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KPERS

Kansas Public Employees Retirement System

Valuation Report as of December 31, 2016

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Cavanaugh Macdonald
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July 10, 2017

Board of Trustees
Kansas Public Employees Retirement System
611 S. Kansas Ave., Suite 100
Topeka, KS 66603

Dear Members of the Board:

At your request, we have performed an actuarial valuation of the Kansas Public Employees Retirement System (KPERS) as of December 31, 2016 for the purpose of determining contribution rates for FY 2020 for the State and Schools (July 1, 2019 to June 30, 2020) and FY 2019 for Local employers (calendar year 2019). The major findings of the valuation are contained in this report, which reflects the plan provisions in place on December 31, 2016 and any legislative changes from the 2017 Session. There was one change to the benefit provisions for the Kansas Police and Firemen's Retirement System along with changes to the scheduled contributions for the State/School group. In addition, the KPERS Board adopted a new set of actuarial assumptions as the result of an experience study completed in November, 2016. These changes to the actuarial assumptions and methods, which are first reflected in the December 31, 2016 actuarial valuation, are discussed in more detail in the Executive Summary of this report.

In preparing our report, we relied, without audit, on information (some oral and some in writing) supplied by the System's staff. This information includes, but is not limited to, statutory 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.

We further certify that all costs, liabilities, 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. 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 indicated in Appendix C.

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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.

Actuarial computations presented in this report are for purposes of determining the actuarial recommended and statutory funding amounts for the System. Actuarial computations for purposes of fulfilling financial accounting requirements for the System under Governmental Accounting Standard Number 67 and computations for financial reporting by employers under Governmental Accounting Standards Number 68 are provided in separate reports. 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 other purposes may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.

The consultants who worked on this assignment are pension actuaries. Cavanaugh Macdonald Consulting, LLC's advice is not intended to be a substitute for qualified legal or accounting counsel.

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 KPERS Executive Director, Alan Conroy, and to members of his staff, who gave substantial assistance in supplying the data on which this report is based.

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

Sincerely,

Patrice Beckham

Brent A. Banister

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

Brent A. Banister Ph.D., FSA, EA, MAAA, FCA
Chief Pension Actuary

OVERVIEW

The Kansas Public Employees Retirement System is an umbrella organization which administers the following three statewide pension groups: the Kansas Public Employees Retirement System (KPERS), the Kansas Police and Firemen's Retirement System (KP&F) and the Kansas Retirement System for Judges (Judges). This report presents the results of the December 31, 2016 actuarial valuations for each of the groups.

The primary purposes of performing actuarial valuations are to:

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

The 2017 Legislature passed several bills that impacted the provisions and funding of KPERS:

- Senate Substitute for Substitute for HB 2052 (S Sub for Sub HB 2052) provides that the contributions for the School group for fiscal year 2017 (FY 2017) will be reduced so the total State/School contribution will be $64.13 million less than the scheduled statutory contributions. This reduction in employer contributions for fiscal year 2017 will be repaid in level-dollar annual installments of $6.4 million over twenty years beginning in fiscal year 2018. These payments are determined as a contribution rate for School employers to be paid in addition to the statutory State/School contribution rate. Further, S Sub for Sub HB 2052 provides that the repayment of the contribution reduction from FY 2016 with interest ($115 million), scheduled in FY 2018, will <u>not</u> be made.
- Senate Substitute for HB 2002 (S Sub for HB 2002) contains KPERS funding provisions for FY 2018 and FY 2019, including the following:
  - **FY 2018**: The contributions for the State/School group for fiscal year 2018 will be made at the currently scheduled statutory rate of 12.01%. In addition, the first installment of $6.4 million on the 20-year amortization of the contribution reduction for FY 2017 will be paid.
  - **FY 2019**: The contributions for School employers within the State/School group for fiscal year 2019 will be reduced so the total State/School employer contribution is $420 million, including the second installment of $6.4 million on the contribution reduction for FY 2017. This results in an expected reduction of $194 million that will be repaid by the School group as a level dollar amount over 20 years beginning in FY 2020.
  - **FY 2020**: The current statutory cap of 1.2% per year will apply in determining the statutory contribution rate for the State/School group for FY 2020. The certified statutory rate from FY 2019 of 13.21%, without inclusion of the $6.4 million amortization of the contribution reduction for FY 2017 and $19.4 million amortization of the contribution reduction for FY 2019, will be increased by 1.2%, resulting in a statutory contribution rate for FY 2020 of 14.41%. The current statutory cap of 1.2% per year will apply for all subsequent years.
- SB 205 changed the duty-related death benefit for KP&F members to the greater of 50% of Final Average Salary and the member's accrued retirement benefit under the 100% joint and survivor option, payable to the member's spouse. Including any benefits that may be due to child beneficiaries, the total monthly benefits may not exceed 90% of the member's Final Average Salary. Prior to this bill, the duty-related spousal death benefit for a KP&F member was 50% of

Final Average Salary, and the maximum available to the family was 75% of the member's Final Average Salary.

- House Substitute for SB 21 (H Sub for SB21) included changes to the working after retirement rules for members who retire on or after January 1, 2018. The key provisions of the bill were to lengthen the waiting period for KPERS members to return to work from 60 days to 180 days for members who retire before attaining age 62, remove the earnings limitation for all retirees, and establish a single employer contribution schedule for all retirees.

The valuation process does not include a specific assumption regarding the re-employment of retirees in KPERS covered positions so the change to the working after retirement provisions in House Substitute for SB 21 did not have an impact on the current valuation results. However, if the changes in the working after retirement provisions impact the current patterns of retirement, this experience will be reflected in future valuations and may eventually impact the retirement assumption used in future valuations.

As a result of the experience study completed in November 2016, there have been several changes to the actuarial assumptions and methods since the prior valuation. The changes to the economic assumptions, which apply to all groups, are effective December 31, 2016, and include:

- The price inflation assumption was lowered from 3.00% to 2.75%.
- The investment return assumption was lowered from 8.00% to 7.75%.
- The general wage growth assumption was lowered from 4.00% to 3.50%.
- The payroll growth assumption was lowered from 4.00% to 3.00%.

The changes to the demographic assumptions, by group, are shown below:

<u>KPERS</u>

- The post-retirement healthy mortality assumption was changed to the RP-2014 Mortality Table, with adjustments to better fit the observed experience for the various KPERS groups. The most recent mortality improvement scale, MP-2016, is used to anticipate future mortality improvements in the valuation process through the next experience study.
- The active member mortality assumption was modified to also be based on the RP-2014 Employee Mortality Table with adjustments.
- The retirement rates for the select period (when first eligible for unreduced benefits under Rule of 85) were increased, but all other retirement rates were decreased.
- Disability rates were decreased for all three groups.
- The termination of employment assumption was increased for all three groups.
- The interest crediting rate assumption for KPERS 3 members was lowered from 6.50% to 6.25%.

<u>KP&F</u>

- The post-retirement healthy mortality assumption was changed to the RP-2014 Mortality Table with 1-year age set forward and the MP-2016 Scale is used to anticipate future mortality improvements.
- The mortality assumption for disabled members was changed to the RP-2014 Disabled Lives Table (generational using MP-2016) with a one-year age set forward.
- The active member mortality assumption was modified to the RP-2014 Employee Mortality Table with a 1-year age set forward with a 90% scaling factor.

- The retirement rates for Tier I were lowered and the ultimate assumed retirement age was changed from 63 to 65 for Tier II.
- The termination of employment rates for Tier II were increased to better match the observed experience.

Judges
- The post-retirement healthy mortality assumption was changed to the RP-2014 Mortality Table with a 2-year age setback and the MP-2016 Scale is used to anticipate future mortality improvements.
- The active member mortality assumption was modified to the RP-2014 Employee Mortality Table with a 2-year age setback with an 80% scaling factor.
- The retirement rates were modified with increases at some ages and decreases at others.

In addition to the changes pertaining to actuarial assumptions, the Board has also adopted a new method for paying off the unfunded actuarial liability (UAL). Under the new method, the UAL is amortized using a "layered" approach, where the December 31, 2015 UAL serves as the initial (legacy) base and is amortized over a period originally set at 40 years beginning July 1, 1993. As of December 31, 2016, sixteen years remain in that period. The change to the UAL as of December 31, 2016 that resulted from the assumption changes is amortized over a closed 25-year period. Any change to the UAL that results from actuarial experience is amortized over closed 20-year periods.

For more information on the change to the actuarial assumptions and methods, please see the complete 2016 Experience Study report, dated November 18, 2016. Below is a summary of the cost impact of the assumption changes on the December 31, 2016 valuation results:

	Old Assumptions and Methods	New Assumptions and Methods	Change
State/School			
Accrued Liability (millions)	$18,465	$18,867	$402
Actuarial Value of Assets	12,177	12,177	0
Unfunded Accrued Liability (millions)	$ 6,288	$ 6,690	$402
Normal Cost Rate	8.21%	8.14%	(0.07%)
UAL Amortization Rate	11.05%	12.60%	1.55%
Actuarial Contribution Rate	19.26%	20.74%	1.48%
Local			
Accrued Liability (millions)	$4,994	$5,095	$101
Actuarial Value of Assets	3,580	3,580	0
Unfunded Accrued Liability (millions)	$1,414	$1,515	$101
Normal Cost Rate	7.82%	7.67%	(0.15%)
UAL Amortization Rate	6.30%	7.22%	0.92%
Actuarial Contribution Rate	14.12%	14.89%	0.77%

	Old Assumptions and Methods	New Assumptions and Methods	Change
KP&F			
Accrued Liability (millions)	$3,093	$3,175	$82
Actuarial Value of Assets	2,329	2,329	0
Unfunded Accrued Liability (millions)	$ 764	$ 846	$82
Normal Cost Rate	15.10%	14.88%	(0.22%)
UAL Amortization Rate	12.30%	14.40%	2.10%
Actuarial Contribution Rate	27.40%	29.28%	1.88%
Judges			
Accrued Liability (millions)	$172.1	$181.7	$9.6
Actuarial Value of Assets	170.6	170.6	0.0
Unfunded Accrued Liability (millions)	$ 1.5	$ 11.1	$9.6
Normal Cost Rate	19.60%	20.30%	0.70%
UAL Amortization Rate	(0.07%)	3.99%	4.06%
Actuarial Contribution Rate	19.53%	24.29%	4.76%

KPERS 3 (Cash Balance members) refers to non-corrections members who either began their participation or were rehired on or after January 1, 2015. Of the 144,564 active KPERS members, 28,511 (about 20%) were KPERS 3 members as of the valuation date. KPERS 3 members receive guaranteed interest of 4.0% on their account balances. There is also the possibility of additional interest credits that are dependent on KPERS' investment return. The additional interest credits, referred to as "dividends", are equal to 75% of the five-year average net compound rate of return, as determined by the board, for the preceding calendar year and the prior four calendar years on the market value of assets that is above 6.0%. If applicable, the dividend is granted as soon as administratively feasible after March 31 and is credited on the account balance as of the previous December 31. Transition rules apply for the initial years until the Cash Balance Plan has been effective for five full calendar years (January 1, 2020). The dividend for 2016 was dependent on the rate of return on the market value of assets for 2015 and 2016. Because the compound average rate of return during this period was 4.3%, no dividend was payable.

The valuation results provide a "snapshot" view of the System's financial condition on December 31, 2016. The unfunded actuarial liability (UAL), for the System as a whole, increased by $522 million due to multiple factors, the most significant of which was the increase in the actuarial liability due to the assumption changes adopted since the prior valuation. A detailed analysis of the change in the unfunded actuarial liability from December 31, 2015 to December 31, 2016 can be found on page 10.

In KPERS, the State, School, and Local employers do not necessarily contribute the full actuarial contribution rate. Based on legislation passed in 1993, the employer contribution rates certified by the Board may not increase by more than the statutory cap. The statutory cap has changed over time, but the current cap is 1.20% for FY 2020 (the rate is set based on the December 31, 2016 actuarial valuation). Although separate valuations are performed for the State and School groups, the statutory contribution rate for the two groups is determined using the combined valuation results. If the actuarial required contribution (ARC) for the State alone is less than the statutory contribution rate when the two groups are combined (as it is this year), the excess of the statutory contribution rate over the actuarial required contribution rate for the State alone is allocated to the School to improve the funding of that group.

A summary of actuarial and statutory employer contribution rates for the Retirement System (excluding the statutory contribution for the Death and Disability Program) for this valuation and the prior valuation follows:

	December 31, 2016 Valuation		
System	**Actuarial**	**Statutory**	**Difference**
State[1]	9.49%	14.41%	(4.92%)
School[1]	16.15%	14.41%	1.74%
State/School[1]	14.74%	14.41%	0.33%
Local[1]	8.89%	8.89%	0.00%
Police & Fire - Uniform Rates[2]	22.13%	22.13%	0.00%
Judges	18.65%	18.65%	0.00%

	December 31, 2015 Valuation		
System	**Actuarial**	**Statutory**	**Difference**
State[1]	8.28%	13.21%	(4.93%)
School[1]	14.59%	13.21%	1.38%
State/School[1]	13.23%	13.21%	0.02%
Local[1]	8.39%	8.39%	0.00%
Police & Fire - Uniform Rates[2]	20.09%	20.09%	0.00%
Judges	14.68%	14.68%	0.00%

1 By statute, rates are allowed to increase by a maximum of 0.9% for FY 2014, 1.0% in FY 2015, 1.1% in FY 2016 and 1.2% in FY 2017 and beyond plus the cost of any benefit enhancements. The December 31, 2016 valuation sets the employer contribution rate for FY 2020 for the State and School group and calendar year 2019 for the Local group. An additional contribution of 0.18% applies to the School group beginning in FY 2018 which increases to 0.69% in FY 2020 due to contribution reductions in FY 2017 and FY 2019 (see table below).

2 For KP&F, the statutory contribution rate is equal to the "Uniform" rate. The rate shown is for local employers. The rate for State employers is 22.11% this year. The uniform rate does not include the payment required to amortize the unfunded past service liability determined separately for each employer. (See Table 15)

Legislation passed in the 2017 session provides for the repayment of the contribution reductions for the School group from 2017 and 2019 in level annual installments over a twenty-year period commencing in fiscal years 2018 and 2020, respectively. These installment payments are determined as an additional contribution rate for the School group and are added to the regular statutory contribution rate determined for the State/School group. The additional contribution rate for the $64 million reduction to the fiscal year 2017 School contributions is 0.18% for fiscal years 2018 and 2019 and 0.17% for FY 2020. The additional contribution rate for the scheduled $194 million reduction to the fiscal year 2019 School contributions is 0.52%, beginning in fiscal year 2020. Therefore, the total statutory contribution rates for the School group for FY 2018 through FY 2020 are shown in the table below:

	FY 2018	**FY 2019**	**FY 2020**
Regular Statutory State/School Contribution Rate	12.01%	13.21%	14.41%
Contribution for FY 2017 Contribution Reduction	0.18%	0.18%	0.17%
Contribution for FY 2019 Contribution Reduction	0.00%	0.00%	0.52%
Total School Contribution Rate	12.19%	13.39%	15.10%

The rate of return on the market value of assets in 2016 was 8.5%, as reported by KPERS, which was higher than the 2016 assumed return of 8.0%. Due to the asset smoothing method, the resulting rate of return on the actuarial value of assets for calendar year 2016 was 8.4%. The net impact of recognizing the scheduled portion of deferred asset experience and the favorable investment experience during 2016 was an increase in the net deferred asset loss from $515 million in the prior valuation to $566 million in the current valuation. Based on the results of this valuation, the State and Local groups continue to be at the actuarial required contribution rate. In addition, the statutory contribution rate for the State/School group is projected to converge with the actuarial required contribution rate before 2033, the end of the amortization period for the legacy unfunded actuarial liability, based on the current statutory funding policy and assuming all actuarial assumptions are met and contributions are made, as scheduled, in future years.

EXPERIENCE - ALL SYSTEMS COMBINED

December 31, 2015 – December 31, 2016

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 December 31, 2016. 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 leads to a method of determining the contributions needed by members and employers in the future to balance the System assets and liabilities.

Changes in both the System's assets and liabilities impacted the change in the actuarial contribution rates between the December 31, 2015 and December 31, 2016 actuarial valuations. On the following pages, each component is examined.

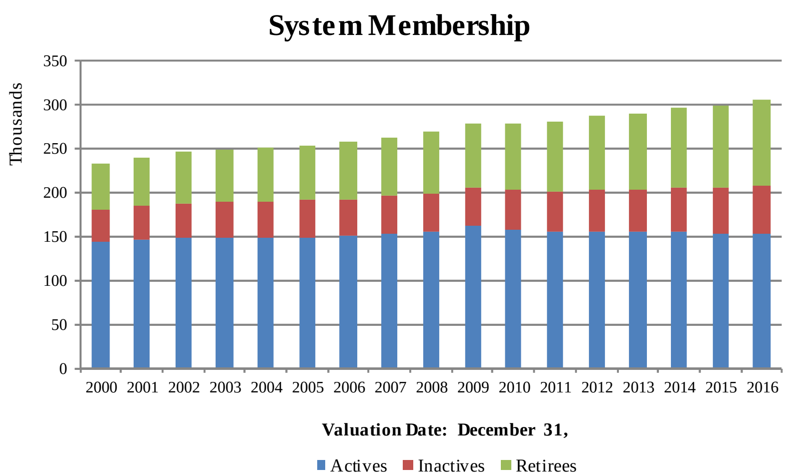
MEMBERSHIP

The following table contains a summary of the changes in the active membership between the December 31, 2015 and December 31, 2016 actuarial valuations.

	State	School	Local	KP&F	Judges	Total
12/31/2015 (Starting count)	22,117	84,020	38,532	7,244	262	152,175
New actives	2,765	10,566	5,307	631	16	19,285
Non-vested Terminations	(859)	(3,991)	(2,134)	(223)	(0)	(7,207)
Elected Refund	(680)	(1,390)	(1,237)	(89)	(1)	(3,397)
Vested Terminations	(571)	(2,360)	(1,132)	(49)	(1)	(4,113)
Total Withdrawals	(2,110)	(7,741)	(4,503)	(361)	(2)	(14,717)
Deaths	(37)	(101)	(67)	(5)	(0)	(210)
Disabilities	(26)	(59)	(37)	(15)	(0)	(137)
Retirements	(797)	(2,288)	(977)	(193)	(22)	(4,277)
Other/Transfer	(33)	(76)	109	2	(2)	0
12/31/2016 (Ending count)	21,879	84,321	38,364	7,303	252	152,119

As can be seen from the table, KPERS experienced a small net decrease in the number of active members with the largest decrease occurring in the State group. This pattern of low (or negative) employee growth has not been unusual in recent years. However, the decline in active membership has an adverse impact on the valuation results. As a result of fewer active members, coupled with low salary increases, the total active member payroll has not grown as expected, so there have been fewer contribution dollars to help fund the System's unfunded actuarial liability.

The following graph shows the number of active and inactive vested members, as well as retirees, in current and prior valuations. The number of active members has declined since 2009 while the number of retirees has continued to grow.



ASSETS

As of December 31, 2016, the System had total funds of $17.7 billion on a market value basis, excluding assets held for the Group Insurance and Optional Life reserves. This was an increase of $0.8 billion from the December 31, 2015 value of $16.9 billion.

In the 2016 session, legislation was passed that provided for the delay of up to $100 million in State and School contributions to KPERS which were to be repaid, with interest at 8%, in fiscal year 2018. The actual contribution reduction for FY 2016 was $97.4 million, including $410,000 in State agency contributions to KP&F. The scheduled repayment was $115 million on June 30, 2018. As a result, KPERS had reflected the contribution reduction as a receivable on their books and the contributions were assumed to be paid when calculations were performed in the December 31, 2015 valuation. Due to legislation in 2017, the contribution reduction will not be repaid, and KPERS has removed the value of the receivable as of December 31, 2016 ($99 million with accrued interest) from their books, resulting in a decrease in the asset value. In this valuation report, the impact of the legislative change is labeled as "non-collectible pension contributions" which lowers the market value of assets as well as the actuarial value of assets, thereby increasing the unfunded actuarial liability.

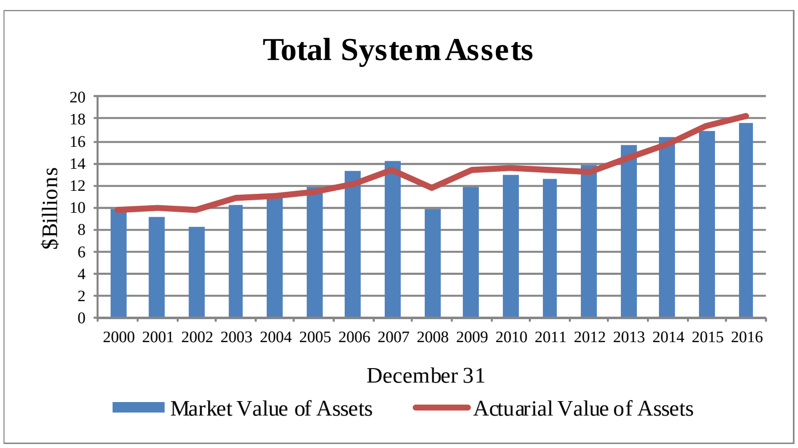
The market value of assets is not used directly in the calculation of contribution rates. An asset valuation method is used to smooth the effect of market fluctuations. The smoothing method calculates the difference between the actual return and the expected return (assumed rate of return) on the market value of assets each year. The difference is recognized equally over a five-year period. See Tables 3A through 3F and 4 for the detailed development of the actuarial value of assets as of December 31, 2016 for each group.

The components of the change in the market value and actuarial value of assets for the Retirement System (in millions) are set forth in the following table.

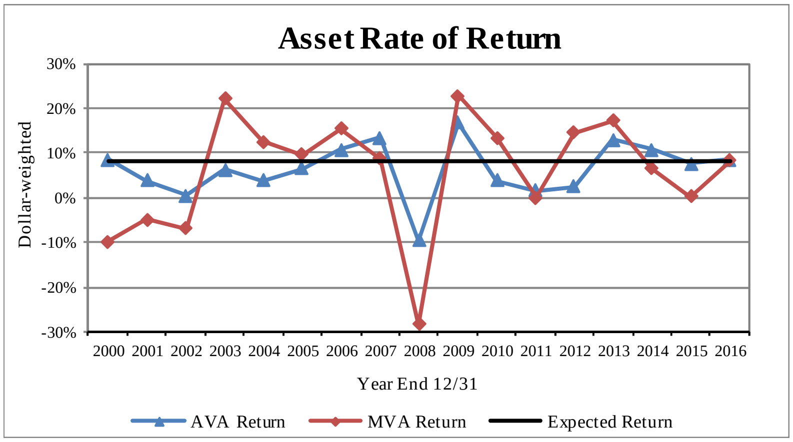
	Market Value $(millions)	Actuarial Value $(millions)
Assets, December 31, 2015	$16,893	$17,409
• Employer and Member Contributions	1,163	1,163
• Benefit Payments	(1,649)	(1,649)
• Non-collectible Pension Contributions	(99)	(99)
• Investment Income, Net of Expenses	1,382	1,432
Assets, December 31, 2016	$17,690	$18,256
Rate of Return	8.5%	8.4%

The actuarial value of assets as of December 31, 2016, was $18.256 billion. The annualized dollar-weighted net rate of return for 2016 was 8.4%, measured on the actuarial value of assets, and 8.5%, measured on the market value of assets as reported by KPERS.

Due to the use of an asset smoothing method, there is $566 million of net deferred investment loss experience that has not yet been recognized, i.e. the market value of assets is lower than the actuarial value. This deferred investment loss will be recognized in the actuarial value of assets over the next four years, but may be offset by actual investment experience if it is more favorable than assumed.



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



The rate of return on the actuarial (smoothed) value of assets has been less volatile than the market value return. The deferred investment loss will be reflected in the actuarial value of assets in the next few years, absent favorable investment experience.

LIABILITIES

The actuarial 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 asset values at the same date is referred to as the unfunded actuarial liability (UAL). The unfunded actuarial liability will be reduced if the employer contributions exceed the employer normal cost for the year, after allowing for interest on the previous balance of the unfunded actuarial liability. Benefit improvements, experience gains and losses, and changes in actuarial assumptions and methods will also impact the total actuarial liability (AL) and the unfunded portion thereof.

The unfunded actuarial liability ($ million) by group is summarized below:

	State	School	Local	KP&F	Judges	Total*
Actuarial Liability	$4,386	$14,481	$5,095	$3,175	$182	$27,318
Actuarial Value of Assets	3,464	8,713	3,580	2,329	171	18,256
Unfunded Actuarial Liability*	$ 922	$ 5,768	$1,515	$ 846	$ 11	$ 9,061

*May not add due to rounding.

See Table 6 for the detailed development of the Actuarial Liability by group. The calculation of the Unfunded Actuarial Liability by group is shown in Table 10.

As mentioned earlier, there were several changes to the actuarial assumptions in this valuation, including a change in the investment return assumption from 8.00% to 7.75%. The net impact of all assumption changes was an increase in the unfunded actuarial liability at December 31, 2016 of $593 million.

Beginning with this valuation, the unfunded actuarial liability is amortized using a "layered" approach. The legacy unfunded actuarial liability is the amount from the December 31, 2015 valuation which was projected to June 30, 2018 for State/School and Judges and December 31, 2017 for Local and KP&F. This initial or legacy amortization base continues to be amortized over the original period, which was set at 40 years beginning July 1, 1993 (16 years remaining as of December 31, 2016). The change in the unfunded actuarial liability in the December 31, 2016 valuation as a result of the assumption changes (projected to June 30, 2019 or December 31, 2018 as appropriate) is amortized over a closed 25-year period. Changes in the unfunded actuarial liability each year that result from actuarial experience are amortized over a closed 20-year period that begins with the fiscal year in which the contributions will apply.

For the State/School group, the current statutory contribution rate is less than the actuarial contribution rate which leads to an increase in the Unfunded Actuarial Liability for the State/School group. Other factors influencing the unfunded actuarial liability from year to year include actual experience versus that expected based on the actuarial assumptions (on both assets and liabilities), changes in actuarial assumptions, procedures or methods, and changes in benefit provisions.

The actual experience measured in this valuation is that which occurred during the prior plan year (calendar year 2016), **based on the previous assumptions that were used in the December 31, 2015 valuation**. For all of the groups, except KP&F, the valuation reflects a net liability gain for the year, largely due to lower salary increases than expected. The total net liability gain for the System was $156 million. The liability loss for KP&F was primarily due to unfavorable mortality experience. The System experienced a return of 8.4% on the actuarial value of assets, which is higher than the assumed return for 2016 of 8.0%. This resulted in an experience gain for all groups of $59 million. Therefore, the net result of all experience (asset and liability) for all groups was an experience gain for the System of $215 million in 2016.

Between December 31, 2015 and December 31, 2016 the change in the unfunded actuarial liability for the System, as a whole, was as follows (in millions):

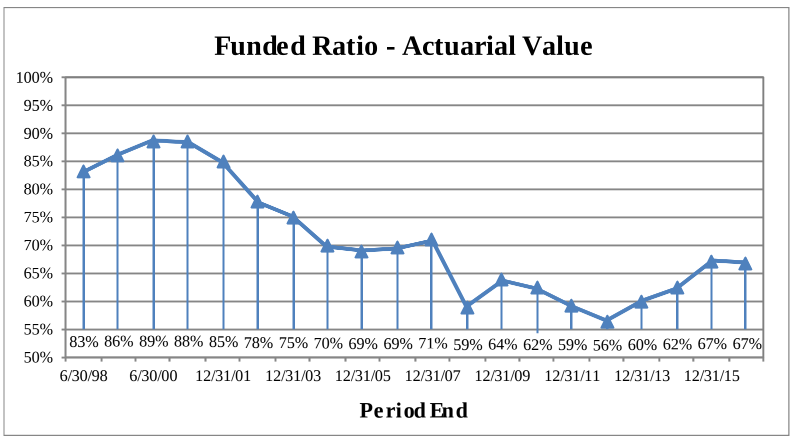
	$ millions
Unfunded Actuarial Liability, December 31, 2015	$ 8,539
• effect of contribution cap/time lag	70
• expected decrease due to amortization	(38)
• (gain)/loss from investment return on actuarial assets	(59)
• demographic experience[1]	(156)
• all other experience	12
• assumption changes	593
• benefit provision changes	1
• non-collectible pension contributions	99
Unfunded Actuarial Liability, December 31, 2016[2]	$ 9,061

[1]Liability gain is about 0.57% of total actuarial liability.
[2]May not add due to rounding.

A detailed summary of the change in the unfunded actuarial liability by group is shown on page 22. Effective with the December 31, 2016 actuarial valuation, the unfunded actuarial liability is amortized by components or "pieces", e.g., the legacy portion of unfunded actuarial liability (over 16 years), the increase due to the changes in actuarial assumptions (over 25 years), the change due to actuarial experience (over 20 years) and the change due to modifying the KP&F benefit structure (over 20 years).

An evaluation of the unfunded actuarial liability on a pure dollar basis may not provide a complete analysis since only the difference between the assets and liabilities (which are both very large numbers) is reflected. Another way to evaluate the unfunded actuarial 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 liability. The funded ratio does not necessarily indicate whether or not additional funding is needed, nor does it indicate whether or not the plan could settle all liabilities with current assets. The funded status information for the KPERS System is shown below (in millions).

	12/31/10	12/31/11	12/31/12	12/31/13	12/31/14	12/31/15	12/31/16
Using Actuarial Value of Assets:							
Funded Ratio (AVA/AL)	62%	59%	56%	60%	62%	67%	67%
Unfunded Actuarial Liability (AL-AVA)	$8,264	$9,228	$10,253	$9,766	$9,468	$8,539	$9,061
Using Market Value of Assets:							
Funded Ratio (MVA/AL)	59%	55%	59%	65%	65%	65%	65%
Unfunded Actuarial Liability (AL-MVA)	$8,936	$10,130	$9,714	$8,584	$8,808	$9,055	$9,627



Changes in actuarial assumptions and methods, coupled with investment returns below the assumed rate and contributions below the actuarial rate significantly reduced the funded ratio over much of this period. The funded ratio is expected to increase steadily in the future assuming assumptions are met and scheduled contributions are made.

Given the current funded status of the System, the deferred investment experience, the amortization method, the amortization period, and the scheduled increases in employer contribution rates, the dollar amount of the unfunded actuarial liability for the entire System is expected to increase over the next few years and then start to decline. The funded ratio is expected to improve absent experience losses in the future, but will continue to be heavily dependent on the actual investment returns.

CONTRIBUTION RATES

The funding objective of the System is to establish contribution rates that over time will remain relatively level, as a percentage of payroll, and to pay off the unfunded actuarial liability in a reasonable timeframe.

Generally, the actuarial contribution rates to the various Systems consist of:

- a "normal cost" for the portion of projected liabilities allocated by the actuarial cost method to service of members during the year following the valuation date and an expense load for administrative expenses for the year,

- an "unfunded actuarial liability contribution" for the excess of the portion of projected liabilities allocated to service to date over the actuarial value of assets.

There is also a statutory contribution rate that is used to finance the Death and Disability Program. Contributions for the Death and Disability Program are deposited in a separate trust fund from which benefits are paid. A separate actuarial analysis and report is prepared for the Death and Disability Program on June 30 of each year, so the death and disability contribution rate is not reflected in this report.

In KPERS, State, School and Local employers do not necessarily contribute the full actuarial contribution rate. Based on legislation passed in 1993, the employer contribution rates certified by the Board may not increase by more than the statutory cap. The statutory cap, which has been changed periodically, is 1.2% for all three groups (0.9% in fiscal year 2014, 1.0% in 2015, and 1.1% in 2016, and 1.2% in 2017 and beyond). In 2015, SB 4 reset the previously certified employer contribution rate for the State/School group for the last half of FY 2015 from 11.27% to 8.65%. In addition, SB 228 lowered the statutory rates for the State/School group from 12.37% to 10.91% for FY 2016 and 13.57% to 10.81% for FY 2017. The December 31, 2014 valuation set the statutory contribution rates for FY 2018, based on the 1.2% statutory cap.

The results of the December 31, 2016 valuation are used to set employer contribution rates for fiscal year 2020 for the State and School (July 1, 2019 to June 30, 2020) and 2019 for Local employers (calendar year 2019). Given the lag between the valuation date in which the employer contribution rates are determined and the effective date of those contribution rates, i.e., a two year lag for Local employers and a two and one-half year lag for the State/School and Judges groups, the unfunded actuarial liability is projected from the valuation date to the first day of the fiscal year in which the contribution rate will apply based on the statutory contribution rates and expected payroll in the intervening years. The unfunded actuarial liability is amortized as a level percentage of payroll for all groups except the Judges who use a level-dollar payment. The payroll growth assumption is 3.0% so the annual amortization payments will increase 3.0% each year. As a result, if total payroll grows 3.0% per year, as assumed, the amortization payment will remain level as a percentage of total current payroll.

A summary of the actuarial and statutory employer contribution rates for the System is shown below:

System	Actuarial	Statutory	Difference
	December 31, 2016 Valuation		
State[1]	9.49%	14.41%	(4.92%)
School[1]	16.15%	14.41%	1.74%
State/School[1]	14.74%	14.41%	0.33%
Local[1]	8.89%	8.89%	0.00%
Police & Fire - Uniform Rates[2]	22.13%	22.13%	0.00%
Judges	18.65%	18.65%	0.00%

1 By statute, rates are allowed to increase by a maximum of 0.9% for FY 2014, 1.0% in FY 2015, 1.1% in FY 2016 and 1.2% in FY 2017 and beyond plus the cost of any benefit enhancements. The December 31, 2016 valuation sets the employer contribution rate for FY 2020 for the State and School group and calendar year 2019 for the Local group. An additional contribution of 0.18% applies to the School group beginning in FY 2018, which increases to 0.69% in FY 2020, due to contribution reductions in FY 2017 and FY 2019.

2 For KP&F, the statutory contribution rate is equal to the "Uniform" rate. The rate shown is for local employers. The rate for State employers is 22.11% this year. The uniform rate does not include the payment required to amortize the unfunded past service liability determined separately for each employer. (See Table 15)

Separate employer contribution rates are calculated for two subgroups of the State: Correctional Employee Groups with normal retirement age 55 (C55) and normal retirement age 60 (C60). The contribution rates are to be calculated by increasing the state statutory contribution rate by the difference in the normal cost rate for the C55 and C60 groups over the normal cost rate for regular state members, but not to exceed the statutory cap on contribution increases. The higher contribution rates are intended to finance the earlier normal retirement age. However, SB 228 reset the statutory employer contribution rates for FY 2016 and FY 2017 for the Correctional Employee groups to be the same as the employer contribution rate for the State/School group (10.91% and 10.81% respectively), eliminating the intended rate differential. The resulting contribution rates for the Correctional Employee Groups for FY 2020 are shown in the following table:

Corrections Group	Statutory Rate
Retirement Age 55:	14.41%
Retirement Age 60:	14.41%

The change in the employer actuarial contribution rate from December 31, 2015 to December 31, 2016 and the primary components thereof are shown in the table on page 23. The employer contribution rates increased from those in the December 31, 2015 valuation primarily due to the new set of assumptions adopted by the Board as a result of the most recent experience study.

Due to statutory caps, the full actuarial contribution rate is not contributed for all KPERS groups. The State and Local groups reached the actuarial required contribution (ARC) date (the year in which the statutory contribution rate is equal to or greater than the actuarial required contribution rate) in 2010 and 2012, respectively, and remain at actuarial required contribution rate in this valuation. Based on the current valuation, there is a difference (shortfall) between the actuarial and statutory contribution rates of 1.74% for the School group and 0.33% for the State/School group. Assuming a 7.75% return on the market value of assets for 2017 and beyond, all other actuarial assumptions are met in the future, and the current statutory funding policy continues and contributions are made as scheduled, the estimated ARC Date for the State/School group is FY 2021 at a rate of 14.99%. For comparison purposes, the projections in last year's valuation (under different assumptions and scheduled contributions) estimated a projected ARC Date of FY 2020 at a rate of 13.12%.

COMMENTS

The most significant impact on the December 31, 2016 valuation was the impact of the new set of actuarial assumptions, adopted by the KPERS Board of Trustees in November, 2016. Those changes increased the unfunded actuarial liability by $593 million and the actuarial contribution rates for all systems. The changes were implemented to provide a better estimate of the future liabilities of the System.

Legislation in 2017 resulted in the reduction in the School group contribution amounts for fiscal years 2017 ($64.4 million) and 2019 ($194.4 million). Those reductions are to be repaid in annual installments, as level dollar amounts, over twenty years. As a result, KPERS will treat them as a receivable on their books. In the valuation process, we also treat these contributions as if they have or will be made so there is no negative impact on the System's funding. However, legislation in the 2017 session provided that the reduced contribution of $97.4 million from fiscal year 2016, scheduled to be repaid in fiscal year 2018, will not be made, therefore reducing the market value and actuarial value of assets and increasing the unfunded actuarial liability for the State/School group and, to a small extent, KP&F.

Like most public retirement systems, KPERS uses an asset smoothing method to average investment experience above and below the assumed rate of return (7.75% for 2017 and forward). Under the asset smoothing method, the difference between the dollar amount of the actual and assumed investment experience is recognized equally over a five-year period. Due to the recognition of the experience in the prior four years using the asset smoothing method, the return on the actuarial value of assets in 2016 was 8.4%. As of the valuation date, the actuarial value of assets exceeds the market value of assets by about 3.2% or $566 million. This deferred experience will flow through the asset smoothing method in the next four years and be recognized in the valuation process, unless offset by investment experience above the 7.75% assumed rate of return. As the deferred investment experience is recognized, the funded ratio can be expected to decrease and the actuarial contribution rate to increase.

While the use of an asset smoothing method is a common procedure used by public retirement systems, it is important to identify the potential impact of the deferred (unrecognized) investment experience. This is particularly important when there are deferred investment losses, but it is also useful to consider the impact on the key actuarial measurements if the deferred investment gains are recognized. To illustrate the impact of the deferred investment experience, the key valuation results are shown in the following table for the State/School and KPF groups using both the actuarial value of assets and the pure market value. The impact would be similar for the other groups.

	State/School		KP&F	
	Actuarial	Market	Actuarial	Market
Actuarial Liability	$18,867	$18,867	$3,175	$3,175
Asset Value	12,177	11,799	2,329	2,256
Unfunded Actuarial Liability*	6,690	7,068	846	918
Funded Ratio	65%	63%	73%	71%
Contribution Rate:				
Normal Cost Rate	8.14%	8.14%	14.88%	14.88%
UAL Payment	12.60%	13.43%	14.40%	15.87%
Actuarial Contribution Rate	20.74%	21.59%	29.28%	30.75%
Employee Rate	6.00%	6.00%	7.15%	7.15%
Employer Rate	14.74%	15.59%	22.13%	23.60%

* May not add due to rounding

Future investment experience will impact the extent to which the deferred investment experience (which is currently a net loss) will be recognized. The ultimate impact of the deferred experience on the employer contribution rate would be similar to the column shown above based on the market value of assets, if all actuarial assumptions are met including the 7.75% return in future years. Also, please refer to the graphs later in this section that show the projected contribution rates assuming a 7.75% rate of return in all future years.

Over the last several years, the development of a comprehensive plan to address the long-term funding of KPERS has been a high priority and significant changes have been made. HB 2014, which was passed by the 2003 Legislature, increased the statutory cap on the State/School employer contribution rate from 0.20% to 0.40% in FY2006, 0.50% in FY2007 and 0.60% in FY 2008 and beyond. It also authorized the issuance of up to $500 million in pension obligation bonds (POBs). The POBs were sold and proceeds of $440.2 million were received on March 10, 2004. The debt service payments on the bonds are paid by the State in addition to the regular KPERS employer contribution rate.

The 2004 Legislature passed SB 520, which continued to address issues related to the long term funding of the System (KPERS Tier 2). It gave the KPERS Board of Trustees the authority to establish the actuarial cost method and amortization method/period. With this authority, the Board changed both the actuarial cost method and the asset valuation method with the December 31, 2003 actuarial valuation. SB 520 also increased the statutory cap for Local employers from 0.15% to 0.40% in FY2006, 0.50% in FY2007 and 0.60% in FY2008 and beyond.

The 2007 Legislature passed SB 362 which created a new benefit structure for members first employed on or after July 1, 2009 (KPERS Tier 2). The change was made partially due to long term funding considerations, but also in response to demographic changes in the membership.

The 2011 Legislature passed Senate Substitute for House Bill 2194 (Sub HB 2194). The intent of this law was to strengthen KPERS' long term funding and improve the sustainability of the system. The bill contained significant changes for both KPERS employers and current and future members. In addition, Sub HB 2194 established a 13 member KPERS Study Commission to study alternative plan designs during the last half of 2011 and make a recommendation for KPERS plan design that would provide for the long term sustainability of the System. The Commission report was due to the Legislature by January 6, 2012. Sub HB 2194 required that the report recommendations be voted on by the 2012 Legislature for the other provisions of Senate Substitute for HB 2194 to become effective. The 2012 Legislature did not move the Study Commission recommendation forward, but some of the other provisions were included in the bill that was ultimately passed in 2012, Senate Sub for House Bill 2333.

The 2012 Legislature passed Sub House Bill 2333, affecting new hires, current members and employers. The changes were made to improve KPERS' long term sustainability. The basic provisions of Sub House Bill 2333, as amended by House Bill 2213 in 2013, included:

- ✓ Increased the statutory cap on employer contribution rates to 0.9% in FY 2014, 1.0% in FY 2015, 1.1% in FY 2016 and 1.2% in FY 2017 and beyond.
- ✓ Contingent upon IRS approval, established an election by Tier 1 members between different contribution rate and benefit levels. The legislation provided that, if the IRS rejected or did not take action to approve the election, Tier 1 members would default to an increase in their employee contributions to 5% of compensation effective January 1, 2014, and 6% effective January 1, 2015, with an increase in the benefit multiplier to 1.85% beginning January 1, 2014, for future years of service only. Subsequently, the IRS issued a private letter ruling stating that the election granted to KPERS 1 members under 2012 HB 2333 was impermissible.
- ✓ For Tier 2 members retiring after July 1, 2012, the cost of living adjustment (COLA) was eliminated, but members received a 1.85% multiplier for all years of service.
- ✓ Created a Cash Balance Plan for new hires beginning January 1, 2015. A cash balance plan is a type of defined benefit plan that includes some elements of a defined contribution plan and shares risk between the employer and employee. Each member has a hypothetical account that is credited with employee contributions, employer pay credits and interest credits. At retirement, the account balance is annuitized to create a guaranteed monthly benefit payable for the member's lifetime. Up to 30% of the account value at retirement may be paid as a lump sum.
- ✓ Beginning in FY 2014, provided for the state to make additional contributions to help pay down KPERS' unfunded actuarial liability until the State/School group reaches a funded ratio of at least 80%. The revenue was to come from the Expanded Lottery Act Revenues Fund (ELARF). However, for FY 2014 through 2017, the ELARF funds were appropriated as a partial funding source to meet the statutory contribution requirements for the School group rather than contributed in addition to the statutory contributions. Therefore, no additional funding of the unfunded actuarial liability has occurred. As a result, projections assume there will not be any additional payments to the unfunded actuarial liability from the ELARF funds.
- ✓ If the State of Kansas sells surplus real estate, 80% of the proceeds is to be used to pay down KPERS' unfunded actuarial liability until the System reaches an 80% funded ratio. However, 2016 SB249 suspended this provision with respect to any sales of surplus real estate during FY 2017.

The 2014 Legislature passed HB 2533 which made changes to the KPERS Tier 3 benefit structure, generally decreasing the portion of the benefit that is guaranteed, thereby increasing the risk-sharing portion of the benefit. The changes in House Bill 2533 were designed to further improve KPERS long term funding and to better manage the investment risk.

The 2015 Legislature passed SB 4 which revised the State/School employer contribution rate from 11.27% to 8.65% for the last half of FY 2015 to correspond with the Governor's allotment. In addition, SB 228 provided for bonds to be issued to improve the funded status of the State/School group and also reduced the previously certified employer contribution rates for FY 2016 and 2017. The following provisions were included in SB 228:

- ✓ Net proceeds of up to $1.0 billion from bonds issued by the state of Kansas were to be deposited into the KPERS trust fund for the State/School group, subject to certain criteria. The bonds had to be issued at an interest rate no greater than 5.0% and approved by the State Finance Council (approval received July 2, 2015).

- ✓ Revised the previously certified State/School employer contribution rate from 12.37% to 10.91% for fiscal year 2016 and from 13.57% to 10.81% for fiscal year 2017. The statutory cap of 1.2% per year was still applicable to employer contribution rates in fiscal year 2018 and beyond.

The 2015 Legislature also passed House Bill 2095 that contained changes to the working after retirement provisions and implemented a pilot program in KP&F for a Deferred Option Retirement Plan for the Kansas Highway Patrol. Neither of these provisions had a significant impact on the long term funding of the System.

The 2016 Legislature passed House Sub for SB 168 which revised the rules pertaining to working after retirement. The bill also made technical and clarifying amendments to statutes related to death and disability contributions, KPERS 3 members, and the Deferred Retirement Option Program (DROP) for certain members of KP&F. None of these provisions had an impact on the December 31, 2015 valuation results. The 2016 Legislature also passed House Sub for SB 161 which provided for the delay of up to $100 million in State and School contributions for fiscal year 2016. House Sub for SB 249 provided that the delayed contributions would be repaid in full, with interest at 8%, by June 30, 2018. The Governor used this allotment authority to delay payments of $97.4 million in State/School group and KP&F State contributions during the final quarter of FY 2016. However, S Sub for Sub HB 2052, passed in the 2017 session, provided that the repayment of these contributions will not be paid.

The 2017 Legislature passed several bills that impacted the provisions and funding of KPERS:

- Senate Substitute for Substitute HB 2052 (S Sub for Sub HB 2052) provides that the contributions for the School group for fiscal year 2017 (FY 2017) will be reduced so the total State/School contribution will be $64.13 million less than the scheduled statutory contributions. This reduction in employer contributions for fiscal year 2017 will be repaid in level-dollar annual installments of $6.4 million over twenty years beginning in fiscal year 2018. These payments are determined as a contribution rate for School employers to be paid in addition to the statutory State/School contribution rate. Further, S Sub for Sub HB 2052 provides that the repayment of the contribution reduction from FY 2016 with interest ($115 million), scheduled in FY 2018, will <u>not</u> be paid.
- Senate Substitute for HB 2002 contains KPERS funding provisions for FY 2018 and FY 2019, including the following:
    - **FY 2018**: The contributions for the State/School group for fiscal year 2018 will be made at the currently scheduled statutory rate of 12.01%. In addition, the first installment of $6.4 million on the 20-year amortization of the contribution reduction for FY 2017 will be included.
    - **FY 2019**: The contributions for School employers within the State/School group for fiscal year 2019 will be reduced so the total employer contribution is $420 million, including the second installment of $6.4 million on the contribution reduction for FY 2017. This results in an expected reduction of $194 million that will be repaid by the School group, as a level dollar amount over 20 years beginning in FY 2020.
    - **FY 2020**: The current statutory cap of 1.2% per year will apply in determining the statutory contribution rate for the State/School group for FY 2020. The certified statutory rate from FY 2019 of 13.21%, without inclusion of the $6.4 million amortization of the contribution reduction for FY 2017 and $19.4 million amortization of the contribution reduction for FY 2019, will be increased by 1.2%, resulting in a statutory contribution rate for FY 2020 of 14.41%. The current statutory cap of 1.2% per year will apply for all subsequent years.
- SB 205 changed the duty-related death benefit for KP&F members to the greater of 50% of Final Average Salary and the member's accrued retirement benefit under the 100% joint and survivor

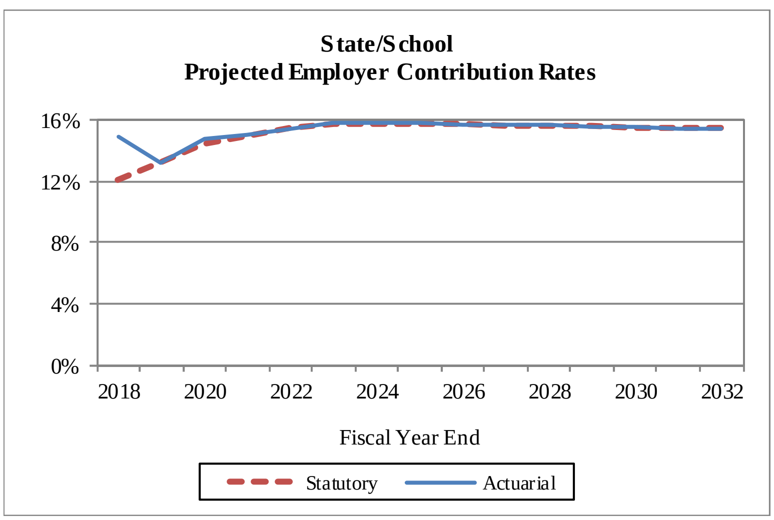
option, payable to the member's spouse. Including any benefits that may be due to child beneficiaries, the total monthly benefits may not exceed 90% of the member's Final Average Salary. Prior to this this bill, the duty-related death benefit for a KP&F member was 50% of Final Average Salary, and the maximum available to the family was 75% of the member's Final Average Salary.

- House Substitute for SB 21 included changes to the working after retirement rules for members who retire on or after January 1, 2018. The key provisions of the bill were to lengthen the waiting period for KPERS members to return to work from 60 days to 180 days for members who retire before attaining age 62, remove the earnings limitation for all retirees, and establish a single employer contribution schedule for all retirees.

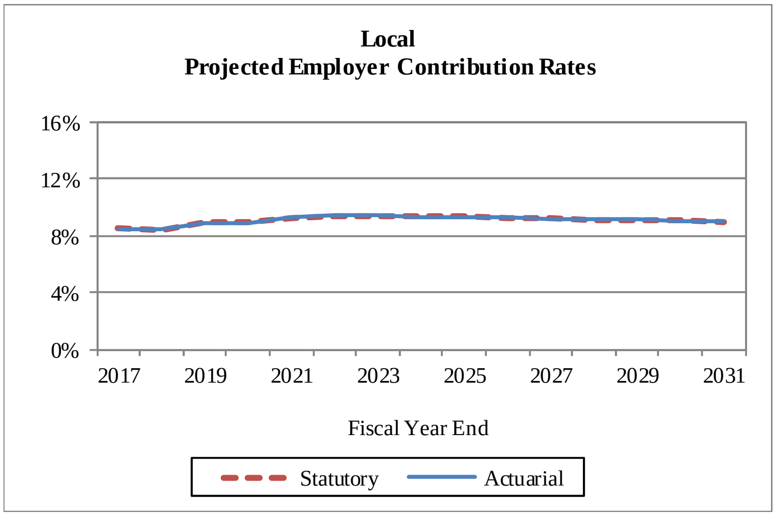
The legacy unfunded actuarial liability is amortized over a period ending in 2033. Increases in the unfunded actuarial liability resulting from the assumption changes adopted following the experience study are amortized over 25 years, while other actuarial experience is being amortized over 20 years. While all of the groups (State/School, Local, KP&F, and Judges) are projected to reach a funded ratio of 100% with the December 31, 2041 valuation when the assumption changes are fully amortized, the actual funding progress will be heavily dependent on the actual investment experience of the System in future years, the continuation of the current statutory funding policy for the State/School group, and actual contributions at the statutory rate.

The following graphs show the preliminary projected employer contribution rates assuming all actuarial assumptions are met in the future, including a 7.75% rate of return on the market value of assets in all years, and that the current statutory funding policy for the State/School group continues and contributions are made as scheduled, including the repayment of the reduced contributions for fiscal year 2017 and fiscal year 2019.

Note that although separate valuations are performed for the State and School groups, the statutory contribution rate for the two is determined using the combined valuation results for the two groups. Contributions which result from the excess of the statutory contribution rate over the actuarial required contribution rate for the State are allocated to the School to improve the funding of that group.



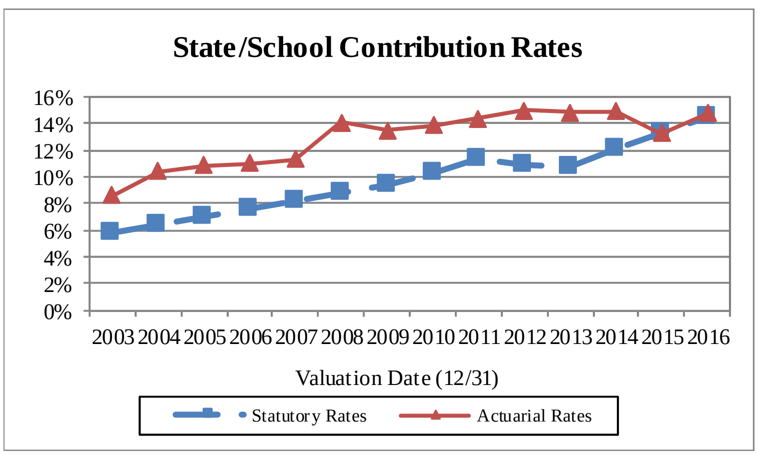
Based on preliminary modeling results which are subject to change, the actuarial required contribution (ARC) date for the State/School group is projected to occur in FY 2021 with an actuarial required contribution rate of 14.99%, assuming all actuarial assumptions are met in future years, and then increase to around 15.75%. The projected ARC Date in last year's valuation (under the old assumptions), was FY 2020 with an ARC rate of 13.12%. Future experience, especially investment returns, will heavily influence the ultimate ARC date and rate.



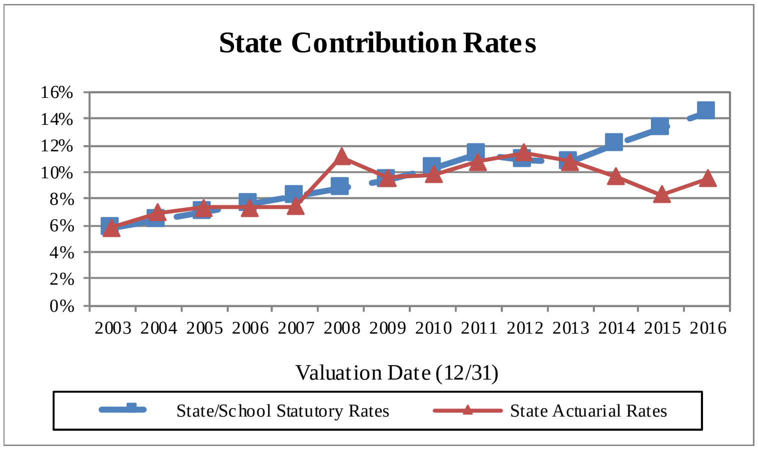
The Local group reached the actuarial required contribution (ARC) Date in the 2012 valuation with an ARC rate of 9.48%, which has decreased and is now 8.89% in the 2016 valuation. The projected contribution rate is expected to increase to around 9.43% as the deferred investment experience is realized, assuming all actuarial assumptions are met in future years. Actual experience in future years, particularly investment returns, will impact the future actuarial and statutory rates.

Historical contribution rates for each group are shown on the following pages. Please note that prior to the December 31, 2003 valuation, one contribution rate was developed for the State and School together as one group. Legislation passed in 2004 split the actuarial valuations into two separate groups, although the statutory contribution rate is still determined on a combined basis. Any excess of the statutory contribution over the actuarial required contribution for the State is allocated to the School group.

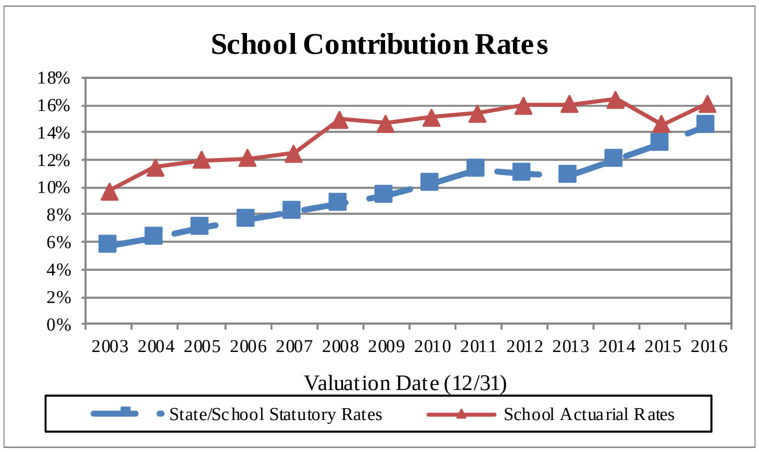
Significant changes in funding methods occurred in 2003, and the System received bond proceeds in 2004 and 2015. Actuarial assumptions were changed in the 2004, 2007, 2011, 2014 and 2016 valuations. These changes impact the comparability of contribution rates between various valuation dates.



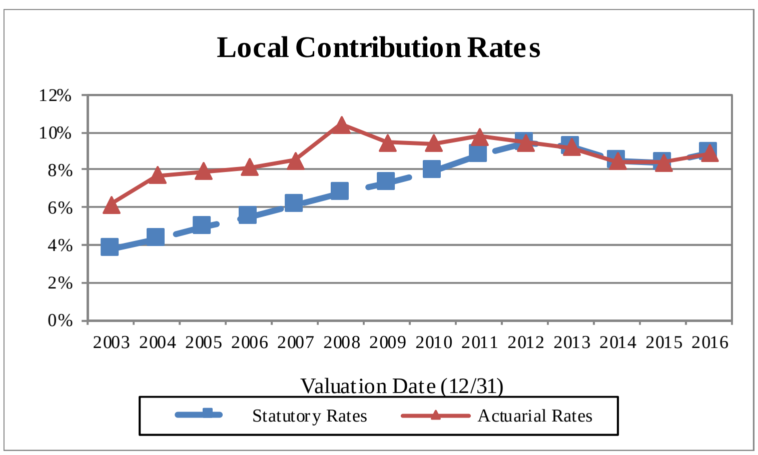
Numerous factors have contributed to the increase in the actuarial required contribution (ARC) rate over much of this period including investment experience, changes in actuarial assumptions, and contributions significantly below the actuarial rate. The ARC rate increased in the current valuation due to the new set of assumptions. As a result, the shortfall between the statutory and actuarial contribution rates increased to 0.33%.



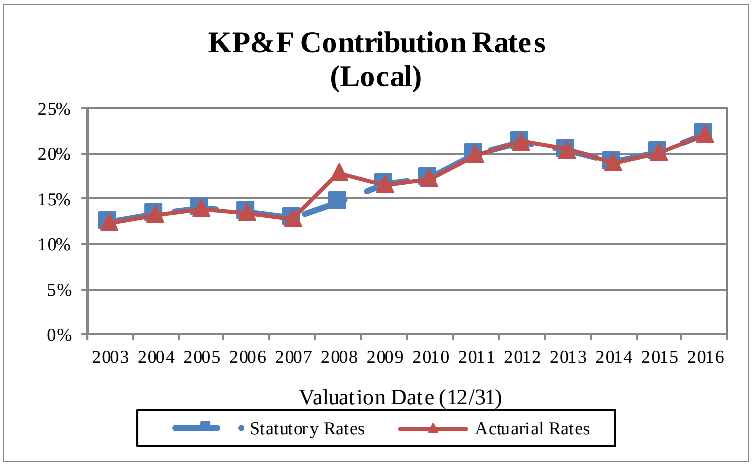
The split of the State group into a separate group with the 2003 valuation, coupled with the bond issue, lowered the State actuarial required contribution (ARC) rate. The State reached the full ARC rate in the 2010 valuation and has remained at ARC except for the recertification of the statutory contribution rate for FY 2016 from 12.37% to 10.91%. In this valuation, the State's actuarial required contribution rate increased to 9.49%, due to the new set of assumptions and methods.



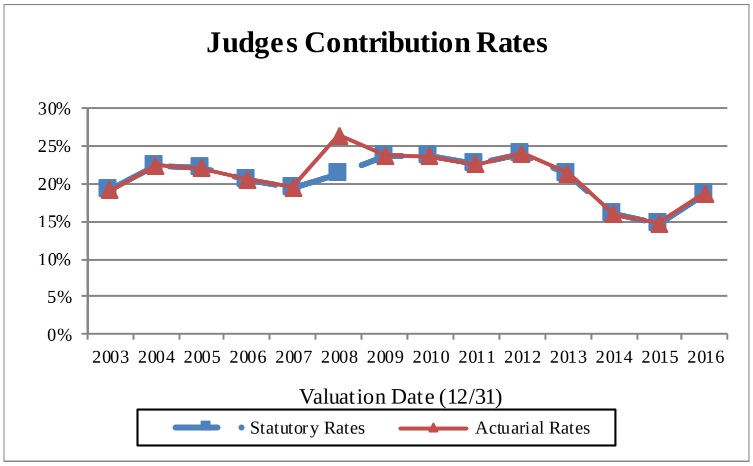
Due to investment experience, changes in actuarial assumptions, and the magnitude of the difference between the actuarial and statutory contribution rates, the funded status of the School group has declined and the actuarial required contribution (ARC) rate has increased over most of this period. The bond proceeds in 2015 decreased the ARC rate, but it increased significantly in the 2016 valuation due to the use of new assumptions and methods.



The Local contribution rate has also been impacted by changes in actuarial assumptions and methods as well as investment performance. With the significant changes in 2012 Sub House Bill 2333 and favorable investment returns, the statutory contribution rate was equal to the actuarial required contribution rate (ARC) in the 2012 valuation. The statutory rate remains equal to the ARC in the 2016 valuation despite the impact of the new assumptions and methods.



Investment experience in 2008 and 2011 resulted in higher contribution rates in the latter part of the period. The change in the assumptions in the 2016 valuation resulted in an increase in the actuarial contribution rate.



Investment experience in 2008 and 2011 resulted in higher contribution rates in the middle of the period. Changes to the actuarial assumptions and methods in the 2016 valuation resulted in a significant increase in the actuarial required contribution (ARC) rate for the Judges System.

SUMMARY OF CHANGE IN UNFUNDED ACTUARIAL LIABILITY
BY SYSTEM
DECEMBER 31, 2016 VALUATION

($ millions)

	State	School	State/School	Local	KP&F	Judges	Total
UAL in 12/31/2015 Valuation Report	$870.4	$5,405.5	$6,275.9	$1,485.7	$771.6	$6.0	$8,539.2
· Effect of contribution cap/time lag	(25.7)	119.8	94.1	(16.5)	(4.8)	(2.5)	70.3
· Expected decrease due to UAL amortization	(3.9)	(24.2)	(28.1)	(6.6)	(3.4)	(0.2)	(38.3)
· Actual vs. expected experience							
Investment return	(15.3)	(27.0)	(42.3)	(8.7)	(7.5)	(0.6)	(59.2)
Demographic experience	(36.3)	(88.0)	(124.3)	(37.6)	7.7	(1.4)	(155.7)
All other experience	8.1	6.8	14.9	(2.2)	(1.1)	0.2	11.8
· Change in actuarial assumptions/methods	120.3	281.0	401.3	100.6	81.9	9.6	593.4
· Change in benefit provisions	0.0	0.0	0.0	0.0	0.7	0.0	0.7
· Non-collectible pension contributions	4.1	94.4	98.5	0.0	0.4	0.0	98.9
UAL in 12/31/2016 Valuation Report	$921.7	$5,768.3	$6,690.0	$1,514.7	$845.5	$11.1	$9,061.4

Note: Numbers may not add due to rounding.

SUMMARY OF
CHANGES IN EMPLOYER ACTUARIAL CONTRIBUTION RATE
BY SYSTEM
AS OF DECEMBER 31, 2016

Percentage of Payroll	State	School	State/School	Local	KP&F[1]	Judges
Actuarial Contribution Rate in 12/31/2015 Valuation	8.28%	14.59%	13.23%	8.39%	20.09%	14.68%
Change Due to Amortization of UAL						
· effect of contribution cap/time lag	(0.23)	0.29	0.18	(0.08)	(0.08)	(0.92)
· UAL amortization	(0.03)	(0.06)	(0.05)	(0.03)	(0.06)	(0.04)
· investment experience	(0.13)	(0.06)	(0.08)	(0.04)	(0.13)	(0.22)
· liability experience	(0.32)	(0.21)	(0.23)	(0.18)	0.13	(0.51)
· all other experience	0.66	(0.04)	0.13	0.17	0.25	0.69
· change in assumptions/methods	1.52	1.56	1.55	0.92	2.10	4.06
· change in benefit provisions	0.00	0.00	0.00	0.00	0.01	0.00
· non-collectible pension contributions	0.04	0.22	0.18	0.00	0.01	0.00
Change in Employer Normal Cost Rate						
· change in benefit provisions	0.00	0.00	0.00	0.00	0.00	0.00
· change in assumptions/methods	(0.22)	(0.04)	(0.07)	(0.15)	(0.22)	0.70
· all other experience	(0.08)	(0.10)	(0.10)	(0.11)	0.03	0.21
Actuarial Contribution Rate in 12/31/2016 Valuation	9.49%	16.15%	14.74%	8.89%	22.13%	18.65%

[1] Contribution rate for Local employers only.

Note: Numbers may not add due to rounding.

SUMMARY OF HISTORICAL CHANGES IN TOTAL SYSTEM UAL
as of
DECEMBER 31, 2016 VALUATION

	As Reported on Valuation Date							
%(millions)	6/30/94	6/30/95	6/30/96	6/30/97	6/30/98	6/30/99	6/30/00	12/31/00
Actual Experience vs. Assumed								
• Investment	$(102)	$(143)	$(280)	$(323)	$(413)	$(369)	$(441)	$(23)
• Other	320	72	136	157	104	46	99	84
Assumption Changes	0	(96)	0	0	350	0	0	(206)
Changes in Data/Procedures	244	0	0	0	0	21	71	145**
Change in Cost Method	0	0	0	0	0	0	0	0
Effect of Contribution Cap/Lag	*	95	70	63	54	78	66	60
Amortization Method	*	47	38	35	32	30	22	12
Change in Benefit Provisions	75	0	0	0	88	0	19	0
Change in Actuarial Firm/Software	0	0	0	0	0	0	0	0
Bond Issue	0	0	0	0	0	0	0	0
Non-Collectible Pension Contributions	0	0	0	0	0	0	0	0
Total	$537	$(25)	$(36)	$(68)	$215	$(194)	$(164)	$72

* Not calculated for this year.
** Reflects the impact of re-establishing the KP&F Supplemental Actuarial Liability at December 31, 2002. The additional unfunded actuarial liability as of December 31, 2000 for the State/School and Local groups not recognized in the prior valuation due to the phase-in of the change in actuarial procedures is included.

Unfunded actuarial liability 6/30/93: $ 968 million
Unfunded actuarial liability 12/31/16: $ 9,061 million

SUMMARY OF HISTORICAL CHANGES IN TOTAL SYSTEM UAL
as of
DECEMBER 31, 2016 VALUATION (continued)

	As Reported on Valuation Date							
%(millions)	12/31/01	12/31/02	12/31/03	12/31/04	12/31/05	12/31/06	12/31/07	12/31/08
Actual Experience vs. Assumed								
• Investment	$350	$644	$140	$456	$167	$(293)	$(626)	$2,332
• Other	(9)	68	(32)	16	(84)	140	99	78
Assumption Changes	0	0	0	437	(5)	0	384	0
Changes in Data/Procedures	5	177**	(286)***	0	0	0	0	0
Change in Cost Method	0	0	1,147	0	0	0	0	0
Effect of Contribution Cap/Lag	115	143	178	179	247	258	251	246
Amortization Method	14	21	47	68	84	83	78	71
Change in Benefit Provisions	0	37	3	1	0	24	2	0
Change in Actuarial Firm/Software	0	0	0	0	0	0	0	0
Bond Issue	0	(41)	(440)	0	0	0	0	0
Non-Collectible Pension Contributions	0	0	0	0	0	0	0	0
Total	$475	$1,049	$757	$1,157	$409	$212	$188	$2,727

** Reflects the impact of re-establishing the KP&F Supplemental Actuarial Liability at December 31, 2002. The additional unfunded actuarial liability as of December 31, 2000 for the State/School and Local groups not recognized in the prior valuation due to the phase-in of the change in actuarial procedures is included.
*** Change in asset valuation method.

Unfunded actuarial liability 6/30/93: $ 968 million
Unfunded actuarial liability 12/31/16: $ 9,061 million

SUMMARY OF HISTORICAL CHANGES IN TOTAL SYSTEM UAL as of DECEMBER 31, 2016 VALUATION (continued)

$(millions)	As Reported on Valuation Date								
	12/31/09	12/31/10	12/31/11	12/31/12	12/31/13	12/31/14	12/31/15	12/31/16	Total
Actual Experience vs. Assumed									
• Investment	$(1,011)	$560	$852	$732	$(653)	$(368)	$52	$(59)	$1,181
• Other	(70)	(334)	(190)	(78)	(125)	(78)	(130)	(144)	145
Assumption Changes	0	0	(64)	0	0	(50)	0	593	1,343
Changes in Data/Procedures	0	0	0	0	0	0	0	0	377
Change in Cost Method	0	0	0	0	0	0	0	0	1,147
Effect of Contribution Cap/Lag	383	320	289	303	246	178	160	70	4,052
Amortization Method	96	68	62	49	46	18	(11)	(38)	972
Change in Benefit Provisions	0	0	15	19	0	1	0	1	285
Change in Actuarial Firm/Software	0	(27)	0	0	0	0	0	0	(27)
Bond Issue	0	0	0	0	0	0	(1,000)	0	(1,481)
Non-Collectible Pension Contributions	0	0	0	0	0	0	0	99	99
Total	$(602)	$587	$964	$1,025	$(487)	$(298)	$(929)	$522	$8,093

Unfunded actuarial liability 6/30/93: $ 968 million
Unfunded actuarial liability 12/31/16: $ 9,061 million

Note: Although a total column is shown, the amounts in each year are not additive because they are calculated on each valuation date and, therefore, represent a value at a different point in time.

SUMMARY OF PRINCIPAL RESULTS

KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM (STATE)

	12/31/2016 Valuation	12/31/2015 Valuation	% Change
1. PARTICIPANT DATA			
Number of:			
Active Members	21,879	22,117	(1.1%)
Retired Members and Beneficiaries	19,652	19,311	1.8%
Inactive Members	8,477	7,978	6.3%
Total Members	50,008	49,406	1.2%
Projected Annual Salaries of Active Members	$ 939,183,195	$ 950,204,558	(1.2%)
Annual Retirement Payments for Retired Members and Beneficiaries	$ 276,258,764	$ 266,428,213	3.7%
2. ASSETS AND LIABILITIES			
a. Total Actuarial Liability	$ 4,385,680,350	$ 4,211,018,764	4.1%
b. Assets for Valuation Purposes	3,463,997,332	3,340,654,264	3.7%
c. Unfunded Actuarial Liability (a) - (b)	921,683,018	870,364,500	5.9%
d. Funded Ratio (b) / (a)	79.0%	79.3%	(0.4%)
e. Market Value of Assets	3,354,619,933	3,244,225,487	3.4%
f. Funded Ratio on Market Value (e) / (a)	76.5%	77.0%	(0.6%)
3. EMPLOYER CONTRIBUTION RATES AS A PERCENT OF PAYROLL			
Normal Cost			
Total	7.74%	8.04%	
Member	6.00%	6.00%	
Employer	1.74%	2.04%	
Amortization of Unfunded Actuarial Liability	7.75%	6.24%	
Actuarial Contribution Rate	9.49%	8.28%	
Statutory Employer Contribution Rate*	14.41%	13.21%	

* The rate in this valuation may not exceed last year's rate by more than the statutory rate increase limit of 1.20% for FY 2017 and later. This rate excludes the contribution rate for the Death and Disability Program. Any excess of the statutory over actuarial contribution rates applied to actual State payroll is deposited to the School assets.

SUMMARY OF PRINCIPAL RESULTS

KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
(SCHOOL)

		12/31/2016 Valuation		12/31/2015 Valuation	% Change
1. PARTICIPANT DATA					
Number of:					
Active Members		84,321		84,020	0.4%
Retired Members and Beneficiaries		51,813		50,188	3.2%
Inactive Members		28,490		27,321	4.3%
Total Members		164,624		161,529	1.9%
Projected Annual Salaries of Active Members	$	3,469,951,831	$	3,428,810,555	1.2%
Annual Retirement Payments for Retired Members and Beneficiaries	$	786,385,615	$	749,416,332	4.9%
2. ASSETS AND LIABILITIES					
a. Total Actuarial Liability	$	14,481,094,448	$	13,798,734,403	4.9%
b. Assets for Valuation Purposes		8,712,789,560		8,393,193,573	3.8%
c. Unfunded Actuarial Liability (a) - (b)		5,768,304,888		5,405,540,830	6.7%
d. Funded Ratio (b) / (a)		60.2%		60.8%	(1.0%)
e. Market Value of Assets		8,444,384,754		8,151,104,207	3.6%
f. Funded Ratio on Market Value (e) / (a)		58.3%		59.1%	(1.4%)
3. EMPLOYER CONTRIBUTION RATES AS A PERCENT OF PAYROLL					
Normal Cost					
Total		8.24%		8.38%	
Member		6.00%		6.00%	
Employer		2.24%		2.38%	
Amortization of Unfunded Actuarial Liability		13.91%		12.21%	
Actuarial Contribution Rate		16.15%		14.59%	
Statutory Employer Contribution Rate*		14.41%		13.21%	

* The rate in this valuation may not exceed last year's rate by more than the statutory rate increase limit of 1.20% for FY 2017 and later. This rate excludes the contribution rate for the Death and Disability Program. An additional contribution rate of 0.18% applies for FY 2018 and FY 2019, and 0.69% for FY 2020.

SUMMARY OF PRINCIPAL RESULTS

KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM (STATE/SCHOOL)

		12/31/2016 Valuation	12/31/2015 Valuation	% Change
1.	**PARTICIPANT DATA**			
	Number of:			
	Active Members	106,200	106,137	0.1%
	Retired Members and Beneficiaries	71,465	69,499	2.8%
	Inactive Members	36,967	35,299	4.7%
	Total Members	214,632	210,935	1.8%
	Projected Annual Salaries of Active Members	$ 4,409,135,026	$ 4,379,015,113	0.7%
	Annual Retirement Payments for Retired Members and Beneficiaries	$ 1,062,644,379	$ 1,015,844,545	4.6%
2.	**ASSETS AND LIABILITIES**			
	a. Total Actuarial Liability	$ 18,866,774,798	$ 18,009,753,167	4.8%
	b. Assets for Valuation Purposes	12,176,786,892	11,733,847,837	3.8%
	c. Unfunded Actuarial Liability (a) - (b)	6,689,987,906	6,275,905,330	6.6%
	d. Funded Ratio (b) / (a)	64.5%	65.2%	(1.1%)
	e. Market Value of Assets	11,799,004,687	$ 11,395,329,694	3.5%
	f. Funded Ratio on Market Value (e) / (a)	62.5%	63.3%	(1.3%)
3.	**EMPLOYER CONTRIBUTION RATES AS A PERCENT OF PAYROLL**			
	Normal Cost			
	Total	8.14%	8.31%	
	Member	6.00%	6.00%	
	Employer	2.14%	2.31%	
	Amortization of Unfunded Actuarial Liability	12.60%	10.92%	
	Actuarial Contribution Rate	14.74%	13.23%	
	Statutory Employer Contribution Rate*	14.41%	13.21%	

* The rate in this valuation may not exceed last year's rate by more than the statutory rate increase limit of 1.20% for FY 2017 and later. This rate excludes the contribution rate for the Death and Disability Program. For the School group only, an additional contribution rate of 0.18% applies for FY 2018 and FY 2019, and 0.69% for FY 2020.

SUMMARY OF PRINCIPAL RESULTS

KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
(LOCAL)

		12/31/2016 Valuation		12/31/2015 Valuation	% Change
1.	**PARTICIPANT DATA**				
	Number of:				
	Active Members	38,364		38,532	(0.4%)
	Retired Members and Beneficiaries	19,805		19,046	4.0%
	Inactive Members	17,224		16,399	5.0%
	Total Members	75,393		73,977	1.9%
	Projected Annual Salaries of Active Members	$ 1,728,976,958	$	1,718,698,667	0.6%
	Annual Retirement Payments for Retired Members and Beneficiaries	$ 232,450,548	$	216,314,510	7.5%
2.	**ASSETS AND LIABILITIES**				
	a. Total Actuarial Liability	$ 5,094,727,138	$	4,806,144,236	6.0%
	b. Assets for Valuation Purposes	3,579,987,885		3,320,449,548	7.8%
	c. Unfunded Actuarial Liability (a) - (b)	1,514,739,253		1,485,694,688	2.0%
	d. Funded Ratio (b) / (a)	70.3%		69.1%	1.7%
	e. Market Value of Assets	3,469,920,041		3,216,043,938	7.9%
	f. Funded Ratio on Market Value (e) / (a)	68.1%		66.9%	1.8%
3.	**EMPLOYER CONTRIBUTION RATES AS A PERCENT OF PAYROLL**				
	Normal Cost				
	Total	7.67%		7.93%	
	Member	6.00%		6.00%	
	Employer	1.67%		1.93%	
	Amortization of Unfunded Actuarial Liability	7.22%		6.46%	
	Actuarial Contribution Rate	8.89%		8.39%	
	Statutory Employer Contribution Rate*	8.89%		8.39%	

* The Statutory Employer Contribution Rate in this valuation may not exceed last year's rate by more than the statutory rate increase limit of 1.20% for FY 2017 and later. This rate excludes the contribution rate for the Death and Disability Program.

SUMMARY OF PRINCIPAL RESULTS

KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
(TOTAL KPERS)

		12/31/2016 Valuation	12/31/2015 Valuation	% Change
1.	**PARTICIPANT DATA**			
	Number of:			
	Active Members	144,564	144,669	(0.1%)
	Retired Members and Beneficiaries	91,270	88,545	3.1%
	Inactive Members	54,191	51,698	4.8%
	Total Members	290,025	284,912	1.8%
	Projected Annual Salaries of Active Members	$ 6,138,111,984	$ 6,097,713,780	0.7%
	Annual Retirement Payments for Retired Members and Beneficiaries	$ 1,295,094,927	$ 1,232,159,055	5.1%
2.	**ASSETS AND LIABILITIES**			
	a. Total Actuarial Liability	$ 23,961,501,936	$ 22,815,897,403	5.0%
	b. Assets for Valuation Purposes	15,756,774,777	15,054,297,385	4.7%
	c. Unfunded Actuarial Liability (a) - (b)	8,204,727,159	7,761,600,018	5.7%
	d. Funded Ratio (b) / (a)	65.8%	66.0%	(0.3%)
	e. Market Value of Assets	15,268,924,728	14,611,373,632	4.5%
	f. Funded Ratio on Market Value (e) / (a)	63.7%	64.0%	(0.5%)

SUMMARY OF PRINCIPAL RESULTS

KANSAS POLICE AND FIREMEN'S RETIREMENT SYSTEM

		12/31/2016 Valuation		12/31/2015 Valuation	% Change
1. PARTICIPANT DATA					
Number of:					
Active Members		7,303		7,244	0.8%
Retired Members and Beneficiaries		5,232		5,065	3.3%
Inactive Members		1,555		1,453	7.0%
Total Members		14,090		13,762	2.4%
Projected Annual Salaries of Active Members	$	485,215,228	$	477,559,955	1.6%
Annual Retirement Payments for Retired Members and Beneficiaries	$	170,130,904	$	159,271,328	6.8%
2. ASSETS AND LIABILITIES					
a. Total Actuarial Liability	$	3,174,533,709	$	2,965,712,160	7.0%
b. Assets for Valuation Purposes		2,329,029,290		2,194,103,726	6.1%
c. Unfunded Actuarial Liability (a) - (b)		845,504,419		771,608,434	9.6%
d. Funded Ratio (b) / (a)		73.4%		74.0%	(0.8%)
e. Market Value of Assets		2,256,070,037		2,126,561,947	6.1%
f. Funded Ratio on Market Value (e) / (a)		71.1%		71.7%	(0.8%)
3. EMPLOYER CONTRIBUTION RATES AS A PERCENT OF PAYROLL					
Normal Cost					
Total		14.88%		15.07%	
Member		7.15%		7.15%	
Employer		7.73%		7.92%	
Amortization of Unfunded Actuarial and Supplemental Liability		14.40%		12.17%	
Actuarial Contribution Rate (Local Employers)		22.13%		20.09%	
Statutory Employer Contribution Rate*		22.13%		20.09%	

* The Statutory Employer Contribution Rate is equal to the Actuarial Rate. This is referred to as the "Uniform" rate, and varies for State and Local employers. The total contribution is equal to the appropriate uniform rate plus the payment required to amortize any unfunded past service liability, determined separately for each employer.

SUMMARY OF PRINCIPAL RESULTS

KANSAS RETIREMENT SYSTEM FOR JUDGES

		12/31/2016 Valuation		12/31/2015 Valuation	% Change
1. PARTICIPANT DATA					
Number of:					
Active Members		252		262	(3.8%)
Retired Members and Beneficiaries		272		256	6.3%
Inactive Members		9		8	12.5%
Total Members		533		526	1.3%
Projected Annual Salaries of Active Members	$	27,123,449	$	28,339,546	(4.3%)
Annual Retirement Payments for Retired Members and Beneficiaries	$	11,272,287	$	10,289,243	9.6%
2. ASSETS AND LIABILITIES					
a. Total Actuarial Liability	$	181,718,728	$	166,170,995	9.4%
b. Assets for Valuation Purposes		170,569,206		160,176,397	6.5%
c. Unfunded Actuarial Liability (a) - (b)		11,149,522		5,994,598	86.0%
d. Funded Ratio (b) / (a)		93.9%		96.4%	(2.6%)
e. Market Value of Assets		165,322,736		155,264,020	6.5%
f. Funded Ratio on Market Value (e) / (a)		91.0%		93.4%	(2.6%)
3. EMPLOYER CONTRIBUTION RATES AS A PERCENT OF PAYROLL					
Normal Cost					
Total		20.30%		19.39%	
Member		5.64%		5.62%	
Employer		14.66%		13.77%	
Amortization of Unfunded Actuarial and Supplemental Liability		3.99%		0.91%	
Actuarial Contribution Rate		18.65%		14.68%	
Statutory Employer Contribution Rate*		18.65%		14.68%	

* Statutory Employer Contribution Rate is equal to the Actuarial Rate. This rate excludes the contribution for the Death and Disability Program.

SUMMARY OF PRINCIPAL RESULTS

ALL SYSTEMS COMBINED

		12/31/2016 Valuation	12/31/2015 Valuation	% Change
1.	**PARTICIPANT DATA**			
	Number of:			
	Active Members	152,119	152,175	(0.0%)
	Retired Members and Beneficiaries	96,774	93,866	3.1%
	Inactive Members	55,755	53,159	4.9%
	Total Members	304,648	299,200	1.8%
	Projected Annual Salaries of Active Members	$ 6,650,450,661	$ 6,603,613,281	0.7%
	Annual Retirement Payments for Retired Members and Beneficiaries	$ 1,476,498,118	$ 1,401,719,626	5.3%
2.	**ASSETS AND LIABILITIES**			
	a. Total Actuarial Liability	$ 27,317,754,373	$ 25,947,780,558	5.3%
	b. Assets for Valuation Purposes	18,256,373,273	17,408,577,508	4.9%
	c. Unfunded Actuarial Liability (a) - (b)	9,061,381,100	8,539,203,050	6.1%
	d. Funded Ratio (b) / (a)	66.8%	67.1%	(0.4%)
	e. Market Value of Assets	17,690,317,501	16,893,199,599	4.7%
	f. Funded Ratio on Market Value (e) / (a)	64.8%	65.1%	(0.5%)

SECTION 2 – SCOPE OF THE REPORT

This report presents the actuarial valuation of the Kansas Public Employees Retirement System (KPERS) as of December 31, 2016. This valuation was prepared at the request of the System's Board of Trustees.

The reader is encouraged to review the actuarial certification letter, where the guidelines employed in the preparation of this report are outlined. Also included in this letter are comments 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 resulting 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.

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 December 31, 2016, as amended by legislation in the 2017 Session.
- 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.

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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. At December 31, 2016, the market value of assets for the Retirement System was $17.690 billion. Table 1 shows the market value of assets as of December 31, 2016 in total and by investment category. Table 2 summarizes the change in the market value of assets, from December 31, 2015 to December 31, 2016, by group.

Actuarial Value of Assets

Neither the market value of assets, representing a "cash-out" value of System assets, nor the book value 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 current asset smoothing method was implemented with the December 31, 2003 actuarial valuation.

Under the asset smoothing method, the difference between the actual return and the expected return (based on the actuarial assumed rate of return) on the market value of assets is calculated each year and recognized equally over a five-year period.

Tables 3A through 3F and Table 4 show the development of the actuarial value of assets (AVA) as of December 31, 2016.

TABLE 1
ANALYSIS OF NET ASSETS AT MARKET VALUE

		December 31, 2016		
		Amount ($ Millions)	% of Total	
Cash & Equivalents	$	471	2.7	%
Alternative Investments		829	4.7	
Real Estate		1,901	10.7	
Fixed Income		4,952	27.9	
Domestic Equity		5,760	32.6	
International Equity		3,777	21.4	
Net Assets	$	17,690	100.0	%

Allocation of Net Assets on December 31, 2016:

State	$	3,355
School		8,444
Local		3,470
KP&F		2,256
Judges		165
Total Net Assets*	$	17,690

* May not add due to rounding

TABLE 2
SUMMARY OF CHANGES IN TOTAL SYSTEM ASSETS
DURING PERIOD ENDED DECEMBER 31, 2016

(Market Value)

	State	School	State/School	Local
Market Value of Assets as of January 1, 2016	$ 3,244,225,487	$ 8,151,104,207	$ 11,395,329,694	$ 3,216,043,938
Contributions:				
Employee	55,977,450	203,816,270	259,793,720	103,751,355
Employee service purchases	1,496,396	3,942,111	5,438,507	1,864,781
Employer	101,983,112	380,355,762	482,338,874	160,972,525
Miscellaneous	259,439	3,322,364	3,581,803	262,856
Total Contributions	159,716,397	591,436,507	751,152,904	266,851,517
Total Investment Income	266,320,264	667,378,180	933,698,444	270,740,046
Total Income	426,036,661	1,258,814,687	1,684,851,348	537,591,563
Less Benefits:				
Annuity Retirement Benefits	(272,962,036)	(771,916,706)	(1,044,878,742)	(225,152,239)
Partial Lump Sum Benefits	(20,674,794)	(59,036,918)	(79,711,712)	(30,187,667)
Retirant Dividends	(250,777)	(535,578)	(786,355)	(126,490)
Withdrawals	(12,508,336)	(28,515,105)	(41,023,441)	(23,111,719)
Death Benefits	(2,523,191)	(5,174,684)	(7,697,875)	(2,552,003)
Total Benefits	(308,919,134)	(865,178,991)	(1,174,098,125)	(281,130,118)
Administrative Expenses	(2,575,374)	(5,968,861)	(8,544,235)	(2,585,342)
Non-collectible Pension Contributions*	(4,147,707)	(94,386,288)	(98,533,995)	-
Net Increase in Assets	110,394,446	293,280,547	403,674,993	253,876,103
Market Value of Assets as of December 31, 2016	$ 3,354,619,933	$ 8,444,384,754	$ 11,799,004,687	$ 3,469,920,041

* Includes unpaid FY 2016 contributions and accrued interest.

TABLE 2 (cont.)
SUMMARY OF CHANGES IN TOTAL SYSTEM ASSETS
DURING PERIOD ENDED DECEMBER 31, 2016

(Market Value)

	KPERS	KP&F	Judges	Total
Market Value of Assets as of January 1, 2016	$ 14,611,373,632	$ 2,126,561,947	$ 155,264,020	$ 16,893,199,599
Contributions:				
Employee	363,545,075	34,284,054	1,454,219	399,283,348
Employee service purchases	7,303,288	1,465,570	170,766	8,939,624
Employer	643,311,399	100,962,531	6,232,621	750,506,551
Miscellaneous	3,844,659	776,247	-	4,620,906
Total Contributions	1,018,004,421	137,488,402	7,857,606	1,163,350,429
Total Investment Income	1,204,438,490	177,540,586	13,097,814	1,395,076,890
Total Income	2,222,442,911	315,028,988	20,955,420	2,558,427,319
Less Benefits:				
Annuity Retirement Benefits	(1,270,030,981)	(163,966,691)	(10,471,576)	(1,444,469,248)
Partial Lump Sum Benefits	(109,899,379)	(13,548,473)	(40,785)	(123,488,637)
Retirant Dividends	(912,845)	(754,329)	(13,350)	(1,680,524)
Withdrawals	(64,135,160)	(4,324,750)	(232,100)	(68,692,010)
Death Benefits	(10,249,878)	(789,803)	(11,243)	(11,050,924)
Total Benefits	(1,455,228,243)	(183,384,046)	(10,769,054)	(1,649,381,343)
Administrative Expenses	(11,129,577)	(1,727,067)	(127,650)	(12,984,294)
Non-collectible Pension Contributions*	(98,533,995)	(409,785)	-	(98,943,780)
Net Increase in Assets	657,551,096	129,508,090	10,058,716	797,117,902
Market Value of Assets as of December 31, 2016	$ 15,268,924,728	$ 2,256,070,037	$ 165,322,736	$ 17,690,317,501

* Includes unpaid FY 2016 contributions and accrued interest.

TABLE 3A
CALCULATION OF EXCESS (SHORTFALL) INVESTMENT INCOME FOR ACTUARIAL VALUE OF NET ASSETS
State

		Plan Year End			
		12/31/2013	**12/31/2014**	**12/31/2015**	**12/31/2016**
1.	Market Value of Assets, beginning of year	$ 2,836,628,752	$ 3,187,375,166	$ 3,256,683,036	$ 3,244,225,487
2.	Contributions during year	143,846,177	156,723,044	141,600,641	159,716,397
3.	Bond Proceeds***	0	0	143,398,079	0
4.	Benefits paid during year	(274,985,220)	(285,452,283)	(302,430,038)	(308,919,134)
5.	Administrative expenses paid during year**	0	(1,949,366)	(2,119,586)	(2,575,374)
6.	Expected investment income	221,785,652	249,863,428	258,216,000	253,583,710
7.	Transfers and receivables*	4,811,175	0	0	0
8.	Non-collectible Pension Contributions	0	0	0	(4,147,707)
9.	Expected Value of Assets, end of year	2,932,086,536	3,306,559,989	3,495,348,132	3,341,883,379
10.	Market Value of Assets, end of year	3,187,375,166	3,256,683,036	3,244,225,487	3,354,619,933
11.	Excess (shortfall) of net investment income	$ 255,288,630	$ (49,876,953)	$ (251,122,645)	$ 12,736,554

* Allocation of administrative reserve in 2013.
** Administrative expenses directly assessed beginning in 2014.
*** Received on August 20, 2015

TABLE 3B
CALCULATION OF EXCESS (SHORTFALL) INVESTMENT INCOME FOR ACTUARIAL VALUE OF NET ASSETS
School

		Plan Year End			
		12/31/2013	**12/31/2014**	**12/31/2015**	**12/31/2016**
1.	Market Value of Assets, beginning of year	$ 6,475,974,488	$ 7,331,598,583	$ 7,540,084,183	$ 8,151,104,207
2.	Contributions during year	484,892,561	527,536,210	576,909,041	591,436,507
3.	Bond Proceeds***	0	0	856,601,921	0
4.	Benefits paid during year	(733,794,417)	(776,083,270)	(834,096,709)	(865,178,991)
5.	Administrative expenses paid during year**	0	(4,498,772)	(4,945,832)	(5,968,861)
6.	Expected investment income	508,313,419	576,600,776	617,259,082	641,115,125
7.	Transfers and receivables*	11,027,658	0	0	0
8.	Non-collectible Pension Contributions	0	0	0	(94,386,288)
9.	Expected Value of Assets, end of year	6,746,413,709	7,655,153,527	8,751,811,686	8,418,121,699
10.	Market Value of Assets, end of year	7,331,598,583	7,540,084,183	8,151,104,207	8,444,384,754
11.	Excess (shortfall) of net investment income	$ 585,184,874	$ (115,069,344)	$ (600,707,479)	$ 26,263,055

* Allocation of administrative reserve in 2013.
** Administrative expenses directly assessed beginning in 2014.
*** Received on August 20, 2015

TABLE 3C
CALCULATION OF EXCESS (SHORTFALL) INVESTMENT INCOME FOR ACTUARIAL VALUE OF NET ASSETS
State/School

		Plan Year End			
		12/31/2013	12/31/2014	12/31/2015	12/31/2016
1.	Market Value of Assets, beginning of year	$ 9,312,603,240	$ 10,518,973,749	$ 10,796,767,219	$ 11,395,329,694
2.	Contributions during year	628,738,738	684,259,254	718,509,682	751,152,904
3.	Bond Proceeds***	0	0	1,000,000,000	0
4.	Benefits paid during year	(1,008,779,637)	(1,061,535,553)	(1,136,526,747)	(1,174,098,125)
5.	Administrative expenses paid during year**	0	(6,448,138)	(7,065,418)	(8,544,235)
6.	Expected investment income	730,099,071	826,464,204	875,475,082	894,698,835
7.	Transfers and receivables*	15,838,833	0	0	0
8.	Non-collectible Pension Contributions	0	0	0	(98,533,995)
9.	Expected Value of Assets, end of year	9,678,500,245	10,961,713,516	12,247,159,818	11,760,005,078
10.	Market Value of Assets, end of year	10,518,973,749	10,796,767,219	11,395,329,694	11,799,004,687
11.	Excess (shortfall) of net investment income	$ 840,473,504	$ (164,946,297)	$ (851,830,124)	$ 38,999,609

* Allocation of administrative reserve in 2013.
** Administrative expenses directly assessed beginning in 2014.
*** Received on August 20, 2015

TABLE 3D
CALCULATION OF EXCESS (SHORTFALL) INVESTMENT INCOME FOR ACTUARIAL VALUE OF NET ASSETS
Local

		Plan Year End			
		12/31/2013	**12/31/2014**	**12/31/2015**	**12/31/2016**
1.	Market Value of Assets, beginning of year	$ 2,587,877,272	$ 3,016,067,035	$ 3,205,746,273	$ 3,216,043,938
2.	Contributions during year	205,539,094	238,652,131	265,369,903	266,851,517
3.	Benefits paid during year	(225,632,450)	(240,180,030)	(260,096,296)	(281,130,118)
4.	Administrative expenses paid during year**	0	(1,882,135)	(2,141,017)	(2,585,342)
5.	Expected investment income	206,241,910	241,151,586	256,582,595	256,621,934
6.	Transfers and receivables*	4,475,688	0	0	0
7.	Expected Value of Assets, end of year	2,778,501,514	3,253,808,587	3,465,461,458	3,455,801,929
8.	Market Value of Assets, end of year	3,016,067,035	3,205,746,273	3,216,043,938	3,469,920,041
9.	Excess (shortfall) of net investment income	$ 237,565,521	$ (48,062,314)	$ (249,417,520)	$ 14,118,112

* Allocation of administrative reserve in 2013.
** Administrative expenses directly assessed beginning in 2014.

TABLE 3E
CALCULATION OF EXCESS (SHORTFALL) INVESTMENT INCOME FOR ACTUARIAL VALUE OF NET ASSETS
KP&F

		Plan Year End			
		12/31/2013	12/31/2014	12/31/2015	12/31/2016
1.	Market Value of Assets, beginning of year	$ 1,784,896,480	$ 2,057,050,931	$ 2,160,304,791	$ 2,126,561,947
2.	Contributions during year	116,843,908	138,573,664	139,181,817	137,488,402
3.	Benefits paid during year	(152,023,019)	(164,926,476)	(176,278,471)	(183,384,046)
4.	Administrative expenses paid during year**	0	(1,275,775)	(1,429,236)	(1,727,067)
5.	Expected investment income	141,411,625	163,480,192	171,312,994	168,256,694
6.	Transfers and receivables*	3,068,438	0	0	0
7.	Non-collectible Pension Contributions	0	0	0	(409,785)
8.	Expected Value of Assets, end of year	1,894,197,432	2,192,902,536	2,293,091,895	2,246,786,145
9.	Market Value of Assets, end of year	2,057,050,931	2,160,304,791	2,126,561,947	2,256,070,037
10.	Excess (shortfall) of net investment income	$ 162,853,499	$ (32,597,745)	$ (166,529,948)	$ 9,283,892

* Allocation of administrative reserve in 2013.
** Administrative expenses directly assessed beginning in 2014.

TABLE 3F
CALCULATION OF EXCESS (SHORTFALL) INVESTMENT INCOME FOR ACTUARIAL VALUE OF NET ASSETS
Judges

		Plan Year End			
		12/31/2013	12/31/2014	12/31/2015	12/31/2016
1.	Market Value of Assets, beginning of year	$ 131,943,611	$ 152,430,594	$ 159,205,632	$ 155,264,020
2.	Contributions during year	8,130,800	7,639,189	8,084,034	7,857,606
3.	Benefits paid during year	(10,392,108)	(10,441,274)	(12,271,670)	(10,769,054)
4.	Administrative expenses paid during year**	0	(94,272)	(104,844)	(127,650)
5.	Expected investment income	10,466,777	12,080,822	12,568,054	12,301,896
6.	Transfers and receivables*	227,120	0	0	0
7.	Expected Value of Assets, end of year	140,376,200	161,615,059	167,481,206	164,526,818
8.	Market Value of Assets, end of year	152,430,594	159,205,632	155,264,020	165,322,736
9.	Excess (shortfall) of net investment income	$ 12,054,394	$ (2,409,427)	$ (12,217,186)	$ 795,918

* Allocation of administrative reserve in 2013.
** Administrative expenses directly assessed beginning in 2014.

TABLE 4
DEVELOPMENT OF ACTUARIAL VALUE OF NET ASSETS

		State	School	State/School	Local	Total KPERS
1.	Excess (shortfall) of investment income					
	a. Year ending 12/31/16	$ 12,736,554	$ 26,263,055	$ 38,999,609	$ 14,118,112	$ 53,117,721
	b. Year ending 12/31/15	(251,122,645)	(600,707,479)	(851,830,124)	(249,417,520)	(1,101,247,644)
	c. Year ending 12/31/14	(49,876,953)	(115,069,344)	(164,946,297)	(48,062,314)	(213,008,611)
	d. Year ending 12/31/13	255,288,630	585,184,874	840,473,504	237,565,521	1,078,039,025
	e. Total	$ (32,974,414)	$ (104,328,894)	$ (137,303,308)	$ (45,796,201)	$ (183,099,509)
2.	Deferral of excess (shortfall) of investment income					
	a. Year ending 12/31/16 (80%)	10,189,243	21,010,444	31,199,687	11,294,490	42,494,177
	b. Year ending 12/31/15 (60%)	(150,673,587)	(360,424,487)	(511,098,074)	(149,650,512)	(660,748,586)
	c. Year ending 12/31/14 (40%)	(19,950,781)	(46,027,738)	(65,978,519)	(19,224,926)	(85,203,445)
	d. Year ending 12/31/13 (20%)	51,057,726	117,036,975	168,094,701	47,513,104	215,607,805
	e. Total	$ (109,377,399)	$ (268,404,806)	$ (377,782,205)	$ (110,067,844)	$ (487,850,049)
3.	Market Value of Assets, end of year	$ 3,354,619,933	$ 8,444,384,754	$ 11,799,004,687	$ 3,469,920,041	$ 15,268,924,728
4.	Actuarial Value of Assets, end of year (3) - (2e)	$ 3,463,997,332	$ 8,712,789,560	$ 12,176,786,892	$ 3,579,987,885	$ 15,756,774,777
5.	Actuarial Value divided by market value (4)/(3)	103.3%	103.2%	103.2%	103.2%	103.2%

TABLE 4 (cont.)
DEVELOPMENT OF ACTUARIAL VALUE OF NET ASSETS

	Total KPERS	KP&F	Judges	Total
1. Excess (shortfall) of investment income				
a. Year ending 12/31/16	$ 53,117,721	$ 9,283,892	$ 795,918	$ 63,197,531
b. Year ending 12/31/15	(1,101,247,644)	(166,529,948)	(12,217,186)	(1,279,994,778)
c. Year ending 12/31/14	(213,008,611)	(32,597,745)	(2,409,427)	(248,015,783)
d. Year ending 12/31/13	1,078,039,025	162,853,499	12,054,394	1,252,946,918
e. Total	$ (183,099,509)	$ (26,990,302)	$ (1,776,301)	$ (211,866,112)
2. Deferral of excess (shortfall) of investment income				
a. Year ending 12/31/16 (80%)	42,494,177	7,427,114	636,734	50,558,025
b. Year ending 12/31/15 (60%)	(660,748,586)	(99,917,969)	(7,330,312)	(767,996,867)
c. Year ending 12/31/14 (40%)	(85,203,445)	(13,039,098)	(963,771)	(99,206,314)
d. Year ending 12/31/13 (20%)	215,607,805	32,570,700	2,410,879	250,589,384
e. Total	$ (487,850,049)	$ (72,959,253)	$ (5,246,470)	$ (566,055,772)
3. Market Value of Assets, end of year	$ 15,268,924,728	$ 2,256,070,037	$ 165,322,736	$ 17,690,317,501
4. Actuarial Value of Assets, end of year (3) - (2e)	$ 15,756,774,777	$ 2,329,029,290	$ 170,569,206	$ 18,256,373,273
5. Actuarial Value divided by Market Value (4)/(3)	103.2%	103.2%	103.2%	103.2%

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, December 31, 2016. In this section, the discussion will focus on the commitments of the System, which are referred to as its liabilities.

Table 5 contains an analysis of the actuarial present value of all future benefits (PVFB) for contributing members, inactive members, retirees and their beneficiaries. The analysis is provided for each group.

The liabilities summarized in Table 5 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 measures of both benefits already earned and future benefits expected to be earned. For all members, active and retired, the value extends over benefits earnable and payable for the rest of their lives and, if an optional benefit is chosen, for the lives of the surviving beneficiaries.

The actuarial assumptions used to determine liabilities are based on the results of the last Triennial Experience Study. This set of assumptions, as shown in Appendix C, was adopted by the Board in November 2016.

The liabilities reflect the benefit structure in place as of December 31, 2016, as amended by any legislation in the 2017 Session.

Actuarial Liabilities

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 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 6 contains the calculation of actuarial liabilities for all groups.

TABLE 5
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
PRESENT VALUE OF FUTURE BENEFITS (PVFB)
AS OF DECEMBER 31, 2016

	State	School	State/School	Local
1. Active employees				
a. Retirement Benefits	$ 1,901,253,753	$ 8,133,442,319	$ 10,034,696,072	$ 3,135,128,507
b. Pre-Retirement Death Benefits	36,270,169	68,961,897	105,232,066	66,569,877
c. Termination Benefits	130,974,790	422,631,333	553,606,123	269,421,521
d. Disability Benefits	66,018,811	116,316,467	182,335,278	77,641,553
e. Total	2,134,517,523	8,741,352,016	10,875,869,539	3,548,761,458
2. Inactive Vested Members	162,665,275	403,213,044	565,878,319	230,913,459
3. Inactive Nonvested Members	12,623,883	32,072,086	44,695,969	28,597,574
4. Disabled Members	75,434,439	95,673,737	171,108,176	64,470,176
5. Retirees	2,330,109,709	7,224,088,183	9,554,197,892	2,009,809,333
6. Beneficiaries	127,390,080	187,514,416	314,904,496	111,370,561
7. Unclaimed Account Reserve	668,200	1,331,800	2,000,000	500,000
8. Total PVFB	$ 4,843,409,109	$ 16,685,245,282	$ 21,528,654,391	$ 5,994,422,561

TABLE 5 (cont.)
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
PRESENT VALUE OF FUTURE BENEFITS (PVFB)
AS OF DECEMBER 31, 2016

	Total KPERS	KP&F	Judges	Total
1. Active employees				
a. Retirement Benefits	$ 13,169,824,579	$ 1,695,006,756	$ 108,146,816	$ 14,972,978,151
b. Pre-Retirement Death Benefits	171,801,943	23,888,997	1,586,021	197,276,961
c. Termination Benefits	823,027,644	58,157,845	0	881,185,489
d. Disability Benefits	259,976,831	170,234,843	0	430,211,674
e. Total	14,424,630,997	1,947,288,441	109,732,837	16,481,652,275
2. Inactive Vested Members	796,791,778	35,328,245	2,281,966	834,401,989
3. Inactive Nonvested Members	73,293,543	19,886,123	0	93,179,666
4. Disabled Members	235,578,352	123,626,062	0	359,204,414
5. Retirees	11,564,007,225	1,504,654,981	90,318,831	13,158,981,037
6. Beneficiaries	426,275,057	136,329,518	14,488,100	577,092,675
7. Unclaimed Account Reserve	2,500,000	0	0	2,500,000
8. Total PVFB	$ 27,523,076,952	$ 3,767,113,370	$ 216,821,734	$ 31,507,012,056

TABLE 6
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
ACTUARIAL LIABILITIES
AS OF DECEMBER 31, 2016

	State	School	State/School	Local
1. Present Value of Future Benefits	$ 4,843,409,109	$ 16,685,245,282	$ 21,528,654,391	$ 5,994,422,561
2. Present Value of Future Normal Costs for Active Members				
a. Retirement Benefits	$ 286,451,092	$ 1,690,658,481	$ 1,977,109,573	$ 579,745,182
b. Pre-Retirement Death Benefits	8,268,294	21,122,501	29,390,795	18,353,989
c. Termination Benefits	138,368,109	450,058,971	588,427,080	273,190,318
d. Disability Benefits	24,641,264	42,310,881	66,952,145	28,405,934
e. Total	457,728,759	2,204,150,834	2,661,879,593	899,695,423
3. Total Actuarial Liability (1) - (2e)	$ 4,385,680,350	$ 14,481,094,448	$ 18,866,774,798	$ 5,094,727,138

TABLE 6 (cont.)
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
ACTUARIAL LIABILITIES
AS OF DECEMBER 31, 2016

	Total KPERS	KP&F	Judges	Total
1. Present Value of Future Benefits	$ 27,523,076,952	$ 3,767,113,370	$ 216,821,734	$ 31,507,012,056
2. Present Value of Future Normal Costs for Active Members				
a. Retirement Benefits	$ 2,556,854,755	$ 423,891,024	$ 34,442,753	$ 3,015,188,532
b. Pre-Retirement Death Benefits	47,744,784	13,364,160	660,253	61,769,197
c. Termination Benefits	861,617,398	65,632,728	0	927,250,126
d. Disability Benefits	95,358,079	89,691,749	0	185,049,828
e. Total	3,561,575,016	592,579,661	35,103,006	4,189,257,683
3. Total Actuarial Liability (1) - (2e)	$ 23,961,501,936	$ 3,174,533,709	$ 181,718,728	$ 27,317,754,373

TABLE 7
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
ACTUARIAL BALANCE SHEET
AS OF DECEMBER 31, 2016

	State	School	State/School	Local
ASSETS				
Actuarial Value of Assets	$ 3,463,997,332	$ 8,712,789,560	$ 12,176,786,892	$ 3,579,987,885
Present Value of Future Normal Costs	457,728,759	2,204,150,834	2,661,879,593	899,695,423
Unfunded Actuarial Liability	921,683,018	5,768,304,888	6,689,987,906	1,514,739,253
Total Net Assets	$ 4,843,409,109	$ 16,685,245,282	$ 21,528,654,391	$ 5,994,422,561
LIABILITIES				
Present Value of Future Benefits				
Active employees	$ 2,134,517,523	$ 8,741,352,016	$ 10,875,869,539	$ 3,548,761,458
Inactive Members *	175,957,358	436,616,930	612,574,288	260,011,033
In-pay Members	2,532,934,228	7,507,276,336	10,040,210,564	2,185,650,070
Total Liabilities	$ 4,843,409,109	$ 16,685,245,282	$ 21,528,654,391	$ 5,994,422,561

*Includes Unclaimed Account Reserves

TABLE 7 (cont.)
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
ACTUARIAL BALANCE SHEET
AS OF DECEMBER 31, 2016

	Total KPERS	KP&F	Judges	Total
ASSETS				
Actuarial Value of Assets	$ 15,756,774,777	$ 2,329,029,290	$ 170,569,206	$ 18,256,373,273
Present Value of Future Normal Costs	3,561,575,016	592,579,661	35,103,006	4,189,257,683
Unfunded Actuarial Liability	8,204,727,159	845,504,419	11,149,522	9,061,381,100
Total Net Assets	$ 27,523,076,952	$ 3,767,113,370	$ 216,821,734	$ 31,507,012,056
LIABILITIES				
Present Value of Future Benefits				
Active employees	$ 14,424,630,997	$ 1,947,288,441	$ 109,732,837	$ 16,481,652,275
Inactive Members *	872,585,321	55,214,368	2,281,966	930,081,655
In-pay Members	12,225,860,634	1,764,610,561	104,806,931	14,095,278,126
Total Liabilities	$ 27,523,076,952	$ 3,767,113,370	$ 216,821,734	$ 31,507,012,056

*Includes Unclaimed Account Reserves

TABLE 8
ANALYSIS OF ACTUARIAL GAIN OR LOSS

	State	School	State/School	Local
1. Expected Actuarial Liability				
a. Actuarial liability at 12/31/15	$ 4,211,018,764	$ 13,798,734,403	$ 18,009,753,167	$ 4,806,144,236
b. Normal cost during 2016	69,245,461	263,547,154	332,792,615	123,396,853
c. Benefit payments for plan year ending 12/31/16	(308,919,134)	(865,178,991)	(1,174,098,125)	(281,130,118)
d. Interest on (a), (b), and (c)	330,302,091	1,091,041,134	1,421,343,225	383,334,416
e. Change in assumptions	120,335,321	280,994,483	401,329,804	100,617,113
f. Amendments	0	0	0	0
g. Expected actuarial liability as of 12/31/16	$ 4,421,982,503	$ 14,569,138,183	$ 18,991,120,686	$ 5,132,362,500
2. Actuarial Liability at 12/31/2016	$ 4,385,680,350	$ 14,481,094,448	$ 18,866,774,798	$ 5,094,727,138
3. Actuarial Liability Gain/(Loss) (1g) - (2)	$ 36,302,153	$ 88,043,735	$ 124,345,888	$ 37,635,362
4. Expected Actuarial Value of Assets				
a. Actuarial value of assets at 12/31/15	$ 3,340,654,264	$ 8,393,193,573	$ 11,733,847,837	$ 3,320,449,548
b. Contributions for plan year ending 12/31/16	159,716,397	591,436,507	751,152,904	266,851,517
c. Benefit payments for plan year ending 12/31/16	(308,919,134)	(865,178,991)	(1,174,098,125)	(281,130,118)
d. Interest on (a), (b) and (c)	261,399,045	660,716,436	922,115,481	265,075,807
e. Non-collectible pension contributions	(4,147,707)	(94,386,288)	(98,533,995)	0
f. Expected actuarial value of assets as of 12/31/16	$ 3,448,702,865	$ 8,685,781,237	$ 12,134,484,102	$ 3,571,246,754
5. Actuarial Value of Assets as of 12/31/16	$ 3,463,997,332	$ 8,712,789,560	$ 12,176,786,892	$ 3,579,987,885
6. Actuarial Value of Assets Gain/(Loss) (5) - (4f)	$ 15,294,467	$ 27,008,323	$ 42,302,790	$ 8,741,131
7. Net Actuarial Gain/(Loss) (3) + (6)	$ 51,596,620	$ 115,052,058	$ 166,648,678	$ 46,376,493

TABLE 8 (cont.)
ANALYSIS OF ACTUARIAL GAIN OR LOSS

	Total KPERS	KP&F	Judges	Total
1. Expected Actuarial Liability				
a. Actuarial liability at 12/31/15	$ 22,815,897,403	$ 2,965,712,160	$ 166,170,995	$ 25,947,780,558
b. Normal cost during 2016	456,189,468	66,613,382	4,765,909	527,568,759
c. Benefit payments for plan year ending 12/31/16	(1,455,228,243)	(183,384,046)	(10,769,054)	(1,649,381,343)
d. Interest on (a), (b), and (c)	1,804,677,641	235,391,798	13,252,477	2,053,321,916
e. Change in assumptions	501,946,917	81,857,258	9,649,779	593,453,954
f. Amendments	0	687,107	0	687,107
g. Expected actuarial liability as of 12/31/16	$ 24,123,483,186	$ 3,166,877,659	$ 183,070,106	$ 27,473,430,951
2. Actuarial Liability at 12/31/2016	$ 23,961,501,936	$ 3,174,533,709	$ 181,718,728	$ 27,317,754,373
3. Actuarial Liability Gain/(Loss) (1g) - (2)	$ 161,981,250	$ (7,656,050)	$ 1,351,378	$ 155,676,578
4. Expected Actuarial Value of Assets				
a. Actuarial value of assets at 12/31/15	$ 15,054,297,385	$ 2,194,103,726	$ 160,176,397	$ 17,408,577,508
b. Contributions for plan year ending 12/31/16	1,018,004,421	137,488,402	7,857,606	1,163,350,429
c. Benefit payments for plan year ending 12/31/16	(1,455,228,243)	(183,384,046)	(10,769,054)	(1,649,381,343)
d. Interest on (a), (b) and (c)	1,187,191,288	173,727,790	12,699,894	1,373,618,972
e. Non-collectible pension contributions	(98,533,995)	(409,785)	0	(98,943,780)
f. Expected actuarial value of assets as of 12/31/16	$ 15,705,730,856	$ 2,321,526,087	$ 169,964,843	$ 18,197,221,786
5. Actuarial Value of Assets as of 12/31/16	$ 15,756,774,777	$ 2,329,029,290	$ 170,569,206	$ 18,256,373,273
6. Actuarial Value of Assets Gain/(Loss) (5) - (4f)	$ 51,043,921	$ 7,503,203	$ 604,363	$ 59,151,487
7. Net Actuarial Gain/(Loss) (3) + (6)	$ 213,025,171	$ (152,847)	$ 1,955,741	$ 214,828,065

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The previous two sections were devoted to a discussion of the assets and liabilities of the System. A comparison of Tables 4 and 6 indicates that current assets fall short of meeting the present value of future benefits (total liability). This is expected in all but a fully closed down 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 and (2) the payment on the unfunded actuarial liability.

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 and/or because of actuarial deficiencies that have occurred because experience has not been as favorable as anticipated. Under these circumstances, an unfunded actuarial liability (UAL) exists.

Description of Rate Components

The actuarial cost method for all three systems is the traditional Entry Age Normal (EAN) – level percent of pay cost method. Under the EAN cost method, the actuarial present value of each member's projected benefits allocates on a level basis over the member's compensation 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 actuarial present value of benefits allocated to prior years of service is called the actuarial liability. The unfunded actuarial liability represents the difference between the actuarial liability and the actuarial value of assets as of the valuation date. The unfunded actuarial liability is calculated each year and reflects experience gains/losses.

The contribution rates based on the December 31, 2016 actuarial valuation will be used to determine employer contribution rates to the Kansas Public Employees Retirement System for fiscal years beginning in 2019 (July 1, 2019 to June 30, 2020 for the State and calendar year 2019 for Local employers).

KPERS

The law provides for the calculation of separate employer contribution rates for three groups: State, School and Local (for all other covered employers).

SB 4 and SB 228, as passed by the 2015 Legislature, reset the statutory employer contribution rate from 11.27% to 8.65% for the last half of fiscal year 2015, from 12.37% to 10.91% for fiscal year 2016, and from 13.57% to 10.81% for fiscal year 2017 for the State/School group. For fiscal year 2018 and beyond, the statutory cap described below will apply.

Legislation provides that the employer contribution rates recommended by the Board of Trustees for all groups cannot increase more than the statutory cap. This cap was increased in Senate Substitute for House Bill 2333, passed by the 2012 Legislature, to 0.90% for FY 2014, 1.0% for FY 2015, 1.1% for FY 2016 and 1.2% for FY 2017 and later. The prior limit on the statutory cap for the State/School group was 0.40%

in FY 2006, 0.50% in FY 2007, and 0.60% in FY 2008 through FY 2013. The prior limit for the Local group was 0.40% in 2006, 0.50% in 2007, and 0.60% in 2008 through 2013. The limits on the increase in the statutory contribution rate do not apply to the increase in the employer contribution rate for benefit enhancements. Although not shown in these rates, the total contribution rates for KPERS employers include the statutory employer contribution to the KPERS Group Life Insurance and disability benefits plan.

The 2016 Legislature passed House Sub for SB 161 and House Sub for SB 249 which impacted KPERS' funding by authorizing a delay of up to $100 million in State/School and KP&F contributions for FY 2016 and providing that the delayed contributions must be paid to KPERS by June 30, 2018 with interest at 8%. Ultimately, a total of $97.4 million in FY 2016 State/School and KP&F contributions was delayed. However, the 2017 Legislature passed Senate Substitute for Substitute for HB 2052, which cancelled payment of the $97.4 million delayed contribution.

Senate Substitute for Substitute for HB 2052 provides that the contributions for the School group for fiscal year 2017 (FY 2017) will be reduced so the total State/School contribution for fiscal year 2017 will be $64.13 million less than the scheduled statutory contributions. This reduction in employer contributions for fiscal year 2017 will be repaid in level-dollar installments of $6.4 million over twenty years beginning in fiscal year 2018. These payments are to be set as a rate for school employers in addition to the statutory State/School group rate. As noted previously, S Sub for Sub HB 2052 also provides that the repayment of the delayed contributions from FY 2016 with interest ($115 million) in FY 2018 will <u>not</u> be made. Finally, 2017 Senate Substitute for HB 2002 contains KPERS funding provisions for FY 2018 and FY 2019, including the following:

- **FY 2018**: The contributions for the State/School group for fiscal year 2018 (FY 2018) will be made at the current statutory rate of 12.01%. In addition, the first installment of $6.4 million on the 20-year amortization of the FY 2017 contribution reduction will be contributed.
- **FY 2019**: The contributions for school employers within the State/School group for fiscal year 2019 (FY 2019) will be reduced so the total employer contribution is $420 million, including the second installment of $6.4 million on the FY 2017 contribution reduction. This results in a reduction of $194 million that will be repaid as a level dollar amount over 20 years beginning in FY 2020.
- **FY 2020**: The current statutory cap of 1.2% per year will apply when determining the statutory contribution rate for the State/School group for FY 2020. The certified statutory rate from FY 2019 of 13.21%, without inclusion of the $6.4 million amortization of the FY 2017 contribution reduction and $19.4 million amortization of the FY 2019 contribution reduction, will be increased by 1.2% resulting in a statutory contribution rate for FY 2020 of 14.41%. The current statutory cap of 1.2% per year will apply for all subsequent years.

Beginning with the December 31, 2016 valuation, the unfunded actuarial liability is amortized using a "layered" approach. The unfunded actuarial liability in the December 31, 2015 valuation, which was projected to June 30, 2018 for the State/School group and to December 31, 2017 for the Local group, serves as the initial or "legacy" amortization base and continues to be amortized over the original period, set at 40 years beginning July 1, 1993 (16 years in the December 31, 2016 valuation). The change in the unfunded actuarial liability in the December 31, 2016 valuation as a result of the assumption changes, which is projected to June 30, 2019 for State/School and December 31, 2018 for Local, is amortized over a closed 25-year period. Changes in the unfunded actuarial liability that result from actuarial experience are amortized over a closed 20-year period beginning with the fiscal year in which the contribution rates will apply. In addition, the increase in the unfunded actuarial liability due to the $300 one-time payment to retirees in 2008 is amortized over 10 years (applies only to Local employers as the State fully funded the increased liability for the $300 one-time payment for its members in 2008).

The unfunded actuarial liability is amortized as a level-percent of payroll using a payroll growth assumption of 3.0%. Therefore, the dollar amount of the annual amortization payment will increase 3.0% each year. As a result, if all assumptions are met in the future (including a 3.0% payroll growth), the amortization payment will remain level as a percentage of total payroll. If payroll increases less/more than 3.0% each year, the amortization payment will increase/decrease as a percentage of total payroll.

The actuarial contribution rate for KPERS is comprised of the normal cost rate and a contribution toward the unfunded actuarial liability. Local employers who affiliate with KPERS for prior service on or after January 1, 1999 pay an additional employer contribution to finance the unfunded actuarial liability as of their affiliation date.

KP&F

The actuarially determined contribution requirements for employers in KP&F are comprised of:

(a) a "uniform" rate, determined separately for State and Local employers, which includes the normal cost and an unfunded actuarial liability payment for the entire group, plus

(b) any payment required to amortize the unfunded past service liability or any 15% excess benefit liability, which is determined separately for each participating employer.

For employers who enter KP&F for future service only, the total cost is the uniform contribution rate.

Beginning with the December 31, 2016 valuation, the unfunded actuarial liability is amortized using a "layered" approach. The unfunded actuarial liability in the December 31, 2015 valuation, which was projected to December 31, 2017 for the KP&F group, serves as the initial or "legacy" amortization base and continues to be amortized over the original period, set at 40 years beginning July 1, 1993 (16 years in the December 31, 2016 valuation). The change in the unfunded actuarial liability in the December 31, 2016 valuation as a result of the assumption changes, which is projected to December 31, 2018 for KP&F, is amortized over a closed 25-year period. Changes in the unfunded actuarial liability that result from actuarial experience are amortized over a closed 20-year period beginning with the fiscal year in which the contribution rates will apply. In addition, the increase in the unfunded actuarial liability due to the $300 one-time payment to retirees in 2008 is amortized over 10 years (applies only to Local employers as the State fully funded the increased liability for the $300 one-time payment for its members in 2008).

The unfunded actuarial liability is amortized as a level-percent of payroll using a payroll growth assumption of 3.0%. Therefore, the dollar amount of the annual amortization payment will increase 3.0% each year. As a result, if all assumptions are met in the future (including a 3.0% payroll growth), the amortization payment will remain level as a percentage of total payroll. If payroll increases less/more than 3.0% each year, the amortization payment will increase/decrease as a percentage of total payroll.

Judges

The actuarial contribution rate for the Judges is comprised of the normal cost rate and a contribution toward the unfunded actuarial liability. Beginning with the December 31, 2016 valuation, the unfunded actuarial liability is amortized using a "layered" approach. The unfunded actuarial liability in the December 31, 2015 valuation, which was projected to June 30, 2018 for the Judges group, serves as the initial or "legacy" amortization base and continues to be amortized over the original period, set at 40 years beginning July 1, 1993 (16 years in the December 31, 2016 valuation). The change in the unfunded actuarial liability in the

December 31, 2016 valuation as a result of the assumption changes, which is projected to June 30, 2019 for Judges, is amortized over a closed 25-year period. Changes in the unfunded actuarial liability that result from actuarial experience are amortized over a closed 20-year period beginning with the fiscal year in which the contribution rates will apply. The unfunded actuarial liability is amortized with payments determined as level-dollar amounts.

Contribution Rate Summary

The normal cost rate for each group is shown in Table 9. The unfunded actuarial liability for each group is shown in Tables 10. Tables 11A and 11B project each group's unfunded actuarial liability to the beginning of the fiscal year in which the contribution rates from the December 31, 2016 actuarial valuation will be applied. Tables 12A-F develop the actuarial contribution rates for the unfunded actuarial liability using the projected unfunded actuarial liability amounts from Tables 11A and 11B. The total actuarial contribution rates determined as of December 31, 2016 are presented in Table 13. The contribution rates for local employers who affiliated with KPERS for prior service and are amortizing the payment of that liability over a period of years (ending no later than 2034) are shown in Tables 14A and 14B. Table 15 shows the KP&F individual employer contribution rates for fiscal years beginning in 2018 and 2019 while Tables 16 and 17 show the calculation of the additional contribution rate due to amortization of prior service unfunded actuarial liability for fiscal years beginning in 2019.

The rates shown in this report, which are based on the actuarial assumptions and cost methods described in Appendix C, are applicable for determining employer contribution rates for fiscal years commencing in 2019.

TABLE 9
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
NORMAL COST RATE
AS OF DECEMBER 31, 2016

	State	School	State/School	Local
1. Normal Cost Rate				
a. Retirement Benefits	4.82%	6.25%	5.95%	4.92%
b. Pre-Retirement Death Benefits	0.15%	0.08%	0.10%	0.16%
c. Termination Benefits	2.20%	1.59%	1.72%	2.19%
d. Disability Benefits	0.41%	0.16%	0.21%	0.24%
e. Administrative Expenses	0.16%	0.16%	0.16%	0.16%
f. Total	7.74%	8.24%	8.14%	7.67%

TABLE 9 (cont.)
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
NORMAL COST RATE
AS OF DECEMBER 31, 2016

	KP&F	Judges
1. Normal Cost Rate		
a. Retirement Benefits	10.50%	19.77%
b. Pre-Retirement Death Benefits	0.35%	0.37%
c. Termination Benefits	1.64%	0.00%
d. Disability Benefits	2.23%	0.00%
e. Administrative Expenses	0.16%	0.16%
f. Total	14.88%	20.30%

TABLE 10
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
UNFUNDED ACTUARIAL LIABILITY (UAL)
AS OF DECEMBER 31, 2016

	State	School	State/School	Local	KP&F	Judges
1. Actuarial Liability	$ 4,385,680,350	$ 14,481,094,448	$ 18,866,774,798	$ 5,094,727,138	$ 3,174,533,709	$ 181,718,728
2. Actuarial Value of Assets	3,463,997,332	8,712,789,560	12,176,786,892	3,579,987,885	2,329,029,290	170,569,206
3. Unfunded Actuarial Liability (UAL)	921,683,018	5,768,304,888	6,689,987,906	1,514,739,253	845,504,419	11,149,522
a. UAL for 2007 One Time Payment	0	0	0	0	0	0
b. UAL for 2008 One Time Payment	0	0	0	269,982	94,295	0
c. Other local employer UAL*	0	0	0	2,617,897	3,201,405	0
d. Remaining UAL	921,683,018	5,768,304,888	6,689,987,906	1,511,851,374	842,208,719	11,149,522

*These amounts are paid directly by the employer and do not enter into the overall unfunded actuarial liability and amortization calculations.

TABLE 11A
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
PROJECTED UNFUNDED ACTUARIAL LIABILITY AT JUNE 30, 2019
EMPLOYERS CONTRIBUTING ON JUNE 30 FISCAL YEARS

	State*	School*	State/School*	Judges
1. Unfunded Actuarial Liability at December 31, 2016	$921,683,018	$5,768,304,888	$6,689,987,906	$11,149,522
2. FY 2017 Expected Contribution Rate	16.77%	16.81%	16.81%	27.13%
3. Normal Cost Rate	7.74%	8.24%	8.14%	20.30%
4. Contribution Rate Applied to UAL for 2017 [(2) – (3)]	9.03%	8.57%	8.67%	6.83%
5. Expected Payroll for January to June, 2017	$469,591,598	$1,734,975,916	$2,204,567,514	$13,561,725
6. Statutory Excess State Contributions	-	$187,837	-	N/A
7. Expected UAL Contribution [(4) * (5)] + (6)	$42,404,121	$148,875,273	$191,136,003	$926,266
8. Projected UAL at June 30, 2017	$913,528,986	$5,835,976,571	$6,749,651,649	$10,629,791
9. FY 2018 Expected Contribution Rate	15.62%	18.01%	18.01%	21.50%
10. Normal Cost Rate	7.74%	8.24%	8.14%	20.30%
11. Contribution Rate Applied to UAL for 2018 [(8) – (9)]	7.88%	9.77%	9.87%	1.20%
12. Expected Payroll for FY 2018	$953,270,944	$3,522,001,109	$4,475,272,053	$27,123,450
13. Statutory Excess State Contributions	-	$22,783,176	-	N/A
14. Expected UAL Contribution (10) * (11)	$75,117,750	$366,882,684	$441,709,352	$325,481
15. Projected UAL at June 30, 2018	$906,353,232	$5,907,430,633	$6,814,243,429	$11,115,742
16. FY 2019 Expected Contribution Rate	14.28%	19.21%	19.21%	20.30%
17. Normal Cost Rate	7.74%	8.24%	8.14%	20.30%
18. Contribution Rate Applied to UAL for 2019 [(14) – (15)]	6.54%	10.97%	11.07%	0.00%
19. Expected Payroll for FY 2019	$981,869,072	$3,627,661,142	$4,609,530,215	$27,123,450
20. Statutory Excess State Contributions	-	$48,406,145	-	N/A
21. Expected UAL Contribution (16) * (17)	$64,214,237	$446,360,572	$510,274,995	$0
22. Projected UAL at June 30, 2019	$909,939,497	$5,901,922,193	$6,812,668,085	$11,977,212

Note: The projected unfunded actuarial liability amount for State/School may not equal the sum of State and School due to rounding. Note that the excess of the State/School statutory contribution rate over the actuarial required contribution rate for the State alone is allocated to the School group.

* Because FY 2017 contribution reductions for the School group are to be repaid over 20 years with interest, they are treated as a long-term receivable and are reflected in total FY2017 contributions. Similarly, FY 2019 reductions of $194.4M are to be repaid over 20 years with interest, and therefore, are also treated as a long-term receivable and are reflected in the FY 2019 contribution.

TABLE 11B
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
PROJECTED UAL AT DECEMBER 31, 2018
EMPLOYERS CONTRIBUTING ON DECEMBER 31 FISCAL YEARS

	KPERS - Local	KP&F
1. Unfunded Actuarial Liability at December 31, 2016	$1,511,851,374	$842,208,719
2. FY 2017 Expected Contribution Rate	14.46%	26.18%
3. Normal Cost Rate	7.67%	14.88%
4. Contribution Rate Applied to UAL for 2017 [(2) – (3)]	6.79%	11.30%
5. Expected Payroll for 2017	$1,728,976,958	$485,215,228
6. Expected UAL Contribution (4) * (5)	$117,397,535	$54,829,321
7. Projected UAL at December 31, 2017	$1,507,158,047	$850,565,581
8. FY 2018 Expected Contribution Rate	14.39%	27.24%
9. Normal Cost Rate	7.67%	14.88%
10. Contribution Rate Applied to UAL for 2018 [(8) – (9)]	6.72%	12.36%
11. Expected Payroll for FY 2018	$1,780,846,267	$499,771,685
12. Expected UAL Contribution (10) * (11)	$119,672,869	$61,771,780
13. Projected UAL at December 31, 2018	$1,499,739,129	$852,363,640

TABLE 12A
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
AMORTIZATION OF THE UNFUNDED ACTUARIAL LIABILITY

STATE

Amortization Base	Original Amount	Remaining Payments	Projected June 30, 2019 Balance	Annual Payment*
2015 Legacy UAL	$ 805,072,157	16	$ 801,473,780	$ 71,365,701
2016 Assumption Changes	138,527,291	25	138,527,291	9,376,730
2016 Experience	(30,061,574)	20	(30,061,574)	(2,315,386)
Total			**$ 909,939,497**	**$ 78,427,045**

* Payment amount reflects mid-year timing.

1. Total UAL Amortization Payments	$ 78,427,045
2. Projected Payroll for 2017	$ 939,183,195
3. Projected Payroll for FY 2020	$ 1,011,325,144
4. UAL Amortization Payment Rate (1) / (3)	7.75%

TABLE 12B
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
AMORTIZATION OF THE UNFUNDED ACTUARIAL LIABILITY

SCHOOL

Amortization Base	Original Amount	Remaining Payments	Projected June 30, 2019 Balance	Annual Payment*
2015 Legacy UAL	$ 5,683,566,131	16	$ 5,658,162,680	$ 503,820,282
2016 Assumption Changes	311,625,331	25	311,625,331	21,093,508
2016 Experience	(67,865,818)	20	(67,865,818)	(5,227,123)
Total			**$ 5,901,922,193**	**$ 519,686,667**

* Payment amount reflects mid-year timing.

1. Total UAL Amortization Payments	$	519,686,667
2. Projected Payroll for 2017	$	3,469,951,831
3. Projected Payroll for FY 2020	$	3,736,490,976
4. UAL Amortization Payment Rate (1) / (3)		13.91%

TABLE 12C
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
AMORTIZATION OF THE UNFUNDED ACTUARIAL LIABILITY

STATE/SCHOOL

Amortization Base	Original Amount	Remaining Payments	Projected June 30, 2019 Balance	Annual Payment*
2015 Legacy UAL	$ 6,489,108,272	16	$ 6,460,104,343	$ 575,227,644
2016 Assumption Changes	451,174,445	25	451,174,445	30,539,403
2016 Experience	(98,610,703)	20	(98,610,703)	(7,595,139)
Total			**$ 6,812,668,085**	**$ 598,171,908**

* Payment amount reflects mid-year timing.
Note: Projected UAL contributions and amounts for State/School may not equal the sum of State and School due to rounding.

1. Total UAL Amortization Payments	$ 598,171,908
2. Projected Payroll for 2017	$ 4,409,135,026
3. Projected Payroll for FY 2020	$ 4,747,816,121
4. UAL Amortization Payment Rate (1) / (3)	12.60%

TABLE 12D
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
AMORTIZATION OF THE UNFUNDED ACTUARIAL LIABILITY

LOCAL

Amortization Base	Original Amount	Remaining Payments	Projected December 31, 2018 Balance	Annual Payment*
2015 Legacy UAL	$ 1,467,792,387	16	$ 1,461,231,895	$ 130,112,601
2016 Assumption Changes	107,171,397	25	107,171,397	7,254,291
2016 Experience	(68,664,163)	20	(68,664,163)	(5,288,613)
Total			**$ 1,499,739,129**	**$ 132,078,279**

* Payment amount reflects mid-year timing.

1. Total UAL Amortization Payments	$	132,078,279
2. Projected Payroll for 2017	$	1,728,976,958
3. Projected Payroll for FY 2019	$	1,834,271,655
4. UAL Amortization Payment Rate (1) / (3)		7.20%
5. UAL Contribution Rate for 2008 One-time Payment (1-Year Amortization)		0.02%
6. Total		7.22%

TABLE 12E
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
AMORTIZATION OF THE UNFUNDED ACTUARIAL LIABILITY

KP&F

Amortization Base	Original Amount	Remaining Payments	Projected December 31, 2018 Balance	Annual Payment*
2015 Legacy UAL	$ 770,980,567	16	$ 767,534,568	$ 68,343,649
2016 Assumption Changes	90,081,927	25	90,081,927	6,097,527
2016 Plan Changes	801,442	20	801,442	61,728
2016 Experience	(6,054,297)	20	(6,054,297)	(466,311)
Total			**$ 852,363,640**	**$ 74,036,593**

* Payment amount reflects mid-year timing.

1. Total UAL Amortization Payments	$	74,036,593
2. Projected Payroll for 2017	$	485,215,228
3. Projected Payroll for FY 2019	$	514,764,836
4. UAL Amortization Payment Rate (1) / (3)		14.38%
5. UAL Contribution Rate for 2008 One-time Payment (1-Year Amortization)**		0.02%
6. Total		14.40%

** Applies to local KP&F employers only.

TABLE 12F
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
AMORTIZATION OF THE UNFUNDED ACTUARIAL LIABILITY

JUDGES

Amortization Base	Original Amount	Remaining Payments	Projected June 30, 2019 Balance	Annual Payment*
2015 Legacy UAL	$ 2,439,245	16	$ 2,366,972	$ 253,514
2016 Assumption Changes	12,158,838	25	12,158,838	1,073,961
2016 Experience	(2,548,598)	20	(2,548,598)	(245,437)
Total			**$ 11,977,212**	**$ 1,082,038**

* Payment amount reflects mid-year timing.

1. Total UAL Amortization Payments	$	1,082,038
2. Projected Payroll for 2017	$	27,123,450
3. UAL Amortization Payment Rate (1) / (2)		3.99%

TABLE 13
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
ACTUARIAL EMPLOYER CONTRIBUTION RATES
FISCAL YEAR COMMENCING IN 2019

	Total Normal Cost	Employee Normal Cost	Employer Normal Cost	Unfunded Actuarial Liability	Total Employer Contribution*
State	7.74%	6.00%	1.74%	7.75%	9.49%
Correctional Employees - Age 55	7.99%	6.00%	1.99%	7.75%	9.74%
Correctional Employees - Age 60	8.88%	6.00%	2.88%	7.75%	10.63%
School	8.24%	6.00%	2.24%	13.91%	16.15%
State/School	8.14%	6.00%	2.14%	12.60%	14.74%
Local	7.67%	6.00%	1.67%	7.22%	8.89%
KP&F Uniform Contribution Rate					
State **	14.88%	7.15%	7.73%	14.38%	22.11%
Local **	14.88%	7.15%	7.73%	14.40%	22.13%
Judges	20.30%	5.64%	14.66%	3.99%	18.65%

* Does not include the contribution to the Death and Disability Program.

** The total contribution rate for each employer is equal to the appropriate uniform contribution rate (state or local) plus an additional rate, if applicable, required to amortize the unfunded past service liability, determined separately for each employer. (See Table 15)

TABLE 14A
LOCAL KPERS AFFILIATION COST FACTORS
FOR FISCAL YEAR BEGINNING IN 2019

Employer	Year Affiliated	Projected 2019 Annual Payroll	Projected 1/1/2019 Unfunded Actuarial Liability	Payment on 1/1/2019 Unfunded Liability	Payment on Unfunded Liability as % of Payroll	Total Rate for Years Commencing[1] in 2019
St. Francis Housing Authority	1999	$23,774	$8,264	$727	3.06%	11.95%
City of Burden	1999	115,474	16,322	1,432	1.24%	10.13%
City of Longton	1999	70,188	19,813	1,743	2.48%	11.37%
Bourbon County RWD#2	1999	280,781	114,865	10,098	3.60%	12.49%
Towanda Township	1999	58,491	9,403	823	1.41%	10.30%
Hays Housing Authority	2000	64,408	1,791	166	0.26%	9.15%
Haysville Community Library	2000	170,714	208,796	18,337	10.74%	19.63%
Hamilton County Library	2000	107,281	13,821	1,215	1.13%	10.02%
Ellis Public Library	2000	34,083	5,250	461	1.35%	10.24%
Bucklin Public Library	2000	32,860	13,043	1,149	3.50%	12.39%
Elkhart Cemetery District	2000	34,556	1,816	164	0.48%	9.37%
City of Linn Valley	2000	162,506	1,022	91	0.06%	8.95%
City of Blue Mound	2000	79,232	2,995	253	0.32%	9.21%
Kansas Workers' Risk Coop for Counties	2000	291,497	53,216	4,642	1.59%	10.48%
Lindsborg Community Library	2002	33,109	3,818	317	0.96%	9.85%
City of North Newton	2002	416,817	171,790	14,585	3.50%	12.39%
City of Arcadia	2002	84,911	16,814	1,425	1.68%	10.57%
City of Linwood	2003	76,703	2,514	214	0.28%	9.17%
Johnson County Fire District #2 Rural	2003	3,193,283	468,288	39,761	1.25%	10.14%
Basehor Community Library	2003	345,151	59,547	5,055	1.46%	10.35%
City of Gypsum	2003	91,893	5,056	430	0.47%	9.36%
City of Bentley	2004	121,081	38,369	3,597	2.97%	11.86%
Mulvane Public Library	2004	120,691	13,754	1,290	1.07%	9.96%
The Center for Counseling and Consultation	2004	2,868,735	1,156,391	108,441	3.78%	12.67%
Doniphan County RFD #2	2005	64,592	9,191	861	1.33%	10.22%
City of Denison	2005	$29,843	$20,276	$1,902	6.37%	15.26%
Stanton County Recreation Commission	2005	85,904	24,979	2,341	2.73%	11.62%
Total		$9,058,558	$2,461,203	$221,520		

[1] Basic local employer contribution rates excluding Death and Disability contribution: FY 2018: 8.39% FY 2019: 8.89%

TABLE 14B
LOCAL KPERS AFFILIATION COST FACTORS - AFFILIATION AFTER 1/1/06
FOR FISCAL YEAR BEGINNING IN 2019

Effective for affiliations on or after January 1, 2006, the payment on the unfunded actuarial liability due to affiliation for prior service is amortized as a fixed level dollar payment. No adjustment is made to the employer contribution rate for these payments.

Employer	Year Affiliated	Unfunded Actuarial Liability on Jan 1 Following Affiliation	Annual Payment Due Jan 1, 2018 to Amortize Unfunded Liability	Final Payment Year
Nippawalla Township	2006	$4,158	$356	2032
City of Vermillion	2006	3,950	338	2032
Oaklawn Improvement District	2010	128,006	11,619	2032
Stockton Recreation Commission	2010	1,245	113	2032

TABLE 15
KP&F
EMPLOYER CONTRIBUTION RATES FOR FISCAL YEARS COMMENCING IN CALENDAR YEARS 2018 AND 2019

Employer	Total Rate for Fiscal Year Commencing in 2018	Recommended Total Rate for Fiscal Year Commencing in 2019
Douglas County Law Enforcement	22.87 %	24.87 %
Ford County	20.09	22.13
Franklin County Sheriff's Dept	20.09	22.13
Gray County Sheriff's Dept.	20.09	22.13
Harvey County Sheriff's Dept.	20.09	22.13
Johnson County Fire Dept.	20.09	22.13
Johnson County Fire No. 1	20.09	22.13
Johnson County Fire No. 2	20.09	22.13
Johnson County Park Commission	20.09	22.13
Johnson County Sheriff's Dept.	20.09	22.13
Labette County Sheriff's Dept.	22.39	24.25
Reno County Sheriff's Dept.	20.09	22.13
Riley County Law Enforcement	20.09	22.13
Sedgwick County Fire No. 1	20.09	22.13
Sedgwick County Sheriff's Dept.	20.22	22.13
Sedgwick County EMT's	20.09	22.13
Shawnee County Sheriff's Dept.	22.59	24.50
Sumner County Sheriff's Dept.	21.14	23.21
Unified Gov't of Wyandotte County	20.09	22.13
City of Abilene	20.09	22.13
City of Arkansas City	20.09	22.13
City of Atchison	20.09	22.13
City of Bonner Springs	20.09	22.13
City of Chanute	20.09	22.13
City of Cimarron	20.09	22.13
City of Coffeyville	20.09	22.13
City of Concordia	20.09	22.13
City of Derby	20.09	22.13
City of Dodge City	25.89	27.78
City of Emporia	20.09	22.13
City of Erie	20.09	22.13
City of Eudora	20.09	22.13
City of Fairway	20.09	22.13
City of Fort Scott	20.09	22.13
City of Herington	20.09	22.13
City of Hutchinson	20.09	22.13
City of Junction City	20.09	22.13

TABLE 15 (cont.)
KP&F
EMPLOYER CONTRIBUTION RATES FOR FISCAL YEARS COMMENCING IN CALENDAR YEARS 2018 AND 2019

Employer	Total Rate for Fiscal Year Commencing in 2018	Recommended Total Rate for Fiscal Year Commencing in 2019
City of Lawrence	20.09 %	22.13 %
City of Leavenworth	20.09	22.13
City of Leawood	20.61	22.60
City of Lenexa	20.09	22.13
City of Manhattan	20.09	22.13
City of Merriam	20.09	22.13
City of McPherson	20.09	22.13
City of Mission	20.09	22.13
City of Newton EMTs	22.86	30.60
City of Newton	20.09	22.13
City of Olathe	20.09	22.13
City of Ottawa	20.09	22.13
City of Parsons	20.09	22.13
City of Pittsburg	20.09	22.13
City of Salina	20.09	22.13
City of Shawnee	20.09	22.13
City of Topeka	20.09	22.13
City of Wellington	20.09	22.13
City of Westwood	20.09	22.13
City of Winfield	22.98	22.13
Board of Regents Campus Police	20.05	22.47
Kansas Bureau of Investigation	20.05	22.47
Kansas Highway Patrol	20.05	22.47
Cowley County Sheriff's Dept	20.09	22.13
City of Gardner Public Safety Officers	20.09	22.13
City of Liberal Police & Firemen	20.09	22.13
City of Oswego	20.09	22.13
Leavenworth County	20.09	22.13
Pottawatomie County	20.09	22.13
City of Roeland Park	20.09	22.13
City of Edwardsville Police	22.08	24.09
City of Garden City	20.09	22.13
City of Lake Quivira	20.09	22.13
City of Paola	20.09	22.13
City of Winfield (EMS)	20.09	22.13
Miami County	20.09	22.13
Atchinson County	20.09	22.13

TABLE 15 (cont.)
KP&F
EMPLOYER CONTRIBUTION RATES FOR FISCAL YEARS COMMENCING IN CALENDAR YEARS 2018 AND 2019

Employer	Total Rate for Fiscal Year Commencing in 2018	Recommended Total Rate for Fiscal Year Commencing in 2019
City of Park City	20.09 %	22.13 %
Dickinson County	20.09	22.13
Leavenworth County (EMS)	20.09	22.13
City of Basehor	20.09	22.13
City of Edwardsville Firemen	24.73	25.87
City of Marion	20.09	22.13
City of Overbrook	20.09	22.13
Leavenworth County Fire District #1	20.09	22.13
Shawnee Heights Fire District	20.09	22.13
City of Lansing	20.09	22.13
State Fire Marshall	20.05	22.47
Seward County	20.09	22.13
City of Hays	20.09	22.13
Ellis County	20.09	22.13
City of Baldwin City	20.09	22.13
McPherson County Rural Fire District #9	20.09	22.13
City of Spring Hill	20.09	22.13
City of Andover	20.09	22.13
Kearny County	20.09	22.13
Neosho County	20.09	22.13
Clark County	20.09	22.13
City of Wakefield	20.09	22.13
Russell County	20.09	22.13
City of Rossville	20.09	22.13
City of Goddard	20.09	22.13
City of El Dorado	20.09	22.13
Northwest Consolidated Fire District	20.09	22.13
City of Girard	20.09	22.13
City of Overland Park	20.09	22.13
City of Victoria	20.09	22.13
City of Burden	20.09	22.13
City of Augusta	20.09	22.13
Ottawa County	20.09	22.13

TABLE 16A
KP&F EMPLOYER ADDITIONAL CONTRIBUTION RATES
PRIOR SERVICE LIABILITY
FOR FISCAL YEARS BEGINNING IN 2019

Employer	1/1/2017 Unfunded Prior Service Liability	Payment on Unfunded Liability
Douglas County Law Enforcement	$741,447	$181,138
Ford County	0	0
Franklin County Sheriff's Dept	0	0
Gray County Sheriff's Dept.	0	0
Harvey County Sheriff's Dept.	0	0
Johnson County Fire Dept.	0	0
Johnson County Fire No. 1	0	0
Johnson County Fire No. 2	0	0
Johnson County Park Commission	0	0
Johnson County Sheriff's Dept.	0	0
Labette County Sheriff's Dept.	152,521	16,582
Reno County Sheriff's Dept.	0	0
Riley County Law Enforcement	0	0
Sedgwick County Fire No. 1	0	0
Sedgwick County Sheriff's Dept.	0	0
Sedgwick County EMT's	0	0
Shawnee County Sheriff's Dept.	490,251	154,845
Sumner County Sheriff's Dept.	17,401	11,639
Unified Gov't of Wyandotte County	0	0
City of Abilene	0	0
City of Arkansas City	0	0
City of Atchison	0	0
City of Bonner Springs	0	0
City of Chanute	0	0
City of Cimarron	0	0
City of Coffeyville	0	0
City of Concordia	0	0
City of Derby	0	0
City of Dodge City	1,164,111	215,432
City of Emporia	0	0
City of Erie	0	0
City of Eudora	0	0
City of Fairway	0	0
City of Fort Scott	0	0
City of Herington	0	0
City of Hutchinson	0	0
City of Junction City	0	0

TABLE 16A (cont.)
KP&F EMPLOYER ADDITIONAL CONTRIBUTION RATES
PRIOR SERVICE LIABILITY
FOR FISCAL YEARS BEGINNING IN 2019

Employer	1/1/2017 Unfunded Prior Service Liability	Payment on Unfunded Liability
City of Lawrence	$0	$0
City of Leavenworth	0	0
City of Leawood	39,748	41,307
City of Lenexa	0	0
City of Manhattan	0	0
City of Merriam	0	0
City of McPherson	0	0
City of Mission	0	0
City of Newton EMTs	20,795	7,898
City of Newton	0	0
City of Olathe	0	0
City of Ottawa	0	0
City of Parsons	0	0
City of Pittsburg	0	0
City of Salina	0	0
City of Shawnee	0	0
City of Topeka	0	0
City of Wellington	0	0
City of Westwood	0	0
City of Winfield	0	0
Board of Regents Campus Police	0	0
Kansas Bureau of Investigation	0	0
Kansas Highway Patrol	0	0
Cowley County Sheriff's Dept	0	0
City of Gardner Public Safety Officers	0	0
City of Liberal Police & Firemen	0	0
City of Oswego	0	0
Leavenworth County	0	0
Pottawatomie County	0	0
City of Roeland Park	0	0
City of Edwardsville Police	215,196	18,952
City of Garden City	0	0
City of Lake Quivira	0	0
City of Paola	0	0
City of Winfield (EMS)	0	0
Miami County	0	0
Atchinson County	0	0

TABLE 16A (cont.)
KP&F EMPLOYER ADDITIONAL CONTRIBUTION RATES
PRIOR SERVICE LIABILITY
FOR FISCAL YEARS BEGINNING IN 2019

Employer	1/1/2017 Unfunded Prior Service Liability	Payment on Unfunded Liability
City of Park City	$0	$0
Dickinson County	0	0
Leavenworth County (EMS)	0	0
City of Basehor	0	0
City of Edwardsville Firemen	359,871	37,963
City of Marion	0	0
City of Overbrook	0	0
Leavenworth County Fire District #1	0	0
Shawnee Heights Fire District	0	0
City of Lansing	0	0
State Fire Marshall	0	0
Seward County	0	0
City of Hays	0	0
Ellis County	0	0
City of Baldwin City	0	0
City of Spring Hill	0	0
City of Andover	0	0
Kearny County	0	0
Neosho County	0	0
Clark County	0	0
City of Wakefield	0	0
Russell County	0	0
City of Rossville	0	0
City of Goddard	0	0
City of El Dorado	0	0
Northwest Consolidated Fire District	0	0
City of Girard	0	0
City of Overland Park	0	0
City of Victoria	0	0
City of Augusta	0	0
Ottawa County	0	0
Total	$ 3,201,341	$ 685,758

TABLE 16B
KP&F EMPLOYER ADDITIONAL CONTRIBUTION RATES
PRIOR SERVICE LIABILITY - AFFILIATION AFTER 1/1/06
FOR FISCAL YEAR BEGINNING IN 2019

Effective for affiliations on or after January 1, 2006, the payment on the unfunded actuarial liability due to affiliation for prior service is amortized as a fixed level dollar payment. No adjustment is made to the employer contribution rate for these payments.

Employer	Year Affiliated	Unfunded Actuarial Liability on Jan 1 Following Affiliation	Annual Payment Due Jan 1, 2018 to Amortize Unfunded Liability	Final Payment Year
McPherson County Rural Fire District #9	2007	$457	$0	2017

Note: Only employers with remaining obligations as of the valuation date are shown.

TABLE 17
KP&F EMPLOYER ADDITIONAL CONTRIBUTION RATES FOR FISCAL YEARS BEGINNING IN 2019

Employer	Number of Employees	Total Estimated 2019 Payroll	Payment on Unfunded Liability (Table 16)	As Percent of Payroll
Douglas County Law Enforcement	80	$6,611,701	$181,138	2.74 %
Ford County	47	2,727,038	0	0.00
Franklin County Sheriff's Dept	50	2,909,103	0	0.00
Gray County Sheriff's Dept.	9	547,826	0	0.00
Harvey County Sheriff's Dept.	19	1,035,724	0	0.00
Johnson County Fire Dept.	147	11,996,727	0	0.00
Johnson County Fire No. 1	30	1,832,377	0	0.00
Johnson County Fire No. 2	66	6,508,394	0	0.00
Johnson County Park Commission	21	1,359,510	0	0.00
Johnson County Sheriff's Dept.	433	36,775,016	0	0.00
Labette County Sheriff's Dept.	16	781,525	16,582	2.12
Reno County Sheriff's Dept.	41	2,483,395	0	0.00
Riley County Law Enforcement	107	7,769,231	0	0.00
Sedgwick County Fire No. 1	133	9,193,957	0	0.00
Sedgwick County Sheriff's Dept.	224	15,841,954	0	0.00
Sedgwick County EMT's	149	8,958,717	0	0.00
Shawnee County Sheriff's Dept.	102	6,532,889	154,845	2.37
Sumner County Sheriff's Dept.	23	1,075,427	11,639	1.08
Unified Gov't of Wyandotte County	828	65,048,940	0	0.00
City of Abilene	23	1,189,337	0	0.00
City of Arkansas City	43	2,548,117	0	0.00
City of Atchison	41	1,953,341	0	0.00
City of Bonner Springs	24	1,653,138	0	0.00
City of Chanute	33	1,872,461	0	0.00
City of Cimarron	0	0	0	0.00
City of Coffeyville	40	2,643,202	0	0.00
City of Concordia	20	890,445	0	0.00
City of Derby	66	3,747,331	0	0.00
City of Dodge City	68	3,815,185	215,432	5.65
City of Emporia	83	4,900,202	0	0.00
City of Erie	3	135,250	0	0.00
City of Eudora	9	564,510	0	0.00
City of Fairway	9	650,152	0	0.00
City of Fort Scott	32	1,495,741	0	0.00
City of Herington	8	343,685	0	0.00
City of Hutchinson	153	10,677,881	0	0.00
City of Junction City	97	6,261,730	0	0.00
City of Lawrence	284	25,627,471	0	0.00
City of Leavenworth	103	5,956,512	0	0.00
City of Leawood	105	8,714,988	41,307	0.47

TABLE 17 (cont.)
KP&F EMPLOYER ADDITIONAL CONTRIBUTION RATES FOR FISCAL YEARS BEGINNING IN 2019

Employer	Number of Employees	Total Estimated 2019 Payroll	Payment on Unfunded Liability (Table 16)	As Percent of Payroll
City of Lenexa	174	$12,574,472	$0	0.00 %
City of Manhattan	74	4,841,265	0	0.00
City of Merriam	31	2,219,522	0	0.00
City of McPherson	46	2,780,618	0	0.00
City of Mission	29	1,972,183	0	0.00
City of Newton EMTs	1	93,238	7,898	8.47
City of Newton	81	5,466,815	0	0.00
City of Olathe	278	23,026,548	0	0.00
City of Ottawa	48	3,189,723	0	0.00
City of Parsons	42	1,820,164	0	0.00
City of Pittsburg	80	4,221,204	0	0.00
City of Salina	158	11,073,354	0	0.00
City of Shawnee	147	12,174,900	0	0.00
City of Topeka	502	38,846,112	0	0.00
City of Wellington	34	1,968,935	0	0.00
City of Westwood	5	346,083	0	0.00
City of Winfield	52	3,139,727	0	0.00
Board of Regents Campus Police	164	9,117,327	0	0.00
Kansas Bureau of Investigation	73	5,782,874	0	0.00
Kansas Highway Patrol	475	35,637,760	0	0.00
Cowley County Sheriff's Dept	24	1,157,837	0	0.00
City of Gardner Public Safety Officers	31	2,242,991	0	0.00
City of Liberal Police & Firemen	54	2,916,524	0	0.00
City of Oswego	5	217,556	0	0.00
Leavenworth County	57	3,151,959	0	0.00
Pottawatomie County	28	1,550,556	0	0.00
City of Roeland Park	14	869,816	0	0.00
City of Edwardsville Police	14	965,866	18,952	1.96
City of Garden City	98	5,774,736	0	0.00
City of Lake Quivira	1	87,728	0	0.00
City of Paola	15	876,119	0	0.00
City of Winfield (EMS)	0	0	0	0.00
Miami County	55	3,324,368	0	0.00
Atchinson County	13	546,092	0	0.00
City of Park City	14	721,534	0	0.00
Dickinson County	18	1,046,696	0	0.00
Leavenworth County (EMS)	41	2,000,886	0	0.00
City of Basehor	12	746,824	0	0.00
City of Edwardsville Firemen	17	1,014,328	37,963	3.74
City of Marion	5	226,024	0	0.00

TABLE 17 (cont.)
KP&F EMPLOYER ADDITIONAL CONTRIBUTION RATES FOR FISCAL YEARS BEGINNING IN 2019

Employer	Number of Employees	Total Estimated 2019 Payroll	Payment on Unfunded Liability (Table 16)	As Percent of Payroll
City of Overbrook	1	$53,670	$0	0.00 %
Leavenworth County Fire District #1	10	571,221	0	0.00
Shawnee Heights Fire District	11	735,436	0	0.00
City of Lansing	16	852,719	0	0.00
State Fire Marshall	10	531,715	0	0.00
Seward County	29	1,652,411	0	0.00
City of Hays	51	2,894,793	0	0.00
Ellis County	46	2,846,456	0	0.00
City of Baldwin City	10	648,171	0	0.00
McPherson County Rural Fire District #9	1	24,648	0	0.00
City of Spring Hill	11	708,723	0	0.00
City of Andover	40	2,274,366	0	0.00
Kearny County	18	1,088,330	0	0.00
Neosho County	16	748,246	0	0.00
Clark County	5	244,497	0	0.00
City of Wakefield	1	37,005	0	0.00
Russell County	8	351,683	0	0.00
City of Rossville	2	93,169	0	0.00
City of Goddard	12	567,838	0	0.00
City of El Dorado	41	2,179,755	0	0.00
Northwest Consolidated Fire District	17	982,781	0	0.00
City of Girard	9	393,560	0	0.00
City of Overland Park	131	7,328,071	0	0.00
City of Victoria	2	152,986	0	0.00
City of Burden	1	35,858	0	0.00
City of Augusta	25	1,405,337	0	0.00
Ottawa County			0	0.00
Total	7,303	524,808,793	685,758	

SECTION 6

HISTORICAL FUNDING AND OTHER INFORMATION

The actuarial 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 Entry Age Normal actuarial liability was determined as part of an actuarial valuation of the System as of December 31, 2016. The actuarial assumptions used in determining the actuarial liability can be found in Appendix C.

TABLE 18
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
HISTORICAL FUNDING INFORMATION
(All Groups Combined)

Schedule of Funding Progress
($ in thousands)

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Liability (AL) (b)	Unfunded AL (UAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAL as a Percent of Covered Payroll ((b-a)/c)
12/31/2003	$10,853,462	$14,439,546	$3,586,084	75%	$4,978,132	72%
12/31/2004	10,971,427	15,714,092	4,742,666	70%	5,102,016	93%
12/31/2005	11,339,293	16,491,762	5,152,469	69%	5,270,351	98%
12/31/2006	12,189,197	17,552,791	5,363,593	69%	5,599,193	96%
12/31/2007	13,433,115	18,984,915	5,551,800	71%	5,949,228	93%
12/31/2008	11,827,619	20,106,787	8,279,168	59%	6,226,526	133%
12/31/2009	13,461,221	21,138,206	7,676,985	64%	6,532,496	118%
12/31/2010	13,589,658	21,853,783	8,264,125	62%	6,494,048	127%
12/31/2011	13,379,020	22,607,170	9,228,150	59%	6,401,462	144%
12/31/2012	13,278,490	23,531,423	10,252,933	56%	6,498,962	158%
12/31/2013	14,562,765	24,328,670	9,765,906	60%	6,509,809	150%
12/31/2014	15,662,010	25,130,467	9,468,457	62%	6,560,105	144%
12/31/2015	17,408,578	25,947,781	8,539,203	67%	6,603,613	129%
12/31/2016	18,256,373	27,317,754	9,061,381	67%	6,650,451	136%

TABLE 19
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
HISTORICAL FUNDING INFORMATION
(All Groups Combined)

Schedule of Employer Contributions
For the Fiscal Year Ended June 30

Year	Actuarial Required Contribution	Percentage Contributed	
2001	$277,096,692	77.6%	
2002	289,519,647	79.7%	
2003	311,365,296	78.9%	
2004	317,900,432	74.0%	
2005	381,791,085	68.6%	
2006	471,424,006	63.4%	
2007	531,292,151	63.9%	
2008	607,662,300	65.1%	
2009	660,833,664	68.0%	
2010	682,062,413	72.1%	
2011	709,964,322	74.1%	
2012	843,361,836	67.4%	
2013	825,196,972	74.9%	
2014	842,285,931	79.4%	
2015	908,019,000	74.5%	
2016	891,638,000	80.9%	*

This information is as reported by KPERS. Cavanaugh Macdonald Consulting has relied on the accuracy of the numbers as provided and has not verified them.

* Includes the long-term receivable contribution of $97.4 million for the State/School group which was subsequently written off in FY 2017.

TABLE 20
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
HISTORICAL FUNDING INFORMATION

Historical Contribution Rates

Valuation Date	State/School Actuarial	State/School Statutory			Local Actuarial	Local Statutory	KP&F*	Judges*
12/31/2000	7.05%	4.58%			4.13%	3.07%	6.86%	16.67%
12/31/2001	7.69%	4.78%			4.64%	3.22%	9.47%	18.67%
12/31/2002	9.14%	5.27%			5.44%	3.41%	11.63%	21.97%
12/31/2003[1]	8.64%	5.77%			6.24%	3.81%	12.39%	19.11%
12/31/2004	10.37%	6.37%			7.69%	4.31%	13.32%	22.38%
12/31/2005	10.86%	6.97%			7.92%	4.93%	13.88%	22.08%
12/31/2006	10.98%	7.57%			8.12%	5.53%	13.49%	20.50%
12/31/2007	11.30%	8.17%			8.52%	6.14%	12.86%	19.49%
12/31/2008	14.09%	8.77%			10.42%	6.74%	17.88%	26.38%
12/31/2009	13.46%	9.37%			9.44%	7.34%	16.54%	23.75%
12/31/2010	13.83%	10.27%	(2)		9.43%	7.94%	17.26%	23.62%
12/31/2011	14.34%	11.27%/8.65%	(3)		9.77%	8.84%	19.92%	22.59%
12/31/2012	14.95%	10.91%	(4)	(5)	9.48%	9.48%	21.36%	23.98%
12/31/2013	14.85%	10.81%	(4)	(5)	9.18%	9.18%	20.42%	21.36%
12/31/2014	14.89%	12.01%			8.46%	8.46%	19.03%	15.89%
12/31/2015	13.23%	13.21%	(5)		8.39%	8.39%	20.09%	14.68%
12/31/2016	14.74%	14.41%			8.89%	8.89%	22.13%	18.65%

* KP&F and Judges contribute the full actuarial contribution rate.

(1) Actuarial cost method changed to Entry Age Normal for valuations on or after 12/31/2003.

(2) Recertified from 9.97% after passage of Sub HB 2333 in the 2012 session.

(3) 11.27% for the first half of the fiscal year. Reduced by the governor's allotment and SB 4 to 8.65% for the second half of the fiscal year.

(4) Recertified from 12.37% to 10.91% and 13.57% to 10.81% after passage of SB 228 in the 2015 session.

(5) Although the rates were not revised, the full contribution amounts were not made.

TABLE 21
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
PROJECTED BENEFIT PAYMENTS

Year	State	School	Local	Total KPERS	KP&F	Judges	Total
2017	$326,189,000	$924,842,000	$303,899,000	$1,554,930,000	$194,995,000	$13,940,000	$1,763,865,000
2018	334,967,000	962,081,000	320,000,000	1,617,048,000	202,656,000	14,074,000	1,833,778,000
2019	345,857,000	1,001,992,000	339,827,000	1,687,676,000	212,097,000	14,911,000	1,914,684,000
2020	354,183,000	1,039,517,000	355,711,000	1,749,411,000	221,240,000	15,484,000	1,986,135,000
2021	361,655,000	1,075,772,000	371,029,000	1,808,456,000	230,284,000	16,090,000	2,054,830,000
2022	370,451,000	1,112,682,000	389,816,000	1,872,949,000	240,017,000	16,650,000	2,129,616,000
2023	378,425,000	1,150,581,000	408,333,000	1,937,339,000	248,723,000	17,469,000	2,203,531,000
2024	385,534,000	1,188,211,000	427,023,000	2,000,768,000	259,191,000	18,141,000	2,278,100,000
2025	392,350,000	1,225,768,000	445,800,000	2,063,918,000	269,320,000	18,510,000	2,351,748,000
2026	398,248,000	1,262,949,000	463,987,000	2,125,184,000	279,561,000	19,023,000	2,423,768,000
2027	403,323,000	1,296,540,000	480,163,000	2,180,026,000	290,038,000	19,189,000	2,489,253,000
2028	406,598,000	1,329,457,000	495,271,000	2,231,326,000	299,141,000	19,333,000	2,549,800,000
2029	408,703,000	1,363,033,000	509,303,000	2,281,039,000	309,329,000	19,947,000	2,610,315,000
2030	410,114,000	1,393,657,000	522,078,000	2,325,849,000	319,534,000	19,794,000	2,665,177,000
2031	410,924,000	1,424,237,000	534,472,000	2,369,633,000	328,904,000	20,103,000	2,718,640,000
2032	410,980,000	1,454,092,000	546,024,000	2,411,096,000	338,125,000	20,079,000	2,769,300,000
2033	409,630,000	1,483,240,000	555,778,000	2,448,648,000	347,919,000	19,957,000	2,816,524,000
2034	407,600,000	1,509,989,000	564,861,000	2,482,450,000	357,233,000	19,753,000	2,859,436,000
2035	404,793,000	1,536,228,000	573,462,000	2,514,483,000	365,454,000	19,556,000	2,899,493,000
2036	401,213,000	1,562,152,000	580,251,000	2,543,616,000	374,190,000	19,303,000	2,937,109,000
2037	397,319,000	1,582,993,000	586,565,000	2,566,877,000	381,930,000	19,318,000	2,968,125,000
2038	392,573,000	1,601,069,000	590,872,000	2,584,514,000	388,907,000	18,611,000	2,992,032,000
2039	387,970,000	1,618,307,000	595,511,000	2,601,788,000	394,848,000	18,462,000	3,015,098,000
2040	382,362,000	1,628,163,000	597,519,000	2,608,044,000	400,158,000	18,035,000	3,026,237,000
2041	376,346,000	1,633,089,000	598,311,000	2,607,746,000	405,128,000	17,588,000	3,030,462,000

Note: Cash flows are the expected future non-discounted payments to current members. These numbers exclude refund payouts to current non-vested inactives and assume future retirees elect the normal form of payment and future withdrawals elect refunds according to valuation assumptions.

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HISTORICAL SUMMARY OF MEMBERS

The following tables display selected historical data for KPERS, KP&F and Judges as available.

KPERS

Valuation		Active Members						Number			
			Average								
Date December 31	Total Count	Number	Age	Entry Age	Service	Annual Pay ($)	Pay Increase	Deferred Disabled*	Inactives	Retired	Act/Ret Ratio
2000	222,968	137,086	44.2	34.1	10.1	30,307	N/A		34,667	51,215	2.68
2001	229,185	139,253	44.4	34.2	10.2	31,279	3.2%		37,175	52,757	2.64
2002	234,023	140,498	44.7	34.3	10.4	31,634	1.1%		39,420	54,105	2.60
2003	237,123	141,401	45.0	34.4	10.6	32,111	1.5%	2,933	37,280	55,509	2.55
2004	238,375	140,779	45.3	34.4	10.8	32,937	2.6%	3,004	37,191	57,401	2.45
2005	241,684	142,047	45.3	34.4	10.9	33,724	2.4%	3,099	37,015	59,523	2.39
2006	245,555	144,227	45.4	34.6	10.8	35,284	4.6%	3,007	36,513	61,808	2.33
2007	249,624	146,406	45.5	34.7	10.8	36,924	4.6%	2,911	37,140	63,167	2.32
2008	255,427	148,569	45.6	34.7	10.9	38,087	3.1%	2,823	37,567	66,468	2.24
2009	264,280	153,386	45.4	34.7	10.7	38,749	1.7%	2,781	39,212	68,901	2.23
2010	265,477	150,482	45.6	34.9	10.7	40,109	3.5%	2,749	40,122	72,124	2.09
2011	267,713	147,647	45.6	34.4	11.2	40,166	0.1%	2,711	41,358	75,997	1.94
2012	272,561	148,605	45.5	34.3	11.2	40,522	0.9%	2,575	41,991	79,390	1.87
2013	275,983	147,957	45.5	34.2	11.3	40,684	0.4%	2,436	43,660	81,930	1.81
2014	281,172	146,746	45.4	34.2	11.2	41,367	1.7%	2,340	46,503	85,583	1.71
2015	284,912	144,669	45.4	34.2	11.2	42,149	1.9%	2,210	49,488	88,545	1.63
2016	290,025	144,564	45.4	34.2	11.2	42,460	0.7%	2,051	52,140	91,270	1.58

*Prior to 2003, deferred disabled members were included in the Inactives count.

HISTORICAL SUMMARY OF MEMBERS
(continued)

KP&F

Valuation		Active Members						Number			
			Average								
Date December 31	Total Count	Number	Age	Entry Age	Service	Annual Pay ($)	Pay Increase	Deferred Disabled*	Inactives	Retired	Act/Ret Ratio
2000	10,083	6,258	38.1	27.7	10.4	44,511	N/A		794	3,031	2.06
2001	10,471	6,405	38.3	27.7	10.6	46,483	4.4%		855	3,211	1.99
2002	10,847	6,548	38.4	27.8	10.6	47,580	2.4%		961	3,338	1.96
2003	11,007	6,464	38.8	27.9	11.0	49,017	3.0%		1,087	3,456	1.87
2004	11,528	6,721	38.9	28.0	11.0	51,014	4.1%	187	1,062	3,558	1.89
2005	11,719	6,772	38.9	27.9	11.0	52,222	2.4%	194	1,099	3,654	1.85
2006	12,070	6,965	39.0	28.1	11.0	53,939	3.3%	186	1,134	3,785	1.84
2007	12,210	7,137	39.1	28.1	11.0	56,068	3.9%	175	1,143	3,755	1.90
2008	12,499	7,242	39.1	28.0	11.1	57,800	3.1%	173	1,175	3,909	1.85
2009	12,556	7,179	39.5	28.1	11.4	60,287	4.3%	181	1,136	4,060	1.77
2010	12,691	7,173	39.6	28.2	11.4	61,805	2.5%	181	1,169	4,168	1.72
2011	12,863	7,143	39.6	27.9	11.7	61,907	0.2%	197	1,208	4,315	1.66
2012	13,109	7,187	39.5	27.8	11.7	62,489	0.9%	203	1,194	4,525	1.59
2013	13,276	7,224	39.6	27.8	11.8	63,928	2.3%	208	1,174	4,670	1.55
2014	13,463	7,204	39.7	27.8	11.9	64,156	0.4%	210	1,196	4,853	1.48
2015	13,762	7,244	39.5	27.8	11.7	65,925	2.8%	210	1,243	5,065	1.43
2016	14,090	7,303	39.3	27.7	11.6	66,441	0.8%	204	1,351	5,232	1.40

*Prior to 2003, deferred disabled members were included in the Inactives count.

HISTORICAL SUMMARY OF MEMBERS
(continued)

JUDGES

Valuation		Active Members						Number		
			Average							
Date December 31	Total Count	Number	Age	Entry Age	Service	Annual Pay ($)	Pay Increase	Inactives	Retired	Act/Ret Ratio
2000	411	247	54.2	43.5	10.8	84,794		14	150	1.65
2001	417	252	54.4	43.9	10.5	85,625	1.0%	18	147	1.71
2002	417	248	55.0	43.9	11.1	86,116	0.6%	15	154	1.64
2003	424	250	55.1	43.8	11.3	86,770	0.8%	15	159	1.56
2004	435	251	55.5	43.9	11.6	88,761	2.3%	18	166	1.51
2005	444	254	55.7	44.1	11.6	90,585	2.1%	19	171	1.47
2006	447	257	56.2	44.2	11.9	96,743	6.8%	18	172	1.49
2007	455	261	56.6	44.8	11.8	101,732	5.2%	14	180	1.45
2008	463	262	57.1	45.2	11.9	104,159	2.4%	11	190	1.38
2009	483	266	57.1	45.6	11.5	105,709	1.5%	14	203	1.31
2010	480	264	57.8	45.7	12.1	107,019	1.2%	10	206	1.28
2011	486	264	58.1	45.5	12.6	109,387	2.2%	7	215	1.23
2012	494	261	58.3	46.0	12.3	107,584	(1.6)%	6	227	1.15
2013	514	265	57.8	46.1	11.7	107,364	(0.2)%	6	243	1.09
2014	516	253	58.2	46.3	11.9	108,411	1.0%	6	257	0.98
2015	526	262	58.4	46.4	12.0	108,166	(0.2%)	8	256	1.02
2016	533	252	58.1	46.5	11.6	107,633	(0.5%)	9	272	0.93

SUMMARY OF DATA FILE RECONCILIATION

The following table reconciles the data Cavanaugh Macdonald Consulting received from KPERS to the final membership counts used in the valuation.

Records on the in-pay data file	116,717
Removed deaths prior to 12/31/16	(19,981)
Records removed because the member has received all benefits or is not eligible for KPERS benefits	(580)
Removed certain periods ending within six months	(17)
Added new retirees from supplemental file	635
Records used in the valuation	96,774

Records on the not-in-pay data file	236,326
Records removed because the member has received all benefits or is not eligible for KPERS benefits	(27,871)
Records removed because the member began receiving benefits	(581)
Records used in the valuation	207,874

These records are allocated as follows:

	State	School	Local	KP&F	Judges
Active members	21,879	84,321	38,364	7,303	252
Inactive vested members	3,571	11,828	5,810	181	9
Inactive nonvested members	4,274	15,837	10,820	1,170	0
Deferred disabled members	632	825	594	204	0
Total	30,356	112,811	55,588	8,858	261
Retirees and beneficiaries	19,652	51,813	19,805	5,232	272
GRAND TOTAL	50,008	164,624	75,393	14,090	533

SUMMARY OF MEMBERSHIP DATA

KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
ACTIVE MEMBER DATA

	12/31/2016	12/31/2015	Change
State			
Number	21,879	22,117	(1.1%)
Tier 1	12,384	13,616	(9.0%)
Tier 2	5,878	6,624	(11.3%)
Tier 3	3,617	1,877	92.7%
Average Current Age	46.69	46.88	(0.4%)
Average Service	12.16	12.35	(1.5%)
Average Pay	$42,926	$42,963	(0.1%)
School			
Number	84,321	84,020	0.4%
Tier 1	45,149	48,343	(6.6%)
Tier 2	22,981	26,646	(13.8%)
Tier 3	16,191	9,031	79.3%
Average Current Age	45.02	44.99	0.1%
Average Service	11.34	11.33	0.1%
Average Pay	$41,152	$40,809	0.8%
State/School			
Number	106,200	106,137	0.1%
Tier 1	57,533	61,959	(7.1%)
Tier 2	28,859	33,270	(13.3%)
Tier 3	19,808	10,908	81.6%
Average Current Age	45.36	45.38	(0.0%)
Average Service	11.51	11.54	(0.3%)
Average Pay	$41,517	$41,258	0.6%
Local			
Number	38,364	38,532	(0.4%)
Tier 1	19,476	21,183	(8.1%)
Tier 2	10,185	12,132	(16.0%)
Tier 3	8,703	5,217	66.8%
Average Current Age	45.37	45.31	0.1%
Average Service	10.27	10.22	0.5%
Average Pay	$45,068	$44,604	1.0%

SUMMARY OF MEMBERSHIP DATA

KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
ACTIVE MEMBER DATA

	12/31/2016	12/31/2015	Change
KPERS Total			
Number	144,564	144,669	(0.1%)
Tier 1	77,009	83,142	(7.4%)
Tier 2	39,044	45,402	(14.0%)
Tier 3	28,511	16,125	76.8%
Average Current Age	45.37	45.36	0.0%
Average Service	11.18	11.19	(0.1%)
Average Pay	$42,460	$42,149	0.7%
KP&F			
Number	7,303	7,244	0.8%
Tier 1	149	200	(25.5%)
Tier 2	7,154	7,044	1.6%
Average Current Age	39.34	39.45	(0.3%)
Average Service	11.58	11.69	(0.9%)
Average Pay	$66,441	$65,925	0.8%
Judges			
Number	252	262	(3.8%)
Average Current Age	58.14	58.44	(0.5%)
Average Service	11.59	11.97	(3.2%)
Average Pay	$107,633	$108,166	(0.5%)
System Total			
Number	152,119	152,175	(0.0%)
Average Current Age	45.10	45.11	(0.0%)
Average Service	11.20	11.22	(0.2%)
Average Pay	$43,719	$43,395	0.7%

SUMMARY OF MEMBERSHIP DATA

KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
INACTIVE MEMBER DATA

	12/31/2016	12/31/2015	Change
State			
inactive vested	3,571	3,422	4.4%
inactive nonvested	4,274	3,860	10.7%
deferred disabled	632	696	(9.2%)
School			
inactive vested	11,828	11,594	2.0%
inactive nonvested	15,837	14,857	6.6%
deferred disabled	825	870	(5.2%)
Local			
inactive vested	5,810	5,567	4.4%
inactive nonvested	10,820	10,188	6.2%
deferred disabled	594	644	(7.8%)
KPERS Total			
inactive vested	21,209	20,583	3.0%
inactive nonvested	30,931	28,905	7.0%
deferred disabled	2,051	2,210	(7.2%)
KP&F			
inactive vested	181	153	18.3%
inactive nonvested	1,170	1,090	7.3%
deferred disabled	204	210	(2.9%)
Judges			
inactive vested	9	8	12.5%
inactive nonvested	0	0	0.0%
deferred disabled	0	0	0.0%
System Total			
inactive vested	21,399	20,744	3.2%
inactive nonvested	32,101	29,995	7.0%
deferred disabled	2,255	2,420	(6.8%)

SUMMARY OF MEMBERSHIP DATA

KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
RETIREE MEMBER DATA

	12/31/2016	12/31/2015	Change
State			
Number	17,700	17,401	1.7%
Average Benefit	$14,596	$14,318	1.9%
Average Age	72.07	72.00	0.1%
School			
Number	49,108	47,589	3.2%
Average Benefit	$15,504	$15,252	1.7%
Average Age	72.01	71.86	0.2%
Local			
Number	17,849	17,148	4.1%
Average Benefit	$12,214	$11,815	3.4%
Average Age	71.85	71.83	0.0%
KPERS Total			
Number	84,657	82,138	3.1%
Average Benefit	$14,620	$14,337	2.0%
Average Age	71.99	71.88	0.2%
KP&F			
Number	4,306	4,146	3.9%
Average Benefit	$35,848	$34,751	3.2%
Average Age	64.74	64.50	0.4%
Judges			
Number	211	195	8.2%
Average Benefit	$44,603	$43,117	3.4%
Average Age	74.24	74.18	0.1%
System Total			
Number	89,174	86,479	3.1%
Average Benefit	$15,716	$15,381	2.2%
Average Age	71.65	71.53	0.2%

SUMMARY OF MEMBERSHIP DATA

KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
BENEFICIARY MEMBER DATA

	12/31/2016	12/31/2015	Change
State			
Number	1,952	1,910	2.2%
Average Benefit	$9,175	$9,045	1.4%
Average Age	76.64	76.47	0.2%
School			
Number	2,705	2,599	4.1%
Average Benefit	$9,246	$9,070	1.9%
Average Age	76.15	75.95	0.3%
Local			
Number	1,956	1,898	3.1%
Average Benefit	$7,388	$7,222	2.3%
Average Age	74.69	74.44	0.3%
KPERS Total			
Number	6,613	6,407	3.2%
Average Benefit	$8,675	$8,515	1.9%
Average Age	75.86	75.66	0.3%
KP&F			
Number	926	919	0.8%
Average Benefit	$17,030	$16,532	3.0%
Average Age	68.16	67.31	1.3%
Judges			
Number	61	61	0.0%
Average Benefit	$30,509	$30,844	(1.1%)
Average Age	77.48	76.62	1.1%
System Total			
Number	7,600	7,387	2.9%
Average Benefit	$9,868	$9,697	1.8%
Average Age	74.93	74.63	0.4%

SUMMARY OF MEMBERSHIP DATA

KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
RETIREE AND BENEFICIARY MEMBER DATA

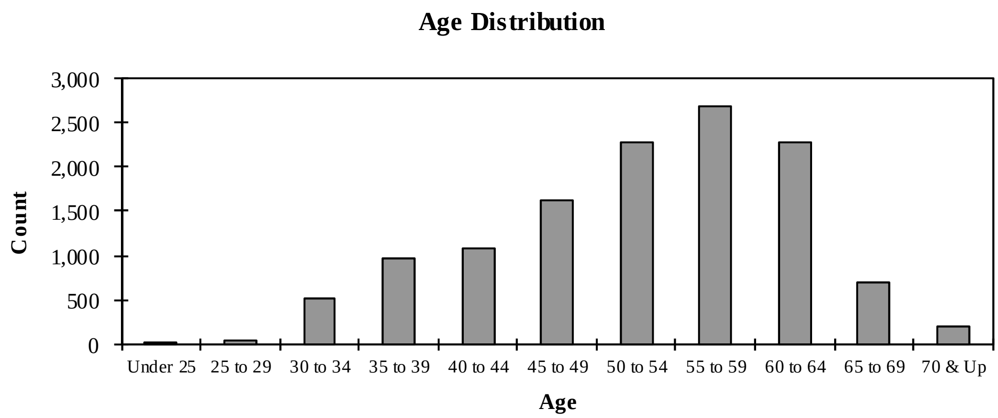
	12/31/2016	12/31/2015	Change
State			
Number	19,652	19,311	1.8%
Average Benefit	$14,058	$13,797	1.9%
Average Age	72.52	72.44	0.1%
School			
Number	51,813	50,188	3.2%
Average Benefit	$15,177	$14,932	1.6%
Average Age	72.22	72.07	0.2%
Local			
Number	19,805	19,046	4.0%
Average Benefit	$11,737	$11,357	3.3%
Average Age	72.13	72.09	0.1%
KPERS Total			
Number	91,270	88,545	3.1%
Average Benefit	$14,190	$13,915	2.0%
Average Age	72.27	72.15	0.2%
KP&F			
Number	5,232	5,065	3.3%
Average Benefit	$32,517	$31,445	3.4%
Average Age	65.35	65.01	0.5%
Judges			
Number	272	256	6.3%
Average Benefit	$41,442	$40,192	3.1%
Average Age	74.97	74.77	0.3%
System Total			
Number	96,774	93,866	3.1%
Average Benefit	$15,257	$14,933	2.2%
Average Age	71.90	71.77	0.2%

KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF ACTIVE MEMBERS
as of December 31, 2016

STATE - Tier 1*

	Service									
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & Up	Total
Under 25	0	1	0	0	0	0	0	0	0	1
25 to 29	0	46	1	0	0	0	0	0	0	47
30 to 34	0	357	152	2	0	0	0	0	0	511
35 to 39	1	361	456	141	1	0	0	0	0	960
40 to 44	1	239	391	396	63	1	0	0	0	1,091
45 to 49	3	242	381	484	392	119	5	0	0	1,626
50 to 54	10	227	399	407	421	546	254	9	0	2,273
55 to 59	18	290	399	479	403	493	382	225	6	2,695
60 to 64	9	237	377	383	341	344	272	259	61	2,283
65 to 69	3	99	124	107	95	102	66	49	56	701
70 & Up	0	27	38	32	28	30	15	13	13	196
Total	45	2,126	2,718	2,431	1,744	1,635	994	555	136	12,384

* Closed effective July 1, 2009.

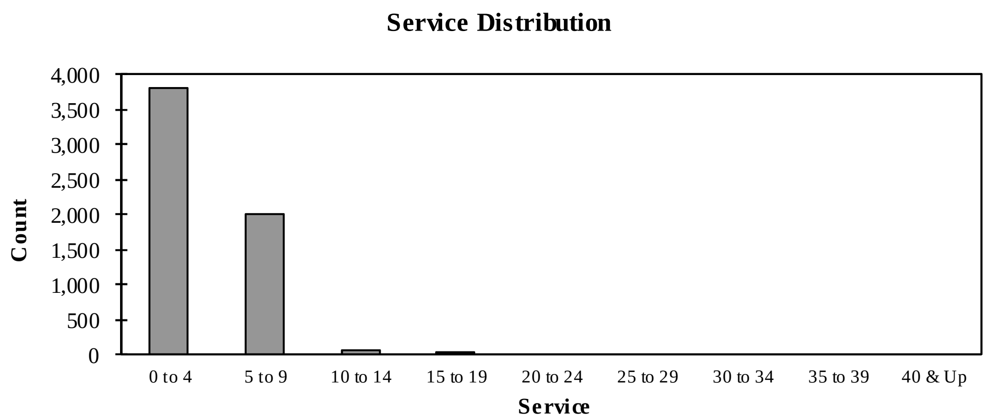


KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF ACTIVE MEMBERS
as of December 31, 2016

STATE - Tier 2*

	Service									
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & Up	Total
Under 25	460	4	0	0	0	0	0	0	0	464
25 to 29	769	203	0	0	0	0	0	0	0	972
30 to 34	629	359	1	0	0	0	0	0	0	989
35 to 39	428	305	7	0	0	0	0	0	0	740
40 to 44	327	215	4	1	0	0	0	0	0	547
45 to 49	322	211	9	0	0	0	0	0	0	542
50 to 54	334	216	7	1	0	0	0	0	0	558
55 to 59	291	210	12	5	0	0	0	0	0	518
60 to 64	174	188	10	2	0	0	0	0	0	374
65 to 69	51	90	2	0	0	0	0	0	0	143
70 & Up	18	13	0	0	0	0	0	0	0	31
Total	3,803	2,014	52	9	0	0	0	0	0	5,878

* Effective date of Tier 2 was July 1, 2009. Closed effective January 1, 2015.

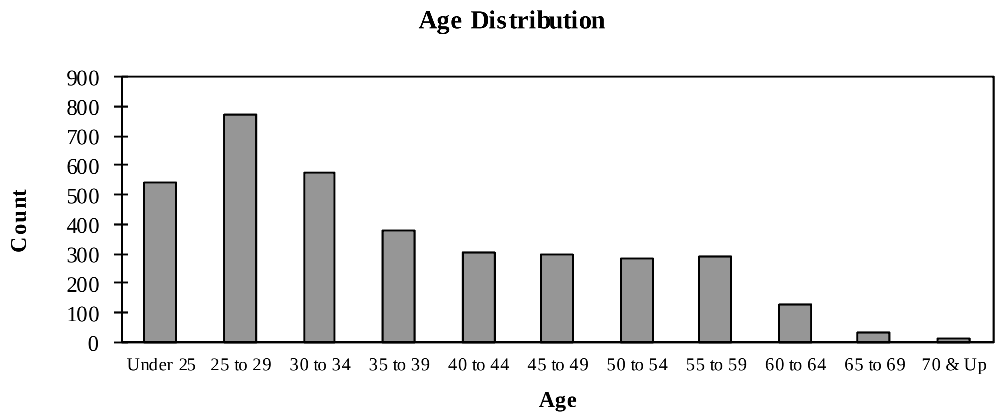


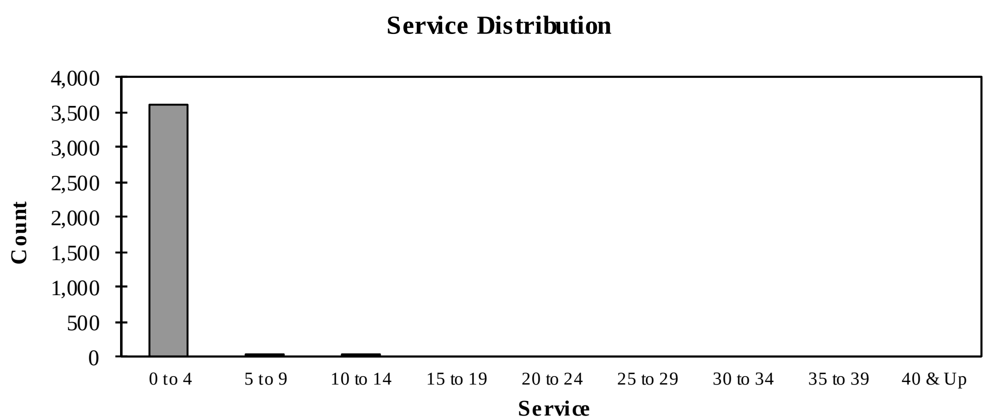
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF ACTIVE MEMBERS
as of December 31, 2016

STATE - Tier 3*

	Service									
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & Up	Total
Under 25	541	0	0	0	0	0	0	0	0	541
25 to 29	769	0	0	0	0	0	0	0	0	769
30 to 34	573	0	0	0	0	0	0	0	0	573
35 to 39	376	4	0	0	0	0	0	0	0	380
40 to 44	301	2	0	0	0	0	0	0	0	303
45 to 49	297	2	0	0	0	0	0	0	0	299
50 to 54	281	4	0	0	0	0	0	0	0	285
55 to 59	289	0	1	0	0	0	0	0	0	290
60 to 64	128	1	0	0	0	0	0	0	0	129
65 to 69	35	0	0	0	0	0	0	0	0	35
70 & Up	13	0	0	0	0	0	0	0	0	13
Total	3,603	13	1	0	0	0	0	0	0	3,617

* Effective date of Tier 3 was January 1, 2015



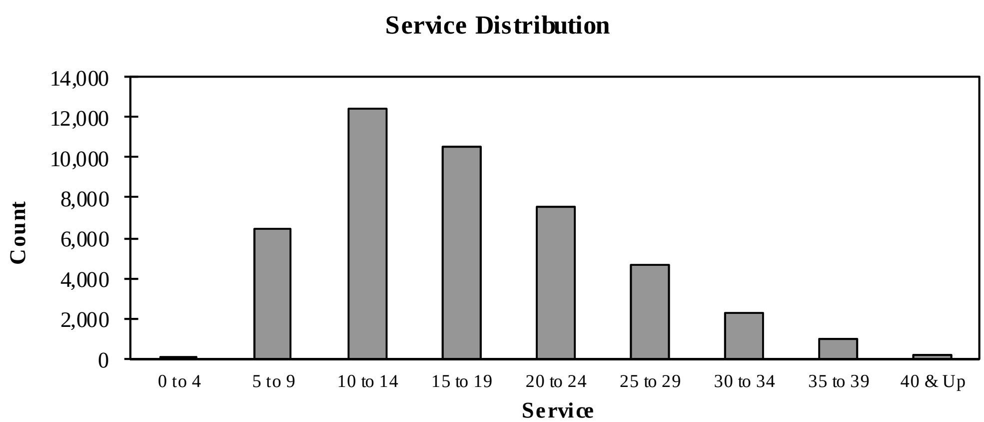


KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF ACTIVE MEMBERS
as of December 31, 2016

SCHOOL - Tier 1*

	Service									
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & Up	Total
Under 25	1	2	2	0	0	0	0	0	0	5
25 to 29	2	79	15	0	0	0	0	0	0	96
30 to 34	4	1,587	991	8	0	0	0	0	0	2,590
35 to 39	0	886	3,306	744	5	0	0	0	0	4,941
40 to 44	5	810	1,646	2,710	444	0	0	0	0	5,615
45 to 49	2	852	1,677	1,762	2,264	386	5	0	0	6,948
50 to 54	1	753	1,750	1,676	1,509	1,956	473	10	0	8,128
55 to 59	4	688	1,549	1,939	1,655	1,255	1,191	351	1	8,633
60 to 64	3	480	994	1,230	1,286	766	409	498	96	5,762
65 to 69	1	230	360	369	304	266	136	85	100	1,851
70 & Up	0	110	150	118	81	44	36	18	23	580
Total	23	6,477	12,440	10,556	7,548	4,673	2,250	962	220	45,149

* Closed effective July 1, 2009.



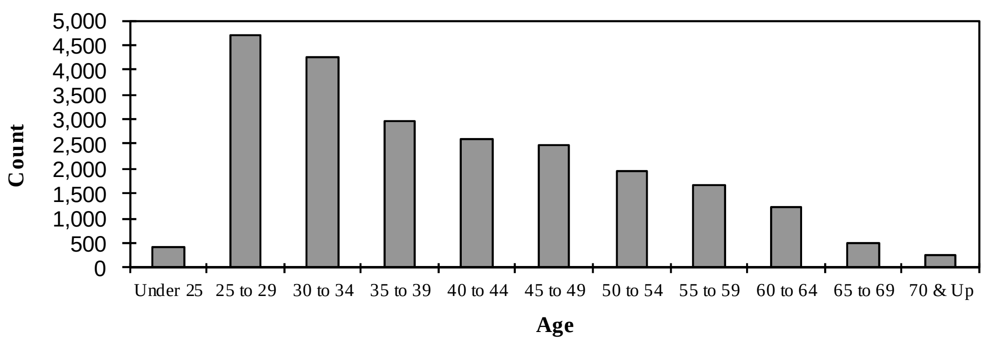
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF ACTIVE MEMBERS
as of December 31, 2016

SCHOOL - Tier 2*

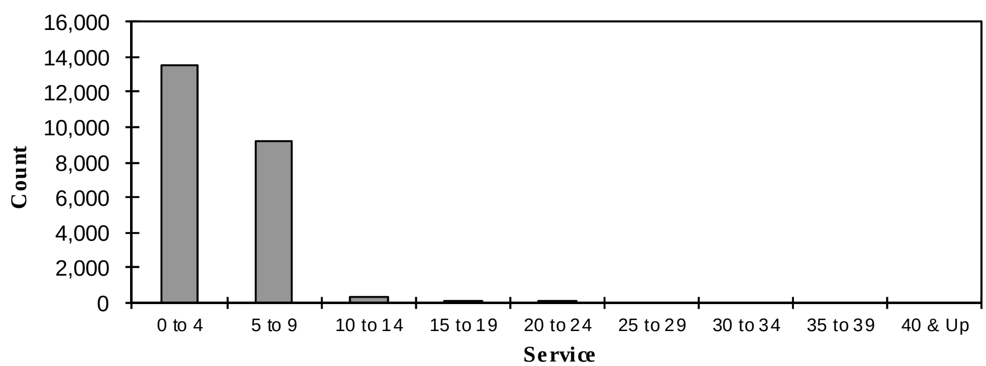
	Service									
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & Up	Total
Under 25	388	11	0	0	0	0	0	0	0	399
25 to 29	3,565	1,151	0	0	0	0	0	0	0	4,716
30 to 34	1,992	2,241	17	0	0	0	0	0	0	4,250
35 to 39	1,660	1,210	75	1	0	0	0	0	0	2,946
40 to 44	1,467	1,040	74	14	0	0	0	0	0	2,595
45 to 49	1,355	1,085	40	5	0	0	0	0	0	2,485
50 to 54	1,047	845	46	7	0	0	0	0	0	1,945
55 to 59	906	720	36	6	0	0	0	0	0	1,668
60 to 64	682	515	12	6	1	0	0	0	0	1,216
65 to 69	294	213	6	0	0	0	0	0	0	513
70 & Up	134	113	1	0	0	0	0	0	0	248
Total	13,490	9,144	307	39	1	0	0	0	0	22,981

* Effective date of Tier 2 was July 1, 2009. Closed effective January 1, 2015.

Age Distribution



Service Distribution

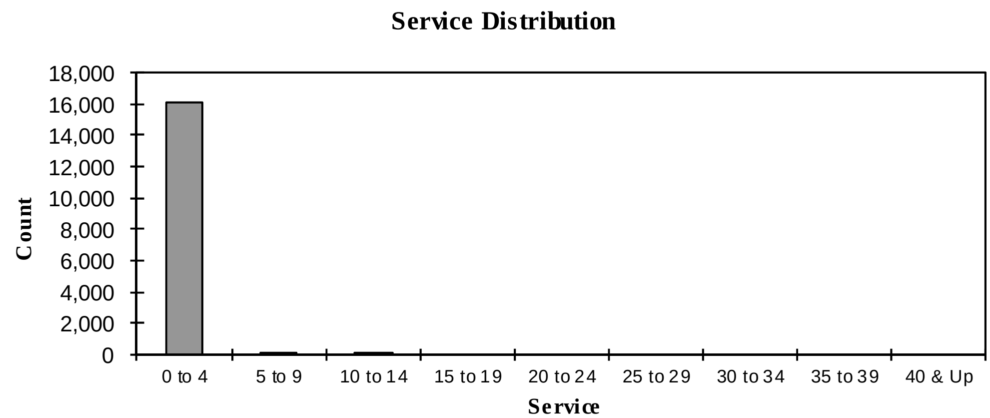


KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF ACTIVE MEMBERS
as of December 31, 2016

SCHOOL - Tier 3*

	Service									
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & Up	Total
Under 25	2,864	0	0	0	0	0	0	0	0	2,864
25 to 29	3,287	13	0	0	0	0	0	0	0	3,300
30 to 34	2,172	25	0	0	0	0	0	0	0	2,197
35 to 39	1,930	9	0	0	0	0	0	0	0	1,939
40 to 44	1,535	6	1	0	0	0	0	0	0	1,542
45 to 49	1,308	14	0	0	0	0	0	0	0	1,322
50 to 54	1,056	9	0	0	0	0	0	0	0	1,065
55 to 59	935	8	0	0	0	0	0	0	0	943
60 to 64	613	3	0	0	0	0	0	0	0	616
65 to 69	276	3	0	0	0	0	0	0	0	279
70 & Up	124	0	0	0	0	0	0	0	0	124
Total	16,100	90	1	0	0	0	0	0	0	16,191

* Effective date of Tier 3 was January 1, 2015

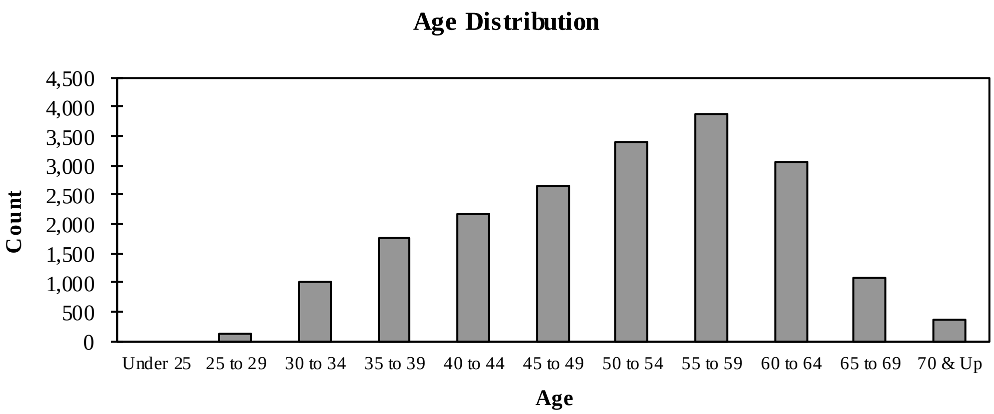


KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF ACTIVE MEMBERS
as of December 31, 2016

LOCAL - Tier 1*

Age	Service 0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & Up	Total
Under 25	0	0	0	0	0	0	0	0	0	0
25 to 29	0	128	3	0	0	0	0	0	0	131
30 to 34	2	698	296	5	0	0	0	0	0	1,001
35 to 39	4	633	857	260	1	0	0	0	0	1,755
40 to 44	2	494	782	732	162	0	0	0	0	2,172
45 to 49	1	448	745	733	546	173	2	0	0	2,648
50 to 54	2	491	692	761	637	606	211	11	0	3,411
55 to 59	2	443	744	822	695	592	386	195	4	3,883
60 to 64	1	379	635	622	554	380	249	167	55	3,042
65 to 69	0	155	257	212	159	129	81	41	38	1,072
70 & Up	0	76	78	79	48	30	19	13	18	361
Total	14	3,945	5,089	4,226	2,802	1,910	948	427	115	19,476

* Closed effective July 1, 2009.



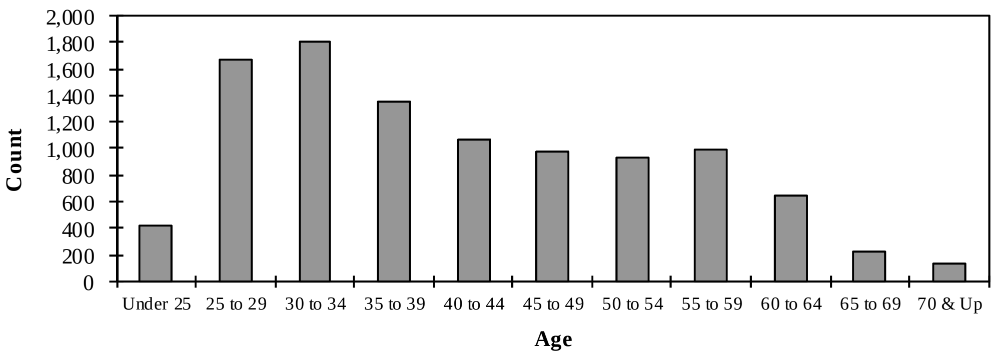
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF ACTIVE MEMBERS
as of December 31, 2016

LOCAL - Tier 2*

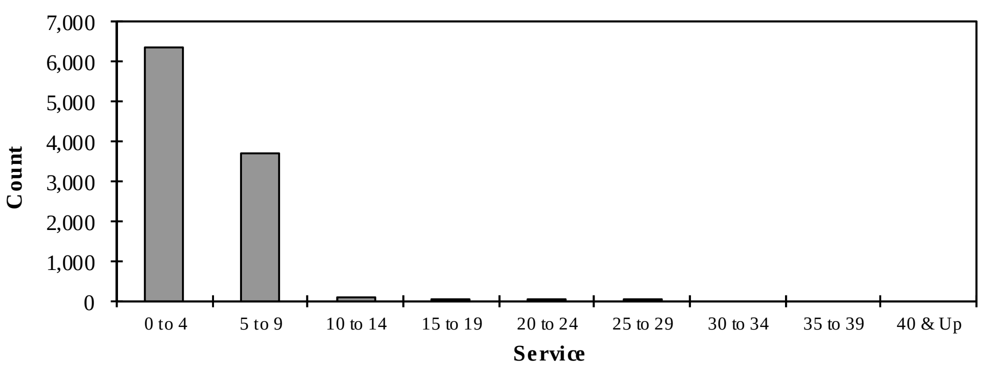
	Service									
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & Up	Total
Under 25	398	21	0	0	0	0	0	0	0	419
25 to 29	1,242	426	0	0	0	0	0	0	0	1,668
30 to 34	1,078	716	4	0	0	0	0	0	0	1,798
35 to 39	829	505	11	1	0	0	0	0	0	1,346
40 to 44	662	385	16	1	1	0	0	0	0	1,065
45 to 49	582	383	16	1	0	0	0	0	0	982
50 to 54	553	357	12	3	0	0	0	0	0	925
55 to 59	541	437	7	0	0	0	0	0	0	985
60 to 64	322	316	8	2	1	2	0	0	0	651
65 to 69	100	112	6	1	0	0	0	0	0	219
70 & Up	66	58	3	0	0	0	0	0	0	127
Total	6,373	3,716	83	9	2	2	0	0	0	10,185

* Effective date of Tier 2 was July 1, 2009. Closed effective January 1, 2015.

Age Distribution



Service Distribution



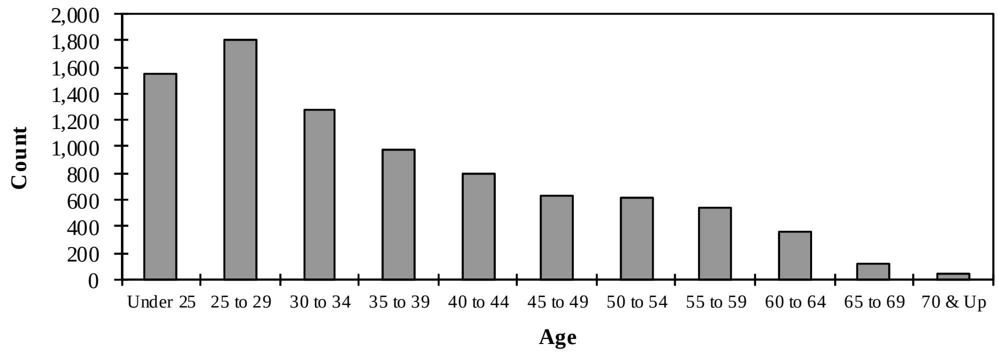
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF ACTIVE MEMBERS
as of December 31, 2016

LOCAL - Tier 3*

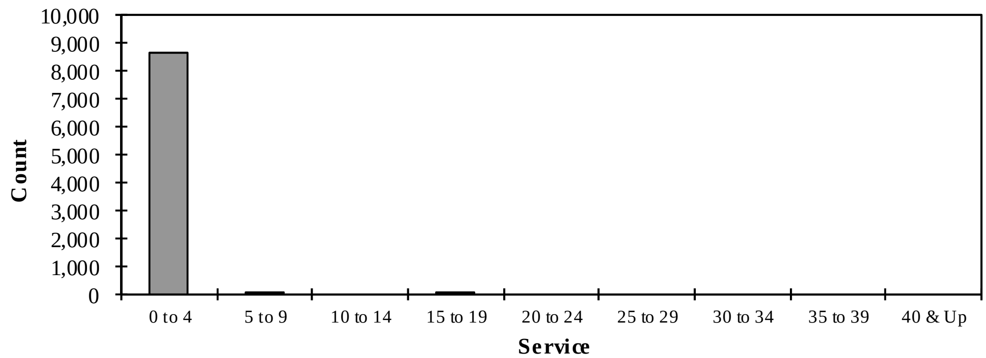
	Service									
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & Up	Total
Under 25	1,556	0	0	0	0	0	0	0	0	1,556
25 to 29	1,796	3	0	0	0	0	0	0	0	1,799
30 to 34	1,268	11	0	0	0	0	0	0	0	1,279
35 to 39	968	8	0	0	0	0	0	0	0	976
40 to 44	783	7	0	0	0	0	0	0	0	790
45 to 49	622	3	0	0	0	0	0	0	0	625
50 to 54	610	0	0	0	0	0	0	0	0	610
55 to 59	544	3	0	0	0	0	0	0	0	547
60 to 64	356	3	0	0	0	0	0	0	0	359
65 to 69	114	0	0	1	0	0	0	0	0	115
70 & Up	47	0	0	0	0	0	0	0	0	47
Total	8,664	38	0	1	0	0	0	0	0	8,703

* Effective date of Tier 3 was January 1, 2015

Age Distribution



Service Distribution

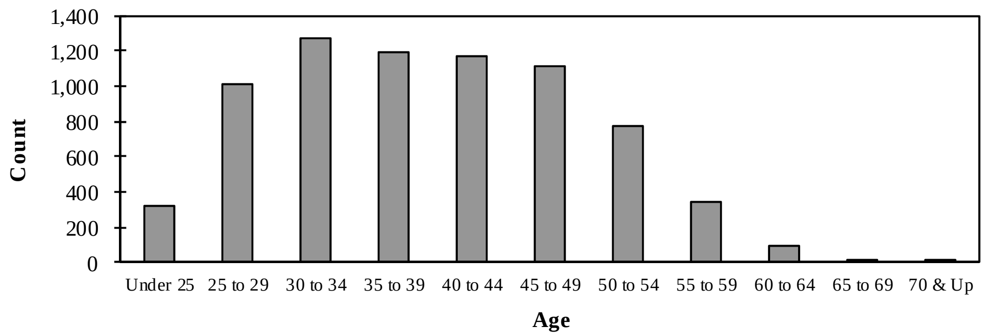


KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF ACTIVE MEMBERS
as of December 31, 2016

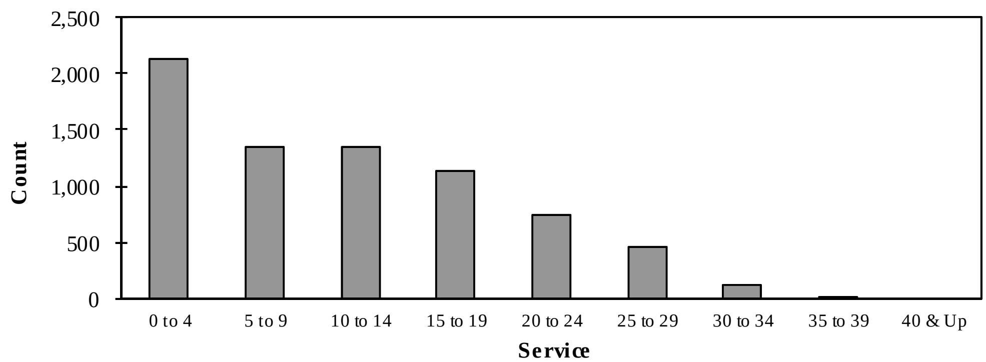
KP&F

	Service									
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & Up	Total
Under 25	320	0	0	0	0	0	0	0	0	320
25 to 29	838	168	0	0	0	0	0	0	0	1,006
30 to 34	516	557	196	0	0	0	0	0	0	1,269
35 to 39	214	306	529	146	1	0	0	0	0	1,196
40 to 44	116	163	300	469	118	0	0	0	0	1,166
45 to 49	67	81	176	312	356	122	2	0	0	1,116
50 to 54	30	44	93	125	187	234	62	0	0	775
55 to 59	27	20	36	62	67	84	44	2	0	342
60 to 64	4	8	17	19	7	22	11	4	0	92
65 to 69	1	2	7	2	1	3	2	1	0	19
70 & Up	0	0	1	0	0	0	0	1	0	2
Total	2,133	1,349	1,355	1,135	737	465	121	8	0	7,303

Age Distribution



Service Distribution

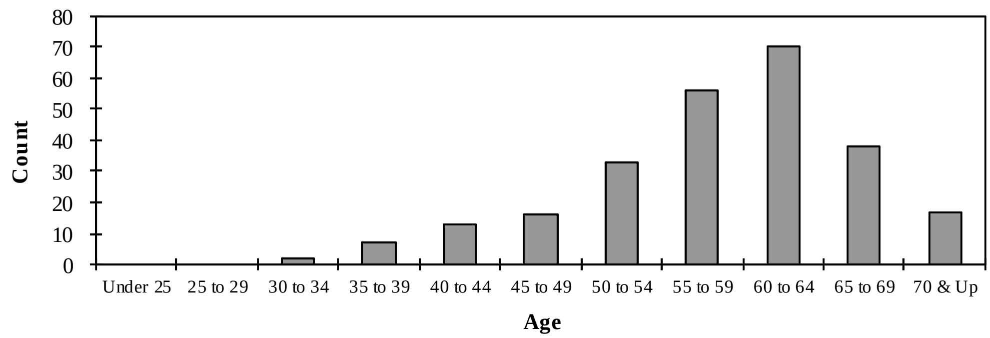


KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF ACTIVE MEMBERS
as of December 31, 2016

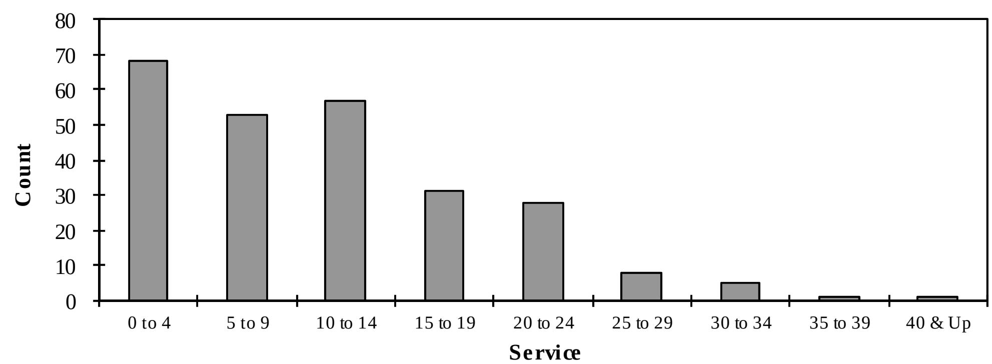
JUDGES

	Service									
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & Up	Total
Under 25	0	0	0	0	0	0	0	0	0	0
25 to 29	0	0	0	0	0	0	0	0	0	0
30 to 34	2	0	0	0	0	0	0	0	0	2
35 to 39	6	1	0	0	0	0	0	0	0	7
40 to 44	9	3	0	0	1	0	0	0	0	13
45 to 49	10	4	2	0	0	0	0	0	0	16
50 to 54	13	12	7	1	0	0	0	0	0	33
55 to 59	11	12	21	8	3	1	0	0	0	56
60 to 64	9	17	14	12	12	4	2	0	0	70
65 to 69	7	3	9	7	8	2	1	1	0	38
70 & Up	1	1	4	3	4	1	2	0	1	17
Total	68	53	57	31	28	8	5	1	1	252

Age Distribution



Service Distribution



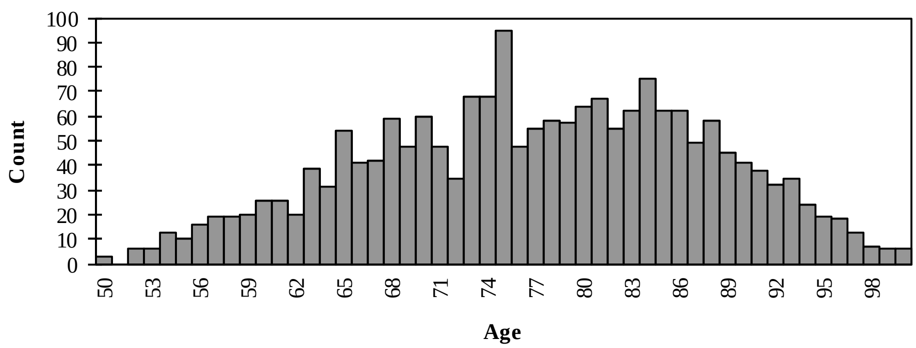
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF RETIREES AND BENEFICIARIES
as of December 31, 2016

STATE

Retirees

Count:	17,700	Average age:	72.1	Average benefit:	$14,596

Beneficiaries

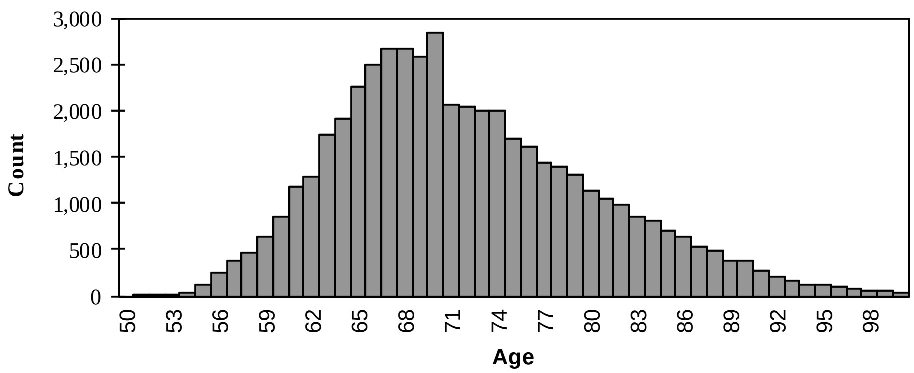


Count:	1,952	Average age:	76.6	Average benefit:	$9,175

KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF RETIREES AND BENEFICIARIES
as of December 31, 2016

SCHOOL

Retirees



Count: 49,108 Average age: 72.0 Average benefit: $15,504

Beneficiaries

Count: 2,705 Average age: 76.2 Average benefit: $9,246

KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF RETIREES AND BENEFICIARIES
as of December 31, 2016

LOCAL

Retirees

Count: 17,849 Average age: 71.9 Average benefit: $12,214

Beneficiaries

Count: 1,956 Average age: 74.7 Average benefit: $7,388

KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF RETIREES AND BENEFICIARIES
as of December 31, 2016

TOTAL KPERS

Retirees

Count:	84,657	Average age:	72.0	Average benefit:	$14,620

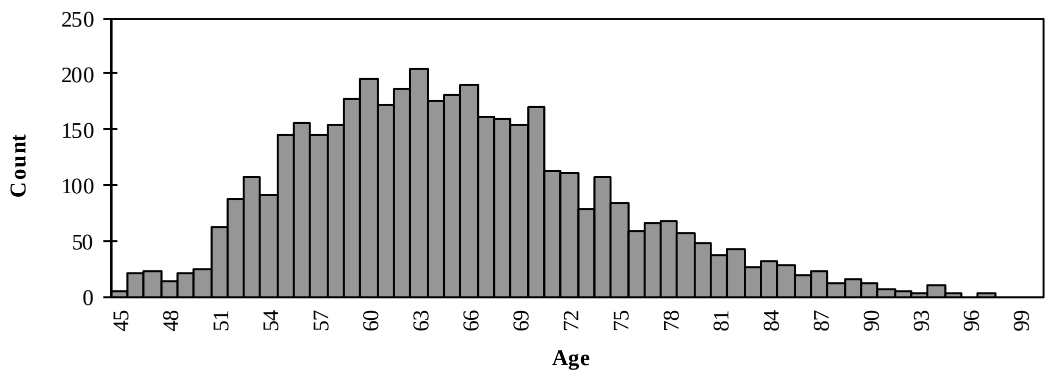
Beneficiaries

Count:	6,613	Average age:	75.9	Average benefit:	$8,675

KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF RETIREES AND BENEFICIARIES
as of December 31, 2016

KP&F

Retirees



Count:	4,306	Average age:	64.7	Average benefit:	$35,848

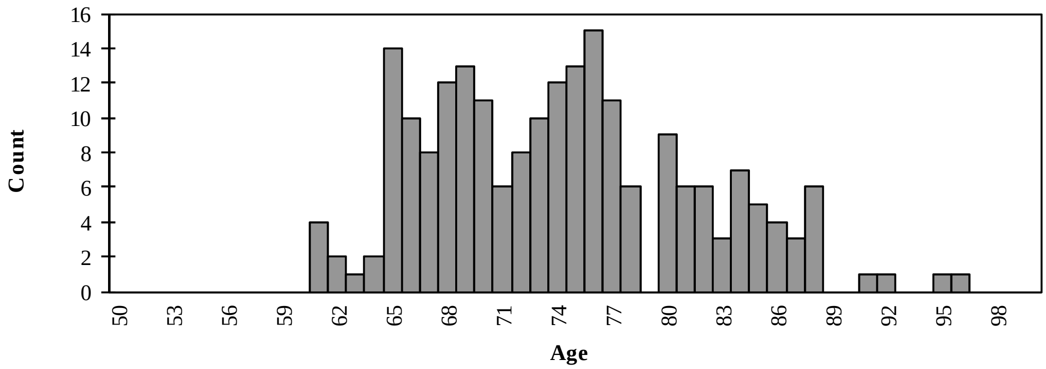
Beneficiaries

Count:	926	Average age:	68.2	Average benefit:	$17,030

KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF RETIREES AND BENEFICIARIES
as of December 31, 2016

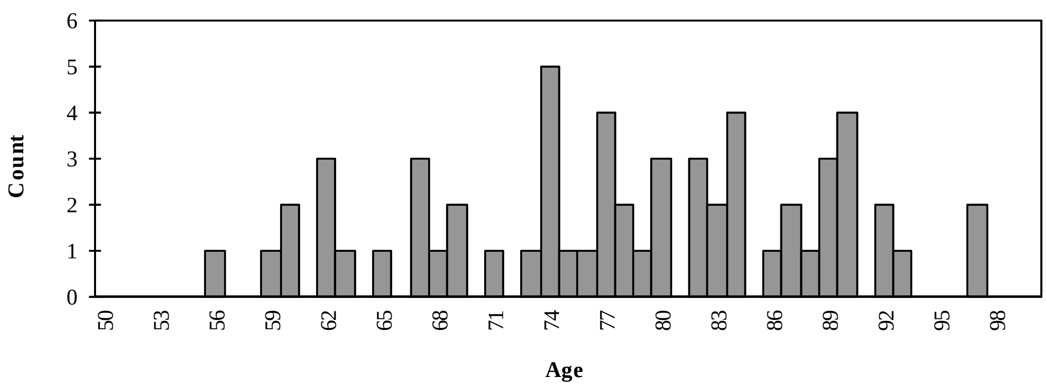
JUDGES

Retirees



Count: 211 Average age: 74.2 Average benefit: $44,603

Beneficiaries

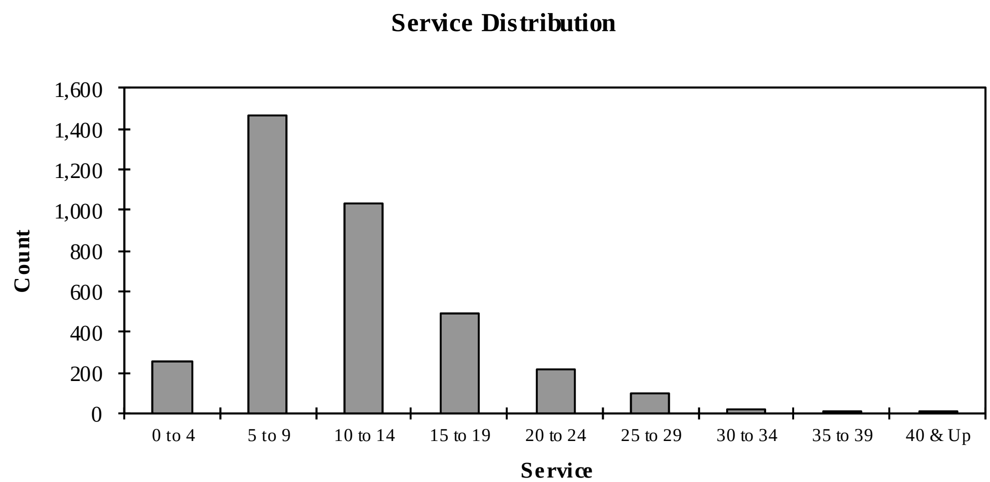


Count: 61 Average age: 77.5 Average benefit: $30,509

KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF INACTIVE VESTED MEMBERS
as of December 31, 2016

STATE

	Service									
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & Up	Total
Under 25	1	0	0	0	0	0	0	0	0	1
25 to 29	5	41	0	0	0	0	0	0	0	46
30 to 34	63	211	16	0	0	0	0	0	0	290
35 to 39	41	276	81	6	0	0	0	0	0	404
40 to 44	32	196	124	34	0	0	0	0	0	386
45 to 49	19	185	188	82	40	5	1	0	0	520
50 to 54	14	177	245	139	71	30	3	0	0	679
55 to 59	16	177	212	145	65	44	4	1	0	664
60 to 64	22	149	139	68	29	9	4	1	1	422
65 to 69	20	46	18	17	10	7	2	5	1	126
70 & Up	19	4	6	1	2	0	0	1	0	33
Total	252	1,462	1,029	492	217	95	14	8	2	3,571

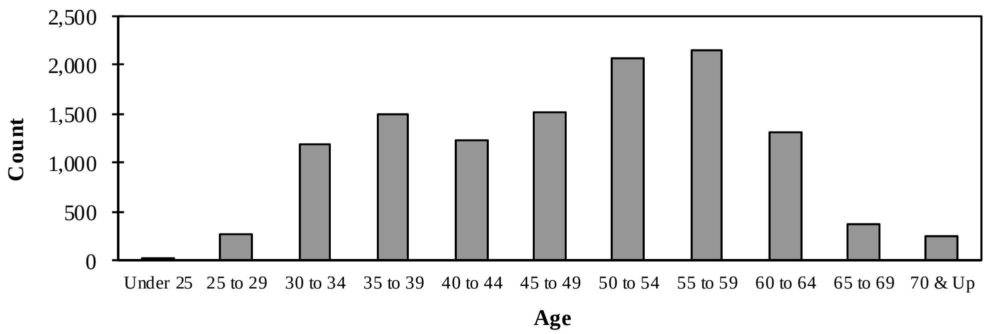


KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF INACTIVE VESTED MEMBERS
as of December 31, 2016

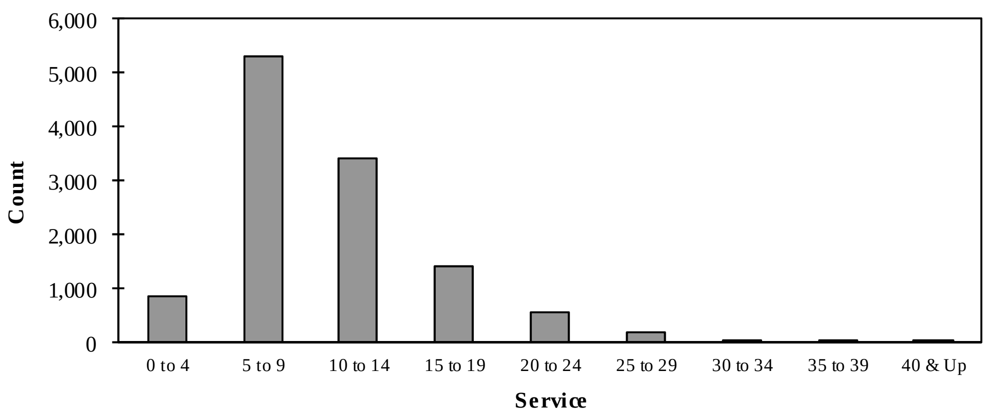
SCHOOL

	Service									
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & Up	Total
Under 25	3	3	0	0	0	0	0	0	0	6
25 to 29	66	190	1	0	0	0	0	0	0	257
30 to 34	125	1,000	68	0	0	0	0	0	0	1,193
35 to 39	90	1,001	373	24	0	0	0	0	0	1,488
40 to 44	70	531	439	186	9	0	0	0	0	1,235
45 to 49	86	611	510	215	88	9	0	0	0	1,519
50 to 54	62	668	746	327	187	69	4	0	0	2,063
55 to 59	59	652	734	413	194	83	9	1	0	2,145
60 to 64	42	514	453	205	69	18	7	3	0	1,311
65 to 69	98	113	90	33	18	9	1	6	2	370
70 & Up	167	37	22	9	5	1	0	0	0	241
Total	868	5,320	3,436	1,412	570	189	21	10	2	11,828

Age Distribution



Service Distribution

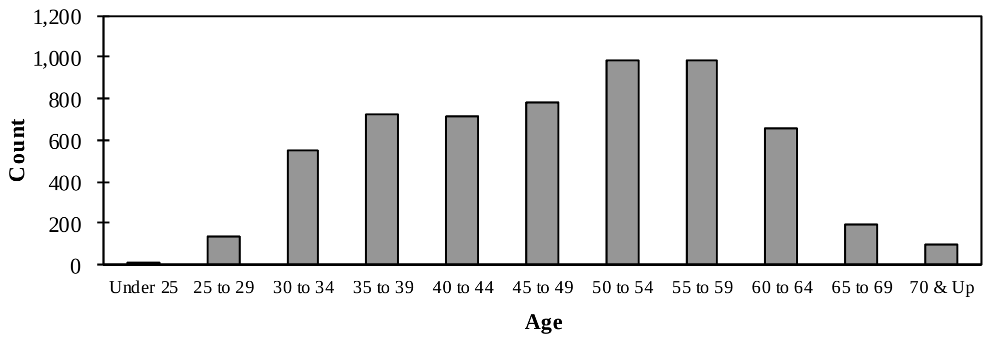


KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF INACTIVE VESTED MEMBERS
as of December 31, 2016

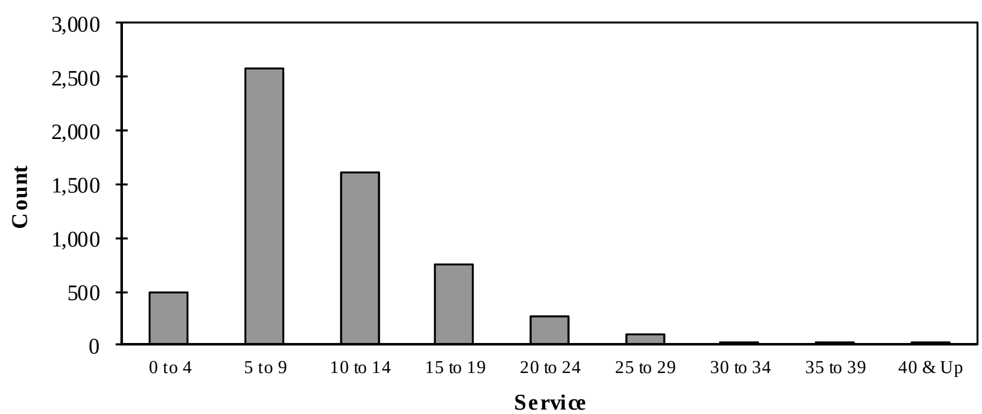
LOCAL

	Service									
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & Up	Total
Under 25	4	4	0	0	0	0	0	0	0	8
25 to 29	43	90	0	0	0	0	0	0	0	133
30 to 34	93	413	43	1	0	0	0	0	0	550
35 to 39	60	492	156	11	0	0	0	0	0	719
40 to 44	32	340	230	104	11	0	0	0	0	717
45 to 49	22	292	274	144	41	6	0	0	0	779
50 to 54	33	300	330	184	99	29	6	1	0	982
55 to 59	47	288	328	192	84	38	5	2	0	984
60 to 64	37	281	195	84	35	17	1	3	0	653
65 to 69	56	59	38	28	2	2	4	0	2	191
70 & Up	57	19	10	4	2	2	0	0	0	94
Total	484	2,578	1,604	752	274	94	16	6	2	5,810

Age Distribution



Service Distribution

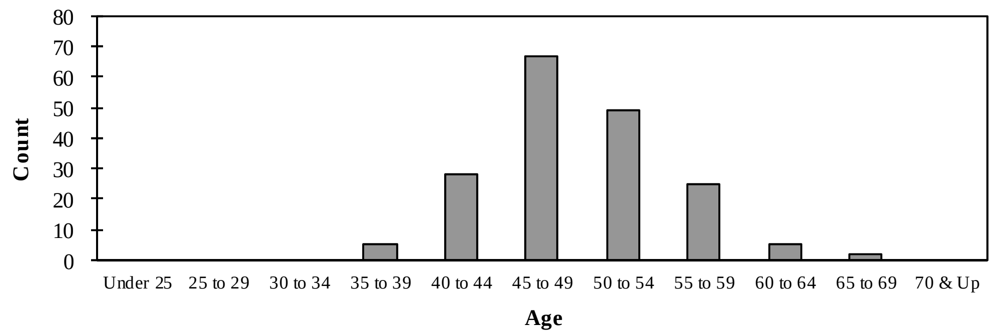


KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF INACTIVE VESTED MEMBERS
as of December 31, 2016

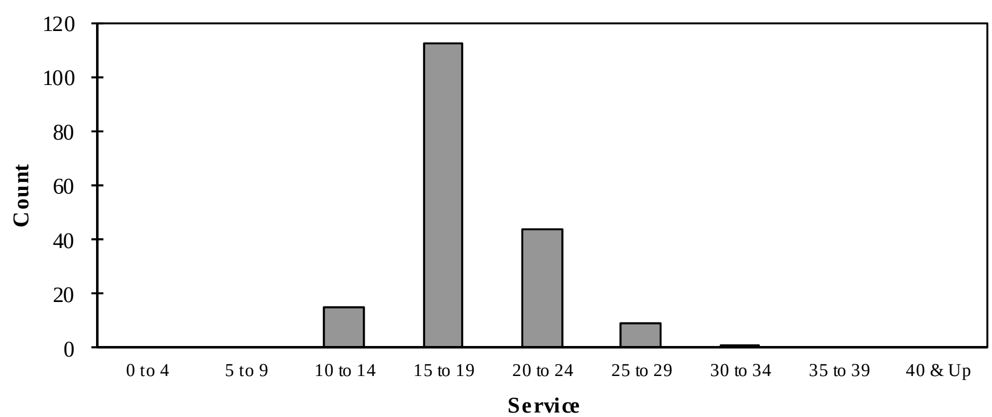
KP&F

	Service									
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & Up	Total
Under 25	0	0	0	0	0	0	0	0	0	0
25 to 29	0	0	0	0	0	0	0	0	0	0
30 to 34	0	0	0	0	0	0	0	0	0	0
35 to 39	0	0	3	2	0	0	0	0	0	5
40 to 44	0	0	3	22	3	0	0	0	0	28
45 to 49	0	0	7	38	19	3	0	0	0	67
50 to 54	0	0	1	30	14	4	0	0	0	49
55 to 59	0	0	1	16	7	0	1	0	0	25
60 to 64	0	0	0	3	1	1	0	0	0	5
65 to 69	0	0	0	1	0	1	0	0	0	2
70 & Up	0	0	0	0	0	0	0	0	0	0
Total	0	0	15	112	44	9	1	0	0	181

Age Distribution



Service Distribution

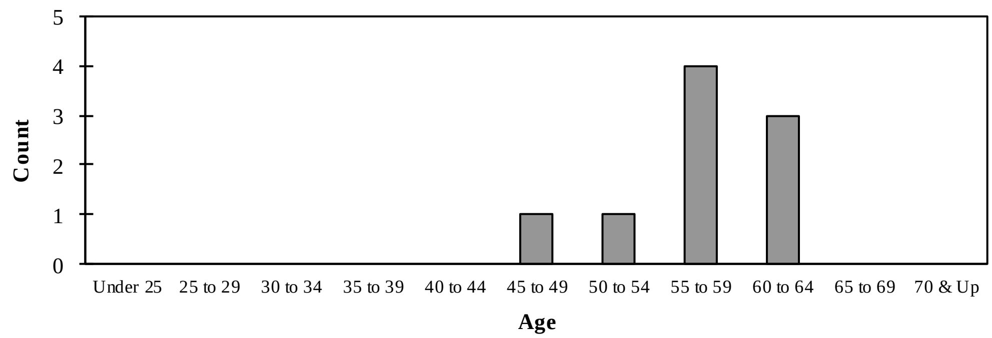


KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF INACTIVE VESTED MEMBERS
as of December 31, 2016

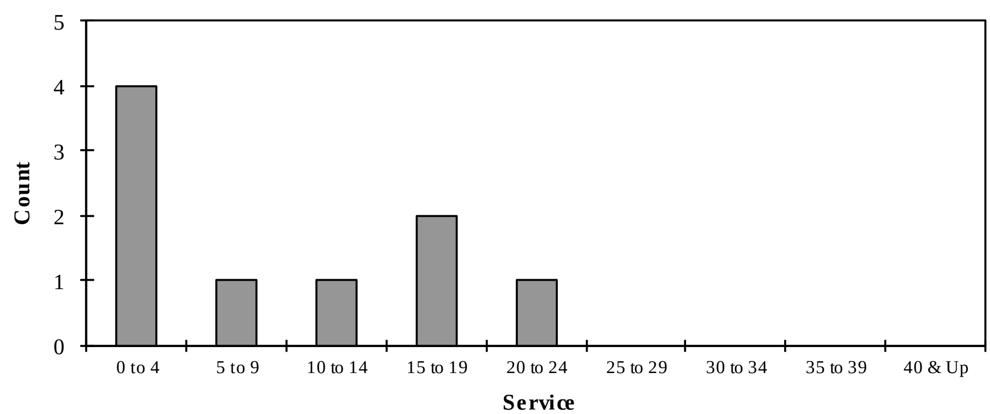
JUDGES

	Service									
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & Up	Total
Under 25	0	0	0	0	0	0	0	0	0	0
25 to 29	0	0	0	0	0	0	0	0	0	0
30 to 34	0	0	0	0	0	0	0	0	0	0
35 to 39	0	0	0	0	0	0	0	0	0	0
40 to 44	0	0	0	0	0	0	0	0	0	0
45 to 49	1	0	0	0	0	0	0	0	0	1
50 to 54	1	0	0	0	0	0	0	0	0	1
55 to 59	2	0	1	1	0	0	0	0	0	4
60 to 64	0	1	0	1	1	0	0	0	0	3
65 to 69	0	0	0	0	0	0	0	0	0	0
70 & Up	0	0	0	0	0	0	0	0	0	0
Total	4	1	1	2	1	0	0	0	0	9

Age Distribution



Service Distribution



Plan Membership

The Kansas Public Employees Retirement System (the Retirement System, or, the System), is an umbrella organization administering three statewide retirement systems: the Kansas Public Employees Retirement System (KPERS), the Kansas Police and Firemen's Retirement System (KP&F), and the Kansas Retirement System for Judges. All three systems are defined benefit, contributory plans that cover nearly all public employees in Kansas. The Kansas Retirement System for Judges is a single employer plan, while the other two are cost-sharing, multiple employer plans. Participation by the State of Kansas is mandatory, whereas participation by local political subdivisions is optional, but irrevocable once elected. Benefit payments are also provided for a certain group of legislative employees.

KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM

Summary of Provisions *

* Tier 2 refers to members who either began their participation or rehired on or after July 1, 2009, but before January 1, 2015. Tier 3 refers to non-corrections members who either began their participation or rehired on or after January 1, 2015. Corrections members do not participate in Tier 3.

This valuation reflects the benefit structure in place as of December 31, 2016.

Employee Membership

Membership is mandatory for all employees in covered positions, except elected officials. A covered position for non-school employees is one that is covered by Social Security, is not seasonal or temporary, and requires at least 1,000 hours of work per year. School employees who work at least 630 hours per year or 3.5 hours per day for at least 180 days are eligible for membership. Effective July 1, 2009, all employees become KPERS members on their date of employment. Prior to July 1, 2009, only School employees were covered immediately, but there was a one-year service requirement for the State and Local groups. Members who retire under the provisions of the Retirement System may not become contributing members again.

Normal Retirement

Eligibility –

Tier 1: (a) Age 65, or (b) age 62 with ten years of credited service, or (c) any age when combined age and years of credited service equal 85 "points". Age is determined by the member's last birthday and is not rounded up.

Tiers 2 & 3: (a) Age 65 with 5 years of credited service or (b) age 60 with 30 years of credited service.

Benefit –

Tiers 1 & 2: Benefits are based on the member's years of credited service, Final Average Salary (FAS), and a statutory multiplier. For those who were hired prior to July 1, 1993, Final Average Salary equals the greater of either: a four-year Final Average Salary, including add-ons, such as sick and annual leave; or a three-year Final Average Salary, excluding add-ons, such as sick and annual leave. For those who are hired on or after July 1, 1993 and before July 1, 2009, Final Average Salary equals the average of the three highest years of salary, excluding add-ons, such as sick and annual leave. Effective July 1, 2009, (Tier 2), Final Average Salary equals the average of the five highest years of salary, excluding additional compensation.

Tier 3: Tier 3 members participate in a cash balance plan with benefits based on the Annuity Savings Account balance, the Retirement Annuity Account balance, and an annuity factor. The member's annuity factor at retirement is based on the member's age and benefit payment form. The current annuity factors were adopted by the Board upon recommendation of the actuary. They are expected to be updated periodically. A member's Annuity Savings Account balance is the sum of mandatory member contributions plus the interest credits and dividends on those contributions. A member's Retirement Annuity Account is the sum of all employer retirement credits to the account plus the interest credits and dividends on those credits.

Mandatory member contributions are 6% of compensation. The employer retirement credits follow the schedule below:

Years of Service	Retirement Credit Rate
Less than 5	3%
5 – 11	4%
12 – 23	5%
24 or more	6%

Interest credits are 4% per annum, paid quarterly. The interest credits are based on the account balances as of the last day of the preceding quarter. There is also a possibility of additional interest credits, depending on KPERS' investment return. These additional interest credits are called "dividends" and are equal to 75% of the five-year average net compound rate of return, as determined by the board, for the preceding calendar year and the previous four calendar years on the market value of assets that is above 6%. A schedule of historical dividend rates is contained in the following table:

Year	Applicable Rate of Return	Compound Average	Dividend
2015	0.2%	0.2%	0.0%
2016	8.5%	4.3%	0.0%

Prior Service Credit – Prior service credit is 0.75% or 1.00% of Final Average Salary per year [School employees receive 0.75% of Final Average Salary for each year of prior service that is not credited under the former Kansas School Retirement System (KSRS)].

Participating Service Credit –

Tier 1: Participating service credit is 1.75% of Final Average Salary for years of service prior to January 1, 2014. Participating service credit is 1.85% of Final Average Salary for years of service after December 31, 2013.

Tier 2: For those retiring on or after January 1, 2012, participating service credit is 1.85% for all years of service.

Tier 3: Not applicable for the Cash Balance Plan.

Early Retirement

Eligibility – Eligibility is age 55 and 10 years of credited service.

Benefit –

Tier 1: The normal retirement benefit is reduced 0.2% per month for each month between the ages of 60 and 62, and 0.6% for each month between the ages of 55 and 60.

Tier 2: The normal retirement benefit is reduced actuarially for early commencement. The reduction factor is 35.0% at age 60 and 57.5% at age 55. If the member has 30 years of credited service, the early retirement reduction is less (50% of regular reduction).

Tier 3: The early retirement benefit is determined in the same manner as a normal retirement benefit, but is based on the account balances and annuity factor at the member's retirement age.

Vesting Requirements

Eligibility – Effective July 1, 2009, a member must have five years of credited service (ten years prior to July 1, 2009). Should the vested member terminate employment, the member must leave accumulated contributions on deposit with the Retirement System to be eligible for future benefits. If a vested member terminates employment and withdraws accumulated contributions, the member forfeits all rights and privileges under the Retirement System.

Benefit –

Tiers 1 & 2: Retirement benefits are payable when the vested member reaches normal retirement age, or reduced benefits are payable when the vested member reaches a specified early retirement age.

Tier 3: Retirement benefits are payable when the vested member meets the retirement eligibility requirements and is based on the member's account balances at retirement. The member's vested account will be granted interest credits and dividends during the deferral period between termination of employment and retirement.

Other Benefits

Withdrawal Benefit – Members who terminate employment may withdraw contributions with interest after the last day on the employer's payroll. Withdrawing member contributions forfeits all membership rights and benefits, which a member may have accrued prior to withdrawing their contributions from the Retirement System. Inactive, non-vested members who return to covered employment within five years after terminating employment, will not have lost any membership rights or privileges if they *haven't* withdrawn contributions. The Retirement Act provides for withdrawal of contributions 31 days after employment terminates, but it does not allow members to borrow from contributions.

Disability Benefit –

Tiers 1 & 2: Members receiving disability benefits under the KPERS Death and Disability Benefits Program continue to receive service credit under KPERS. If a disabled member retires after receiving disability benefits for at least five years immediately preceding retirement, the member's Final Average Salary is adjusted by the actuarial salary increase assumption rates in existence during the member's period of disability prior to July 1, 1993, 5% per year to July, 1998 and the change in CPI-U less 1%, not to exceed 4% after July, 1998.

Tier 3: For any Tier 3 member who becomes disabled, such member's Annuity Savings Account and Retirement Annuity Account will be credited with employee contributions, employer retirement credits, interest credits and dividends for the entire period of disability, but no later than the member's normal retirement age. The salary upon which credits are based shall be the employee's salary at the time of disability. After five years of disability, the underlying salary shall be increased by the lesser of (a) the percentage increase in CPI-U, minus 1%, and (b) 4% per annum.

Death Benefits – Pre-retirement death (non-service connected) –

Tiers 1 & 2: The member's accumulated contributions plus interest are paid in a lump sum to the designated beneficiary. In lieu of receiving the member's accumulated contributions, the surviving spouse of a member who is eligible to retire at death may elect to receive benefits under any survivor option. The spouse must be the member's sole designated beneficiary to exercise this option. If the member had at least 10 years of credited service, but had not reached retirement age, the spouse may elect to leave the member's contributions on deposit with the System and receive a monthly benefit to begin on the date the member would have been eligible to retire.

Tier 3: If a vested member dies before attaining normal retirement age, the member's surviving spouse shall receive an annuity on the date the member would have attained normal retirement age had such member not died. The benefit is based upon the member's Annuity Savings Account and Retirement Annuity Account, and is payable as a single life annuity with 10-year certain.

Service-connected accidental death – The member's accumulated contributions plus interest, plus lump sum amount of $50,000, plus annual benefit based on 50% of Final Average Salary; reduced by Workers' Compensation benefits and subject to a minimum benefit of $100 a month; are payable to a spouse, minor children, or dependent parents, for life, or until the youngest child reaches age 18 (or up to age 23 if they are full-time students), in this order of preference. The monthly accidental death benefit is in lieu of any joint/survivor benefit for which the surviving spouse would have been eligible. For Tier 3 members, Final Average Salary equals the average of the three final years of salary.

Post-retirement death – A lump sum amount of $4,000 is payable to the member's beneficiary. If the member has selected a retirement option, benefits are paid to the joint annuitant or the designated beneficiary. Under joint and survivor retirement options, if the joint annuitant predeceases the retired member, the reduced option benefit is increased to the amount the retired member would have received if no retirement option had been elected. Benefits payable to a joint annuitant cease at the joint annuitant's death. If a member does not select an option, the designated beneficiary receives the excess, if any, of the member's accumulated contributions plus interest over total benefits paid to date of death.

Member Contributions

Tier 1: Prior to January 1, 2014, member contributions were 4% of compensation for Tier 1. 2012 HB 2333 established an election by Tier 1 members, contingent upon IRS approval, between different contribution rate and benefit levels. The legislation provided that, if the IRS rejected or did not take action to approve the election, Tier 1 members would default to an increase in their employee contributions to 5% of compensation effective January 1, 2014, and 6% effective January 1, 2015, with an increase in the benefit multiplier to 1.85% beginning January 1, 2014, for future years of service only. Subsequently, the IRS issued a private letter ruling stating that the election granted to KPERS 1 members under 2012 HB 2333 was impermissible.

Tier 2: The member contribution rate for Tier 2 is 6% of compensation.

Tier 3: The member contribution rate for Tier 3 is 6% of compensation.

Interest on Member Contributions

Tier 1: Interest is credited to members' contribution accounts on June 30 each year, based on the account balance as of the preceding December 31. Those who became members prior to July 1, 1993, have interest credited to their accounts at the rate of 8% per year. Those who become members on and after July 1, 1993, have interest credited to their accounts at the rate of 4% per year.

Tier 2: Interest is credited to members' contribution accounts on June 30 each year, based on the account balance as of the preceding December 31, at the rate of 4% per year.

Tier 3: Interest credited varies by years of service. Please refer to the Tier 3 Benefit section under Normal Retirement in these Plan Provisions.

Employer Contributions

Rates are certified by the Board of Trustees, based on the results of annual actuarial valuations and statutory provisions.

Board of Regents Plan Members (TIAA and equivalents)

Board of Regents plan members (TIAA and equivalents) do not make contributions to KPERS. They receive prior service benefits for service before 1962; the benefit is 1% of Final Average Salary for each year of credited prior service. Service after 1961 is counted for purposes of determining eligibility for vesting.

Correctional Members

Correctional employees, as certified to the Board of Trustees by the Secretary of Corrections, are defined in K.S.A. 74-4914a: (a) correctional officers, (b) certain directors and deputy directors of correctional institutions, (c) correctional power plant operators, (d) correctional industries employees, (e) correctional food service employees, and (f) correctional maintenance employees.

Tier 1: For groups (a) and (b) with at least 3 consecutive years of credited service in such positions immediately preceding retirement, normal retirement age is 55 or Rule of 85; and early retirement requirements are age 50 with 10 years of credited service. For groups (c), (d), (e), and (f) with at least 3 consecutive years of service in such positions immediately preceding retirement, normal retirement age is 60 or Rule of 85, and early retirement requirements are 55 with 10 years of credited service.

Tier 2: For groups (a) and (b) with at least 3 consecutive years of credited service in such positions immediately preceding retirement, normal retirement age is 55 with 10 years of credited service, and early retirement requirements are age 50 with 10 years of credited service. For groups (c), (d), (e), and (f) with at least 3 consecutive years of service in such positions immediately preceding retirement, normal retirement age is 60 with 10 years of credited service, and early retirement requirements are 55 with 10 years of credited service.

Cost of Living Adjustments (COLAs)

Tier 2 Members Who Retired Prior to July 1, 2012: 2% cost-of-living adjustment (COLA) each year beginning at age 65 or the second July 1 after the retirement date, whichever is later. Other Tier 2 members will not receive a COLA.

Tier 3: Upon retirement, the benefit option selected by the member may include a self-funded cost of living adjustment feature, in which the account value is converted to a benefit amount that increases by a fixed percentage over time.

KANSAS POLICE & FIREMEN'S RETIREMENT SYSTEM

Normal Retirement

Tier I – age 55 and 20 years of service or 32 years of service (regardless of age).

Tier II – age 50 and 25 years of service, or age 55 and 20 years of service, or age 60 and 15 years of service.

Benefits – Benefits are based on the member's Final Average Salary. For those who were hired prior to July 1, 1993, Final Average Salary equals the average of the highest three of the last five years of credited participating service, including add-ons, such as sick and annual leave. For those who are hired on or after July 1, 1993, Final Average Salary equals the average of the highest three of the last five years of participating service, excluding add-ons, such as sick and annual leave. Benefits are based on a member's years of credited service and a multiplier of 2.5% of Final Average Salary for each year of credited service, to a maximum of 90% of Final Average Salary (first effective July 1, 2013).

Local Plan – For members covered by local plan provisions on the employer's entry date, normal retirement is at age 50 with 22 years of credited service.

Early Retirement

Eligibility – Members must be at least age 50 and have 20 years of credited service.

Benefit – Normal retirement benefits are reduced 0.4% per month under age 55.

Vesting Requirements

Eligibility – Tier I: The member must have 20 years of credited service; if terminating employment, the member must leave contributions on deposit with the Retirement System to be eligible for future benefits. Unreduced benefits are payable at age 55 or reduced benefits are payable as early as age 50.

Eligibility – Tier II: The member must have 15 years of credited service to be considered vested. If terminating employment, the member must leave contributions on deposit with the Retirement System to be eligible for future benefits. A vested member may draw unreduced benefits as early as age 50 with 25 years of credited service, age 55 with 20 years of credited service, or age 60 with 15 years of credited service. A reduced benefit is available at age 50 with 20 years of credited service.

Other Benefits

Withdrawal Benefits – Members who terminate employment before retirement may withdraw contributions with interest after the last day on the employer's payroll. Withdrawal of contributions forfeits all membership rights and benefits, which a member may have accrued prior to withdrawing accumulated contributions from the Retirement System. Inactive, nonvested members, who return to covered employment within five years after terminating employment, will not have lost any membership rights or privileges if they *haven't* withdrawn contributions.

Disability Benefits

Tier I: Service-connected disability – There are no age or service requirements to be eligible for this benefit. There is an annual benefit of 50% of Final Average Salary, plus 10% of Final Average Salary for each dependent child under age 18 (or up to age 23 for full-time students), to a maximum of 75% of Final Average Salary. If dependent child benefits aren't payable, the benefit is 50% of Final Average Salary or 2.5% for each year of credited service up to a maximum of 90% of Final Average Salary. Upon the death of a member after two years from the proximate cause of death which is the original service-connected disability, the same benefits are payable. Upon the death of a member after two years from a cause different than the disability for which the member is receiving service-connected disability benefits, the surviving spouse receives a lump sum payment of 50% of Final Average Salary. Additionally, a pension benefit of one-half the member's benefit is payable to either the spouse or to the dependent children.

Tier I: Non-Service-connected disability – An annual benefit of 2.5% times years of credited service times Final Average Salary with a minimum of 25% of FAS and a maximum of 90% of FAS.

Tier II: There is no distinction between service-connected and non-service-connected disability benefits. The annual benefit is 50% of Final Average Salary. Service Credit is granted during the period of disability. Disability benefits convert to age and service retirement at the earliest date the member is eligible for full retirement benefits. If the member is disabled for at least five years immediately preceding retirement, the member's Final Average Salary is adjusted during the period of disability.

Death Benefits (Tier I and Tier II)

Active Member Service Connected Death – There is no age or service requirement. An annual benefit equal to the greater of the accrued retirement benefit under the 100% joint and survivor option and 50% of Final Average Salary is payable to the spouse, plus 10% of Final Average Salary for each dependent child under age 18 (or up to age 23 for full-time students), to a maximum of 90% of Final Average Salary Active Member.

Active Member Non-Service Connected Death – A lump sum of 100% of Final Average Salary and a pension of 2.5% of Final Average Salary per year of credited service (to a maximum of 50%) is payable to the spouse. If there is no spouse, the monthly benefit is paid to the dependent children (age 18, or 23 if a full time student). If there is no surviving spouse or eligible children, the beneficiary will receive a lump sum payment of 100% of the member's current annual pay, inclusive of the member's accumulated contributions.

Inactive Member Death – If an inactive member is eligible for retirement when death occurs, and the inactive member's spouse is the sole beneficiary, the spouse may elect to receive benefits as a joint annuitant under any option in lieu of a refund of the member's accumulated contributions.

Post-Retirement Death – There is a lump sum amount of $4,000 payable, less any death benefit payable under local plan provisions. If the member has selected a retirement option, benefits are paid to the joint annuitant or the designated beneficiary. Under joint and survivor options, if the joint annuitant predeceases the retired member, the benefit is increased to the amount the retired member would have received if no option had been selected. Benefits payable to the joint annuitant cease when the joint annuitant dies. If no option is selected, the designated beneficiary receives the excess, if any, of the member's accumulated contributions over total benefits paid to the date of death. The surviving spouse of a transfer member (who was covered by local plan on the employer's entry date, who dies after retirement, and who has not elected a retirement benefit option) receives a lump sum payment of 50% of Final Average Salary. Additionally, a pension benefit of three-fourths of the member's benefit is payable either to the spouse or dependent children.

Classifications

Tier I – Members have Tier I coverage if they were employed prior to July 1, 1989, and they did not elect coverage under Tier II.

Tier II – Members have Tier II coverage if they were employed July 1, 1989, or later. This also includes members employed before July 1, 1989 who elected Tier II coverage.

Some KP&F members are considered either Tier I or Tier II Transfer or Brazelton members.

Transfer Member – A member who is a former member of a local plan who elected to participate in KP&F. Former Kansas Highway Patrol and former Kansas Bureau of Investigation members are included in this group.

Brazelton member – A member who participated in a class action lawsuit, whose contribution is lower, and whose benefits are offset by Social Security.

Member Contributions

Member contributions are 7.15% of compensation, effective July 1, 2013.

Brazelton members contribute .008% with a Social Security offset. Benefits payable to these members are reduced by one-half of original Social Security benefits accruing from employment with the participating employer.

Employer Contributions

Individual rates are certified by the Board of Trustees for each participating employer based on the results of annual actuarial valuations.

Deferred Retirement Option Program (DROP) for Kansas Highway Patrol (KHP)

Upon attaining normal retirement age, members of the KHP have the option of participating in the DROP plan for a minimum of three years and no more than five years. This is a one-time, irrevocable election. After electing to participate, a member's monthly retirement benefit is deposited into the member's DROP account for the duration of the DROP period. The DROP account accrues interest on an annual basis, equalling either 0.0% or 3.0%. Employer and employee contributions continue to be made to the System, but the member does not earn any additional service credit after the effective date of the DROP election. At the end of the DROP period, a member is entitled to a distribution from the DROP account.

KANSAS JUDGES RETIREMENT SYSTEM

Normal Retirement

Eligibility – (a) Age 65, or (b) age 62 with ten years of credited service, or (c) any age when combined age and years of credited service equals 85 “points”. Age is determined by the member’s last birthday and is not rounded up.

Benefit – The benefit is based on the member’s Final Average Salary, which is the average of the three highest years of service under any retirement system administered by KPERS. The basic formula for those who were members prior to July 1, 1987, is 5% of Final Average Salary for each year of service up to ten years, plus 3.5% for each year of service greater than ten, to a maximum of 70% of Final Average Salary. For those who became members on or after July 1, 1987, the formula is 3.5% for each year, to a maximum benefit of 70% of Final Average Salary.

Early Retirement

Eligibility – A member must be age 55 and have ten years of credited service to take early retirement.

Benefit – The retirement benefit is reduced 0.2% per month for each month between the ages of 60 and 62, and 0.6% per month for each month between the ages of 55 and 60.

Vesting Requirements

Eligibility – There is no minimum service requirement; however, after terminating employment, the member must leave contributions on deposit with the Retirement System in order to be eligible for future benefits. Eligible judges who have service credited under KPERS have vested benefits under both KPERS and the Retirement System for Judges when the combined total credited service equals ten years.

Benefit – Normal benefit accrued at termination is payable at age 62 or in reduced amount at age 55, provided the member has 10 years of credited service. Otherwise, benefits are not payable until age 65.

Other Benefits

Disability Benefits – These benefits are payable if a member is defined as totally and permanently disabled as certified by the Supreme Court. The disability benefit, payable until age 65, is 3.5% of Final Average Salary for each year of service (minimum of 50% and maximum of 70% of Final Average Salary). Benefits are recalculated when the member reaches retirement age based on participating service credit for the period of disability. If a judge is disabled for at least five years immediately preceding retirement, the judge’s Final Average Salary is adjusted.

Withdrawal Benefit – Members who terminate employment may withdraw contributions with interest, but they will forfeit any right to a future benefit if they do.

Pre-retirement Death – A refund of the member’s accumulated contributions is payable. In lieu of receiving the member’s accumulated contributions, the surviving spouse of a member who is eligible to retire at death may elect to receive benefits under any survivor benefit option. If the member had at least ten years of credited service, but hadn’t reached retirement age at the time of death, the spouse may elect a monthly benefit to begin on the date the member first would have been eligible to retire as long as the member’s contributions aren’t withdrawn.

Post-retirement Death – A lump sum death benefit of $4,000 is payable to the member's beneficiary. If the member had selected an option with survivor benefits, those benefits are paid to the joint annuitant or to the member's designated beneficiary. Under retirement options with survivor benefits, if the joint annuitant predeceases the retired member, the retirement benefit is increased to the amount the retired member would have received if no survivor benefits had been elected. Benefits payable to a joint annuitant cease when the joint annuitant dies. If no option was chosen by the retired member, the member's designated beneficiary receives the excess, if any, of the member's accumulated contributions over the total benefits paid to the date of the retired member's death.

Member Contributions

Judges contributions are 6% of compensation. Upon reaching the maximum retirement benefit level of 70% of Final Average Salary, the contribution rate is reduced to 2%.

Employer Contributions

Rates are certified by the Board of Trustees, based on the results of annual actuarial valuations.

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KPERS

Rate of Investment Return 7.75%

Price Inflation 2.75%

Payroll Growth: 3.00%

KPERS 3 Interest Crediting Rate, including dividends 6.25% per annum

Administrative Expenses: 0.16% of covered payroll

Rates of Mortality:
Post-retirement

The RP-2014 Healthy Annuitant table was first adjusted by an age setback or set forward. Rates were further adjusted to fit actual experience. Rates are projected into the future using Scale MP-2016.

Starting Table
School Males: RP-2014 M White Collar Healthy +0
School Females: RP-2014 F White Collar Healthy +0
State Males: RP-2014 M Healthy +2
State Females: RP-2014 F Healthy +1
Local Males: RP-2014 M Healthy +2
Local Females: RP-2014 F Healthy +1

Sample Rates (2014)

	School		State		Local	
Age	Male	Female	Male	Female	Male	Female
50	0.310%	0.172%	0.462%	0.332%	0.532%	0.276%
55	0.438%	0.225%	0.635%	0.397%	0.732%	0.367%
60	0.585%	0.323%	0.868%	0.582%	1.001%	0.536%
65	0.849%	0.544%	1.267%	0.909%	1.461%	0.838%
70	1.389%	0.876%	1.974%	1.460%	2.276%	1.346%
75	2.383%	1.459%	3.208%	2.381%	3.699%	2.196%
80	4.520%	3.192%	5.255%	4.249%	6.163%	3.939%
85	8.618%	6.444%	9.025%	7.662%	10.674%	7.119%
90	15.900%	11.824%	15.570%	13.531%	18.416%	12.573%
95	26.671%	20.501%	23.721%	22.137%	28.057%	20.570%
100	39.563%	31.961%	32.978%	32.888%	39.006%	30.559%

Pre-retirement

School Males: 80 % of RP-2014 M White Collar +0
School Females: 80% of RP-2014 F White Collar +0
State Males: 90% of RP-2014 M Total Dataset +2
State Females: 90% of RP-2014 F Total Dataset +1
Local Males: 90% of RP-2014 M Total Dataset +2
Local Females: 90% of RP-2014 F Total Dataset +1

Disabled Life Mortality

RP-2014 Disabled Life Table with same age adjustments as used for pre-retirement mortality tables.

Rates of Salary Increase

	Rate of Increase*		
Years of Service	School	State	Local
1	11.50%	10.00%	10.00%
5	6.05%	5.10%	5.70%
10	4.60%	4.40%	4.70%
15	4.10%	3.90%	4.30%
20	3.60%	3.60%	4.10%
25	3.50%	3.50%	3.60%
30	3.50%	3.50%	3.50%

*Includes general wage increase assumption of 3.50% (composed of 2.75% inflation and 0.75% productivity)

Load for Pre-1993 Hires State: 2.2%, School: 0.5%, Local: 2.0%, KPF: 7.0% C55/C60: 2.2%

Rates of Termination

	School		State		Local	
Duration	Male	Female	Male	Female	Male	Female
0	21.00%	23.00%	21.00%	21.00%	21.00%	24.00%
1	18.00%	18.00%	18.00%	18.00%	17.00%	21.00%
2	14.50%	14.50%	15.25%	15.25%	14.25%	18.00%
3	11.00%	11.00%	13.50%	12.75%	12.50%	14.75%
4	8.50%	9.00%	12.00%	10.75%	11.00%	12.75%
5	7.00%	7.75%	10.75%	9.75%	9.75%	11.00%
6	6.25%	7.00%	9.50%	8.75%	8.75%	10.00%
7	5.75%	6.25%	8.50%	7.75%	7.75%	9.00%
8	5.25%	5.50%	7.50%	7.00%	6.50%	8.00%
9	4.75%	5.00%	6.50%	6.25%	5.75%	7.00%
10	4.25%	4.50%	5.50%	5.50%	5.25%	6.25%
11	4.00%	4.00%	5.00%	5.00%	4.75%	5.50%
12	3.75%	3.50%	4.50%	4.50%	4.50%	5.00%
13	3.50%	3.25%	4.25%	4.25%	4.25%	4.75%
14	3.25%	3.00%	4.00%	4.00%	4.00%	4.50%
15	3.00%	2.75%	3.80%	3.80%	3.80%	4.25%
16	2.75%	2.50%	3.60%	3.60%	3.60%	4.00%
17	2.50%	2.25%	3.40%	3.40%	3.40%	3.80%
18	2.25%	2.00%	3.20%	3.20%	3.20%	3.60%
19	2.00%	1.75%	3.00%	3.00%	3.00%	3.40%
20	1.75%	1.50%	2.80%	2.80%	2.80%	3.20%
21	1.50%	1.40%	2.60%	2.60%	2.60%	3.00%
22	1.40%	1.30%	2.40%	2.40%	2.40%	2.75%
23	1.30%	1.20%	2.20%	2.20%	2.20%	2.50%
24	1.20%	1.00%	2.00%	2.00%	2.00%	2.25%
25	1.00%	1.10%	1.80%	1.80%	1.80%	2.00%
26	1.10%	1.00%	1.60%	1.60%	1.60%	1.75%
27	1.00%	0.75%	1.40%	1.40%	1.40%	1.50%
28	0.75%	0.50%	1.20%	1.20%	1.20%	1.25%
29	0.50%	0.50%	1.00%	1.00%	1.00%	1.00%
30	0.50%	0.50%	0.80%	0.80%	0.80%	0.80%
30+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Retirement Rates

School

	Rule of 85	
Age	1st Year With 85 Points	After 1st Year With 85 Points
53	20%	15%
55	20%	15%
57	24%	15%
59	28%	22%
61	25%	25%

Early Retirement		Normal Retirement	
Age	Rate	Age	Rate
55	3%	62	25%
56	3%	63	25%
57	3%	64	30%
58	5%	65	35%
59	10%	66-74	30%
60	12%	75	100%
61	16%		

State

	Rule of 85	
Age	1st Year With 85 Points	After 1st Year With 85 Points
53	16%	12%
55	16%	12%
57	16%	10%
59	16%	10%
61	25%	20%

Early Retirement		Normal Retirement	
Age	Rate	Age	Rate
55	4%	62	20%
56	4%	63	20%
57	4%	64	20%
58	6%	65	35%
59	6%	66-74	27%
60	8%	75	100%
61	15%		

Local

	Rule of 85	
Age	1st Year With 85 Points	After 1st Year With 85 Points
53	15%	7%
55	15%	10%
57	15%	10%
59	15%	12%
61	25%	20%

Early Retirement		Normal Retirement	
Age	Rate	Age	Rate
55	3%	62	22%
56	3%	63	22%
57	3%	64	22%
58	3%	65	35%
59	6%	66-69	27%
60	6%	70-74	25%
61	15%	75	100%

- Inactive vested members – Earliest unreduced retirement age.

- For correctional employees with an age 55 normal retirement date -

Age	Rate
55	10%
58	10%
60	15%
62	20%
65	100%

- For correctional employees with an age 60 normal retirement date -

Age	Rate
60	20%
61	20%
62	35%
63	20%
64	20%
65	60%
66	60%
67	60%
68	100%

- For TIAA employees – Age 66.

Rates of Disability

Age	School	State	Local
25	.020%	.023%	.022%
30	.022%	.065%	.047%
35	.027%	.103%	.070%
40	.046%	.200%	.103%
45	.088%	.300%	.180%
50	.145%	.400%	.260%
55	.195%	.500%	.310%
60	.280%	.550%	.380%

Indexation of Final Average Salary for Disabled Members: 1.75% per year

Probability of Vested Members Leaving Contributions With System

Tier 1:

Age	School	State	Local
25	80%	65%	60%
30	80%	65%	70%
35	80%	65%	70%
40	80%	65%	70%
45	82%	75%	70%
50	87%	85%	74%
55	100%	100%	100%

Tier 2: Members are assumed to elect to take a refund if it is more valuable than the deferred annuity. The comparison is based on 7.75% interest and a 50% Male/50% Female blend of the RP-2014 Mortality Table, projected to 2045 (static).

Tier 3: 100% of vested members are assumed to leave their contributions with the System.

Marriage Assumption: 70% of all members are assumed married with male spouse assumed 3 years older than the female.

Partial Lump Sum Option (PLSO): 40% of Tier 1 and Tier 2 members are assumed to take a PLSO equal to 30% of the value of their benefit upon retirement. 100% of Tier 3 members are assumed to take a PSLO equal to 30% of the value of their benefit upon retirement.

KPF

Rate of Investment Return 7.75%

Price Inflation 2.75%

Payroll Growth: 3.00%

Administrative Expenses: 0.16% of covered payroll

Rates of Mortality: Mortality rates are projected into the future using Scale MP-2016

Post-retirement RP-2014 Total Dataset Table, set forward one year

Pre-retirement 90% of the RP-2014 Total Dataset Table, set forward one year *

*70% of preretirement deaths assumed to be service related.

Disabled Life Mortality RP-2014 Disabled Life Table, set forward one year

Rates of Salary Increase

Years of Service	Rate of Increase*
1	12.0%
5	6.5%
10	4.4%
15	3.8%
20	3.5%
25	3.5%

*Includes general wage increase assumption of 3.50% (composed of 2.75% inflation and 0.75% productivity)

Rates of Termination

Years of Service	Rate
1	11.0%
5	6.0%
10	2.8%
15	1.8%
20	1.1%
25	0.0%

Retirement Rates

Tier 1:

Early Retirement Age	Early Retirement Rate	Normal Retirement Age	Normal Retirement Rate
50	5%	55	30%
51	7%	56	30%
52	7%	57	30%
53	15%	58	30%
54	30%	59	30%
		60	30%
		61	30%
		62	100%

Tier 2:

Early Retirement Age	Early Retirement Rate	Normal Retirement Age	Normal Retirement Rate
50	10%	50	25%
51	10%	53	25%
52	10%	55	25%
53	10%	58	20%
54	20%	60	25%
		61	25%
		62	30%
		63	30%
		64	30%
		65	100%

Inactive Vested: Earliest unreduced retirement age.

Rates of Disability

Age	Rate*
22	.06%
27	.07%
32	.15%
37	.35%
42	.56%
47	.76%
52	.96%
57	1.00%

*90% assumed to be service-connected under KP & F Tier 1.

Marriage Assumption: 80% of all members assumed married with male spouse assumed to be three years older than female. When an active member dies, they have no child beneficiaries.

DROP Election 75% of Kansas Highway Patrol members are assumed to enter DROP for the maximum DROP period.

Judges

Rate of Investment Return	7.75%
Price Inflation	2.75%
Administrative Expenses:	0.16% of covered payroll
Rates of Mortality:	Mortality rates are projected into the future using Scale MP-2016.
Post-retirement	RP-2014 Total Dataset Table, set back two years
Pre-retirement	80% of RP-2014 Total Dataset Table, set back two years
Rates of Salary Increase	4.00%
Rates of Termination	None assumed
Disabled Life Mortality	RP-2014 Disabled Retiree Table, set back two years
Rates of Disability	None assumed

Retirement Rates

Age	Rate
62	20%
63-64	10%
65-66	25%
67-69	10%
70+	100%

Marriage Assumption: 70% of all members are assumed married with male spouse assumed 3 years old than female.

TECHNICAL VALUATION PROCEDURES

Data Procedures

In-pay members:

If a birth date is not available, the member is assumed to have retired at 62. If a retirement date is also not available, the member is assumed to be 75.

If a beneficiary birth date is needed but not supplied, males are assumed to be 3 years older than females.

Not in-pay members:

If a birth date is not available, it is assigned according to the following schedule:

System	Active member age at hire	Inactive member age at valuation
KPERS	34.7	50
KPF	27.5	49
Judges	43.4	54

If gender is not provided, it is assigned randomly with a 40% probability of being male and 60% probability of being female.

If salary information is not available for an active record, it is assigned according to the following schedule:

System	Salary
KPERS	$24,700
KPF	$36,100
Judges	$79,100

Salaries for first year members are annualized.

Other Valuation Procedures

No actuarial accrued liability in excess of the unclaimed member contribution balance is held for nonvested, inactive members. A reserve is also held for accounts that have been forfeited but could be reclaimed in the future.

Benefits above the projected IRC Section 415 limit for active participants are assumed to be immaterial for the valuation. The compensation limitation under IRC Section 401(a) (17) is considered in this valuation. On a projected basis, the impact of this limitation is insignificant.

Salary increases are assumed to apply to annual amounts.

Decrements are assumed to occur mid-year, except that immediate retirement is assumed for those who are at or above the age at which retirement rates are 100%. Standard adjustments are made for multiple decrements. Withdrawal does not operate once early or unreduced retirement eligibility is met.

Tier 3 employees who transfer employment to a non-KPERS covered position are treated as actives who are not accruing benefits.

Actuarial Methods

1. Funding Method

Under the entry age normal cost method, the actuarial present value of each member's projected benefits is allocated on a level basis over the member's compensation 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 actuarial present value of benefits allocated to prior years of service is called the actuarial liability. The unfunded actuarial liability represents the difference between the actuarial liability and the actuarial value of assets as of the valuation date. The unfunded actuarial liability is calculated each year and reflects experience gains/losses.

There is currently a lag between the valuation date in which the employer contribution rates are determined and the effective date of those contribution rates, i.e., a two year lag for Local employers and a two and one-half year lag for the State/School group. The unfunded actuarial liability (UAL) is projected from the valuation date to the first day of the fiscal year in which the contribution rate will apply based on the scheduled statutory contribution rates and expected payroll in the intervening years.

For valuations beginning with December 31, 2016 and following, the unfunded actuarial liability is amortized using a "layered" approach. The unfunded actuarial liability in the December 31, 2015 valuation, which was projected to June 30, 2018 for the State/School and Judges groups and to December 31, 2017 for the Local and KP&F groups, serves as the initial or "legacy" amortization base and continues to be amortized over the original period, set at 40 years beginning July 1, 1993 (16 years in the December 31, 2016 valuation). The change in the unfunded actuarial liability in the December 31, 2016 valuation as a result of the assumption changes, which is projected to June 30, 2019 for State/School and Judges and to December 31, 2018 for Local and KP&F, is amortized over a closed 25-year period, and changes in the unfunded actuarial liability that result from actuarial experience are amortized over a closed 20-year period beginning with the fiscal year in which the contribution rates will apply. In addition, the increase in the unfunded actuarial liability due to the $300 one-time payment to retirees in 2008 is amortized over 10 years (applies only to Local employers as the State fully funded the increased liability for the $300 one-time payment for its members in 2008).

The UAL is amortized as a level percentage of payroll for all groups except Judges, who use a level dollar payment. The payroll growth assumption is 3% so the annual amortization payments will increase 3% each year. As a result, if total payroll grows 3% per year, as assumed, the amortization payment will remain level as a percentage of total current payroll.

2. Asset Valuation Method

For actuarial purposes, assets are valued using an asset smoothing method. The difference between the actual return and the expected return (based on the actuarial assumed rate of return) on the market value of assets is calculated each year and recognized equally over a five-year period.

The following are key terms used in the discussion of actuarial funding valuations. Actuarial measurements for other purposes, such as accounting, may use different terms.

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 anticipated experience, based on the actuarial assumptions, 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. Sometimes referred to as “unfunded actuarial liability” or “unfunded accrued liability”.

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