri as of April 30, 2017 for determining the actuarial contribution for the fiscal year ending in 2019. The major findings of the valuation are contained in this report, which reflects the benefit provisions in effect as of April 30, 2017. There were no changes in benefit provisions or actuarial assumptions since the prior valuation. However, there was one change in the actuarial methods used in the valuation. The Board adopted a new Funding Policy at their November 8, 2016 meeting. As a result, the amortization policy for the unfunded actuarial accrued liability (UAAL) was changed from an open 30-year period to a closed 30-year period, beginning with the April 30, 2017 valuation. Any new unfunded actuarial accrued liability generated as a result of actuarial experience in subsequent years will be layered and amortized over a closed 20-year period.

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. We found this information to be reasonably consistent and comparable with information used for other purposes. The valuation results depend on the integrity of this information. If any of this information is inaccurate or incomplete, our results may be different and our calculations may need to be revised.

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); and which, in combination, offer our best estimate of anticipated experience affecting the System.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. Due to the limited scope of our assignment, we did not perform an analysis of the potential range of future measurements. The Board of Trustees has the final decision regarding the appropriateness of the assumptions and adopted them as indicated in Appendix C.

Actuarial computations presented in this report are for purposes of determining the recommended funding amounts for the System. The calculations in the enclosed report have been made on a basis consistent with our understanding of the System's funding requirements and goals. Determinations for purposes other than meeting these requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes. For example, actuarial computations for purposes of fulfilling financial accounting requirements for the System under Governmental Accounting Standard No. 67 are provided in a separate report.

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 actuarial principles and practices. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

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.

Respectfully submitted,

Patrice A. Beckham, FSA, EA, FCA, MAAA
Principal and Consulting Actuary

Bryan K. Hoge, FSA, EA, FCA, MAAA
Senior Actuary

OVERVIEW

This report presents the results of the April 30, 2017 actuarial valuation of the Civilian Employees' Retirement System of the Police Department of Kansas City, Missouri. The primary purposes of performing a valuation are to:

- Determine the employer contribution 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 were no changes to the benefit provisions or the actuarial assumptions from those used in the prior valuation. However, there was one change in the actuarial methods used in the valuation. The Board adopted a new Funding Policy at their November 8, 2016 meeting. As a result, the amortization policy for the unfunded actuarial accrued liability (UAAL) was changed from an open 30-year period (reset to 30 each valuation) to a closed 30-year period (declining by one each valuation), beginning with the April 30, 2017 valuation. Any new unfunded actuarial accrued liability generated as a result of actuarial experience in subsequent years will be layered and amortized over a closed 20-year period.

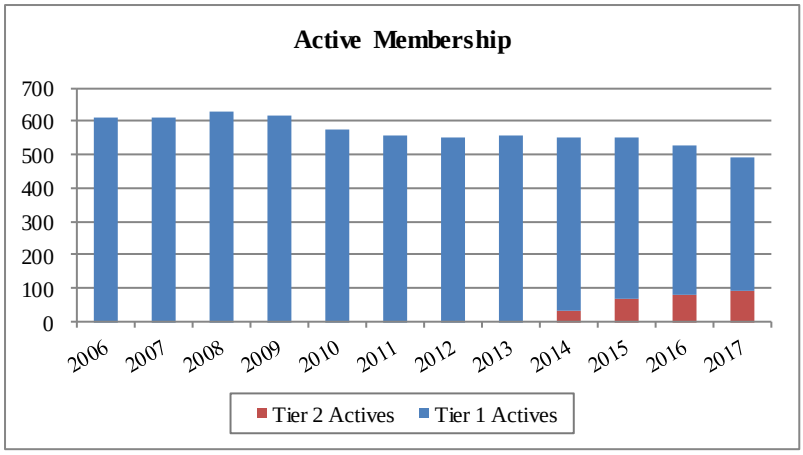
The valuation results provide a "snapshot" view of the System's financial condition on April 30, 2017. The UAAL decreased slightly from the prior valuation by $0.5 million (from $34.5 million to $34.0 million). The investment return on the market value of assets for fiscal year 2017 was 9.5%. After applying the asset smoothing method, the return on the actuarial value of assets was 6.1%, less than the assumed rate of return of 7.5%. As a result, there was an experience loss on assets. Net demographic experience resulted in a gain of $2.9 million on liabilities, primarily due to salary increases that were lower than expected, based on the actuarial assumptions. A detailed analysis of the change in the UAAL from April 30, 2016 to April 30, 2017 is shown on page 4.

MEMBERSHIP

The 2013 session of the Missouri General Assembly passed legislation that modified the benefit provisions for members hired on or after August 28, 2013 (called Tier II). As a result, the normal cost rate for this group of members is lower than the normal cost rate for members hired before that date. As of April 30, 2017, there were 90 members in Tier II out of a total of 492 active members (about 18% of total actives). The Tier II portion of total estimated payroll was about 15% of total payroll. Over time, as the Tier I members retire or leave covered employment and are replaced by members covered by the Tier II benefit structure, the normal cost rate for the System is expected to decline. However, it will likely take ten to fifteen years before a noticeable difference is observed in the valuation results. In addition, the decrease in the number of new hires in recent years has reduced the number of members in Tier II and the related cost savings compared to the expected results when the legislation was passed.

The number of active members in the 2017 valuation was 492 compared to 526 in the 2016 valuation, a decrease of 6.5%. As the graph on the following page shows, the number of active members in this valuation is the smallest in the last ten years. When the number of active members declines, the actuarial contribution rate is negatively impacted. While the normal cost rate is unaffected, the contribution rate for the amortization of the unfunded actuarial accrued liability (UAAL) assumes that covered payroll will increase 3.75% each year. A decline in the number of active members usually results in lower covered

payroll than the assumed increase of 3.75%. As a result, the amortization payment is divided by a smaller payroll amount and the UAAL contribution rate increases.



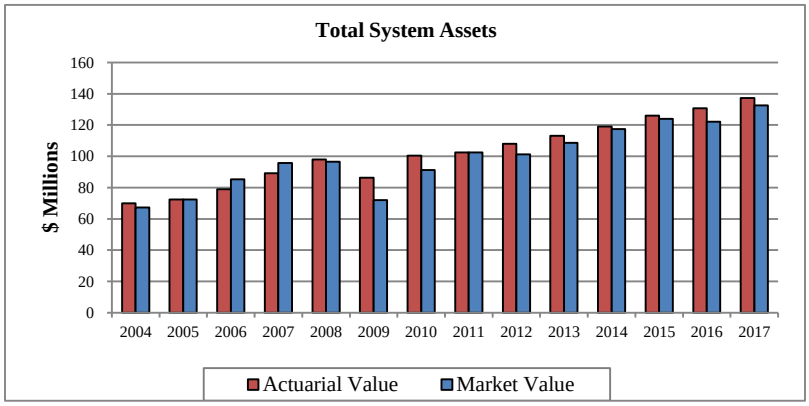
ASSETS

As of April 30, 2017, the System had total assets, when measured on a market value basis, of $132.6 million. This was an increase of $10.5 million from the April 30, 2016 figure of $122.1 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." The current smoothing method recognizes the difference between the actual and expected return on the market value of assets evenly over a five-year period.

A summary of the asset experience follows:

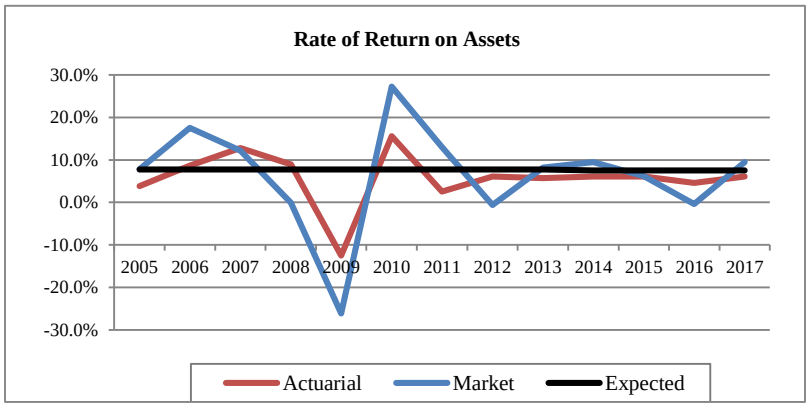
	Market Value ($M)	Actuarial Value ($M)
Assets, April 30, 2016	$122.1	$130.6
• City and Member Contributions	6.3	6.3
• Benefit Payments and Refunds	(7.2)	(7.2)
• Administrative Expenses	(0.1)	(0.1)
• Investment Income (net of expenses)	11.5	7.6
Assets, April 30, 2017	$132.6	$137.2

The annualized dollar-weighted rate of return, measured on the market value of assets, was 9.5%. However, due to the use of an asset smoothing method, the rate of return on the actuarial value of assets was 6.1%. Since this return was less than 7.5%, the assumed rate of return, there was an actuarial loss of about $2.1 million, which increased the unfunded actuarial accrued liability. Historical asset information is shown in the following two graphs:



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 2011 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 7.5% assumption in the last decade.

Note: Results for years before 2011 were prepared by the prior actuary

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) if the actuarial accrued liability exceeds the asset value. 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 on the previous balance of the unfunded actuarial accrued liability. Benefit improvements, experience gains and losses, and changes in actuarial assumptions and methods 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, 2017 are:

Actuarial Accrued Liability	$171,188,191
Actuarial Value of Assets	(137,233,636)
Unfunded Actuarial Accrued Liability	$ 33,954,555

Between April 30, 2016 and April 30, 2017, the change in the unfunded actuarial accrued liability (UAAL) for the System was as follows (in millions):

	$ millions
UAAL, April 30, 2016	34.5
• effect of contributions less than actuarial rate	0.0
• expected change due to amortization method	0.7
• loss from investment return on actuarial assets	2.1
• demographic experience[1]	(2.9)
• all other experience	(0.4)
UAAL, April 30, 2017	34.0

[1] Liability gain is about 1.72% of total actuarial liability

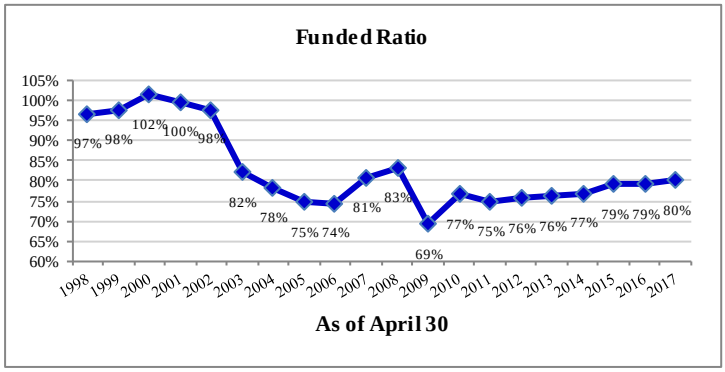
The net experience for the plan year was a gain of $0.8 million, the combined result of an actuarial loss of $2.1 million on System assets (actuarial value) and a liability gain of $2.9 million. The liability gain was primarily the result of salaries that were lower than expected, based on the actuarial assumptions.

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 (if the market value of assets was used, the funded ratios would differ). This information for recent years is shown in the following table (in millions). Historical information is shown in the graph following the chart below.

	4/30/2013	4/30/2014	4/30/2015	4/30/2016	4/30/2017
Actuarial Value of Assets ($M)	$113.2	$119.1	$126.0	$130.6	$137.2
Actuarial Accrued Liability ($M)	$148.7	$155.3	$160.5	$165.1	$171.2
Funded Ratio (Assets/Liability)	76%	77%	79%	79%	80%

The funded ratio does not indicate whether or not the System could settle current liabilities, nor does it, by itself, indicate what the future funding requirements will be.

The following graph illustrates the funded ratio over the last 20 years. The funded ratio was near 100% in the early years of this period, but has declined due to benefit changes, assumption changes, and actual experience that was less favorable than expected based on the actuarial assumptions. Over the more recent past, the funded ratio has stabilized around 75% to 80%.



The decline in the funded ratio since 2000 is a reflection of actual contributions significantly below the actuarial required contributions, coupled with investment returns that were lower than the actuarial assumed rate. The System's funded status will continue to be heavily dependent on actual investment returns in the future as well as the City's contribution policy. Plan changes passed by the 2013 Missouri General Assembly, which included changes to both the benefit structure and contributions, are expected to improve the System's funded status over the long term, if all actuarial assumptions are met. While these changes have improved the outlook for the long term financial health of the System, actual investment returns will continue to be a critical factor in the health of the System over time.

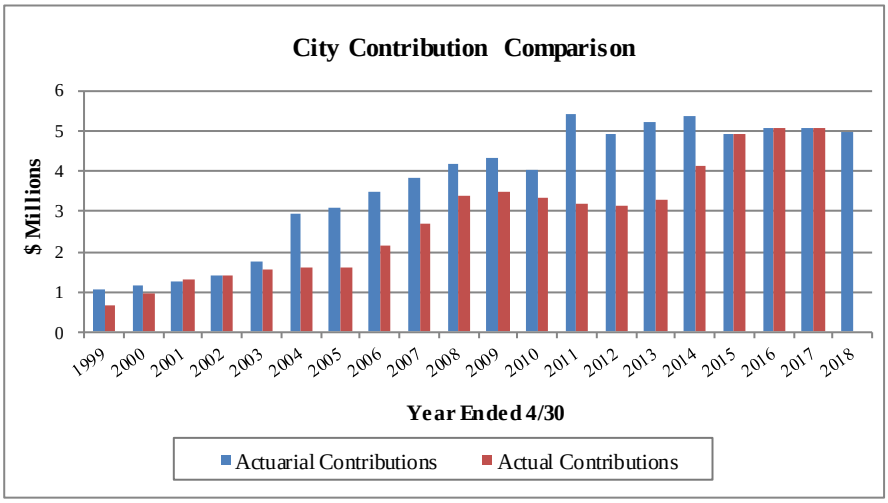
CONTRIBUTION RATES

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 actuarial contribution rate for the fiscal year ending 2019 is computed based on the results of the April 30, 2017 actuarial valuation. The City's actuarial contribution rate equals the normal cost, budgeted expenses, and an amortization payment on the unfunded actuarial accrued liability. The City's actuarial contribution rate for FY 2019 is 17.98% of payroll (normal cost rate of 10.78% and an UAAL payment of 7.20%) or $4,778,854.

The following graph shows the actuarial contributions for the City compared to the amount actually contributed by the City in each year. With the legislative changes in 2013, the City has begun to contribute the full amount of the actuarially determined contribution. Effective with the April 30, 2017 valuation, the amortization payment on the UAAL is calculated using a closed 30-year period (declines by one each year in the future until it reaches zero). Under this funding policy, the System's funded ratio is expected to slowly improve from its current level and ultimately reach full funding at the end of the amortization period.



FINANCIAL PROJECTIONS

While the April 30, 2017 valuation results indicate the System's financial status at a single point in time, it does not provide any insight into future trends in contributions or funded status. Projections that model a change in one key variable can provide insight into the longer term trend of projected City contributions; the funded status (ratio of actuarial assets over liabilities); and the unfunded actuarial accrued liability (actuarial accrued liability minus actuarial assets). Certain projections, using investment return scenarios selected for purposes of sensitivity analysis, are included in section 6 of this report.

COMMENTS

As of April 30, 2017, the actuarial accrued liability was $171.2 million and the actuarial value of assets was $137.2 million, resulting in an unfunded actuarial accrued liability (UAAL) of $34.0 million. The funded ratio increased slightly to 80% from last year's valuation at 79% and the UAAL decreased by $0.5 million, as a result of actual experience during FY 2017.

Retirement plans use several mechanisms to create stability in the contribution rates. These mechanisms include an asset smoothing method, which averages the peaks and valleys of investment returns, and amortization of actuarial gains and losses, including investment experience, over a number of years. The System utilizes an asset smoothing method that recognizes the difference between the actual and expected return on the market value of assets evenly over a five-year period. The return on the market value of assets was 9.5%, but due to the asset smoothing method only part of the FY 2017 investment experience is recognized in the current valuation along with a portion of the investment experience in the prior four years. As a result, the return on the actuarial value of assets was 6.1%, which resulted in an increase in the UAAL since it was less than the assumed rate of return of 7.5%. There was an actuarial gain from actual demographic experience that was more favorable than expected, based on the actuarial assumptions, largely due to salary experience.

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. Over the last ten years, investment returns have been lower than the assumed rate of return and the actual contributions to the System have been below the actuarial contributions. Beginning September 1, 2013, the City began to contribute the full dollar amount of the Actuarial Required Contribution as it is shown on Table 11. Based on the funding policy adopted by the Board in November 2016, the UAAL at April 30, 2017 is amortized over a closed 30-year period and new pieces of UAAL from experience in subsequent years are layered and amortized over a 20-year period. As a result, City contributions to the System are higher and the System's funding status over the long-term is expected to improve.

Based on the Board's policy, an *ad hoc* Cost of Living Adjustment (COLA) 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), 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 total Actuarial Required 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 Actuarial Required Contribution Amount.

Based upon the results of the April 30, 2017 valuation (which indicate the funded ratio exceeds 75%), and the Board's policy, an *ad hoc* COLA can be granted. However, the Board may want to take into consideration that asset returns in the short-term (the next 5 to 10 years) are expected to be significantly lower than the assumed rate of return of 7.5%. If this unfolds as expected, it will cause the funded ratio to decline, perhaps significantly.

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.

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

1. MEMBER DATA	4/30/2017 Valuation	4/30/2016 Valuation	% Change
Number of:			
Active members			
- Tier 1	402	443	(9.3%)
- Tier 2	90	83	8.4%
- Total	492	526	(6.5%)
Retired Members and Beneficiaries	262	248	5.6%
Inactive Vested Members	33	30	10.0%
Total Members	787	804	(2.1%)
Annual Projected Salaries of Active Members	$ 25,618,042	$ 27,165,226	(5.7%)
Annual Retirement Payments for Retired Members and Beneficiaries*	$ 6,831,855	$ 6,180,915	10.5%
*Does not include supplemental benefits			
2. ASSETS AND LIABILITIES			
Total Actuarial Accrued Liability	$171,188,191	$165,081,932	3.7%
Market Value of Assets	132,565,840	122,134,689	8.5%
Actuarial Value of Assets	137,233,636	130,604,532	5.1%
Unfunded Actuarial Accrued Liability	$ 33,954,555	$ 34,477,400	(1.5%)
Funded Ratio (Actuarial Value)	80%	79%	1.3%
Funded Ratio (Market Value)	77%	74%	4.1%
3. EMPLOYER CONTRIBUTION RATES AS A PERCENT OF PAYROLL			
Normal Cost	15.78%	15.83%	(0.3%)
Member Financed	(5.00%)	(5.00%)	0.0%
Employer Normal Cost	10.78%	10.83%	(0.5%)
Amortization of Unfunded Actuarial Accrued Liability	7.20%	6.89%	4.5%
Employer Contribution Rate	17.98%	17.72%	1.5%
4. EMPLOYER CONTRIBUTION FOR FOLLOWING FISCAL YEAR	$ 4,778,854	$ 4,994,191	(4.3%)

SECTION 2 – SCOPE OF THE REPORT

This report, prepared at the request of the System's Board of trustees, presents the actuarial valuation of the Civilian Employees' Retirement System of the Police Department of Kansas City, Missouri as of April 30, 2017. There were no changes to the benefit provisions or the actuarial assumptions from those used in the prior valuation. However, there was one change in the actuarial methods used in the valuation. The Board adopted a new Funding Policy at their November 8, 2016 meeting. As a result, the amortization policy for the unfunded actuarial accrued liability (UAAL) was changed from an open 30-year period (reset to 30 each valuation) to a closed 30-year period (declining by one each valuation), beginning with the April 30, 2017 valuation. Any new unfunded actuarial accrued liability generated as a result of actuarial experience in subsequent years will be layered and amortized over a closed 20-year period.

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 30-year financial projections of the system under various return scenarios. Section 7 includes other historical funding information.

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, 2017.
- 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.

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, 2017. On that date, the assets available for the payment of benefits are appraised. The assets are compared with the liabilities of the System (the present value of future expected benefit payments), 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, 2017, and April 30, 2016, in total and by investment category. Table 2 summarizes the change in the market value of assets from April 30, 2016 to April 30, 2017.

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. The Board adopted a new asset smoothing method effective with the April 30, 2011 valuation. Under this asset smoothing methodology, the difference between the actual and assumed investment returns on the market value of assets is recognized evenly over a five-year period. The method was implemented by resetting the actuarial value of assets at April 30, 2011 to the market value of assets.

TABLE 1

CIVILIAN EMPLOYEES' RETIREMENT SYSTEM OF THE POLICE DEPARTMENT OF KANSAS CITY, MISSOURI

STATEMENT OF NET PLAN ASSETS AT MARKET VALUE

	Market Value	
	April 30, 2017	**April 30, 2016**
Cash & Equivalents	$996,489	$2,151,051
Receivables	312,301	365,523
Stocks:		
Common & Preferred Corporate	31,622,285	29,212,876
World Equities	20,064,867	17,443,327
Foreign	10,111,281	7,015,944
Bonds:		
U.S. Government	18,571,973	16,560,206
Corporate	13,945,667	14,731,066
Asset Backed Securities	1,054,717	1,312,031
Real Estate	16,065,727	14,762,704
Partnerships and Hedge Funds	19,956,310	18,824,440
Total Assets	$132,701,617	$122,379,168
Accounts Payable	(135,777)	(244,479)
Net Assets Available for Benefits	$132,565,840	$122,134,689

TABLE 2

CIVILIAN EMPLOYEES' RETIREMENT SYSTEM OF THE POLICE DEPARTMENT OF KANSAS CITY, MISSOURI

STATEMENT OF CHANGES IN NET ASSETS DURING YEAR ENDED APRIL 30, 2017

(Market Value)

1. Market Value of Assets as of April 30, 2016	$	122,134,689
2. Contributions:		
a. Members	$	1,253,047
b. City		5,063,240
c. Miscellaneous		0
d. Total	$	6,316,287
3. Investment Income		
a. Interest and Dividends	$	2,264,567
b. Net Securities Lending Income		36,760
c. Investment Expenses		(761,024)
d. Net Appreciation in Fair Value		9,880,055
e. Net Investment Income	$	11,420,358
4. Deductions		
a. Refunds of Member Contributions	$	296,738
b. Benefits Paid:		
(1) Retirement Benefits		6,830,981
(2) Death Benefits		7,000
(3) Partial Lump Sums		50,518
c. Administrative Expenses		120,257
d. Total	$	7,305,494
5. Net Change [2d] + [3e] - [4d]	$	10,431,151
6. Market Value of Assets as of April 30, 2017 [1] + [5]	$	132,565,840

TABLE 3

CIVILIAN EMPLOYEES' RETIREMENT SYSTEM
OF THE POLICE DEPARTMENT OF KANSAS CITY, MISSOURI

DEVELOPMENT OF ACTUARIAL VALUE OF ASSETS

Under the current asset smoothing method, the difference between the actual and assumed investment return on the market value of assets is recognized evenly over a five-year period. The method was implemented by resetting the actuarial value of assets at April 30, 2011 equal to the market value of assets.

	Plan Year End			
	4/30/2014	4/30/2015	4/30/2016	4/30/2017
1. Market Value of Assets, Beginning of Year	$ 108,517,949	$ 117,341,038	$ 123,941,107	$ 122,134,689
2. Contributions During Year	5,436,191	6,253,747	6,335,555	6,316,287
3. Benefits and Expenses During Year	6,377,546	6,433,277	7,347,870	7,305,494
4. Expected Net Investment Income	8,104,184	8,793,967	9,258,307	9,123,677
5. Expected Value of Assets, End of Year	115,680,778	125,955,475	132,187,099	130,269,159
6. Market Value of Assets, End of Year	117,341,038	123,941,107	122,134,689	132,565,840
7. Excess/(Shortfall) of Net Investment Income	$ 1,660,260	$ (2,014,368)	$ (10,052,410)	$ 2,296,681

TABLE 3
(continued)

CIVILIAN EMPLOYEES' RETIREMENT SYSTEM
OF THE POLICE DEPARTMENT OF KANSAS CITY, MISSOURI

1. Excess/(Shortfall) of Investment Income		
a. Year ending 4/30/2017	$	2,296,681
b. Year ending 4/30/2016		(10,052,410)
c. Year ending 4/30/2015		(2,014,368)
d. Year ending 4/30/2014		1,660,260
e. Total	$	(8,109,837)
2. Deferral of Excess/(Shortfall) of Investment Income		
a. Year ending 4/30/2017 (80%)	$	1,837,345
b. Year ending 4/30/2016 (60%)		(6,031,446)
c. Year ending 4/30/2015 (40%)		(805,747)
d. Year ending 4/30/2014 (20%)		332,052
e. Total	$	(4,667,796)
3. Market Value End of Year	$	132,565,840
4. Actuarial Value End of year (3) - (2e)	$	137,233,636
5. Ratio of Actuarial Value to Market Value		103.5%
6. Difference Between Actuarial & Market Value	$	4,667,796
7. Rate of Return on Actuarial Value of Assets		6.1%
8. Rate of Return on Market Value of Assets		9.5%

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, 2017. 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, 2017, with one exception. When certain criteria for the funded ratio and actual contributions are met, the Board has discretion to grant a COLA (it is not part of the statutory benefit structure). Even though the COLA is not guaranteed to be paid, the liabilities reflect a 2.5% annual cost of living adjustment for all future years as it better reflects the long term liabilities.

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 perform this allocation, it is necessary for the funding method to "break down" 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 the actuarial accrued liability for the System. The Entry Age Normal actuarial cost method is used to develop the actuarial accrued liability.

TABLE 4

CIVILIAN EMPLOYEES' RETIREMENT SYSTEM OF THE POLICE DEPARTMENT OF KANSAS CITY, MISSOURI

PRESENT VALUE OF FUTURE BENEFITS (PVFB) AS OF APRIL 30, 2017

1. Active employees		
a. Retirement Benefit	$	112,580,436
b. Pre-Retirement Death Benefit		839,927
c. Withdrawal Benefit		1,202,403
d. Disability Benefit		3,617,404
e. Supplemental Benefit		3,887,804
f. Total	$	122,127,974
2. Inactive Vested Members		
a. Retirement Benefit	$	1,869,389
b. Supplemental Benefit		250,172
c. Total	$	2,119,561
3. In Pay Members		
a. Retirees	$	72,404,589
b. Disabled Members		1,995,280
c. Beneficiaries		2,696,797
d. Supplemental Benefit		4,115,955
e. Partial Lump Sum Payable		47,561
f. Total	$	81,260,182
4. Total Present Value of Future Benefits		
[1f] + [2c] + [3f]	$	205,507,717

TABLE 5

CIVILIAN EMPLOYEES' RETIREMENT SYSTEM OF THE POLICE DEPARTMENT OF KANSAS CITY, MISSOURI

ACTUARIAL ACCRUED LIABILITY AS OF APRIL 30, 2017

1. Active employees		
a. Present Value of Future Benefits	$	122,127,974
b. Present Value of Future Normal Costs		34,319,526
c. Actuarial Accrued Liability [1a] - [1b]	$	87,808,448
2. Inactive Vested Members	$	2,119,561
3. In Pay Members		
a. Retirees	$	72,404,589
b. Disabled Members		1,995,280
c. Beneficiaries		2,696,797
d. Supplemental Benefit		4,115,955
e. Lump Sum Distribution		47,561
f. Total	$	81,260,182
4. Total Actuarial Accrued Liability [1c] + [2] + [3f]	$	171,188,191

TABLE 6

CIVILIAN EMPLOYEES' RETIREMENT SYSTEM OF THE POLICE DEPARTMENT OF KANSAS CITY, MISSOURI

DERIVATION OF SYSTEM EXPERIENCE GAIN/(LOSS)

Liabilities		
1. Actuarial liability as of May 1, 2016	$	165,081,932
2. Normal cost for year		3,835,504
3. Assumed interest on (1) & (2)		12,668,808
4. Benefit payments during FYE 2017		(7,185,237)
5. Interest on benefit payments		(264,575)
6. Expected actuarial liability as of April 30, 2017	$	174,136,432
7. Actuarial liability as of April 30, 2017	$	171,188,191
Assets		
8. Actuarial value of assets as of May 1, 2016	$	130,604,532
9. Actual contributions		6,316,287
10. Benefit payments and expenses during FYE 2017		(7,305,494)
11. Interest on items (8), (9) and (10)		9,758,915
12. Expected actuarial value of assets as of April 30, 2017	$	139,374,240
13. Actual actuarial value of assets as of April 30, 2017	$	137,233,636
Gain / (Loss)		
14. Expected unfunded actuarial liability / (surplus) (6) – (12)	$	34,762,192
15. Actual unfunded actuarial liability / (surplus) (7) – (13)	$	33,954,555
16. Actuarial Gain / (Loss) (14) – (15)	$	807,637
17. Actuarial Gain / (Loss) on actuarial assets (13) – (12)	$	(2,140,604)
18. Actuarial Gain / (Loss) on actuarial liability (6) – (7)	$	2,948,241

TABLE 7

CIVILIAN EMPLOYEES' RETIREMENT SYSTEM
OF THE POLICE DEPARTMENT OF KANSAS CITY, MISSOURI

ACTUARIAL GAIN/(LOSS) BY SOURCE

Source of Gain/(Loss)	Gain/(Loss) ($M)
Retiree Mortality	(0.2)
Withdrawal	0.7
Retirement	(0.1)
Disability	0.0
Death	0.0
Salary	2.6
New actives	(0.1)
COLA Experience	0.0
Other	0.0
Total Liability Gain/(Loss)	2.9
Asset Gain/(Loss)	(2.1)
Total Gain/(Loss)	0.8

Note: Numbers may not add due to rounding

TABLE 8

CIVILIAN EMPLOYEES' RETIREMENT SYSTEM OF THE POLICE DEPARTMENT 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, 2017. The "Retirees" column shows benefits expected to be paid to all other members. This includes those who, as of April 30, 2017, are receiving benefit payments and inactive vested members who are entitled to a future benefit. No future members are reflected.

Retirement, Survivor, Withdrawal and Supplemental Benefits

Year Ending April 30	Actives	Retirees	Total
2018	$ 585,000	$ 7,221,000	$ 7,806,000
2019	1,374,000	7,237,000	8,611,000
2020	2,041,000	7,244,000	9,285,000
2021	2,709,000	7,263,000	9,972,000
2022	3,412,000	7,262,000	10,674,000
2023	4,120,000	7,246,000	11,366,000
2024	4,829,000	7,213,000	12,042,000
2025	5,537,000	7,169,000	12,706,000
2026	6,226,000	7,135,000	13,361,000
2027	6,917,000	7,069,000	13,986,000
2028	7,645,000	6,998,000	14,643,000
2029	8,412,000	6,896,000	15,308,000
2030	9,214,000	6,783,000	15,997,000
2031	10,031,000	6,728,000	16,759,000
2032	10,852,000	6,634,000	17,486,000
2033	11,674,000	6,487,000	18,161,000
2034	12,492,000	6,336,000	18,828,000
2035	13,349,000	6,144,000	19,493,000
2036	14,246,000	5,917,000	20,163,000
2037	15,108,000	5,690,000	20,798,000

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 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 although the City contributes the dollar amount from the valuation. The contribution rate based on the April 30, 2017 actuarial valuation will be used to determine the dollar amount of the actuarial required employer contribution (contribution rate times expected payroll) to the Civilian Employees' Retirement System of the Police Department of Kansas City, Missouri for fiscal year end 2019. 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, 2017, 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 of April 30, 2017, as a level percent of payroll, over a closed 30-year period. Any new unfunded actuarial accrued liability generated as a result of actuarial experience in subsequent years will be layered and amortized over a closed 20-year period. Active member payroll is assumed to increase 3.75% per year. Note that the use of closed amortization periods will result in the System being fully funded at the end of the amortization period, if all actuarial assumptions are met.

Contribution Rate Summary

In Table 9, the amortization payment related to the unfunded actuarial accrued liability, as of April 30, 2017, is developed. Table 10 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 11.

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

TABLE 9

CIVILIAN EMPLOYEES' RETIREMENT SYSTEM OF THE POLICE DEPARTMENT OF KANSAS CITY, MISSOURI

DEVELOPMENT OF UAAL CONTRIBUTION RATE

1. Actuarial Accrued Liability as of April 30, 2017	$	171,188,191
2. Actuarial Value of Assets	$	137,233,636
3. Unfunded Actuarial Accrued Liability as of April 30, 2017	$	33,954,555
4. Total Contribution Rate for FYE 2018*		22.72%
5. Normal Cost Rate		15.78%
6. Contribution Rate Applied to Fund the UAAL for FYE 2018 (4) - (5)		6.94%
7. Expected Payroll for FYE 2018	$	25,618,042
8. Projected UAAL on April 30, 2018 $[(3) * 1.075] - [(6) * (7) * 1.075^{.5}]$	$	34,657,789
9. Amortization Factor (30 Year Closed/Level % of Pay)		18.7865
10. UAAL Contribution Adjusted to Mid-year of FYE 2019 $[(8) / (9)] * 1.075^{.5}$	$	1,912,754
11. Expected Payroll for FYE 2019	$	26,578,719
12. UAAL Contribution Rate for FYE 2019 (10) / (11)		7.20%

* Reflects member contributions of 5.00% and City contributions of 17.72%

TABLE 10

CIVILIAN EMPLOYEES' RETIREMENT SYSTEM OF THE POLICE DEPARTMENT OF KANSAS CITY, MISSOURI

CITY CONTRIBUTION RATES

	Valuation Date*	
	4/30/2017	**4/30/2016**
Normal Cost		
Service pensions	12.77%	12.83%
Pre-retirement death pensions	0.14%	0.14%
Disability pensions	0.64%	0.64%
Termination benefits	1.55%	1.54%
Supplemental retirement benefit	0.28%	0.28%
Administrative expenses	0.40%	0.40%
Total Normal Cost	15.78%	15.83%
Total UAAL Amortization payment	7.20%	6.89%
Total Actuarial Contribution Rate	22.98%	22.72%
Member Portion	5.00%	5.00%
City Portion	17.98%	17.72%

* The valuation results are used to determine the employer contribution rate for the fiscal year ending two years later.

TABLE 11

CIVILIAN EMPLOYEES' RETIREMENT SYSTEM OF THE POLICE DEPARTMENT OF KANSAS CITY, MISSOURI

COMPUTED AND ACTUAL CITY CONTRIBUTIONS COMPARATIVE STATEMENT

				Fiscal Year Contributions				
				As a % of Projected Pay		$ Contributions		
Fiscal Year Beginning May 1		Valuation Date April 30	Projected Annual Payroll	Annual Required Contribution	Reported FY City Contribution	Annual Required Contribution	Projected FY City Contribution	Actual Dollar Contribution
1998		1998	$15,295,680	6.80 %	4.38 %	$1,040,673	$ 669,951	$ 674,228
1999		1999	15,430,846	7.47	5.76	1,152,018	888,817	944,475
2000		2000	17,786,369	7.08	7.14	1,259,454	1,269,947	1,286,166
2001		2001	18,831,325	7.49	7.14	1,410,466	1,344,557	1,420,668
2002		2002	21,688,988	8.12	7.14	1,761,146	1,548,594	1,567,833
2003	*	2003	22,931,521	12.84	7.14	2,944,407	1,637,311	1,601,243
2004		2003	23,963,439	12.84	7.14	3,076,906	1,710,990	1,612,080
2005	#	2004	24,088,026	14.45	9.14	3,480,720	2,201,646	2,175,167
2006		2005	24,285,644	15.87	11.14	3,854,132	2,705,421	2,681,732
2007		2006	26,073,120	16.12	13.14	4,202,987	3,426,008	3,372,411
2008		2007	26,618,596	16.24	13.14	4,322,860	3,497,684	3,470,682
2009		2008	28,127,592	14.27	13.14	4,013,807	3,695,966	3,329,727
2010		2009	28,684,028	18.87	13.14	5,412,676	3,769,081	3,185,041
2011		2010	27,181,807	18.19	13.14	4,944,371	3,571,689	3,146,124
2012	*	2011	26,248,238	19.82	13.14	5,202,401	3,449,018	3,283,458
2013		2012	26,265,640	20.40 **	16.33 **	5,358,191	4,289,179	4,122,375
2014	*#	2013	27,453,706	17.96	17.96	4,930,686	4,930,686	4,930,686
2015		2014	28,092,195	17.97	17.97	5,048,167	5,048,167	5,048,167
2016		2015	28,932,802	17.50	17.50	5,063,240	5,063,240	5,063,240
2017		2016	28,183,922	17.72	17.72	4,994,191	4,994,191	
2018		2017	26,578,719	17.98		4,778,854		

* After changes in actuarial assumptions or methods.
** Effective September 1, 2013, the actuarial contribution rate was revised to 22.93% and the City began contributing the full employer actuarial
# After changes in benefits.
Note: For years prior to 2011, information is shown from the prior actuary's

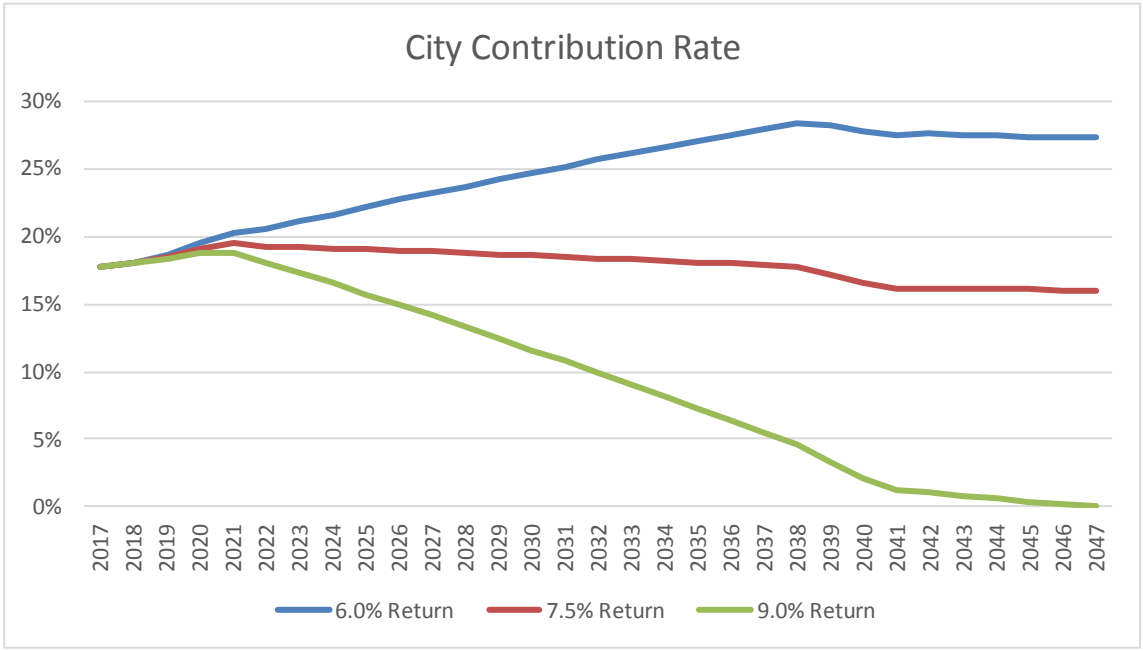
While the April 30, 2017 valuation results indicate the System's financial status at a single point in time, projections are used to identify trends and to compare various scenarios rather than predicting some future state of events. The projections model a change in one key variable to provide insight into the longer term trend of (1) the projected City contributions; (2) the projected System funded status (ratio of actuarial assets over liabilities); and (3) the unfunded actuarial accrued liability (actuarial accrued liability minus actuarial assets). The projections also show how sensitive the results are to the key variable being modeled. The projections do not predict the System's financial condition or its ability to pay benefits in the future and do not provide any guarantee of future financial soundness of the System. Over time, a defined benefit plan's total cost will depend on a number of factors, including the amount of benefits paid, the number of people paid benefits, plan expenses, and the amount of earnings on assets invested to pay benefits. These amounts and other variables are uncertain and unknowable at the time the projections were prepared. Because not all of the assumptions will unfold exactly as expected, actual results will differ from the projections shown.

The following three investment return scenarios are modeled:

(1) Returns of 7.5% (current assumption),
(2) Returns of 9.0% (1.5% higher than the current assumption), and
(3) Returns of 6.0% (1.5% lower than the current assumption).

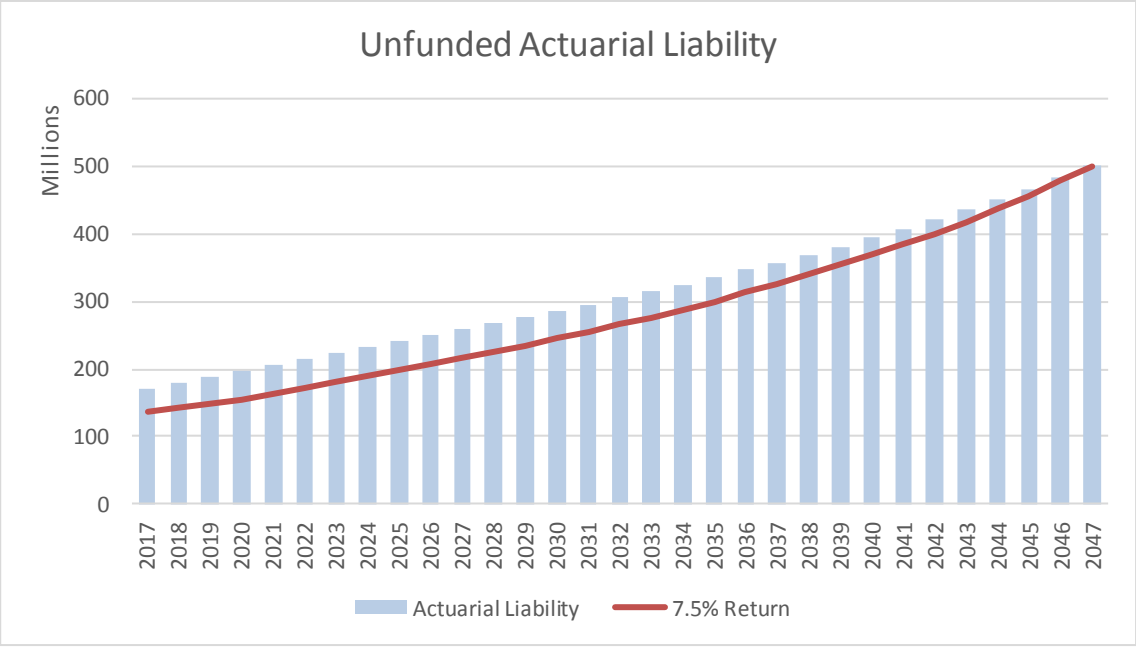
The projections assume that all actuarial assumptions, other than investment return, are met in all future years and that the City makes contributions equal to the full amount of the actuarially determined contribution as calculated by the System's actuary, based on the Board's Funding Policy (including closed amortization periods). Note that the 2.5% COLA is assumed to be granted in all years even when the Board's criteria is not met. These projections include estimates of future valuation results, including the unfunded actuarial accrued liability and funded ratio. It should be noted that these actuarial measurements do not indicate the sufficiency of plan assets to settle the plan's obligations nor do they, on their own, indicate future funding requirements.

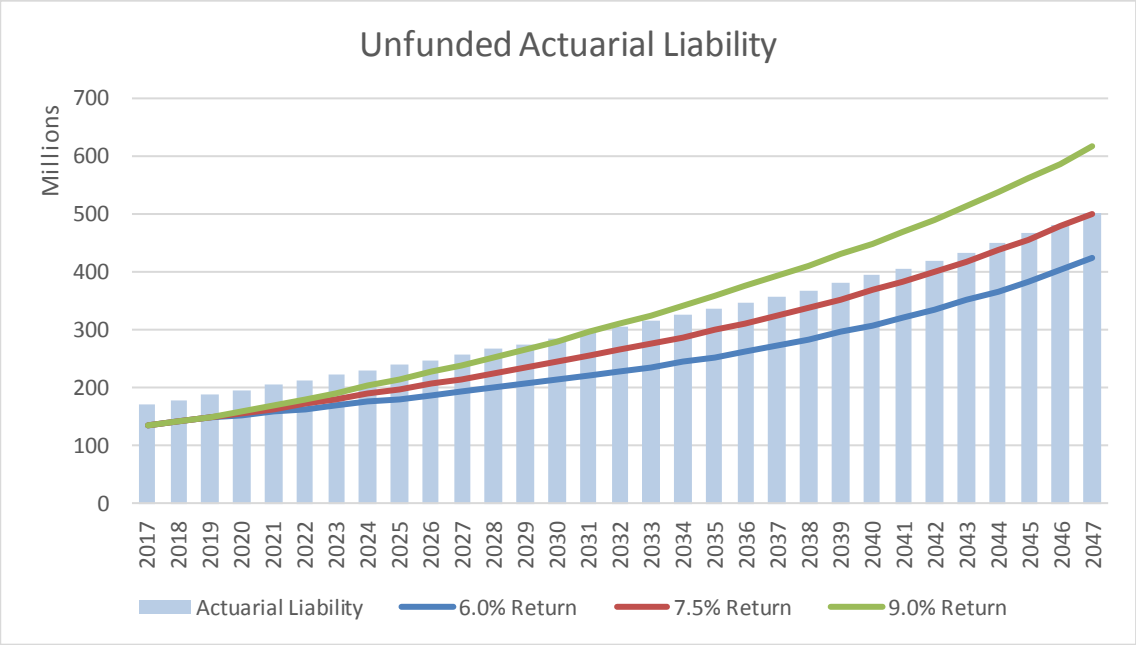
Effect of Various Returns on City Contribution Rate



Unfunded Actuarial Accrued Liability

The following graphs compare the actuarial value of assets (red line) to the System's actuarial accrued liabilities (light blue bars). The first graph shows the baseline case, while the second graph shows the sensitivity of the results to the rate of return.





Funded Ratio

The following graph shows the projected System funded ratio (ratio of actuarial value of assets to actuarial accrued liabilities). The years shown in the chart are valuation dates (April 30 of each year).

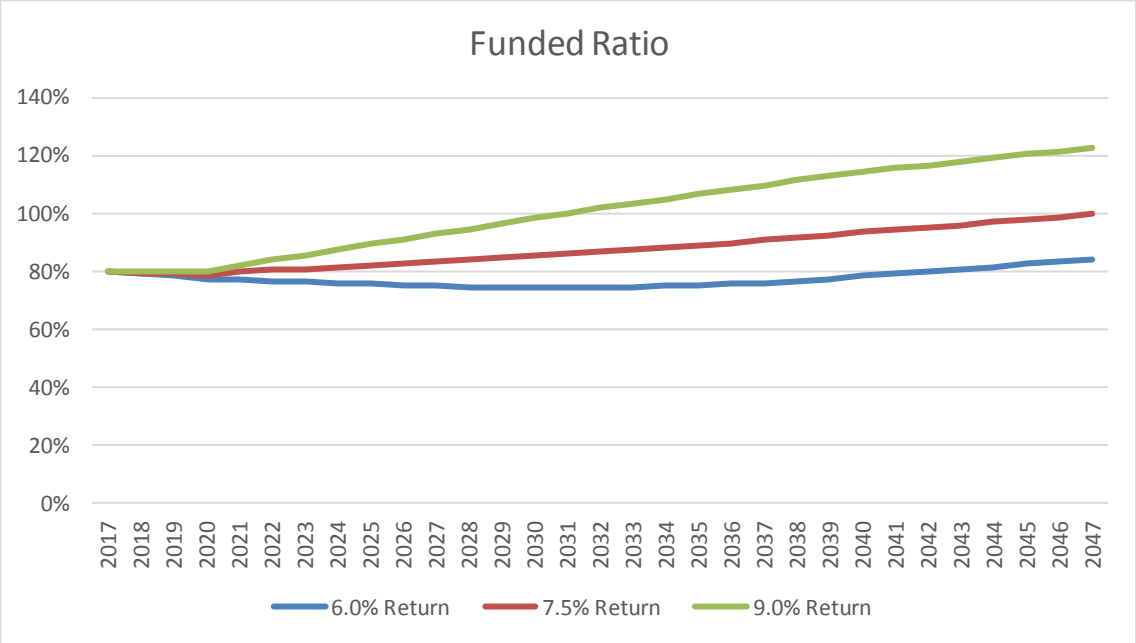


TABLE 12

CIVILIAN EMPLOYEES' RETIREMENT SYSTEM OF THE POLICE DEPARTMENT OF KANSAS CITY, MISSOURI

PROJECTION OF VALUATION RESULTS

Projection Based on April 30, 2017 Actuarial Valuation
7.5% Investment Return
Amounts in thousands

Valuation as of April 30, (1)	Covered Payroll at Valuation (2)	Actuarial Accrued Liability (AAL) (3)	Actuarial Value of Assets (AVA) (4)	Unfunded AAL (5)	Funded Ratio Using AVA (6)	UAAL Amortization Payment Rate (7)	Normal Cost Rate (8)	Actuarial Contribution Rate (9)	Member Contribution Rate (10)	Employer Actuarial Contribution Rate (11)	Dollar Amount of Employer Contribution* (12)
2017	$25,618	$171,188	$137,234	$33,955	80.2%	7.20%	15.78%	22.98%	5.00%	17.98%	$4,779
2018	26,210	179,820	143,335	36,486	79.7%	7.81%	15.71%	23.52%	5.00%	18.52%	5,036
2019	26,918	188,372	149,082	39,290	79.1%	8.45%	15.65%	24.10%	5.00%	19.10%	5,334
2020	27,766	196,932	155,400	41,531	78.9%	8.90%	15.59%	24.49%	5.00%	19.49%	5,615
2021	28,682	205,505	163,946	41,559	79.8%	8.77%	15.53%	24.30%	5.00%	19.30%	5,743
2022	29,643	214,072	172,216	41,855	80.4%	8.77%	15.47%	24.24%	5.00%	19.24%	5,917
2023	30,686	222,660	180,543	42,117	81.1%	8.74%	15.41%	24.15%	5.00%	19.15%	6,097
2024	31,771	231,318	189,020	42,298	81.7%	8.72%	15.35%	24.07%	5.00%	19.07%	6,286
2025	32,955	240,062	197,668	42,394	82.3%	8.68%	15.31%	23.99%	5.00%	18.99%	6,493
2026	34,224	248,927	206,531	42,396	83.0%	8.63%	15.26%	23.89%	5.00%	18.89%	6,707
2027	35,566	257,960	215,674	42,286	83.6%	8.57%	15.22%	23.79%	5.00%	18.79%	6,934
2028	36,946	267,154	225,090	42,063	84.3%	8.52%	15.18%	23.70%	5.00%	18.70%	7,168
2029	38,398	276,509	234,794	41,715	84.9%	8.46%	15.13%	23.59%	5.00%	18.59%	7,406
2030	39,890	286,016	244,796	41,220	85.6%	8.40%	15.09%	23.49%	5.00%	18.49%	7,652
2031	41,461	295,612	255,036	40,576	86.3%	8.34%	15.05%	23.39%	5.00%	18.39%	7,911
2032	43,167	305,345	265,585	39,761	87.0%	8.27%	15.01%	23.28%	5.00%	18.28%	8,187
2033	44,934	315,296	276,543	38,753	87.7%	8.20%	14.98%	23.18%	5.00%	18.18%	8,475
2034	46,818	325,499	287,951	37,547	88.5%	8.12%	14.95%	23.07%	5.00%	18.07%	8,777
2035	48,691	335,987	299,872	36,115	89.3%	8.06%	14.92%	22.98%	5.00%	17.98%	9,083
2036	50,660	346,763	312,318	34,445	90.1%	8.00%	14.89%	22.89%	5.00%	17.89%	9,403
2037	52,723	357,896	325,381	32,515	90.9%	7.93%	14.87%	22.80%	5.00%	17.80%	9,737
2038	54,884	369,414	339,119	30,295	91.8%	7.35%	14.85%	22.20%	5.00%	17.20%	9,794
2039	57,083	381,388	353,637	27,751	92.7%	6.74%	14.82%	21.56%	5.00%	16.56%	9,807
2040	59,367	393,845	368,672	25,173	93.6%	6.30%	14.80%	21.10%	5.00%	16.10%	9,917
2041	61,759	406,845	384,248	22,597	94.4%	6.40%	14.78%	21.18%	5.00%	16.18%	10,367
2042	64,217	420,493	400,558	19,934	95.3%	6.39%	14.76%	21.15%	5.00%	16.15%	10,760
2043	66,817	434,869	418,033	16,837	96.1%	6.37%	14.74%	21.11%	5.00%	16.11%	11,168
2044	69,473	450,041	436,708	13,333	97.0%	6.36%	14.72%	21.08%	5.00%	16.08%	11,590
2045	72,239	466,072	456,674	9,398	98.0%	6.35%	14.70%	21.05%	5.00%	16.05%	12,029
2046	75,113	483,046	478,060	4,987	99.0%	6.34%	14.69%	21.03%	5.00%	16.03%	12,492

* Amounts shown are contributions in the fiscal year ending two years after the valuation date.

TABLE 13

CIVILIAN EMPLOYEES' RETIREMENT SYSTEM OF THE POLICE DEPARTMENT OF KANSAS CITY, MISSOURI

CITY CONTRIBUTIONS UNDER ALTERNATE SCENARIOS

Projection Based on April 30, 2017 Actuarial Valuation
Board's Funding Policy (Layered Amortization of UAL)
Amounts in Thousands

Fiscal Year End April 30,*	City Contribution Amounts at Various Investment Returns		
	7.5% Return	9.0% Return	6.0% Return
2019	$4,779	$4,779	$4,779
2020	5,036	5,006	5,066
2021	5,334	5,234	5,438
2022	5,615	5,393	5,831
2023	5,743	5,359	6,118
2024	5,917	5,317	6,492
2025	6,097	5,263	6,889
2026	6,286	5,195	7,311
2027	6,493	5,118	7,765
2028	6,707	5,024	8,241
2029	6,934	4,915	8,749
2030	7,168	4,788	9,280
2031	7,406	4,633	9,836
2032	7,652	4,457	10,421
2033	7,911	4,259	11,038
2034	8,187	4,040	11,689
2035	8,475	3,799	12,377
2036	8,777	3,531	13,110
2037	9,083	3,228	13,862
2038	9,403	2,896	14,659
2039	9,737	2,533	15,502
2040	9,794	1,908	16,035
2041	9,807	1,273	16,464
2042	9,917	776	16,938
2043	10,367	666	17,704
2044	10,760	540	18,355
2045	11,168	416	19,036
2046	11,590	281	19,742
2047	12,029	150	20,483
2048	12,492	23	21,259

*The Actuarially Determined Contribution (ADC) determined in the annual actuarial valuation is contributed in the following fiscal year. For example, the dollar amount of the ADC for fiscal year-end April 30, 2019 is based on the ADC calculated in the April 30, 2017 valuation.

Note: Projections assume a constant population and no actuarial gains and losses other than recognition of the deferred investment experience as of April 30, 2017.

The actuarial accrued liability is a measure intended to help the reader assess (i) a retirement plan'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 Entry Age Normal actuarial liability was determined as part of an actuarial valuation of the System as of April 30, 2017. The actuarial assumptions used in determining the actuarial liability can be found in Appendix C.

TABLE 14

CIVILIAN EMPLOYEES' RETIREMENT SYSTEM OF THE POLICE DEPARTMENT OF KANSAS CITY, MISSOURI

SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS

Valuation Date	April 30, 2017
Actuarial cost method	Entry Age Normal
Amortization method for unfunded actuarial accrued liabilities	Level-percent
Amortization period	30 year closed beginning with the 2017 valuation
Asset valuation method	5-year smoothing of actual versus expected return on market value
Actuarial assumptions:	
Investment rate of return	7.50%, net of investment expenses
Projected salary increases including wage inflation at 3.75%	3.75% to 7.75%
Cost-of-living adjustments	2.50% simple

Membership of the plan consisted of the following at April 30, 2017, the date of the latest actuarial valuation:

Retirees and beneficiaries receiving benefits	262
Terminated plan members entitled to but not yet receiving benefits	33
Active plan members	492
Total	787

TABLE 15

CIVILIAN EMPLOYEES' RETIREMENT SYSTEM OF THE POLICE DEPARTMENT OF KANSAS CITY, MISSOURI

SCHEDULE OF FUNDING PROGRESS

Actuarial Valuation Date		Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (UAAL) (b) - (a)	Funded Ratio (a) / (b)	Active Member Covered Payroll** (c)	UAAL as a Percentage of Active Member Covered Payroll [(b) - (a)] / (c)
4/30/1998		$41,835,057	$43,200,513	$1,365,456	97%	$15,295,680	9%
4/30/1999		47,593,329	48,627,168	1,033,839	98%	15,430,846	7%
4/30/2000		56,905,524	56,038,915	(866,609)	102%	17,786,369	(5%)
4/30/2001		61,895,208	62,097,908	202,700	100%	18,831,325	1%
4/30/2002		66,401,308	67,814,254	1,412,946	98%	20,755,012	7%
4/30/2003	*	68,182,691	83,044,509	14,861,818	82%	21,944,040	68%
4/30/2004	#	69,868,024	89,141,414	19,273,390	78%	22,058,127	87%
4/30/2005		72,382,548	97,103,806	24,721,258	75%	22,239,092	111%
4/30/2006		78,846,717	105,928,172	27,081,455	74%	23,875,937	113%
4/30/2007		89,110,860	110,394,115	21,283,255	81%	25,472,341	84%
4/30/2008		97,989,985	117,626,995	19,637,010	83%	27,045,762	73%
4/30/2009		86,332,962	124,990,468	38,657,506	69%	27,580,796	140%
4/30/2010		100,515,970	131,222,564	30,706,594	77%	26,136,353	117%
4/30/2011	*	102,522,611	137,040,461	34,517,850	75%	25,238,690	137%
4/30/2012		108,018,073	142,907,530	34,889,457	76%	25,255,423	138%
4/30/2013	*#	113,170,844	148,662,779	35,491,935	76%	26,461,403	134%
4/30/2014		119,075,893	155,264,022	36,188,129	77%	27,076,814	134%
4/30/2015		126,029,676	160,470,682	34,441,006	79%	27,887,038	124%
4/30/2016		130,604,532	165,081,932	34,477,400	79%	27,165,226	127%
4/30/2017		137,233,636	171,188,191	33,954,555	80%	25,618,042	133%

* 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.

\# After change in benefit provisions.

Note: Results for years prior to 2011 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 16

CIVILIAN EMPLOYEES' RETIREMENT SYSTEM OF THE POLICE DEPARTMENT OF KANSAS CITY, MISSOURI

SCHEDULE OF CITY CONTRIBUTIONS

Fiscal Year Ending April 30	Annual Required Contribution	Percent Contribution	Contribution Shortfall/(Excess)
1997	$ 465,004	90%	$ N/A
1998	1,035,180	44%	581,963
1999	1,040,673	65%	366,445
2000	1,152,018	82%	207,543
2001	1,259,454	102%	(26,712)
2002	1,410,461	101%	(10,207)
2003	1,761,146	89%	193,313
2004	2,944,407	54%	1,343,164
2005	3,076,906	52%	1,464,826
2006	3,480,720	62%	1,305,553
2007	3,854,132	70%	1,172,400
2008	4,202,987	80%	830,576
2009	4,322,860	80%	852,178
2010	4,013,807	83%	684,080
2011	5,412,676	59%	2,227,635
2012	4,944,371	64%	1,798,247
2013	5,202,401	63%	1,918,943
2014	5,358,191	77%	1,235,816
2015	4,930,686	100%	0
2016	5,048,167	100%	0
2017	5,063,240	100%	0

Note: For years prior to 2011, information shown is from the prior actuary's report.

TABLE 17

CIVILIAN EMPLOYEES' RETIREMENT SYSTEM OF THE POLICE DEPARTMENT OF KANSAS CITY, MISSOURI

SOLVENCY TEST

Valuation Date April 30		Entry Age Actuarial Accrued Liabilities (1) Active Member Contributions	(2) Retirees and Beneficiaries	(3) Active Members (Employer Financed Portion)	Valuation Assets	Portion of Actuarial Accrued Liabilities Covered by Reported Assets (1)	(2)	(3)
2004	#	$ 8,218,260	$ 26,402,483	$ 54,520,671	$ 69,868,024	100 %	100 %	65 %
2005		8,641,718	32,330,097	56,131,991	72,382,548	100	100	56
2006		9,373,054	34,786,783	61,768,335	78,846,717	100	100	56
2007		9,972,284	36,754,725	63,667,106	89,110,860	100	100	67
2008		10,652,040	40,458,961	66,515,994	97,989,985	100	100	70
2009		11,220,613	43,984,225	69,785,630	86,332,962	100	100	45
2010		11,328,650	51,740,006	68,153,908	100,515,970	100	100	55
2011	*	12,057,814	55,401,727	69,580,920	102,522,611	100	100	50
2012		12,623,138	56,978,299	73,306,093	108,018,073	100	100	52
2013	*#	12,957,382	61,173,449	74,531,948	113,170,844	100	100	52
2014		13,366,753	65,924,948	75,972,321	119,075,893	100	100	52
2015		13,831,974	69,298,850	77,339,858	126,029,676	100	100	55
2016		14,009,918	73,396,064	77,675,950	130,604,532	100	100	56
2017		13,748,200	81,260,182	76,179,809	137,233,636	100	100	55

* After changes in actuarial assumptions or methods.

\# After changes in benefits

Note: Results for years before 2011 were prepared by the prior actuary.

MEMBER DATA RECONCILIATION

April 30, 2016 to April 30, 2017

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.

	Active Participants	Retirees	Disableds	Beneficiaries	Inactive Vested	Total
Members as of 04/30/2016	526	218	9	21	30	804
New Members	21	0	0	0	0	21
Rehires	2	0	0	0	0	2
Terminations						
Refunded	(32)	0	0	0	0	(32)
Inactive Vested	(4)	0	0	0	4	0
Retirements						
Service	(20)	21	0	0	(1)	0
Disability	0	0	0	0	0	0
Deaths						
Cashed Out/Payments Ended	0	0	0	0	0	0
With Beneficiary	0	(2)	0	2	0	0
Without Beneficiary	(1)	(2)	(1)	(4)	0	(8)
Data Adjustments	0	0	0	0	0	0
Members as of 04/30/2017	**492**	**235**	**8**	**19**	**33**	**787**

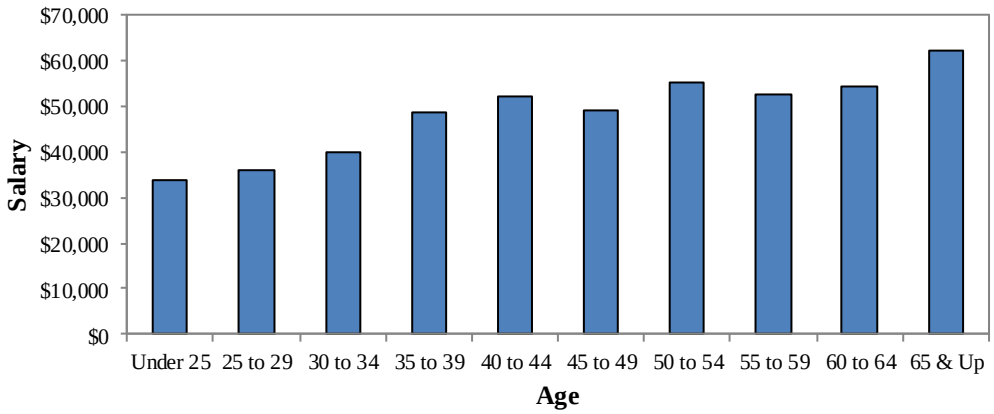
CIVILIAN EMPLOYEES' RETIREMENT SYSTEM
OF THE POLICE DEPARTMENT OF KANSAS CITY, MISSOURI
SUMMARY OF ACTIVE MEMBERS
as of April 30, 2017

Total

	Number			Annual Reported Compensation*		
Age	Male	Female	Total	Male	Female	Total**
Under 25	8	8	16	$ 266,677	$ 270,247	$ 536,924
25 to 29	12	24	36	398,752	897,447	1,296,199
30 to 34	15	30	45	587,557	1,202,148	1,789,704
35 to 39	20	47	67	959,373	2,305,316	3,264,689
40 to 44	17	43	60	1,037,459	2,079,697	3,117,156
45 to 49	20	52	72	1,034,825	2,486,261	3,521,086
50 to 54	22	29	51	1,166,244	1,648,344	2,814,587
55 to 59	22	56	78	1,285,420	2,818,919	4,104,339
60 to 64	14	37	51	974,181	1,786,695	2,760,877
65 & Up	5	11	16	374,551	616,622	991,173
Total**	155	337	492	$ 8,085,039	$ 16,111,695	$ 24,196,734

* Compensation reported in the valuation data for the prior plan year with annualization of pay for new hires.
** May not add due to rounding

Average Salary by Age



Average age:	45.7
Average service:	14.2
Average salary:	$49,180

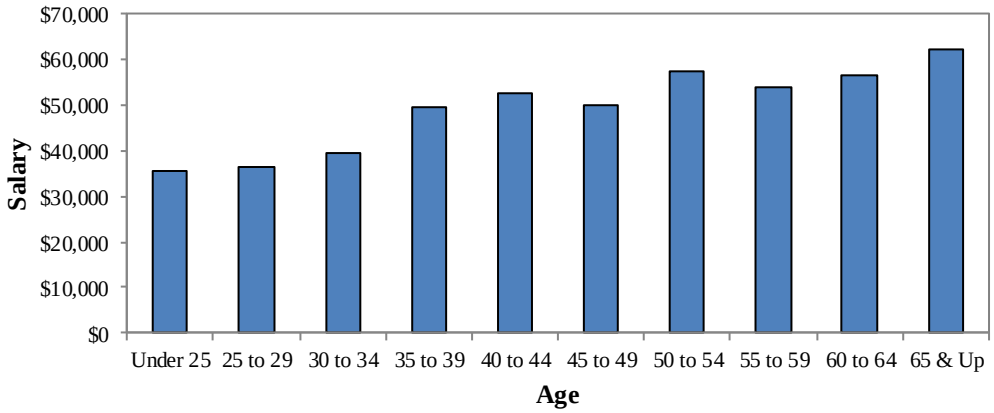
CIVILIAN EMPLOYEES' RETIREMENT SYSTEM
OF THE POLICE DEPARTMENT OF KANSAS CITY, MISSOURI
SUMMARY OF ACTIVE MEMBERS
as of April 30, 2017

Tier 1

	Number			Annual Reported Compensation*		
Age	Male	Female	Total	Male	Female	Total**
Under 25	1	1	2	$ 41,264	$ 29,848	$ 71,112
25 to 29	6	10	16	198,010	385,152	583,162
30 to 34	12	22	34	455,919	889,005	1,344,925
35 to 39	18	38	56	887,661	1,886,371	2,774,032
40 to 44	16	38	54	964,259	1,865,320	2,829,579
45 to 49	18	47	65	939,042	2,309,210	3,248,252
50 to 54	20	23	43	1,106,739	1,360,788	2,467,527
55 to 59	20	51	71	1,180,200	2,658,740	3,838,940
60 to 64	13	32	45	947,824	1,593,174	2,540,998
65 & Up	5	11	16	374,551	616,622	991,173
Total**	129	273	402	$ 7,095,468	$ 13,594,232	$ 20,689,700

* Compensation reported in the valuation data for the prior plan year with annualization of pay for new hires.
** May not add due to rounding

Average Salary by Age



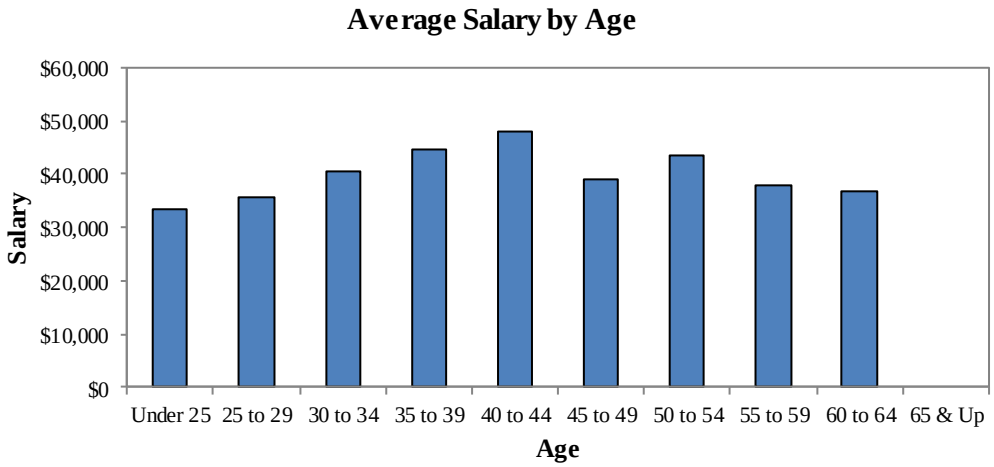
Average age:	47.5
Average service:	17.0
Average salary:	$51,467

CIVILIAN EMPLOYEES' RETIREMENT SYSTEM
OF THE POLICE DEPARTMENT OF KANSAS CITY, MISSOURI
SUMMARY OF ACTIVE MEMBERS
as of April 30, 2017

Tier 2

	Number			Annual Reported Compensation*		
Age	Male	Female	Total	Male	Female	Total**
Under 25	7	7	14	$ 225,412	$ 240,400	$ 465,812
25 to 29	6	14	20	200,742	512,295	713,037
30 to 34	3	8	11	131,637	313,142	444,779
35 to 39	2	9	11	71,713	418,944	490,657
40 to 44	1	5	6	73,200	214,377	287,577
45 to 49	2	5	7	95,783	177,051	272,834
50 to 54	2	6	8	59,505	287,555	347,061
55 to 59	2	5	7	105,221	160,178	265,399
60 to 64	1	5	6	26,357	193,521	219,878
65 & Up	0	0	0	0	0	0
Total**	26	64	90	$ 989,571	$ 2,517,464	$ 3,507,034

* Compensation reported in the valuation data for the prior plan year with annualization of pay for new hires.
** May not add due to rounding



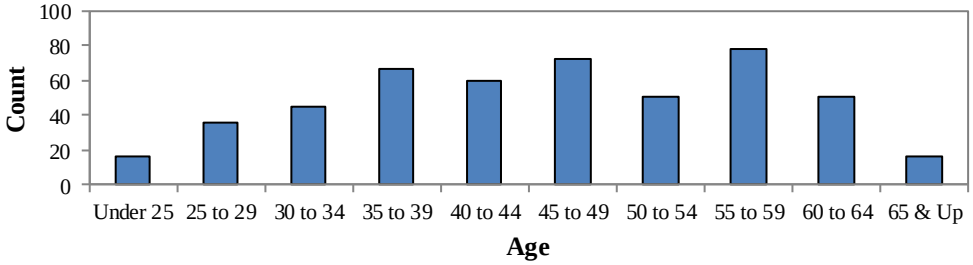
Average age:	37.6
Average service:	2.0
Average salary:	$38,967

CIVILIAN EMPLOYEES' RETIREMENT SYSTEM
OF THE POLICE DEPARTMENT OF KANSAS CITY, MISSOURI
DISTRIBUTION OF ACTIVE MEMBERS
As of April 30, 2017

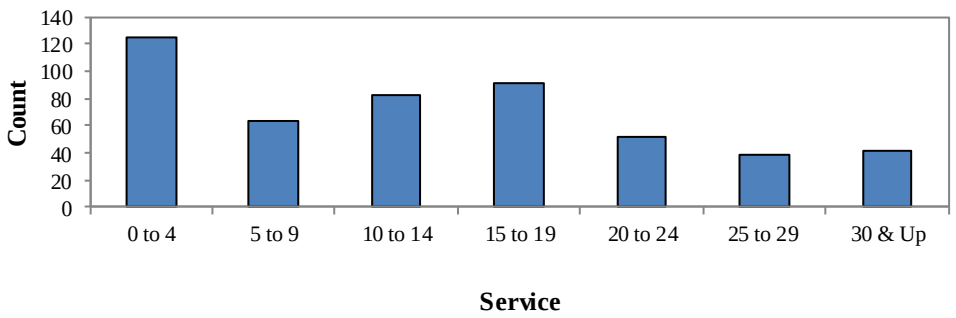
Total

	Years of Service							
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up	Total
Under 25	16	0	0	0	0	0	0	16
25 to 29	31	5	0	0	0	0	0	36
30 to 34	17	18	10	0	0	0	0	45
35 to 39	15	15	25	12	0	0	0	67
40 to 44	6	2	14	26	12	0	0	60
45 to 49	11	10	8	22	9	12	0	72
50 to 54	10	4	4	7	12	8	6	51
55 to 59	11	4	15	13	9	9	17	78
60 to 64	7	4	7	7	7	7	12	51
65 & Up	1	1	0	4	2	2	6	16
Total	125	63	83	91	51	38	41	492

Age Distribution



Service Distribution

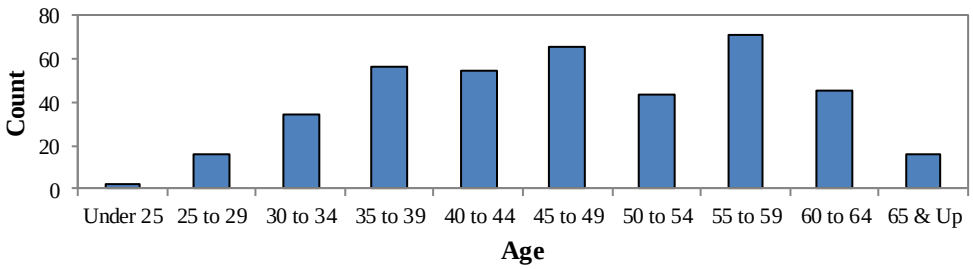


CIVILIAN EMPLOYEES' RETIREMENT SYSTEM
OF THE POLICE DEPARTMENT OF KANSAS CITY, MISSOURI
DISTRIBUTION OF ACTIVE MEMBERS
As of April 30, 2017

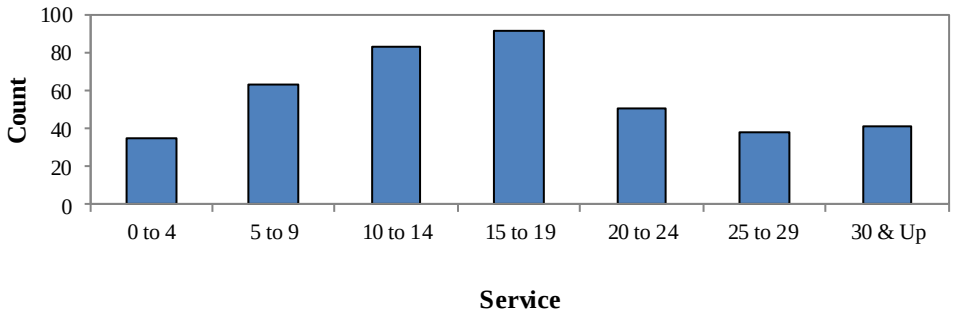
Tier 1

	Years of Service							
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up	Total
Under 25	2	0	0	0	0	0	0	2
25 to 29	11	5	0	0	0	0	0	16
30 to 34	6	18	10	0	0	0	0	34
35 to 39	4	15	25	12	0	0	0	56
40 to 44	0	2	14	26	12	0	0	54
45 to 49	4	10	8	22	9	12	0	65
50 to 54	2	4	4	7	12	8	6	43
55 to 59	4	4	15	13	9	9	17	71
60 to 64	1	4	7	7	7	7	12	45
65 & Up	1	1	0	4	2	2	6	16
Total	35	63	83	91	51	38	41	402

Age Distribution



Service Distribution

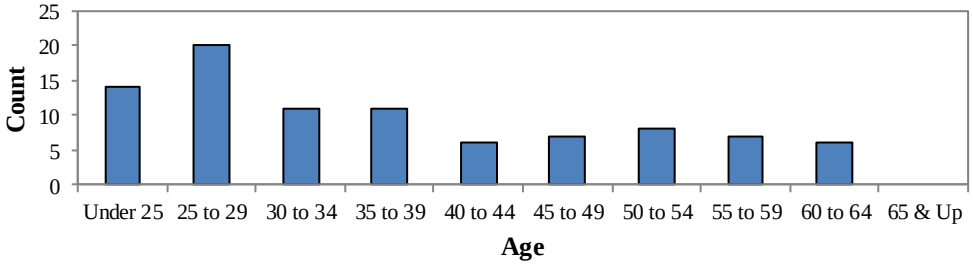


CIVILIAN EMPLOYEES' RETIREMENT SYSTEM
OF THE POLICE DEPARTMENT OF KANSAS CITY, MISSOURI
DISTRIBUTION OF ACTIVE MEMBERS
As of April 30, 2017

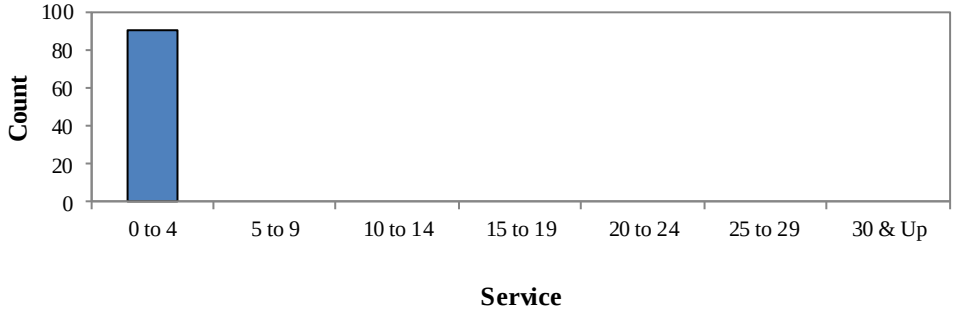
Tier 2

	Years of Service							
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up	Total
Under 25	14	0	0	0	0	0	0	14
25 to 29	20	0	0	0	0	0	0	20
30 to 34	11	0	0	0	0	0	0	11
35 to 39	11	0	0	0	0	0	0	11
40 to 44	6	0	0	0	0	0	0	6
45 to 49	7	0	0	0	0	0	0	7
50 to 54	8	0	0	0	0	0	0	8
55 to 59	7	0	0	0	0	0	0	7
60 to 64	6	0	0	0	0	0	0	6
65 & Up	0	0	0	0	0	0	0	0
Total	90	0	0	0	0	0	0	90

Age Distribution



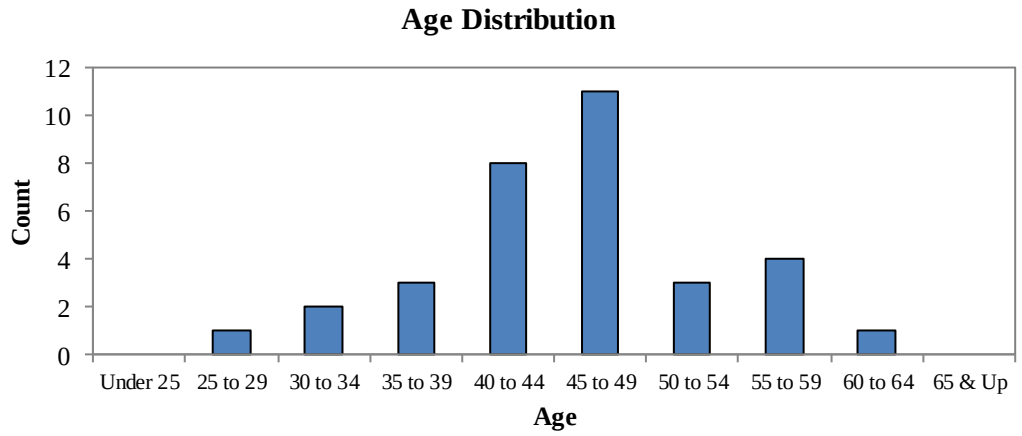
Service Distribution



CIVILIAN EMPLOYEES' RETIREMENT SYSTEM
OF THE POLICE DEPARTMENT OF KANSAS CITY, MISSOURI
SUMMARY OF INACTIVE VESTED MEMBERS
as of April 30, 2017

	Number			Current Monthly Benefit at Retirement*		
Age	Male	Female	Total	Male	Female	Total**
Under 25	0	0	0	$ 0	$ 0	$ 0
25 to 29	0	1	1	0	486	486
30 to 34	2	0	2	1,033	0	1,033
35 to 39	0	3	3	0	1,738	1,738
40 to 44	3	5	8	3,398	4,946	8,344
45 to 49	4	7	11	4,841	9,101	13,942
50 to 54	1	2	3	379	2,232	2,610
55 to 59	2	2	4	2,220	1,033	3,253
60 to 64	1	0	1	323	0	323
65 & Up	0	0	0	0	0	0
Total**	13	20	33	$ 12,193	$ 19,537	$ 31,730

* Does not include supplemental benefits
** May not add due to rounding



CIVILIAN EMPLOYEES' RETIREMENT SYSTEM
OF THE POLICE DEPARTMENT OF KANSAS CITY, MISSOURI
SUMMARY OF RETIRED MEMBERS
as of April 30, 2017

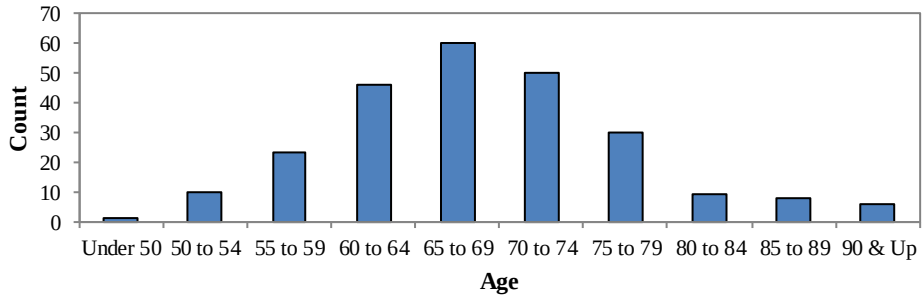
Healthy & Disabled Retirees

	Number			Monthly Benefit*		
Age	Male	Female	Total	Male	Female	Total**
Under 50	1	0	1	$ 1,108	$ 0	$ 1,108
50 to 54	5	5	10	16,751	11,076	27,827
55 to 59	9	14	23	29,581	35,615	65,196
60 to 64	15	31	46	41,387	84,735	126,122
65 to 69	25	35	60	67,779	73,026	140,805
70 to 74	21	29	50	50,985	52,071	103,055
75 to 79	10	20	30	19,437	30,544	49,981
80 to 84	4	5	9	7,460	6,216	13,676
85 to 89	6	2	8	10,980	795	11,775
90 & Up	2	4	6	3,419	3,529	6,947
Total**	98	145	243	$ 248,886	$ 297,607	$ 546,493

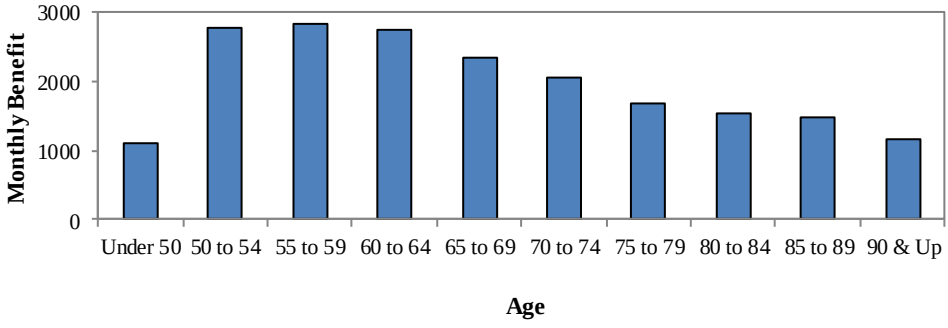
* Does not include supplemental benefits

** May not add due to rounding

Age Distribution



Average Benefit

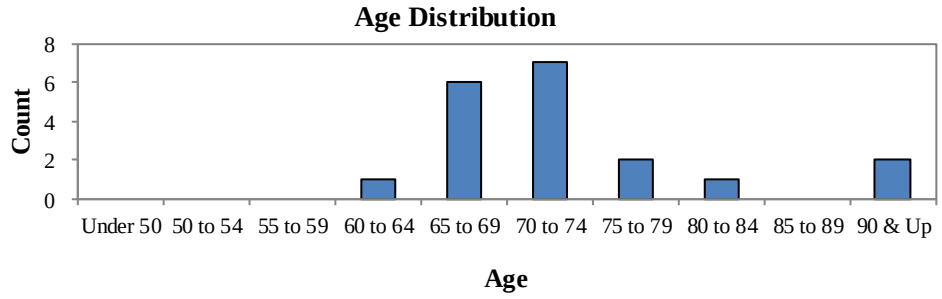


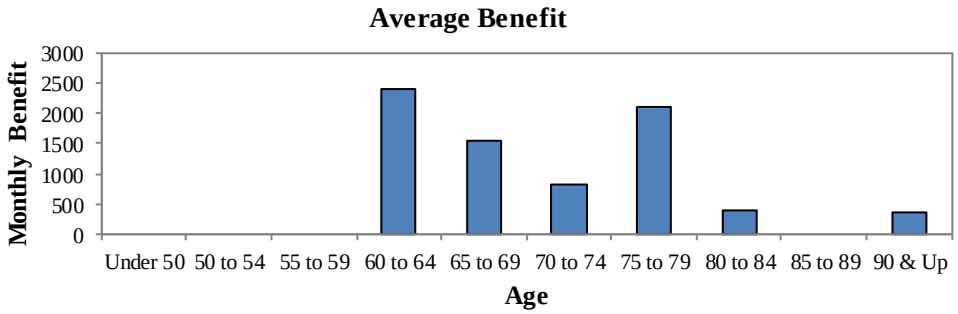
CIVILIAN EMPLOYEES' RETIREMENT SYSTEM
OF THE POLICE DEPARTMENT OF KANSAS CITY, MISSOURI
SUMMARY OF RETIRED MEMBERS
as of April 30, 2017

Beneficiaries

	Number			Monthly Benefit*		
Age	Male	Female	Total	Male	Female	Total**
Under 50	0	0	0	$ 0	$ 0	$ 0
50 to 54	0	0	0	0	0	0
55 to 59	0	0	0	0	0	0
60 to 64	0	1	1	0	2,409	2,409
65 to 69	1	5	6	252	9,030	9,282
70 to 74	1	6	7	1,207	4,632	5,839
75 to 79	0	2	2	0	4,179	4,179
80 to 84	0	1	1	0	391	391
85 to 89	0	0	0	0	0	0
90 & Up	0	2	2	0	728	728
Total**	2	17	19	$ 1,459	$ 21,369	$ 22,828

* Does not include supplemental benefits
** May not add due to rounding





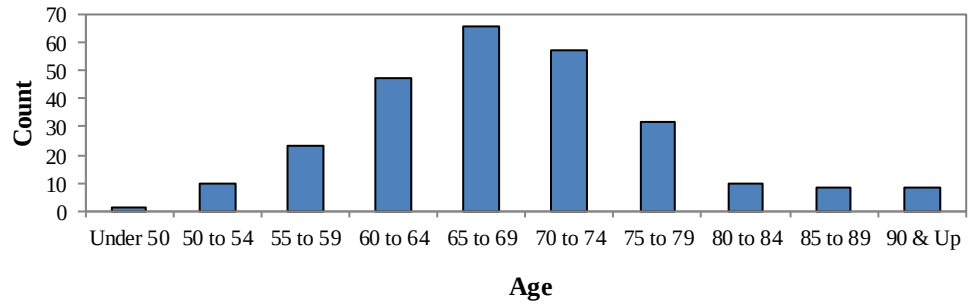
CIVILIAN EMPLOYEES' RETIREMENT SYSTEM
OF THE POLICE DEPARTMENT OF KANSAS CITY, MISSOURI
SUMMARY OF RETIRED MEMBERS
as of April 30, 2017

Combined Retirees & Beneficiaries

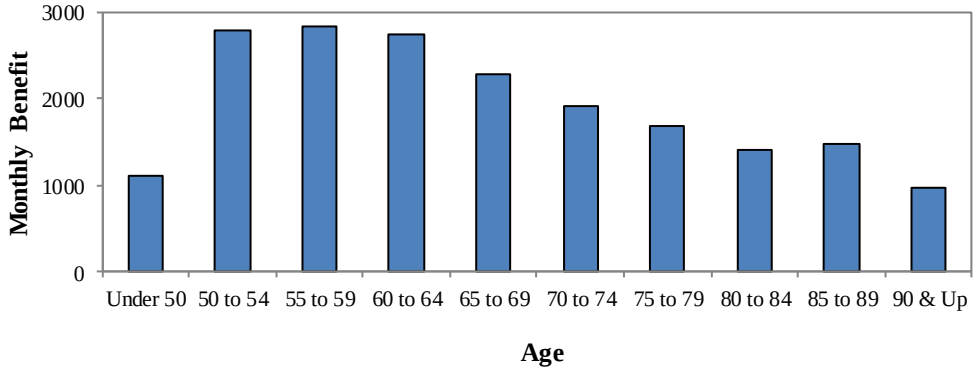
	Number			Monthly Benefit*		
Age	Male	Female	Total	Male	Female	Total**
Under 50	1	0	1	$ 1,108	$ 0	$ 1,108
50 to 54	5	5	10	16,751	11,076	27,827
55 to 59	9	14	23	29,581	35,615	65,196
60 to 64	15	32	47	41,387	87,144	128,531
65 to 69	26	40	66	68,031	82,056	150,087
70 to 74	22	35	57	52,192	56,702	108,894
75 to 79	10	22	32	19,437	34,723	54,160
80 to 84	4	6	10	7,460	6,607	14,067
85 to 89	6	2	8	10,980	795	11,775
90 & Up	2	6	8	3,419	4,256	7,675
Total**	100	162	262	$ 250,345	$ 318,976	$ 569,321

* Does not include supplemental benefits
** May not add due to rounding

Age Distribution



Average Benefit



CIVILIAN EMPLOYEES' RETIREMENT SYSTEM OF THE POLICE DEPARTMENT OF KANSAS CITY, MISSOURI

SUMMARY OF BENEFIT PROVISIONS

Membership

All regularly appointed full-time civilian employees of the Kansas City, Missouri Police Department who are not eligible to receive a pension from any other City-funded retirement system, shall become members as a condition of their employment.
Tier I member – A person who became a member prior to August 28, 2013 and remains a member on August 28, 2013.
Tier II member – A person who became a member on or after August 28, 2013.

Service Retirement

Eligibility –

Tier I member – Later of age 65 or member's 10th anniversary of employment.

Tier II member – Later of age 67 or member's 20th anniversary of employment.

Amount of Pension – Benefit equal to 2% of Final Compensation multiplied by years of creditable service.

Final Compensation –

Tier I member – 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.

Tier II member – Average annual compensation during the three years of service with the highest salary, whether consecutive or otherwise, or during the entire period of service if less than three years.

Early Retirement

Tier I members – Eligible for early retirement as follows:

a) Beginning at age 55, if member has at least 10 years of creditable service. Pension computed as service retirement and then reduced by 0.50% for each month the benefit commences prior to the month following that in which the member turns age 60.
b) Beginning at age 60, if member has at least 5 years of creditable service. Pension computed as service retirement and then reduced by 0.50% for each month the benefit commences prior to the month following that in which the member turns age 65.
c) At any time after the member's age plus years of creditable service equals or exceeds 80 (Rule of 80). Pension computed as service retirement without reduction.

Tier II members – Eligible for early retirement as follows:

a) Beginning at age 62, if member has at least 5 years of creditable service. Pension computed as service retirement and then reduced by 0.50% for each month the benefit commences prior to the month following that in which the member turns age 67.

b) Beginning at age 62, if a member has at least 20 years of creditable service. Pension computed as service retirement without reduction.
c) At any time after the member's age plus years of creditable service equals or exceeds 85 (Rule of 85). Pension computed as service retirement without reduction.

Deferred Retirement (Vested Termination)

Eligibility **–** 5 or more years of creditable service.

Amount of Pension – Computed as service retirement but based upon service, Final Compensation and benefit formula in effect at termination of employment. Benefit may begin at early retirement age, adjusted by applicable reductions.

Duty Disability

Eligibility – A member in active service who has a total and permanent disability that prevents the member from engaging in any occupation or performing any work for remuneration or profit for the remainder of their life. The disability must be the direct result of performance of duties with the Police Department. No age or service requirement.

Amount of Pension – 50% of Final Compensation payable for the remainder of the member's life or as long as the permanent disability continues.

Duty disability benefits may be subject to offset or reduction by amounts paid or payable under any Workers' Compensation law. A disability retiree who is not age 60 may be required by the Retirement Board to undergo continuing eligibility reviews once every three years which may include a medical re-examination.

Non-duty Disability

Eligibility – A member in active service, with a minimum of 10 years of service, who has a total and permanent disability that prevents the member from engaging in any occupation or performing any work for remuneration or profit for the remainder of their life. Disability is not the direct result of performance of duties with the Police Department.

Amount of pension – 30% of Final Compensation but in no event less than the amount the member would have been entitled to as a pension if the member had retired on the same date with equivalent age and creditable service.

A disability retiree who is not age 60 may be required by the Retirement Board to undergo continuing eligibility reviews once every three years which may include a medical re-examination.

Death in Service (less than 20 years of service)

Eligibility – Death of an active member with at least 5 but less than 20 years of service.

Amount of Pension – 50% of the member's accrued pension payable to the surviving spouse for spouse's lifetime. The effective date shall be the later of the first day of the month after the member's death or what would have been the member's earliest retirement date.

Funeral Benefit - $1,000 payable upon the death of an active member.

Death in Service (20 or more years of service)

Eligibility – Death of an active member with 20 or more years of service.

Amount of Pension – Surviving spouse may elect the greater of 50% of the member's accrued pension commencing as described above, or a monthly benefit determined on a joint and survivor's basis from the actuarial value of the member's accrued pension at date of death.

Funeral Benefit - $1,000 payable upon the death of an active member.

Death After Retirement

Eligibility – Death of a retired member who was receiving a benefit.

Amount of Pension – Eligible surviving spouse receives a pension equal to 50% of the member's benefit at the time of actual retirement plus cost of living adjustments. Benefit is payable for the life of the surviving spouse.

In lieu of the 50% surviving spouse death benefit, a member may elect, at the time of retirement, a reduced actuarially equivalent 100% surviving spouse annuity. In such case, the surviving spouse shall receive the same amount as the benefit being paid to the member and such benefit is payable for the life of the surviving spouse.

If the total amount paid to a member and surviving spouse is less than the member's accumulated contributions, with interest, an amount equal to the difference shall be paid to the member's named beneficiary.

Funeral Benefit - $1,000 payable upon the death of a retired member.

Non-Vested Termination

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

Amount of Benefit – Refund of member's contributions with interest.

Post-Retirement Benefit Increases

Eligibility – Members and surviving spouses eligible if member's pension commenced by December 31 of prior calendar year.

Amount of Benefit – May receive an annual cost-of-living adjustment in an amount not to exceed 3% of their respective base pension. Base pension is the pension computed under the provisions of the law at the date of retirement, without regard to cost-of-living adjustments. The COLA adjustment is normally effective with the June 1st benefit payment.

Statutes require that the Retirement Board must act upon the advice of a qualified actuary when granting cost of living adjustments. The liabilities in this report assume a 2.5% ad hoc COLA will be granted in each future year.

Member Contributions

5% of base pay.

Supplemental Retirement Benefit

Retirement on or before August 28, 2007 – current retired and disabled members and their surviving spouses are eligible to receive the supplemental benefit of $160 per month in addition to pension benefits.

Retirements after August 28, 2007 – current and future retired and disabled members and their surviving spouses are eligible to receive the supplemental benefit of $160 per month if the member had 15 years of creditable service.

Optional Form of Benefit Payment

Members retiring with at least one or more years of service beyond their eligible retirement date 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.

CIVILIAN EMPLOYEES' RETIREMENT SYSTEM OF THE POLICE DEPARTMENT 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 UAAL is amortized over a closed 30-year period beginning with the April 30, 2017 valuation.

Asset Valuation Method

The Board adopted a new asset smoothing method effective with the April 30, 2011 valuation. Under the new methodology, the difference between the actual and assumed investment return on the market value of assets is recognized evenly over a five-year period. No corridor is used with the new method. The change to a new asset smoothing method was implemented by setting the actuarial value of assets at April 30, 2011 equal to the market value of assets.

Actuarial Assumptions

Valuations beginning with the April 30, 2013 actuarial valuation include assumptions and methods resulting from the experience study covering the 5-year period from May 1, 2007 to April 30, 2012.

The Board adopted a new Funding Policy at their November 8, 2016 meeting. The amortization policy for the unfunded actuarial accrued liability (UAAL) was changed from an open 30-year period (reset to 30 each valuation) to a closed 30-year period (declining by one each valuation), beginning with the April 30, 2017 valuation. Any new UAAL generated as a result of actuarial experience in subsequent years will be layered and amortized over a closed 20-year period.

Economic Assumptions

Investment return rate: 7.50% per year, net of investment expenses, compounded annually.

Pay increase assumption: Rates for sample years of service are shown below.

	Annual Rate of Pay Increase		
Years of Service	General Wage Growth	Merit and Longevity	Total
0	3.75%	4.00%	7.75%
1	3.75%	4.00%	7.75%
2	3.75%	4.00%	7.75%
3	3.75%	4.00%	7.75%
4	3.75%	4.00%	7.75%
5	3.75%	4.00%	7.75%
10	3.75%	4.00%	7.75%
15	3.75%	2.00%	5.75%
20	3.75%	0.00%	3.75%

Price inflation: 3.0% per year, compounded annually.

Payroll Growth Assumption: 3.75% per year, compounded annually.

Mortality Tables:

Healthy Retirees:	RP-2000 Healthy Annuitant Table with a 1 year age set forward 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 with a 1 year age set forward using Scale AA to model future mortality improvement.

Rates of separation from active membership:

Years of Service	% of Active Members Separating Within Next Year
0	18.0%
1	16.0%
2	14.0%
3	12.0%
4	10.0%
5	9.0%
10	4.0%
15	0.5%
16+	0.0%

The rates do not apply to members eligible to retire and do not include separation on account of death or disability.

Rates of Disability:

Sample Ages	% of Active Members Becoming Disabled Within Next Year
25	0.023%
30	0.030%
35	0.038%
40	0.053%
45	0.075%
50	0.135%
55	0.270%
60	0.675%
65	3.200%

It is assumed that 1/3 of disabilities will be duty related.

Rates of Electing Refund upon Termination: Vested members are assumed to elect a deferred benefit unless the refund of employee contributions exceeds the present value of the deferred benefit.

Rates of Retirement:

Age	Reduced	Unreduced
50		15%
55	2%	15%
60	15%	15%
61	15%	15%
62	15%	30%
63	15%	20%
64	15%	35%
65		35%
66		35%
67		35%
68		35%
69		35%
70		100%

Inactive vested members are assumed to retire at the first unreduced retirement age.

Miscellaneous and Technical Assumptions

Marriage Assumption:	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.
Pay Increase Timing:	Assumed to occur at the start of the fiscal year.
Pay Annualization:	Reported pays for members with less than 1 year of service were annualized for valuation purposes.
Decrement Timing:	Decrements of all types are assumed to occur mid-year.
Eligibility Testing:	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.
Benefit Service:	Service calculated to the nearest month, as of the decrement date, is used to determine the amount of benefit payable.
Other:	Turnover decrement does not operate during retirement eligibility.
Interest on Member Contributions:	None assumed.
Form of Payment:	The assumed normal form of payment is a 50% joint and survivor annuity, if married. Otherwise, a single life annuity.
Administrative Expense:	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.
Cost of Living Adjustment:	It was assumed the Retirement Board will grant, on average, a 2.5% cost of living adjustment each year.

Actuarial Accrued Liability	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."
Actuarial Assumptions	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.
Accrued Service	Service credited under the system which was rendered before the date of the actuarial valuation.
Actuarial Equivalent	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.
Actuarial Cost Method	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."
Experience Gain (Loss)	The difference between actual experience and actuarial assumptions anticipated experience during the period between two actuarial valuation dates.
Actuarial Present Value	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.
Amortization	Paying off an interest-discounted amount with periodic payments of interest and principal, as opposed to paying off with lump sum payment.
Normal Cost	The actuarial present value of retirement system benefits allocated to the current year by the actuarial cost method.
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.