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KPERS

Kansas Public Employees Retirement System

Valuation Report as of December 31, 2019

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July 15, 2020

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, 2019 for the purpose of determining contribution rates for FY 2023 for the State and Schools (July 1, 2022 to June 30, 2023) and FY 2022 for Local employers (calendar year 2022). The major findings of the valuation are contained in this report, which reflects the plan provisions in place on December 31, 2019 and any legislative changes from the 2020 Session. There was one change to the benefit provisions for the Kansas Police and Firemen's Retirement System. Previously the Deferred Retirement Option Program (DROP) was only available to Kansas Highway Patrol members, but as of July 1, 2019 members of the Kansas Bureau of Investigation can also participate in DROP. This change did not have a material impact on the current valuation results.

The KPERS Board adopted a new set of actuarial assumptions at their January 17, 2020 meeting, based on the experience study prepared during 2019. While the Board adopted all of the recommended changes to the demographic assumptions, they did not adopt any of the recommended sets of economic assumptions. The economic assumptions used in the December 31, 2018 valuation remain in place. Based on the data presented in the experience study report, it is our professional opinion that the set of economic assumptions used in this valuation do not comply with Actuarial Standard of Practice Number 27. In addition, a few minor changes to the census data specifications were implemented this year as a result of a meeting with KPERS staff in January 2020. These meetings occur periodically to ensure that both the actuary and the System's staff have an understanding of the required data items and their use in the valuation process. The changes to the actuarial assumptions and census data, which are first reflected in the December 31, 2019 actuarial valuation, are discussed in more detail in the Executive Summary of the 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.

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We 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 with the exception of the set of economic assumptions. 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 the set of assumptions in Appendix C.

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 a thorough 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 Standard 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 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, 2019 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.

As a result of the triennial experience study prepared during 2019, there have been several changes to the actuarial assumptions since the prior valuation. The Board elected to adopt all of the recommended changes to the demographic assumptions, but did not adopt any of the recommended sets of economic assumptions. The changes to the demographic assumptions first used in this valuation, by group, are shown below:

KPERS

- Retirement rates were adjusted to partially reflect observed experience.
- Termination rates were increased for most KPERS groups.
- Disability rates were reduced.
- Factors for the State group that are used to anticipate higher liabilities due to higher final average salary at retirement for pre-1993 hires were modified to better reflect actual experience.
- The administrative expense load for contribution rates was increased from 0.16% to 0.18%.

KP&F

- Retirement rates were adjusted to partially reflect observed experience.
- Factors for the KP&F group that are used to anticipate higher liabilities due to higher final average salary at retirement for pre-1993 hires were modified to better reflect actual experience.
- The administrative expense load for contribution rates was increased from 0.16% to 0.18%.

Judges

- Retirement rates were adjusted to partially reflect observed experience.
- The administrative expense load for contribution rates was increased from 0.16% to 0.18%.

For more information about the changes to the actuarial assumptions, please see the complete 2019 Experience Study report, dated January 7, 2020. Below is a summary of the cost impact of the assumption changes on the December 31, 2019 valuation results. The change in the unfunded actuarial liability (UAL) was amortized over 25 years.

	Prior Assumptions	New Assumptions	Change
State/School			
Actuarial Liability (millions)	$20,594	$20,551	($43)
Actuarial Value of Assets	13,960	13,960	0
Unfunded Actuarial Liability (millions)	$ 6,634	$ 6,591	($43)
Normal Cost Rate	7.87%	7.82%	(0.05%)
UAL Amortization Rate	12.10%	12.02%	(0.08%)
Actuarial Contribution Rate	19.97%	19.84%	(0.13%)
Local			
Actuarial Liability (millions)	$5,729	$5,725	($4)
Actuarial Value of Assets	4,202	4,202	0
Unfunded Actuarial Liability (millions)	$1,527	$1,523	($4)
Normal Cost Rate	7.41%	7.34%	(0.07%)
UAL Amortization Rate	7.57%	7.55%	(0.02%)
Actuarial Contribution Rate	14.98%	14.89%	(0.09%)
KP&F			
Actuarial Liability (millions)	$3,575	$3,571	($4)
Actuarial Value of Assets	2,628	2,628	0
Unfunded Actuarial Liability (millions)	$ 947	$ 943	($4)
Normal Cost Rate	14.87%	14.86%	(0.01%)
UAL Amortization Rate	15.23%	15.17%	(0.06%)
Actuarial Contribution Rate	30.10%	30.03%	(0.07%)
Judges			
Actuarial Liability (millions)	$196.1	$195.6	($0.5)
Actuarial Value of Assets	185.3	185.3	0.0
Unfunded Actuarial Liability (millions)	$ 10.8	$ 10.3	($0.5)
Normal Cost Rate	20.50%	20.25%	(0.25%)
UAL Amortization Rate	3.40%	3.15%	(0.25%)
Actuarial Contribution Rate	23.90%	23.40%	(0.50%)

As noted earlier, Cavanaugh Macdonald Consulting (CMC) recommended changes to the set of economic assumptions. Three alternate sets of economic assumptions were presented in the experience study report, but the KPERS Board elected to continue the use of the economic assumptions used in the December 31, 2018 valuation. Based on the data presented in the experience study report, it is our professional opinion that the set of economic assumptions used in this valuation do not comply with Actuarial Standard of Practice Number 27. The following table illustrates how the valuation results would differ if the set of economic assumptions labeled Alternate 1, from the experience study, had been used in the December 31, 2019 valuation. The key differences in the economic assumptions include an investment return assumption of 7.50% instead of 7.75%, a general wage inflation assumption of 3.25% instead of 3.50% and a payroll growth assumption of 2.75% instead of 3.00%.

	Unfunded Actuarial Liability	Funded Ratio	Actuarial Contribution Rate
State/School	$6,988M	66.6%	20.81%
Local	$1,627M	72.1%	15.62%
KPF	$1,028M	71.9%	31.61%
Judges	$14.1M	95.2%	25.26%

There was a small impact on the December 31, 2019 valuation results due to some minor changes to the census data file provided by KPERS for the valuation. These modifications were the result of a meeting with KPERS staff to review and discuss the census data file used in the valuation process. One of the changes for the current data file was for KPERS to include the actual years of service for each benefit multiplier (1.75% for service earned prior to January 1, 2014 and 1.85% for service earned thereafter) for KPERS 1 members. In the past, only total years of service for each member were provided so those years had to be split into the years for the different benefit multipliers by Cavanaugh Macdonald assuming each member had been continuously employed since January 1, 2014. As a result of this data refinement, the actuarial liability for KPERS (State, School and Local) decreased by about $67 million. In addition, we also started receiving data elements for KP&F members who are currently participating in the Deferred Retirement Option Program (DROP) so their liability can be more accurately determined. There are relatively few KP&F members participating in DROP due to its limited availability so the impact of this change was relatively small, increasing the actuarial liability for KP&F by $6 million.

KPERS 3 (Cash Balance members) refers to non-correction members who either began their participation or were rehired on or after January 1, 2015. About 40% of the active KPERS membership on the valuation date were KPERS 3 members. KPERS 3 members receive guaranteed interest credits of 4.0% on their account balances. There is also the possibility of additional interest credits that are dependent on KPERS' actual investment returns. 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 previous December 31 account balances. The dividend for 2019 was dependent on the net rate of return on the market value of assets for calendar years 2015 through 2019. The average annualized net return for the five-year period, as calculated by KPERS, was 7.1%. Using the statutory formula, an additional interest credit (dividend) of 0.825% was granted by the Board for 2019. Dividend credits are included in the assumption used for the interest crediting rate so the 2019 dividend did not increase the unfunded actuarial liability.

The valuation results provide a "snapshot" view of the System's financial condition on December 31, 2019. The net change in the unfunded actuarial liability for the total System was a decrease of $195 million due to multiple factors (see page 10). The total UAL is composed of various pieces, or layers, of unfunded actuarial liability. However, the initial UAL base, referred to as the 2015 legacy UAL base, represents the majority of the current unfunded actuarial liability. The remaining amortization period for the 2015 legacy UAL base is 13 years as of the valuation date. As the remaining amortization period for that base shortens over time, the portion of the amortization payment that is applied to the principal of the outstanding balance, instead of interest, increases. As a result, the remaining balance of the 2015 legacy UAL base is expected to decline more rapidly over time and have a significantly positive impact on the System's total unfunded actuarial liability, if the full actuarial contributions are made. The unfunded actuarial liability portion of the statutory contribution was a key factor in the decrease in the unfunded actuarial liability from the prior valuation. There also were additional contributions of $51 million and $115 million during calendar year 2019 that decreased the unfunded actuarial liability. A detailed analysis of the components of the change in the unfunded actuarial liability from December 31, 2018 to December 31, 2019 can be found on page 10.

In KPERS, the State, School and Local employer contribution rates certified by the Board may not increase over the prior year by more than the statutory cap. The statutory cap has changed over time, but the current cap is 1.20% for FY 2023 (the rate set based on the December 31, 2019 actuarial valuation). Also, while separate valuations are performed for the State and School groups, the statutory contribution rate for the two groups is determined using their combined valuation results. Due to the statutory cap, the employer contribution rate was below the actuarial contribution for many years. However, the statutory State/School employer contribution rate has been equal to the actuarial required contribution rate starting with the December 31, 2017 valuation (FY 2021 contribution rates). By statute, 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 in this valuation), 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, 2019 Valuation		
System	**Actuarial**	**Statutory**	**Difference**
State[1]	10.08%	13.86%	(3.78%)
School[1]	14.83%	13.86%	0.97%
State/School[1]	13.86%	13.86%	0.00%
Local[1]	8.90%	8.90%	0.00%
Police & Fire - Uniform Rates[2]	22.99%	22.99%	0.00%
Judges	17.77%	17.77%	0.00%

	December 31, 2018 Valuation		
System	Actuarial	Statutory	Difference
State[1]	9.97%	14.09%	(4.12%)
School[1]	15.15%	14.09%	1.06%
State/School[1]	14.09%	14.09%	0.00%
Local[1]	8.87%	8.87%	0.00%
Police & Fire - Uniform Rates [2]	22.80%	22.80%	0.00%
Judges	18.40%	18.40%	0.00%

[1] By statute, rates are allowed to increase by a maximum of 1.2%, plus the cost of any benefit enhancements. The December 31, 2019 valuation sets the employer contribution rate for FY 2023 for the State and School group and calendar year 2022 for the Local group. An additional contribution of 0.61% applies to the School group in FY 2023 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 both State and Local employers. The uniform rate does not include the payment required to amortize the unfunded past service liability determined separately for each employer (Table 15).

Due to the statutory cap for the KPERS group, the statutory contribution rate for the State/School group was less than the actuarial required contribution rate (ARC) for more than twenty years. In the December 31, 2017 actuarial valuation (which set the FY 2021 contribution rates), the State/School group reached the ARC date (statutory contribution rate equal to the actuarial contribution rate) at a contribution rate of 14.23%. The two contribution rates have continued to be equal in the December 31, 2018 and December 31, 2019 valuations. This is an important milestone for the State/School group which will serve to reduce the unfunded actuarial liability and improve the funded ratio of the State/School group.

Legislation passed in the 2017 session provided for the payment of the delayed contributions for the School group from FY 2017 and FY 2019 in level annual installments of $6.4 million and $19.4 million over 20-year periods commencing in FY 2018 and FY 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 delayed School contributions from fiscal year 2017 is 0.17% for FY 2021, 0.16% for FY 2022, and 0.15% for FY 2023. The additional contribution rate for the scheduled $194 million delayed School contributions from fiscal year 2019 is 0.51% for FY 2021, 0.48% for FY 2022 and 0.46% for FY 2023. The total statutory contribution rates for the School group for FY 2021 through FY 2023 are shown in the following table:

	FY 2021	FY 2022	FY 2023
Regular Statutory State/School Contribution Rate	14.23%	14.09%	13.86%
Contribution for FY 2017 Contribution Reduction	0.17%	0.16%	0.15%
Contribution for FY 2019 Contribution Reduction	0.51%	0.48%	0.46%
Total School Contribution Rate	14.91%	14.73%	14.47%

The net rate of return on the market value of assets in 2019 was 17.1%, as reported by KPERS, which was significantly above the 2019 assumed return of 7.75%. However, due to the reflection of past investment experience through the asset smoothing method, the net rate of return on the actuarial value of assets for calendar year 2019 was 6.7%, less than the assumed return of 7.75%. The combined impact of recognizing the scheduled portion of deferred asset experience and the favorable investment experience during 2019 changed the net deferred asset loss of $1.2 billion in the prior valuation to a net deferred asset gain of $568 million in the current valuation. Based on the results of this valuation, the statutory contribution rates for the State, State/School and Local groups continue to be at the actuarial required contribution rate.

EXPERIENCE - ALL SYSTEMS COMBINED

December 31, 2018 – December 31, 2019

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, 2019. 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 membership, assets and liabilities impacted the change in the actuarial contribution rates between the December 31, 2018 and December 31, 2019 actuarial valuations. On the following pages, each component is examined.

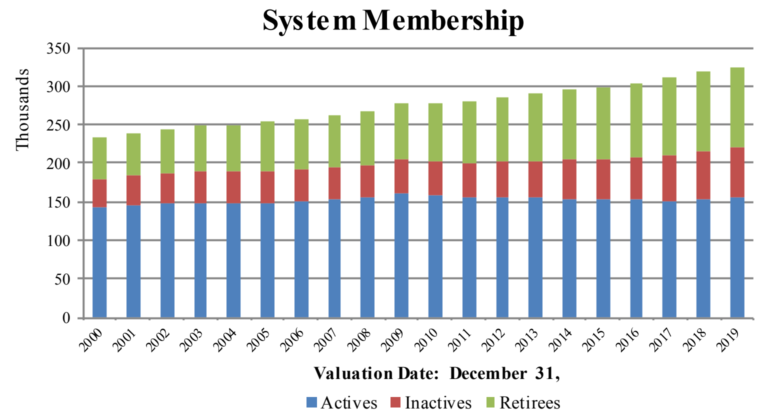
MEMBERSHIP

The following table contains a summary of the changes in the active membership between the December 31, 2018 and December 31, 2019 actuarial valuations.

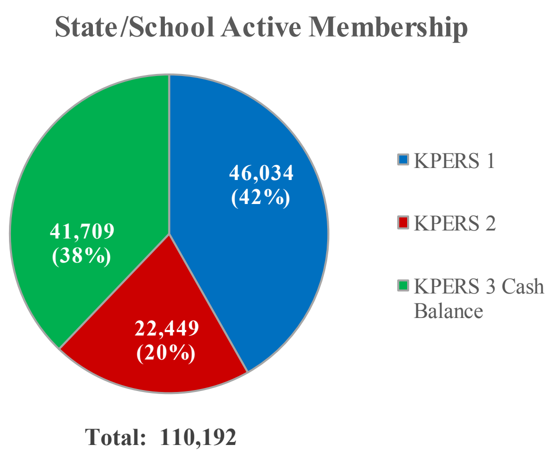
	State	School	Local	KP&F	Judges	Total
12/31/2018 (Starting count)	20,893	87,245	37,966	7,695	256	154,055
New actives	3,118	11,707	5,510	768	27	21,130
Non-vested Terminations	(936)	(4,215)	(2,182)	(299)	0	(7,632)
Elected Refund	(581)	(1,198)	(1,085)	(107)	(2)	(2,973)
Vested Terminations	(484)	(2,201)	(1,158)	(43)	(4)	(3,890)
Total Withdrawals	(2,001)	(7,614)	(4,425)	(449)	(6)	(14,495)
Deaths	(36)	(62)	(54)	(7)	(1)	(160)
Disabilities	(32)	(60)	(36)	(18)	0	(146)
Retirements	(714)	(2,207)	(1,009)	(185)	(16)	(4,131)
Other/Transfer	11	(56)	55	(7)	(3)	0
12/31/2019 (Ending count)	21,239	88,953	38,007	7,797	257	156,253

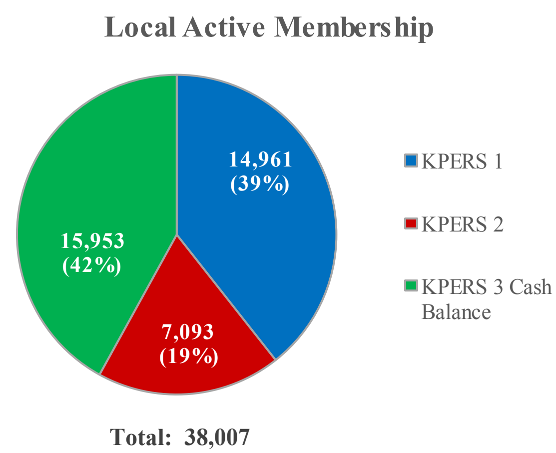
As can be seen from the table, KPERS, in total, experienced a net increase in the number of active members with the largest increase occurring in the School group. As the following graph shows, active membership growth has been relatively stagnant overall for the past decade, with the active membership peaking in the December 31, 2009 valuation. While this pattern of low (or at times negative) employee growth has not been unusual in the public sector, the general decline in active membership has an adverse impact on the actuarial contribution rates. In general, fewer active members result in total active member payroll that does not grow as expected. When this occurs, contribution dollars into the System are lower, the unfunded actuarial liability does not decrease as scheduled, and the unfunded actuarial liability contribution rate increases because the dollar amount of the amortization payment is divided by a smaller amount of payroll.

The following graph shows the number of active and inactive vested members, as well as retirees, in the current and prior valuations. The number of active members is lower in this valuation than it was in 2009 while the number of retirees has grown over that period.



KPERS currently has three different benefit structures. The most recent tier, KPERS 3 (Cash Balance members), covers non-corrections members who either began their participation or were rehired on or after January 1, 2015. KPERS 2 includes members who either began their participation or were rehired on or after July 1, 2009, but before January 1, 2015. Of the 148,199 active KPERS members, 29,542 (about 20%) are KPERS 2 members and 57,662 (about 39%) are KPERS 3 members as of the valuation date. The split of KPERS members in the State/School group and Local group by benefit tier is shown below:





Because KPERS 3 is a relatively new group, those members have few years of service and, therefore, relatively low liability so the valuation results are more significantly affected by members of KPERS 1 and KPERS 2. As time passes and more active members are in KPERS 3, the cash balance benefit structure will have an increasing impact on the overall valuation results. One aspect of this change is that total valuation results are expected to have less volatility since KPERS 3 has some risk sharing features built in to the interest crediting rate on account balances. For example, lower investment returns will translate into lower dividends and smaller account balances, mitigating the growth in the KPERS 3 actuarial liability.

ASSETS

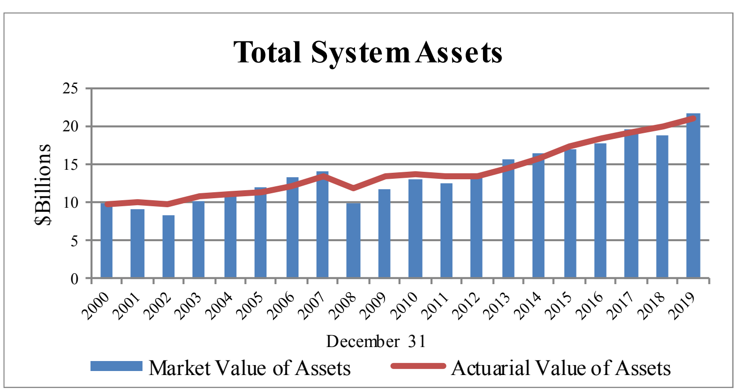
As of December 31, 2019, the System had total funds of $21.5 billion on a market value basis, excluding assets held for the Group Insurance and Optional Life reserves. This was an increase of $2.8 billion from the December 31, 2018 value of $18.7 billion.

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 net 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, 2019 for each group.

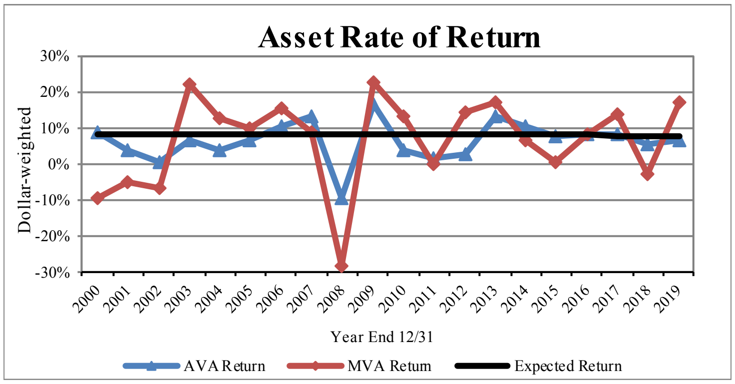
The components of the change in the total market value and actuarial value of assets for the Retirement System (in millions) are set forth in the following table.

	Market Value $(millions)	Actuarial Value $(millions)
Assets, December 31, 2018	$18,670	$19,898
- Employer and Member Statutory Contributions	1,466	1,466
- Additional Contributions	166	166
- Benefit Payments	(1,877)	(1,877)
- Investment Income, Net of Expenses	3,118	1,323
Assets, December 31, 2019	$21,543	$20,976
Net Rate of Return	+17.1%	+6.7%

Due to the use of an asset smoothing method, there is a net deferred investment gain of $0.6 billion that has not yet been recognized, i.e. the market value of assets is greater than the actuarial value. This deferred investment gain 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 less 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 net rate of return on the actuarial (smoothed) value of assets has been less volatile than the market value return. The deferred investment gain in this valuation will be reflected in the actuarial value of assets in the next few years, absent future unfavorable 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. 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 and the unfunded portion thereof.

The unfunded actuarial liability by group is summarized below (in millions):

	State	School	Local	KP&F	Judges	Total*
Actuarial Liability	$4,604	$15,901	$5,705	$3,578	$196	$29,982
Actuarial Value of Assets	3,642	10,318	4,202	2,628	185	20,976
Unfunded Actuarial Liability*	$962	$5,583	$1,502	$949	$10	$9,007
Funded Ratio	79.1%	64.9%	73.7%	73.5%	94.7%	70.0%

* 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.

The unfunded actuarial liability is amortized using a “layered” approach. The legacy unfunded actuarial liability is the amount of unfunded actuarial liability in the December 31, 2015 valuation which was then projected to June 30, 2018 for State/School and Judges and December 31, 2017 for Local and KP&F to reflect the lag between the valuation date and the fiscal year to which the contribution rates set in the valuation apply. This initial or legacy unfunded actuarial liability amortization base continues to be amortized over the original amortization period, which was set at 40 years beginning July 1, 1993 (13 years remaining as of December 31, 2019). The change in the unfunded actuarial liability, resulting from the assumption changes reflected in the 2016 and 2019 valuations, was amortized over a closed 25-year period. Changes in the unfunded actuarial liability that result from actuarial experience each year (gains and losses) are amortized over a closed 20-year period that begins with the fiscal year in which the contribution rates will apply.

Prior to the December 31, 2017 valuation (which set the contribution rates for fiscal year 2021), the statutory contribution rate for the State/School group had been less than the actuarial contribution rate since the 1994 valuation which resulted in an annual increase in the unfunded actuarial liability for that group (see graph on page 20). 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, methods or census data, and changes in benefit provisions.

The actual experience measured in this valuation is that which occurred during the prior plan year (calendar year 2019). For State, School, Local and KP&F, the valuation results reflect a net liability loss for the year (which increases the unfunded actuarial liability), largely due to salary increases that were greater than expected. In contrast, there was a small net liability gain for Judges during 2019 due to higher than expected mortality. Combining these, the total net liability loss for the System was $114 million, about 0.38% of the actuarial liability. In addition, the System experienced a return of 6.7% on the actuarial value of assets, which is lower than the assumed return of 7.75%, resulting in an experience loss of $210 million. Therefore, the aggregate result of combined experience (asset and liability) in 2019 for all groups was an experience loss for the System of $324 million.

Between December 31, 2018 and December 31, 2019 the change in the unfunded actuarial liability for the System, as a whole, was as follows (in millions):

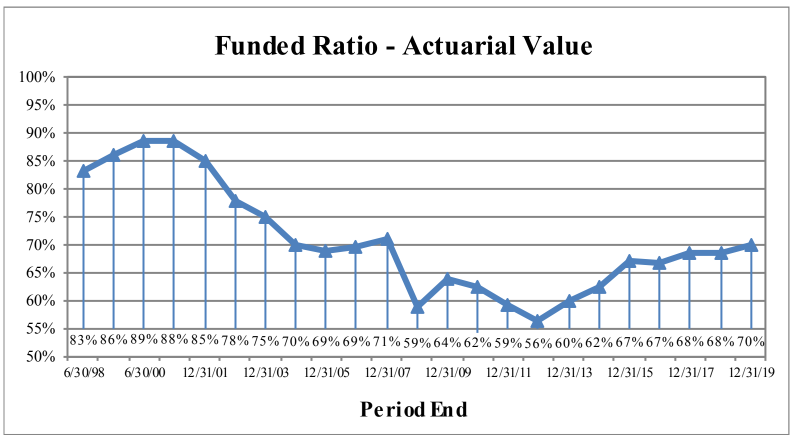
	$ millions
Unfunded Actuarial Liability, December 31, 2018	$ 9,202
• effect of contribution cap/time lag	18
• expected decrease due to amortization method	(169)
• (gain)/loss from investment return on actuarial assets	210
• demographic experience[1]	114
• additional contributions	(175)
• all other experience	(82)
• assumption changes	(51)
• data refinements	(60)
Unfunded Actuarial Liability, December 31, 2019[2]	$ 9,007

[1]Liability loss is about 0.38% 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 23.

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 total System is shown in the following table (in millions).

	12/31/13	12/31/14	12/31/15	12/31/16	12/31/17	12/31/18	12/31/19
Using Actuarial Value of Assets:							
Funded Ratio (AVA/AL)	60%	62%	67%	67%	68%	68%	70%
Unfunded Actuarial Liability (AL-AVA)	$9,766	$9,468	$8,539	$9,061	$8,907	$9,202	$9,007
Using Market Value of Assets:							
Funded Ratio (MVA/AL)	65%	65%	65%	65%	70%	64%	72%
Unfunded Actuarial Liability (AL-MVA)	$8,584	$8,808	$9,055	$9,627	$8,569	$10,430	$8,439



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 and amortization periods, and the scheduled employer contribution rates, the dollar amount of the unfunded actuarial liability for the entire System is expected to decrease over the next few years as the unrecognized investment experience flows through the asset smoothing method. Over the longer term, the funded ratio is expected to improve, but will continue to be heavily dependent on the actual investment returns in the future.

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 by the Legislature periodically, is 1.20% for all three groups. 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, 2015 SB 228 authorized the sale of $1.0 billion in bonds to deposit in the trust fund, but also 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, 2015 valuation set the statutory contribution rates for FY 2019, based on the 1.20% statutory cap. Since the December 31, 2017 valuation, the statutory contribution rate for both State/School and Local have been equal to the actuarial required contribution rate.

The results of the December 31, 2019 valuation are used to set employer contribution rates for fiscal year 2023 for the State and School (July 1, 2022 to June 30, 2023) and fiscal year 2022 for Local employers (calendar year 2022). Given the lag between the valuation date used to set the employer contribution rates 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 where a level-dollar payment is used. 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. However, if actual payroll growth is less than 3.0%, then the unfunded actuarial liability contribution rate will increase.

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

	December 31, 2019 Valuation		
System	Actuarial	Statutory	Difference
State[1]	10.08%	13.86%	(3.78%)
School[1]	14.83%	13.86%	0.97%
State/School[1]	13.86%	13.86%	0.00%
Local[1]	8.90%	8.90%	0.00%
Police & Fire - Uniform Rates[2]	22.99%	22.99%	0.00%
Judges	17.77%	17.77%	0.00%

1 By statute, rates are allowed to increase by a maximum of 1.2%, plus the cost of any benefit enhancements. The December 31, 2019 valuation sets the employer contribution rate for FY 2023 for the State and School group and calendar year 2022 for the Local group. An additional contribution of 0.61% applies to the School group in FY 2023 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 both State and Local employers. The uniform rate does not include the payment required to amortize the unfunded past service liability determined separately for each employer (Table 15).

Due to statutory caps, the full actuarial contribution rate is not necessarily 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 ARC rate) in the 2010 and 2012 valuations, respectively, and remain at the ARC rate in this valuation. However, due to the lag between the valuation date and the applicable fiscal year for the contribution rate, the State group did not actually contribute the full ARC until FY 2014 and the Local group until CY 2015. Based on the current valuation, there is a difference (shortfall) between the actuarial and statutory contribution rates of 0.97% for the School group. However, the statutory contribution rate is set for the combined State/School group and the ARC date occurs in FY 2021 at a rate of 14.23% of pay, based on the December 31, 2017 valuation. The statutory and actuarial required contribution rates remain equal in this valuation.

Separate employer contribution rates are calculated for two subgroups of the State: Correctional Employee Groups with a normal retirement age of 55 (C55) and a normal retirement age of 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, 2015 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 for a time. The resulting contribution rates for the Correctional Employee Groups for FY 2023 are shown in the following table:

Corrections Group	Statutory Rate
Retirement Age 55:	14.14%
Retirement Age 60:	14.84%

The change in the employer actuarial contribution rate from December 31, 2018 to December 31, 2019 and the primary components thereof are shown in the table on page 24. The employer contribution rates increased from those in the December 31, 2018 valuation for State, Local and KP&F, primarily due to unfavorable investment and liability experience during 2019. For the School group (and by extension the State/School group), the decrease in the contribution rate was largely due to covered payroll that increased by 4.5%, which is higher than the assumed payroll growth rate of 3.0%. When the same contribution amount required to amortize the unfunded actuarial liability is spread over a larger payroll, the unfunded actuarial liability contribution rate is reduced. The Judges group had a liability gain as well as a significant decrease in the contribution rate due to the assumption changes, resulting in a lower contribution in the December 31, 2019 valuation compared to the December 31, 2018 valuation.

COMMENTS

Like most public retirement systems, KPERS uses an asset smoothing method to average investment experience above and below the assumed net rate of return (7.75%). 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. While the return on the market value of assets for 2019 was 17.1%, only a portion of the favorable experience is recognized in the current valuation. Along with the scheduled recognition of the investment experience in the prior four years using the asset smoothing method, the return on the actuarial value of assets in 2019 was 6.7%. This generated an experience loss on assets because the actual return was lower than the assumed return of 7.75%. As of the valuation date, the market value of assets exceeds the actuarial value of assets by about 2.7% or $0.6 billion. This deferred experience will flow through the asset smoothing method in the next four years and be recognized in the valuation process, but may be offset if future investment experience is below the 7.75% assumed net rate of return. As the deferred investment experience is recognized, the funded ratio can be expected to increase and the actuarial contribution rate to decrease.

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 significant 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	$20,505	$20,505	$3,578	$3,578
Asset Value	13,960	14,334	2,628	2,697
Unfunded Actuarial Liability*	$ 6,545	$ 6,171	$ 949	$ 881
Funded Ratio	68%	70%	74%	75%
Contribution Rate:				
Normal Cost Rate	7.90%	7.90%	14.87%	14.87%
UAL Payment	11.96%	11.30%	15.27%	14.26%
Actuarial Contribution Rate	19.86%	19.20%	30.14%	29.13%
Employee Rate	6.00%	6.00%	7.15%	7.15%
Employer Rate	13.86%	13.20%	22.99%	21.98%

* May not add due to rounding

Future investment experience will impact the extent to which the deferred investment experience (which is currently a net gain) 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% net rate of return in all future years.

The triennial experience study was performed during 2019 and the Board adopted changes to the demographic assumptions at the January 17, 2020 meeting. Although Cavanaugh Macdonald Consulting recommended changes to the economic assumptions, the Board voted to retain the set of economic assumptions used in the December 31, 2018 valuation. Based on the analysis performed in the experience study, we do not believe the current set of economic assumptions is reasonable, as defined by Actuarial Standard of Practice Number 27. We continue to observe low inflation and bond rates and expectations are for the situation to continue. This will tend to keep expected returns lower, at least in the short term. We suggest the Board contemplate lowering the investment return assumption, along with possible ways to address the impact on contribution rates if that is a concern. CMC is committed to working closely with the Board and staff to develop ideas and concepts that will assist the Board in meeting their goals.

Over the last two decades, a comprehensive plan has been developed to address the long-term funding of KPERS and significant changes have occurred. 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 FY 2006, 0.50% in FY 2007 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. 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 FY 2006, 0.50% in FY 2007 and 0.60% in FY 2008 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 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 KPERS 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, KPERS 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 KPERS 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 SB 249 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 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 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, 2015 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 still applied 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 for the 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 would <u>not</u> be paid (subsequent legislation passed by the 2019 Legislature repaid these delayed contributions).

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) provided that a portion of the contributions for the School group for FY 2017 would be delayed so the total State/School contribution was $64.13 million less than the scheduled statutory contributions. The delayed employer contributions for fiscal year 2017 are 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 provided that the repayment of the contribution reduction from FY 2016 with interest ($115 million), scheduled in FY 2018, would not be paid (subsequent legislation passed by the 2019 Legislature repaid these delayed contributions).

- Senate Substitute for HB 2002 contained KPERS funding provisions for FY 2018 and FY 2019, including the following:
  - **FY 2018**: The contribution for the State/School group for fiscal year 2018 was made at the scheduled statutory rate of 12.01%. In addition, the first installment of $6.4 million on the 20-year amortization of the delayed contributions for FY 2017 was included.
  - **FY 2019**: A portion of the employer contributions for School employers within the State/School group for fiscal year 2019 were delayed so the total employer contribution was $420 million, including the second installment of $6.4 million on the delayed contribution for FY 2017. This resulted in an expected delay of $194 million to 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 applied 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 delayed contributions in FY 2017 and $19.4 million amortization of the delayed contributions in FY 2019, was 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 applies 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 2018 Legislature passed House Substitute for Senate Bill 109 that provided for the following additional funding to the KPERS School group:

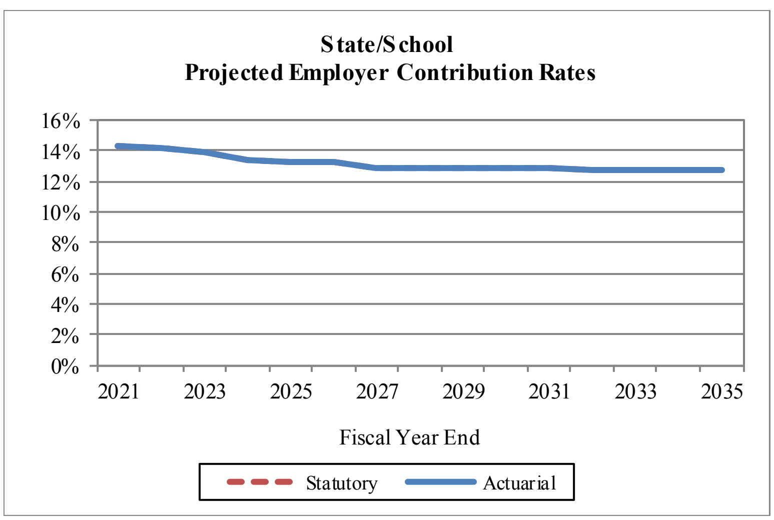
- An additional payment of $82 million in July 2018 (received by KPERS).
- A contingent additional payment of up to $56 million to be paid in FY 2018, if actual FY 2018 receipts exceed the consensus revenue estimates (full amount received in June, 2018).
- A contingent additional payment of up to $56 million to be paid in FY 2019, if actual FY 2019 receipts exceed the consensus revenue estimates (this payment was changed by the 2019 Legislature to a transfer of $51 million in FY 2020 which was received by KPERS on July 1, 2019).

The 2019 Legislature passed two pieces of legislation that impacted the contributions to KPERS. Senate Bill 9 provided for a transfer of $115 million from the State General Fund to KPERS in March, 2019. This payment covered the $97 million in missed KPERS School contributions for FY 2016 plus interest. The additional contribution lowered the State/School actuarial contribution rate by 0.29%. The 2019 Legislature also passed House Substitute for Senate Bill 25. This legislation repealed the actions of the 2018 Legislature which provided for a contingent payment of up to $56 million in FY 2019, if actual FY 2019 receipts exceeded the consensus revenue estimates. Instead, this legislation directly transferred $51 million to the KPERS Trust Fund in FY 2020 (received by KPERS on July 1, 2019). The net reduction of $5 million did not have a significant impact on the valuation results.

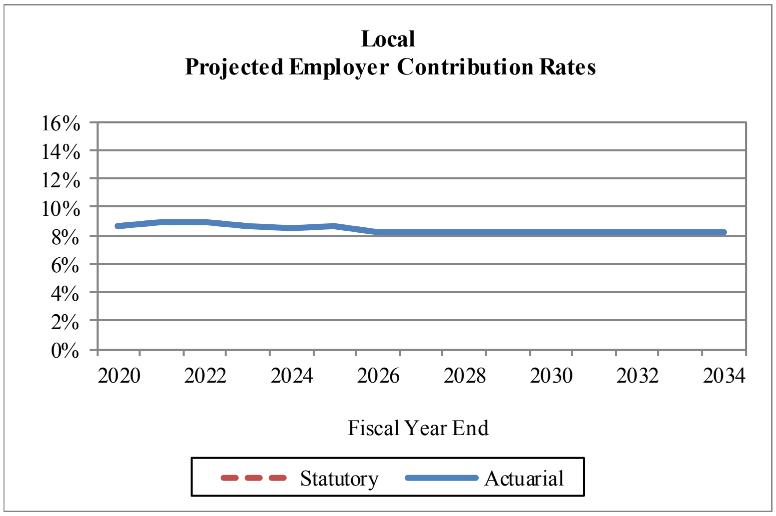
The legacy unfunded actuarial liability is amortized over a closed period ending in 2033 (13 years remaining as of this valuation date). Increases in the unfunded actuarial liability resulting from the assumption changes adopted in the December 31, 2016 and December 31, 2019 valuations are amortized over a closed 25 year period, while other actuarial experience bases (gains/losses) are amortized over closed 20 year periods. While all of the groups (State/School, Local, KP&F, and Judges) are projected to reach a funded ratio of 100%, 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. Any material extension of the amortization periods will delay funding progress by reducing contributions in the short term and increasing them over the long term.

The following graphs show the preliminary projected employer contribution rates assuming all actuarial assumptions are met in the future, including a 7.75% net rate of return on the market value of assets in all years, and that the current statutory funding policy for the State/School group (including the amortization policy) continues and contributions are made as scheduled. Note that we have not reflected any possible impact of the global pandemic upon either investment return or mortality experience because the significance of these impacts, if any, cannot be reasonably assessed at this time.

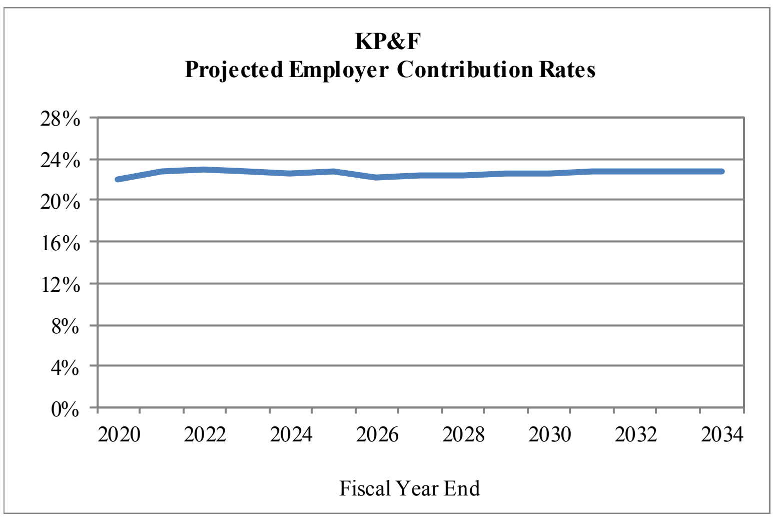
Note that although separate valuations are performed for the State and School groups, the statutory contribution rate for the two is determined using the combined valuation results for the two groups. Contributions which result from the excess of the statutory contribution rate over the actuarial required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



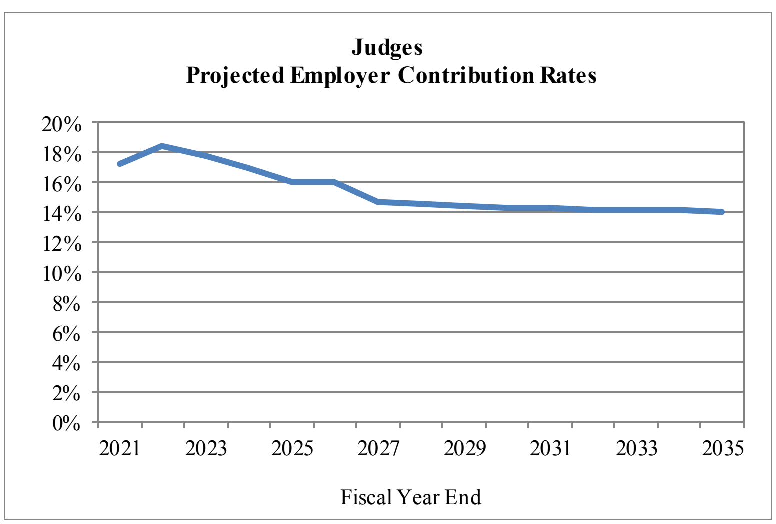
Based on the December 31, 2017 valuation results, the actuarial required contribution (ARC) date for the State/School group occurs in FY 2021 at an ARC rate of 14.23%. Given the deferred investment experience, it decreases to around 13% and then holds steady at that level. During the entire projection period, the statutory rate is expected to be equal to the ARC rate. Actual experience in future years, particularly investment returns, will significantly impact future actuarial and statutory rates.



The Local group reached the ARC date in the 2012 valuation at an ARC rate of 9.48%, which has decreased and is now 8.90% in the 2019 valuation. The projected contribution rate is expected to remain steady around 9% as the deferred investment experience is recognized and then decrease slightly to around 8% over the long term. Actual experience in future years, particularly investment returns, will significantly impact future actuarial and statutory rates.



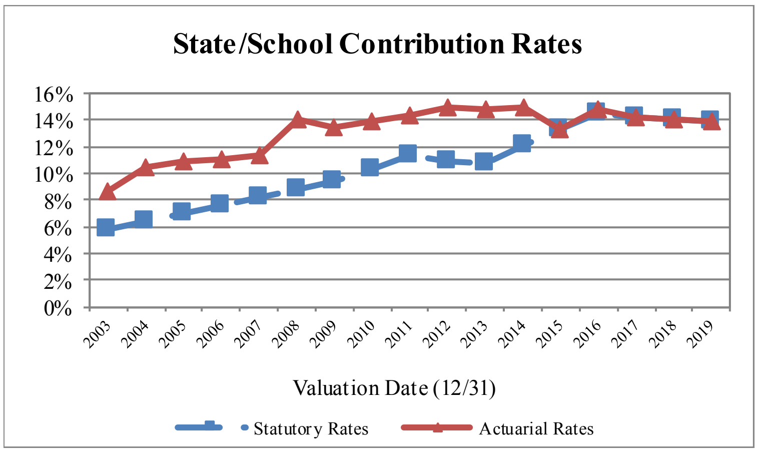
The projected employer contribution rate for KP&F is expected to remain steady around 23% even as the deferred investment experience is recognized through the asset smoothing method. However, actual experience in future years, particularly investment returns, will significantly impact future contribution rates.



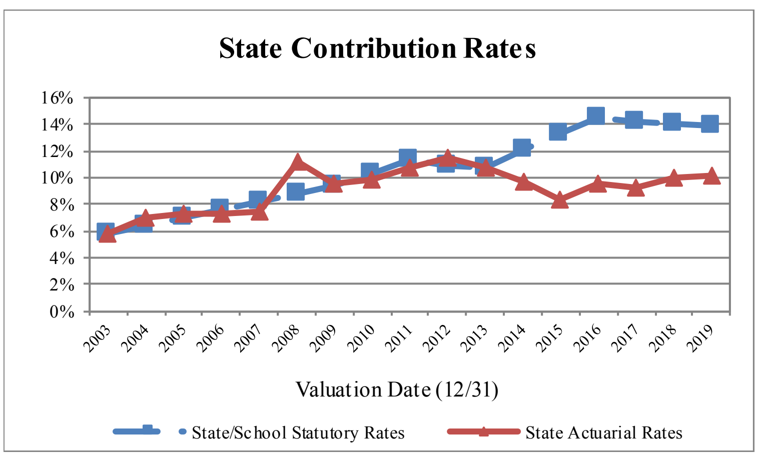
The projected employer contribution rate for Judges is expected to decrease as the deferred investment experience is recognized through the asset smoothing method and the system moves toward full funding. Actual experience in future years, particularly investment returns, will significantly impact future employer contribution 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 has still been determined on a combined basis. By statute, any excess of the statutory contribution over the actuarial required contribution for the State is allocated to the School group.

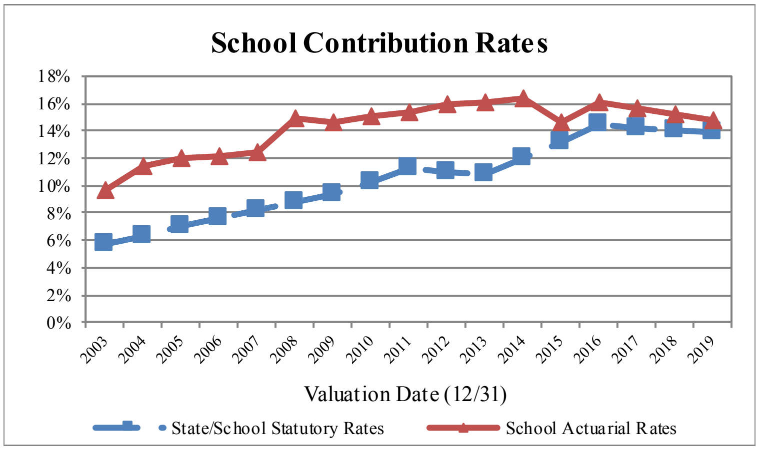
Significant changes to funding methods occurred in 2003, and the System received bond proceeds in 2004 and 2015. Actuarial assumptions were changed in the 2004, 2007, 2011, 2014, 2016 and 2019 valuations. These changes impact the comparability of contribution rates between various valuation dates.



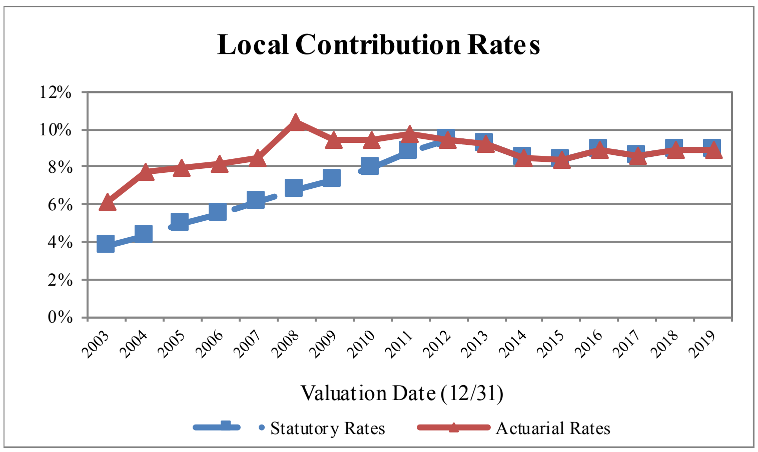
Numerous factors have contributed to the increase in the ARC rate for the State/School group over much of this period including investment experience, changes in actuarial assumptions, and contributions significantly below the actuarial rate. Due to additional contributions and higher payroll growth than expected during 2019, the ARC rate decreased to 13.86%.



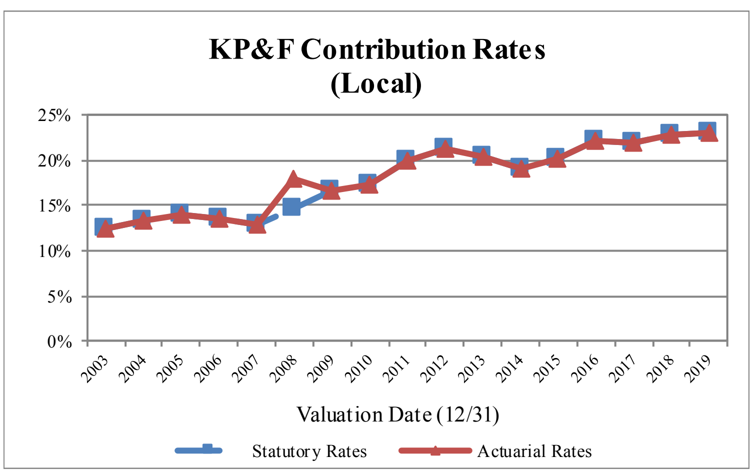
The split of the State group into a separate group with the 2003 valuation, coupled with the bond issue, lowered the State ARC rate. The State reached the full ARC rate in the 2010 valuation and has remained at ARC except for the recertification of the statutory contribution rate for FY 2017 from 12.37% to 10.91%. In this valuation, the State's ARC rate increased to 10.10%, due to unfavorable investment and liability experience during 2019.



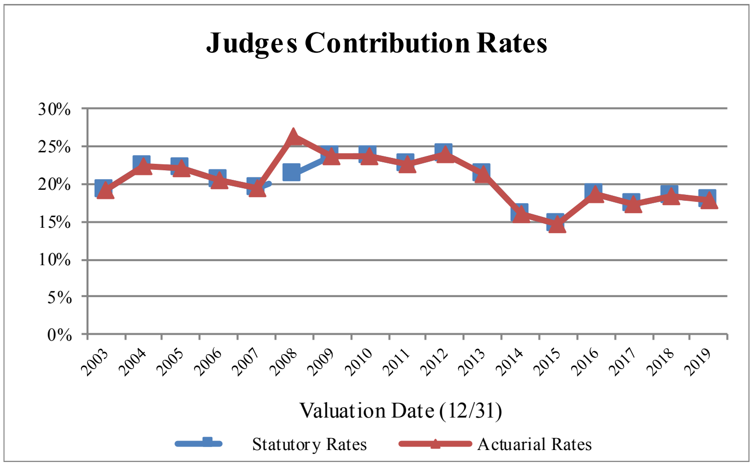
Due to investment experience, changes in actuarial assumptions, and the magnitude of the difference between the actuarial and statutory contribution rates, the ARC rate increased during the early part of this period. Increases to the statutory contribution rate and contribution sharing from the State group has helped to stabilize the ARC rate.



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 ARC rate in the 2012 valuation. In this valuation, the Local group's ARC rate increased slightly to 8.90%, due to unfavorable investment and liability experience during 2019.



Investment experience in 2008, 2011, and 2019 resulted in higher contribution rates in the latter part of the period. The assumption changes reflected in the 2016 valuation increased the contribution rate. Unfavorable investment experience on an actuarial basis during 2019 resulted in an increase in the ARC rate for the KP&F System.



Investment experience in 2008 and 2011 resulted in higher contribution rates in the middle of the period. The assumption changes reflected in the 2016 valuation increased the contribution rate, but assumption changes in the 2019 valuation deceased the contribution rate. Favorable demographic experience during 2019 contributed to a decrease in the ARC rate for the Judges System.

SUMMARY OF CHANGE IN UNFUNDED ACTUARIAL LIABILITY BY SYSTEM DECEMBER 31, 2019 VALUATION

($ millions)

	State	School	State/School	Local	KP&F	Judges	Total
UAL in 12/31/2018 Valuation Report	$934.7	$5,821.7	$6,756.4	$1,501.6	$933.2	$10.7	$9,201.8
· Effect of contribution cap/time lag	11.6	2.3	13.9	(0.4)	3.6	0.5	17.6
· Expected decrease due to UAL amortization	(11.2)	(100.3)	(111.5)	(42.0)	(15.8)	(0.1)	(169.4)
· Actual vs. expected experience							
Investment return	40.6	100.3	140.9	37.4	29.6	2.4	210.2
Demographic experience	31.9	45.1	77.0	36.0	3.1	(1.9)	114.1
All other experience	(23.5)	(44.7)	(68.2)	(6.4)	(6.4)	(0.8)	(81.7)
· Additional contributions	0.0	(174.6)	(174.6)	0.0	0.0	0.0	(174.6)
· Change in actuarial assumptions/methods	(1.5)	(40.7)	(42.3)	(3.9)	(4.4)	(0.5)	(51.0)
· Data refinements	(20.2)	(26.4)	(46.6)	(20.2)	6.5	0.0	(60.3)
UAL in 12/31/2019 Valuation Report	$962.3	$5,582.7	$6,545.1	$1,502.1	$949.4	$10.3	$9,006.8

Note: Numbers may not add due to rounding.

SUMMARY OF CHANGES IN EMPLOYER ACTUARIAL CONTRIBUTION RATE BY SYSTEM AS OF DECEMBER 31, 2019

Percentage of Payroll	State	School	State/School	Local	KP&F[1]	Judges
Actuarial Contribution Rate in 12/31/2018 Valuation	9.97%	15.15%	14.09%	8.87%	22.80%	18.40%
Change Due to Amortization of UAL						
· effect of contribution cap/time lag	0.08	0.00	0.02	0.00	0.05	0.15
· UAL amortization	0.00	0.00	0.00	0.00	0.00	(0.11)
· investment experience	0.29	0.18	0.21	0.14	0.38	0.74
· liability experience	0.23	0.08	0.11	0.14	0.04	(0.58)
· all other experience	(0.21)	(0.19)	(0.21)	(0.08)	(0.16)	(0.36)
· additional contributions in FY 2019[2]	0.00	0.00	0.00	0.00	0.00	0.00
· payroll growth	(0.11)	(0.19)	(0.17)	0.00	(0.17)	0.00
· assumptions/methods	(0.02)	(0.09)	(0.08)	(0.02)	(0.06)	(0.25)
· data refinements	(0.15)	(0.04)	(0.06)	(0.08)	0.10	0.00
Change in Employer Normal Cost Rate						
· data refinements	0.13	0.07	0.08	0.09	0.01	0.00
· assumptions/methods	(0.06)	(0.05)	(0.05)	(0.07)	(0.01)	(0.25)
· all other experience	(0.07)	(0.09)	(0.08)	(0.09)	0.01	0.03
Actuarial Contribution Rate in 12/31/2019 Valuation	10.08%	14.83%	13.86%	8.90%	22.99%	17.77%

[1] Contribution rate for Local employers only.

[2] Additional contributions received in 2019 were already reflected in the development of the actuarial contribution rate during the 12/31/2019 valuation. Therefore, making these contributions during 2019 did not impact the change in the actuarial contribution rate.

Note: Numbers may not add due to rounding.

SUMMARY OF HISTORICAL CHANGES IN TOTAL SYSTEM UNFUNDED ACTUARIAL LIABILITY as of DECEMBER 31, 2019 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
Additional 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 12/31/19: $ 9,007 million

SUMMARY OF HISTORICAL CHANGES IN TOTAL SYSTEM UNFUNDED ACTUARIAL LIABILITY as of DECEMBER 31, 2019 VALUATION (continued)

%(millions)	As Reported on Valuation Date							
	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
Additional 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 12/31/19: $ 9,007 million

SUMMARY OF HISTORICAL CHANGES IN TOTAL SYSTEM UNFUNDED ACTUARIAL LIABILITY
as of
DECEMBER 31, 2019 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
Actual Experience vs. Assumed								
• Investment	$(1,011)	$560	$852	$732	$(653)	$(368)	$52	$(59)
• Other	(70)	(334)	(190)	(78)	(125)	(78)	(130)	(144)
Assumption Changes	0	0	(64)	0	0	(50)	0	593
Changes in Data/Procedures	0	0	0	0	0	0	0	0
Change in Cost Method	0	0	0	0	0	0	0	0
Effect of Contribution Cap/Lag	383	320	289	303	246	178	160	70
Amortization Method	96	68	62	49	46	18	(11)	(38)
Change in Benefit Provisions	0	0	15	19	0	1	0	1
Change in Actuarial Firm/Software	0	(27)	0	0	0	0	0	0
Bond Issue	0	0	0	0	0	0	(1,000)	0
Non-Collectible Pension Contributions	0	0	0	0	0	0	0	99
Additional Contribution	0	0	0	0	0	0	0	0
Total	$(602)	$587	$964	$1,025	$(487)	$(298)	$(929)	$522

Unfunded actuarial liability 6/30/93: $ 968 million
Unfunded actuarial liability 12/31/19: $ 9,007 million

SUMMARY OF HISTORICAL CHANGES IN TOTAL SYSTEM UNFUNDED ACTUARIAL LIABILITY as of DECEMBER 31, 2019 VALUATION (continued)

		As Reported on Valuation Date		
$(millions)	**12/31/17**	**12/31/18**	**12/31/19**	**Total**
Actual Experience vs. Assumed				
• Investment	$(117)	$476	$210	$1,750
• Other	(50)	69	32	196
Assumption Changes	0	0	(51)	1,292
Changes in Data/Procedures	0	0	(60)	317
Change in Cost Method	0	0	0	1,147
Effect of Contribution Cap/Lag	149	64	18	4,283
Amortization Method	(136)	(171)	(169)	496
Change in Benefit Provisions	0	0	0	285
Change in Actuarial Firm/Software	0	0	0	(27)
Bond Issue	0	0	0	(1,481)
Non-Collectible Pension Contributions	0	0	0	99
Additional Contributions	0	(143)	(175)	(318)
Total	$(154)	$295	$(195)	$8,039

Unfunded actuarial liability 6/30/93: $ 968 million
Unfunded actuarial liability 12/31/19: $ 9,007 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 values at different points in time.

SUMMARY OF PRINCIPAL RESULTS

KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM (STATE)

		12/31/2019 Valuation		12/31/2018 Valuation	% Change
1. PARTICIPANT DATA					
Number of:					
Active Members		21,239		20,893	1.7%
Retired Members and Beneficiaries		20,844		20,522	1.6%
Inactive Members		9,573		9,346	2.4%
Total Members		51,656		50,761	1.8%
Projected Annual Salaries of Active Members	$	995,918,683	$	954,158,850	4.4%
Annual Retirement Payments for Retired Members and Beneficiaries	$	307,303,369	$	297,580,405	3.3%
2. ASSETS AND LIABILITIES					
a. Total Actuarial Liability	$	4,603,839,926	$	4,527,410,069	1.7%
b. Assets for Valuation Purposes	$	3,641,509,766	$	3,592,747,329	1.4%
c. Unfunded Actuarial Liability (a) - (b)	$	962,330,160	$	934,662,740	3.0%
d. Funded Ratio (b) / (a)		79.1%		79.4%	(0.4%)
e. Market Value of Assets	$	3,743,398,257	$	3,371,313,965	11.0%
f. Funded Ratio on Market Value (e) / (a)		81.3%		74.5%	9.1%
3. EMPLOYER CONTRIBUTION RATES AS A PERCENT OF PAYROLL					
Normal Cost					
Total		7.59%		7.59%	
Member		6.00%		6.00%	
Employer		1.59%		1.59%	
Amortization of Unfunded Actuarial Liability		8.49%		8.38%	
Actuarial Contribution Rate		10.08%		9.97%	
Statutory Employer Contribution Rate*		13.86%		14.09%	

* 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)

		12/31/2019 Valuation		12/31/2018 Valuation	% Change
1. PARTICIPANT DATA					
Number of:					
Active Members		88,953		87,245	2.0%
Retired Members and Beneficiaries		56,616		55,027	2.9%
Inactive Members		32,413		31,409	3.2%
Total Members		177,982		173,681	2.5%
Projected Annual Salaries of Active Members	$	3,910,350,769	$	3,740,759,271	4.5%
Annual Retirement Payments for Retired Members and Beneficiaries	$	899,162,177	$	861,574,541	4.4%
2. ASSETS AND LIABILITIES					
a. Total Actuarial Liability	$	15,900,876,965	$	15,431,399,978	3.0%
b. Assets for Valuation Purposes	$	10,318,132,870	$	9,609,729,576	7.4%
c. Unfunded Actuarial Liability (a) - (b)	$	5,582,744,095	$	5,821,670,402	(4.1%)
d. Funded Ratio (b) / (a)		64.9%		62.3%	4.2%
e. Market Value of Assets	$	10,590,524,379	$	9,015,296,513	17.5%
f. Funded Ratio on Market Value (e) / (a)		66.6%		58.4%	14.0%
3. EMPLOYER CONTRIBUTION RATES AS A PERCENT OF PAYROLL					
Normal Cost					
Total		7.98%		8.05%	
Member		6.00%		6.00%	
Employer		1.98%		2.05%	
Amortization of Unfunded Actuarial Liability		12.85%		13.10%	
Actuarial Contribution Rate		14.83%		15.15%	
Statutory Employer Contribution Rate*		13.86%		14.09%	

* 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 0.68% applies for FY 2021, 0.64% for FY 2022 and 0.61% for FY 2023.

SUMMARY OF PRINCIPAL RESULTS

KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM (STATE/SCHOOL)

		12/31/2019 Valuation		12/31/2018 Valuation	% Change
1. PARTICIPANT DATA					
Number of:					
Active Members		110,192		108,138	1.9%
Retired Members and Beneficiaries		77,460		75,549	2.5%
Inactive Members		41,986		40,755	3.0%
Total Members		229,638		224,442	2.3%
Projected Annual Salaries of Active Members	$	4,906,269,452	$	4,694,918,121	4.5%
Annual Retirement Payments for Retired Members and Beneficiaries	$	1,206,465,546	$	1,159,154,946	4.1%
2. ASSETS AND LIABILITIES					
a. Total Actuarial Liability	$	20,504,716,891	$	19,958,810,047	2.7%
b. Assets for Valuation Purposes	$	13,959,642,636	$	13,202,476,905	5.7%
c. Unfunded Actuarial Liability (a) - (b)	$	6,545,074,255	$	6,756,333,142	(3.1%)
d. Funded Ratio (b) / (a)		68.1%		66.1%	3.0%
e. Market Value of Assets	$	14,333,922,636	$	12,386,610,478	15.7%
f. Funded Ratio on Market Value (e) / (a)		69.9%		62.1%	12.6%
3. EMPLOYER CONTRIBUTION RATES AS A PERCENT OF PAYROLL					
Normal Cost					
Total		7.90%		7.95%	
Member		6.00%		6.00%	
Employer		1.90%		1.95%	
Amortization of Unfunded Actuarial Liability		11.96%		12.14%	
Actuarial Contribution Rate		13.86%		14.09%	
Statutory Employer Contribution Rate*		13.86%		14.09%	

* 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 0.68% applies for FY 2021, 0.64% for FY 2022 and 0.61% for FY 2023.

SUMMARY OF PRINCIPAL RESULTS

KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM (LOCAL)

		12/31/2019 Valuation		12/31/2018 Valuation	% Change
1. PARTICIPANT DATA					
Number of:					
Active Members		38,007		37,966	0.1%
Retired Members and Beneficiaries		22,099		21,303	3.7%
Inactive Members		19,410		19,024	2.0%
Total Members		79,516		78,293	1.6%
Projected Annual Salaries of Active Members	$	1,846,129,228	$	1,792,796,339	3.0%
Annual Retirement Payments for Retired Members and Beneficiaries	$	286,232,067	$	266,840,648	7.3%
2. ASSETS AND LIABILITIES					
a. Total Actuarial Liability	$	5,704,514,304	$	5,492,551,998	3.9%
b. Assets for Valuation Purposes	$	4,202,428,554	$	3,990,999,061	5.3%
c. Unfunded Actuarial Liability (a) - (b)	$	1,502,085,750	$	1,501,552,937	0.0%
d. Funded Ratio (b) / (a)		73.7%		72.7%	1.4%
e. Market Value of Assets	$	4,323,027,610	$	3,752,043,860	15.2%
f. Funded Ratio on Market Value (e) / (a)		75.8%		68.3%	11.0%
3. EMPLOYER CONTRIBUTION RATES AS A PERCENT OF PAYROLL					
Normal Cost					
Total		7.43%		7.50%	
Member		6.00%		6.00%	
Employer		1.43%		1.50%	
Amortization of Unfunded Actuarial Liability		7.47%		7.37%	
Actuarial Contribution Rate		8.90%		8.87%	
Statutory Employer Contribution Rate*		8.90%		8.87%	

* 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)

		12/31/2019 Valuation	12/31/2018 Valuation	% Change
1.	**PARTICIPANT DATA**			
	Number of:			
	Active Members	148,199	146,104	1.4%
	Retired Members and Beneficiaries	99,559	96,852	2.8%
	Inactive Members	61,396	59,779	2.7%
	Total Members	309,154	302,735	2.1%
	Projected Annual Salaries of Active Members	$ 6,752,398,680	$ 6,487,714,460	4.1%
	Annual Retirement Payments for Retired Members and Beneficiaries	$ 1,492,697,613	$ 1,425,995,594	4.7%
2.	**ASSETS AND LIABILITIES**			
	a. Total Actuarial Liability	$ 26,209,231,195	$ 25,451,362,045	3.0%
	b. Assets for Valuation Purposes	$ 18,162,071,190	$ 17,193,475,966	5.6%
	c. Unfunded Actuarial Liability (a) - (b)	$ 8,047,160,005	$ 8,257,886,079	(2.6%)
	d. Funded Ratio (b) / (a)	69.3%	67.6%	2.5%
	e. Market Value of Assets	$ 18,656,950,246	$ 16,138,654,338	15.6%
	f. Funded Ratio on Market Value (e) / (a)	71.2%	63.4%	12.3%

SUMMARY OF PRINCIPAL RESULTS

KANSAS POLICE AND FIREMEN'S RETIREMENT SYSTEM

		12/31/2019 Valuation		12/31/2018 Valuation	% Change
1. PARTICIPANT DATA					
Number of:					
Active Members		7,797		7,695	1.3%
Retired Members and Beneficiaries		5,763		5,595	3.0%
Inactive Members		1,852		1,711	8.2%
Total Members		15,412		15,001	2.7%
Projected Annual Salaries of Active Members	$	554,539,001	$	532,371,865	4.2%
Annual Retirement Payments for Retired Members and Beneficiaries	$	201,954,477	$	191,441,617	5.5%
2. ASSETS AND LIABILITIES					
a. Total Actuarial Liability	$	3,577,512,085	$	3,456,777,628	3.5%
b. Assets for Valuation Purposes	$	2,628,140,348	$	2,523,573,517	4.1%
c. Unfunded Actuarial Liability (a) - (b)	$	949,371,737	$	933,204,111	1.7%
d. Funded Ratio (b) / (a)		73.5%		73.0%	0.7%
e. Market Value of Assets	$	2,696,650,789	$	2,361,673,707	14.2%
f. Funded Ratio on Market Value (e) / (a)		75.4%		68.3%	10.4%
3. EMPLOYER CONTRIBUTION RATES AS A PERCENT OF PAYROLL					
Normal Cost					
Total		14.87%		14.86%	
Member		7.15%		7.15%	
Employer		7.72%		7.71%	
Amortization of Unfunded Actuarial and Supplemental Liability		15.27%		15.09%	
Actuarial Contribution Rate (Local Employers)		22.99%		22.80%	
Statutory Employer Contribution Rate*		22.99%		22.80%	

* 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

		12/31/2019 Valuation		12/31/2018 Valuation	% Change
1. PARTICIPANT DATA					
Number of:					
Active Members		257		256	0.4%
Retired Members and Beneficiaries		298		286	4.2%
Inactive Members		9		5	80.0%
Total Members		564		547	3.1%
Projected Annual Salaries of Active Members	$	29,066,581	$	28,535,137	1.9%
Annual Retirement Payments for Retired Members and Beneficiaries	$	12,807,544	$	12,216,738	4.8%
2. ASSETS AND LIABILITIES					
a. Total Actuarial Liability	$	195,593,331	$	191,996,752	1.9%
b. Assets for Valuation Purposes	$	185,323,804	$	181,280,044	2.2%
c. Unfunded Actuarial Liability (a) - (b)	$	10,269,527	$	10,716,708	(4.2%)
d. Funded Ratio (b) / (a)		94.7%		94.4%	0.3%
e. Market Value of Assets	$	189,825,166	$	169,210,144	12.2%
f. Funded Ratio on Market Value (e) / (a)		97.1%		88.1%	10.2%
3. EMPLOYER CONTRIBUTION RATES AS A PERCENT OF PAYROLL					
Normal Cost					
Total		20.25%		20.48%	
Member		5.63%		5.65%	
Employer		14.62%		14.83%	
Amortization of Unfunded Actuarial and Supplemental Liability		3.15%		3.57%	
Actuarial Contribution Rate		17.77%		18.40%	
Statutory Employer Contribution Rate*		17.77%		18.40%	

* 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

		12/31/2019 Valuation		12/31/2018 Valuation	% Change
1. PARTICIPANT DATA					
Number of:					
Active Members		156,253		154,055	1.4%
Retired Members and Beneficiaries		105,620		102,733	2.8%
Inactive Members		63,257		61,495	2.9%
Total Members		325,130		318,283	2.2%
Projected Annual Salaries of Active Members	$	7,336,004,262	$	7,048,621,462	4.1%
Annual Retirement Payments for Retired Members and Beneficiaries	$	1,707,459,634	$	1,629,653,949	4.8%
2. ASSETS AND LIABILITIES					
a. Total Actuarial Liability	$	29,982,336,611	$	29,100,136,425	3.0%
b. Assets for Valuation Purposes	$	20,975,535,342	$	19,898,329,527	5.4%
c. Unfunded Actuarial Liability (a) - (b)	$	9,006,801,269	$	9,201,806,898	(2.1%)
d. Funded Ratio (b) / (a)		70.0%		68.4%	2.3%
e. Market Value of Assets	$	21,543,426,201	$	18,669,538,189	15.4%
f. Funded Ratio on Market Value (e) / (a)		71.9%		64.2%	12.0%

This report presents the actuarial valuation of the Kansas Public Employees Retirement System (KPERS) as of December 31, 2019. 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. Section 6 provides other historical information about the System. Section 7 discusses risks, related to funding, for the System to consider.

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, 2019, as amended by legislation in the 2020 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, 2019, the market value of assets for the Retirement System was $21.543 billion. Table 1 shows the market value of assets as of December 31, 2019 in total and by investment category. Table 2 summarizes the change in the market value of assets, from December 31, 2018 to December 31, 2019, 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, 2019.

TABLE 1
ANALYSIS OF NET ASSETS AT MARKET VALUE

	December 31, 2019		
	Amount ($ Millions)	% of Total	
Cash & Equivalents	$ 554	2.6	%
Alternative Investments	1,650	7.7	
Real Estate	2,523	11.7	
Fixed Income	5,781	26.8	
Domestic Equity	6,486	30.1	
International Equity	4,549	21.1	
Net Assets	$ 21,543	100.0	%

Allocation of Net Assets on December 31, 2019:

State	$ 3,743
School	10,591
Local	4,323
KP&F	2,697
Judges	190
Total Net Assets*	$ 21,543

* May not add due to rounding

TABLE 2
SUMMARY OF CHANGES IN TOTAL SYSTEM ASSETS DURING PERIOD ENDED DECEMBER 31, 2019

(Market Value)

	State	School	State/School	Local
Market Value of Assets as of January 1, 2019	$ 3,371,313,965	$ 9,015,296,513	$ 12,386,610,478	$ 3,752,043,860
Contributions:				
Employee	59,262,395	228,760,941	288,023,336	111,333,858
Employee service purchases	719,152	2,788,774	3,507,926	1,103,480
Statutory Employer	98,379,520	623,336,406	721,715,926	170,007,103
Additional Employer	0	166,000,000	166,000,000	0
Miscellaneous	102,630	479,415	582,045	330,775
Total Contributions	158,463,697	1,021,365,536	1,179,829,233	282,775,216
Total Investment Income	556,844,824	1,520,837,686	2,077,682,510	632,270,819
Total Income	715,308,521	2,542,203,222	3,257,511,743	915,046,035
Less Benefits:				
Annuity Retirement Benefits	(303,643,127)	(883,544,906)	(1,187,188,033)	(277,017,749)
Partial Lump Sum Benefits	(20,245,126)	(49,090,782)	(69,335,908)	(29,165,569)
Retirant Dividends	(123,057)	(257,826)	(380,883)	(68,193)
Withdrawals	(13,915,607)	(21,317,185)	(35,232,792)	(31,995,282)
Death Benefits	(2,659,451)	(5,560,210)	(8,219,661)	(2,820,326)
Total Benefits	(340,586,368)	(959,770,909)	(1,300,357,277)	(341,067,119)
Administrative Expenses	(2,637,861)	(7,204,447)	(9,842,308)	(2,995,166)
Net Increase in Assets	372,084,292	1,575,227,866	1,947,312,158	570,983,750
Market Value of Assets as of December 31, 2019	$ 3,743,398,257	$ 10,590,524,379	$ 14,333,922,636	$ 4,323,027,610

TABLE 2 (cont.)
SUMMARY OF CHANGES IN TOTAL SYSTEM ASSETS
DURING PERIOD ENDED DECEMBER 31, 2019

(Market Value)

	KPERS	KP&F	Judges	Total
Market Value of Assets as of January 1, 2019	$ 16,138,654,338	$ 2,361,673,707	$ 169,210,144	$ 18,669,538,189
Contributions:				
Employee	399,357,194	39,153,800	1,551,957	440,062,951
Employee service purchases	4,611,406	983,700	18,972	5,614,078
Statutory Employer	891,723,029	122,384,056	4,826,276	1,018,933,361
Additional Employer	166,000,000	0	0	166,000,000
Miscellaneous	912,820	302,789	4,176	1,219,785
Total Contributions	1,462,604,449	162,824,345	6,401,381	1,631,830,175
Total Investment Income	2,709,953,329	396,054,765	28,112,966	3,134,121,060
Total Income	4,172,557,778	558,879,110	34,514,347	4,765,951,235
Less Benefits:				
Annuity Retirement Benefits	(1,464,205,782)	(197,910,604)	(12,423,275)	(1,674,539,661)
Partial Lump Sum Benefits	(98,501,477)	(17,165,352)	(1,219,782)	(116,886,611)
Retirant Dividends	(449,076)	(608,452)	(9,424)	(1,066,952)
Withdrawals	(67,228,074)	(6,055,665)	(80,601)	(73,364,340)
Death Benefits	(11,039,987)	(285,781)	(33,067)	(11,358,835)
Total Benefits	(1,641,424,396)	(222,025,854)	(13,766,149)	(1,877,216,399)
Administrative Expenses	(12,837,474)	(1,876,174)	(133,176)	(14,846,824)
Net Increase in Assets	2,518,295,908	334,977,082	20,615,022	2,873,888,012
Market Value of Assets as of December 31, 2019	$ 18,656,950,246	$ 2,696,650,789	$ 189,825,166	$ 21,543,426,201

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

		Plan Year End			
		12/31/2016	12/31/2017	12/31/2018	12/31/2019
1.	Market Value of Assets, beginning of year	$ 3,244,225,487	$ 3,354,619,933	$ 3,653,660,034	$ 3,371,313,965
2.	Contributions during year	159,716,397	155,642,178	149,037,254	158,463,697
3.	Benefits paid during year	(308,919,134)	(318,261,310)	(327,306,703)	(340,586,368)
4.	Administrative expenses paid during year	(2,575,374)	(2,183,431)	(2,391,057)	(2,637,861)
5.	Expected investment income	253,583,710	253,716,102	276,288,680	254,250,948
6.	Non-collectible Pension Contributions	(4,147,707)	0	0	0
7.	Expected Value of Assets, end of year	3,341,883,379	3,443,533,472	3,749,288,208	3,440,804,381
8.	Market Value of Assets, end of year	3,354,619,933	3,653,660,034	3,371,313,965	3,743,398,257
9.	Excess (shortfall) of net investment income	$ 12,736,554	$ 210,126,562	$ (377,974,243)	$ 302,593,876

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

		Plan Year End			
		12/31/2016	12/31/2017	12/31/2018	12/31/2019
1.	Market Value of Assets, beginning of year	$ 8,151,104,207	$ 8,444,384,754	$ 9,335,940,612	$ 9,015,296,513
2.	Contributions during year	591,436,507	644,270,462	875,578,047	1,021,365,536
3.	Benefits paid during year	(865,178,991)	(898,475,592)	(925,448,228)	(959,770,909)
4.	Administrative expenses paid during year	(5,968,861)	(5,418,910)	(6,220,763)	(7,204,447)
5.	Expected investment income	641,115,125	644,567,102	721,402,429	700,753,774
6.	Non-collectible Pension Contributions	(94,386,288)	0	0	0
7.	Expected Value of Assets, end of year	8,418,121,699	8,829,327,816	10,001,252,097	9,770,440,467
8.	Market Value of Assets, end of year	8,444,384,754	9,335,940,612	9,015,296,513	10,590,524,379
9.	Excess (shortfall) of net investment income	$ 26,263,055	$ 506,612,796	$ (985,955,584)	$ 820,083,912

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

		Plan Year End			
		12/31/2016	12/31/2017	12/31/2018	12/31/2019
1.	Market Value of Assets, beginning of year	$ 11,395,329,694	$ 11,799,004,687	$ 12,989,600,646	$ 12,386,610,478
2.	Contributions during year	751,152,904	799,912,640	1,024,615,301	1,179,829,233
3.	Benefits paid during year	(1,174,098,125)	(1,216,736,902)	(1,252,754,931)	(1,300,357,277)
4.	Administrative expenses paid during year	(8,544,235)	(7,602,341)	(8,611,820)	(9,842,308)
5.	Expected investment income	894,698,835	898,283,204	997,691,109	955,004,722
6.	Non-collectible Pension Contributions	(98,533,995)	0	0	0
7.	Expected Value of Assets, end of year	11,760,005,078	12,272,861,288	13,750,540,305	13,211,244,848
8.	Market Value of Assets, end of year	11,799,004,687	12,989,600,646	12,386,610,478	14,333,922,636
9.	Excess (shortfall) of net investment income	$ 38,999,609	$ 716,739,358	$ (1,363,929,827)	$ 1,122,677,788

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

		Plan Year End			
		12/31/2016	12/31/2017	12/31/2018	12/31/2019
1.	Market Value of Assets, beginning of year	$ 3,216,043,938	$ 3,469,920,041	$ 3,920,141,884	$ 3,752,043,860
2.	Contributions during year	266,851,517	256,527,900	264,639,299	282,775,216
3.	Benefits paid during year	(281,130,118)	(296,109,951)	(319,763,099)	(341,067,119)
4.	Administrative expenses paid during year	(2,585,342)	(2,316,542)	(2,595,471)	(2,995,166)
5.	Expected investment income	256,621,934	267,325,526	301,616,107	288,452,837
6.	Expected Value of Assets, end of year	3,455,801,929	3,695,346,974	4,164,038,720	3,979,209,628
7.	Market Value of Assets, end of year	3,469,920,041	3,920,141,884	3,752,043,860	4,323,027,610
8.	Excess (shortfall) of net investment income	$ 14,118,112	$ 224,794,910	$ (411,994,860)	$ 343,817,982

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

		Plan Year End			
		12/31/2016	12/31/2017	12/31/2018	12/31/2019
1.	Market Value of Assets, beginning of year	$ 2,126,561,947	$ 2,256,070,037	$ 2,495,082,288	$ 2,361,673,707
2.	Contributions during year	137,488,402	134,862,351	146,568,251	162,824,345
3.	Benefits paid during year	(183,384,046)	(194,826,032)	(208,000,052)	(222,025,854)
4.	Administrative expenses paid during year	(1,727,067)	(1,414,015)	(1,653,595)	(1,876,174)
5.	Expected investment income	168,256,694	172,511,420	190,969,931	180,707,113
6.	Non-collectible Pension Contributions	(409,785)	0	0	0
7.	Expected Value of Assets, end of year	2,246,786,145	2,367,203,761	2,622,966,823	2,481,303,137
8.	Market Value of Assets, end of year	2,256,070,037	2,495,082,288	2,361,673,707	2,696,650,789
9.	Excess (shortfall) of net investment income	$ 9,283,892	$ 127,878,527	$ (261,293,116)	$ 215,347,652

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

		Plan Year End			
		12/31/2016	12/31/2017	12/31/2018	12/31/2019
1.	Market Value of Assets, beginning of year	$ 155,264,020	$ 165,322,736	$ 180,462,402	$ 169,210,144
2.	Contributions during year	7,857,606	6,708,292	6,102,283	6,401,381
3.	Benefits paid during year	(10,769,054)	(12,587,218)	(12,155,548)	(13,766,149)
4.	Administrative expenses paid during year	(127,650)	(99,408)	(119,442)	(133,176)
5.	Expected investment income	12,301,896	12,585,174	13,751,107	12,828,662
6.	Expected Value of Assets, end of year	164,526,818	171,929,576	188,040,802	174,540,862
7.	Market Value of Assets, end of year	165,322,736	180,462,402	169,210,144	189,825,166
8.	Excess (shortfall) of net investment income	$ 795,918	$ 8,532,826	$ (18,830,658)	$ 15,284,304

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 12/31/19	$ 302,593,876	$ 820,083,912	$ 1,122,677,788	$ 343,817,982	$ 1,466,495,770
	b. Year ending 12/31/18	(377,974,243)	(985,955,584)	(1,363,929,827)	(411,994,860)	(1,775,924,687)
	c. Year ending 12/31/17	210,126,562	506,612,796	716,739,358	224,794,910	941,534,268
	d. Year ending 12/31/16	12,736,554	26,263,055	38,999,609	14,118,112	53,117,721
	e. Total	$ 147,482,749	$ 367,004,179	$ 514,486,928	$ 170,736,144	$ 685,223,072
2.	Deferral of excess (shortfall) of investment income					
	a. Year ending 12/31/19 (80%)	242,075,101	656,067,130	898,142,231	275,054,386	1,173,196,617
	b. Year ending 12/31/18 (60%)	(226,784,546)	(591,573,350)	(818,357,896)	(247,196,916)	(1,065,554,812)
	c. Year ending 12/31/17 (40%)	84,050,625	202,645,118	286,695,743	89,917,964	376,613,707
	d. Year ending 12/31/16 (20%)	2,547,311	5,252,611	7,799,922	2,823,622	10,623,544
	e. Total	$ 101,888,491	$ 272,391,509	$ 374,280,000	$ 120,599,056	$ 494,879,056
3.	Market Value of Assets, end of year	$ 3,743,398,257	$ 10,590,524,379	$ 14,333,922,636	$ 4,323,027,610	$ 18,656,950,246
4.	Actuarial Value of Assets, end of year (3) - (2e)	$ 3,641,509,766	$ 10,318,132,870	$ 13,959,642,636	$ 4,202,428,554	$ 18,162,071,190
5.	Actuarial Value divided by market value (4)/(3)	97.3%	97.4%	97.4%	97.2%	97.3%

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 12/31/19	$ 1,466,495,770	$ 215,347,652	$ 15,284,304	$ 1,697,127,726
b. Year ending 12/31/18	(1,775,924,687)	(261,293,116)	(18,830,658)	(2,056,048,461)
c. Year ending 12/31/17	941,534,268	127,878,527	8,532,826	1,077,945,621
d. Year ending 12/31/16	53,117,721	9,283,892	795,918	63,197,531
e. Total	$ 685,223,072	$ 91,216,955	$ 5,782,390	$ 782,222,417
2. Deferral of excess (shortfall) of investment income				
a. Year ending 12/31/19 (80%)	1,173,196,617	172,278,122	12,227,443	1,357,702,182
b. Year ending 12/31/18 (60%)	(1,065,554,812)	(156,775,870)	(11,298,395)	(1,233,629,077)
c. Year ending 12/31/17 (40%)	376,613,707	51,151,411	3,413,130	431,178,248
d. Year ending 12/31/16 (20%)	10,623,544	1,856,778	159,184	12,639,506
e. Total	$ 494,879,056	$ 68,510,441	$ 4,501,362	$ 567,890,859
3. Market Value of Assets, end of year	$ 18,656,950,246	$ 2,696,650,789	$ 189,825,166	$ 21,543,426,201
4. Actuarial Value of Assets, end of year (3) - (2e)	$ 18,162,071,190	$ 2,628,140,348	$ 185,323,804	$ 20,975,535,342
5. Actuarial Value divided by Market Value (4)/(3)	97.3%	97.5%	97.6%	97.4%

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, 2019. 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 January 2020. Note the Board did not adopt any of the three sets of economic assumptions recommended in the Experience Study. In our professional opinion, the set of economic assumption used in the current valuation do not comply with actuarial standards of practice. Alternate results, using one of the recommended sets of economic assumptions, are included in the Executive Summary of this report.

The liabilities reflect the benefit structure in place as of December 31, 2019, as amended by any legislation in the 2020 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 attributable to the past and
(2) that 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, 2019

	State	School	State/School	Local
1. Active employees				
a. Retirement Benefits	$ 1,913,129,962	$ 8,710,937,748	$ 10,624,067,710	$ 3,236,612,283
b. Pre-Retirement Death Benefits	38,577,175	78,588,776	117,165,951	71,779,348
c. Termination Benefits	153,316,534	560,464,826	713,781,360	309,492,618
d. Disability Benefits	45,249,437	112,871,492	158,120,929	57,473,406
e. Total	2,150,273,108	9,462,862,842	11,613,135,950	3,675,357,655
2. Inactive Vested Members	167,879,156	441,664,688	609,543,844	280,470,447
3. Inactive Nonvested Members	15,377,917	36,711,101	52,089,018	32,799,745
4. Disabled Members	48,540,830	64,229,468	112,770,298	45,254,751
5. Retirees	2,572,413,553	8,128,588,132	10,701,001,685	2,469,905,978
6. Beneficiaries	135,376,732	216,633,212	352,009,944	129,991,625
7. Unclaimed Account Reserve	668,200	1,331,800	2,000,000	500,000
8. Total PVFB	$ 5,090,529,496	$ 18,352,021,243	$ 23,442,550,739	$ 6,634,280,201

TABLE 5 (cont.)
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
PRESENT VALUE OF FUTURE BENEFITS (PVFB)
AS OF DECEMBER 31, 2019

	Total KPERS	KP&F	Judges	Total
1. Active employees				
a. Retirement Benefits	$ 13,860,679,993	$ 1,861,134,801	$ 112,441,514	$ 15,834,256,308
b. Pre-Retirement Death Benefits	188,945,299	26,955,415	1,579,820	217,480,534
c. Termination Benefits	1,023,273,978	67,965,679	0	1,091,239,657
d. Disability Benefits	215,594,335	193,140,953	0	408,735,288
e. Total	15,288,493,605	2,149,196,848	114,021,334	17,551,711,787
2. Inactive Vested Members	890,014,291	42,160,267	1,737,813	933,912,371
3. Inactive Nonvested Members	84,888,763	24,185,498	0	109,074,261
4. Disabled Members	158,025,049	85,903,934	0	243,928,983
5. Retirees	13,170,907,663	1,813,035,742	103,375,186	15,087,318,591
6. Beneficiaries	482,001,569	154,348,215	14,545,122	650,894,906
7. Unclaimed Account Reserve	2,500,000	0	0	2,500,000
8. Total PVFB	$ 30,076,830,940	$ 4,268,830,504	$ 233,679,455	$ 34,579,340,899

TABLE 6
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
ACTUARIAL LIABILITIES
AS OF DECEMBER 31, 2019

	State	School	State/School	Local
1. Present Value of Future Benefits	$ 5,090,529,496	$ 18,352,021,243	$ 23,442,550,739	$ 6,634,280,201
2. Present Value of Future Normal Costs for Active Members				
a. Retirement Benefits	$ 289,852,534	$ 1,776,560,283	$ 2,066,412,817	$ 554,087,809
b. Pre-Retirement Death Benefits	9,344,290	24,943,413	34,287,703	19,699,891
c. Termination Benefits	170,588,345	608,464,976	779,053,321	336,184,503
d. Disability Benefits	16,904,401	41,175,606	58,080,007	19,793,694
e. Total	486,689,570	2,451,144,278	2,937,833,848	929,765,897
3. Total Actuarial Liability (1) - (2e)	$ 4,603,839,926	$ 15,900,876,965	$ 20,504,716,891	$ 5,704,514,304

TABLE 6 (cont.)
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
ACTUARIAL LIABILITIES
AS OF DECEMBER 31, 2019

	Total KPERS	KP&F	Judges	Total
1. Present Value of Future Benefits	$ 30,076,830,940	$ 4,268,830,504	$ 233,679,455	$ 34,579,340,899
2. Present Value of Future Normal Costs for Active Members				
a. Retirement Benefits	$ 2,620,500,626	$ 495,732,585	$ 37,391,491	$ 3,153,624,702
b. Pre-Retirement Death Benefits	53,987,594	15,592,896	694,633	70,275,123
c. Termination Benefits	1,115,237,824	75,398,281	0	1,190,636,105
d. Disability Benefits	77,873,701	104,594,657	0	182,468,358
e. Total	3,867,599,745	691,318,419	38,086,124	4,597,004,288
3. Total Actuarial Liability (1) - (2e)	$ 26,209,231,195	$ 3,577,512,085	$ 195,593,331	$ 29,982,336,611

TABLE 7
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
ACTUARIAL BALANCE SHEET
AS OF DECEMBER 31, 2019

	State	School	State/School	Local
ASSETS				
Actuarial Value of Assets	$ 3,641,509,766	$ 10,318,132,870	$ 13,959,642,636	$ 4,202,428,554
Present Value of Future Normal Costs	486,689,570	2,451,144,278	2,937,833,848	929,765,897
Unfunded Actuarial Liability	962,330,160	5,582,744,095	6,545,074,255	1,502,085,750
Total Net Assets	$ 5,090,529,496	$ 18,352,021,243	$ 23,442,550,739	$ 6,634,280,201
LIABILITIES				
Present Value of Future Benefits				
Active employees	$ 2,150,273,108	$ 9,462,862,842	$ 11,613,135,950	$ 3,675,357,655
Inactive Members *	183,925,273	479,707,589	663,632,862	313,770,192
In-pay Members	2,756,331,115	8,409,450,812	11,165,781,927	2,645,152,354
Total Liabilities	$ 5,090,529,496	$ 18,352,021,243	$ 23,442,550,739	$ 6,634,280,201

*Includes Unclaimed Account Reserves

TABLE 7 (cont.)
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
ACTUARIAL BALANCE SHEET
AS OF DECEMBER 31, 2019

	Total KPERS	KP&F	Judges	Total
ASSETS				
Actuarial Value of Assets	$ 18,162,071,190	$ 2,628,140,348	$ 185,323,804	$ 20,975,535,342
Present Value of Future Normal Costs	3,867,599,745	691,318,419	38,086,124	4,597,004,288
Unfunded Actuarial Liability	8,047,160,005	949,371,737	10,269,527	9,006,801,269
Total Net Assets	$ 30,076,830,940	$ 4,268,830,504	$ 233,679,455	$ 34,579,340,899
LIABILITIES				
Present Value of Future Benefits				
Active employees	$ 15,288,493,605	$ 2,149,196,848	$ 114,021,334	$ 17,551,711,787
Inactive Members *	977,403,054	66,345,765	1,737,813	1,045,486,632
In-pay Members	13,810,934,281	2,053,287,891	117,920,308	15,982,142,480
Total Liabilities	$ 30,076,830,940	$ 4,268,830,504	$ 233,679,455	$ 34,579,340,899

*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 12/31/18	$ 4,527,410,069	$ 15,431,399,978	$ 19,958,810,047	$ 5,492,551,998
b. Normal cost during 2019	63,995,683	270,779,674	334,775,357	119,168,137
c. Benefit payments for plan year ending 12/31/19	(340,586,368)	(959,770,909)	(1,300,357,277)	(341,067,119)
d. Interest on (a), (b), and (c)	342,882,477	1,180,421,739	1,523,304,216	421,938,560
e. Assumption changes	(1,546,995)	(40,713,031)	(42,260,026)	(3,889,926)
f. Data refinements	(20,181,302)	(26,386,945)	(46,568,247)	(20,187,022)
g. Expected actuarial liability as of 12/31/19	$ 4,571,973,564	$ 15,855,730,506	$ 20,427,704,070	$ 5,668,514,628
2. Actuarial Liability at 12/31/2019	$ 4,603,839,926	$ 15,900,876,965	$ 20,504,716,891	$ 5,704,514,304
3. Actuarial Liability Gain/(Loss) (1g) - (2)	$ (31,866,362)	$ (45,146,459)	$ (77,012,821)	$ (35,999,676)
4. Expected Actuarial Value of Assets				
a. Actuarial value of assets at 12/31/18	$ 3,592,747,329	$ 9,609,729,576	$ 13,202,476,905	$ 3,990,999,061
b. Contributions for plan year ending 12/31/19	158,463,697	1,021,365,536	1,179,829,233	282,775,216
c. Benefit payments for plan year ending 12/31/19	(340,586,368)	(959,770,909)	(1,300,357,277)	(341,067,119)
d. Interest on (a), (b) and (c)	271,512,344	747,096,299	1,018,608,643	307,085,763
e. Expected actuarial value of assets as of 12/31/19	$ 3,682,137,002	$ 10,418,420,502	$ 14,100,557,504	$ 4,239,792,921
5. Actuarial Value of Assets as of 12/31/19	$ 3,641,509,766	$ 10,318,132,870	$ 13,959,642,636	$ 4,202,428,554
6. Actuarial Value of Assets Gain/(Loss) (5) - (4e)	$ (40,627,236)	$ (100,287,632)	$ (140,914,868)	$ (37,364,367)
7. Net Actuarial Gain/(Loss) (3) + (6)	$ (72,493,598)	$ (145,434,091)	$ (217,927,689)	$ (73,364,043)

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

	Total KPERS	KP&F	Judges	Total
1. Expected Actuarial Liability				
a. Actuarial liability at 12/31/18	$ 25,451,362,045	$ 3,456,777,628	$ 191,996,752	$ 29,100,136,425
b. Normal cost during 2019	453,943,494	72,545,235	5,050,628	531,539,357
c. Benefit payments for plan year ending 12/31/19	(1,641,424,396)	(222,025,854)	(13,766,149)	(1,877,216,399)
d. Interest on (a), (b), and (c)	1,945,242,776	265,079,550	14,747,687	2,225,070,013
e. Assumption changes	(46,149,952)	(4,391,522)	(501,013)	(51,042,487)
f. Data refinements	(66,755,269)	6,459,442	0	(60,295,827)
g. Expected actuarial liability as of 12/31/19	$ 26,096,218,698	$ 3,574,444,479	$ 197,527,905	$ 29,868,191,082
2. Actuarial Liability at 12/31/2019	$ 26,209,231,195	$ 3,577,512,085	$ 195,593,331	$ 29,982,336,611
3. Actuarial Liability Gain/(Loss) (1g) - (2)	$ (113,012,497)	$ (3,067,606)	$ 1,934,574	$ (114,145,529)
4. Expected Actuarial Value of Assets				
a. Actuarial value of assets at 12/31/18	$ 17,193,475,966	$ 2,523,573,517	$ 181,280,044	$ 19,898,329,527
b. Contributions for plan year ending 12/31/19	1,462,604,449	162,824,345	6,401,381	1,631,830,175
c. Benefit payments for plan year ending 12/31/19	(1,641,424,396)	(222,025,854)	(13,766,149)	(1,877,216,399)
d. Interest on (a), (b) and (c)	1,325,694,406	193,325,693	13,769,144	1,532,789,243
e. Expected actuarial value of assets as of 12/31/19	$ 18,340,350,425	$ 2,657,697,701	$ 187,684,420	$ 21,185,732,546
5. Actuarial Value of Assets as of 12/31/19	$ 18,162,071,190	$ 2,628,140,348	$ 185,323,804	$ 20,975,535,342
6. Actuarial Value of Assets Gain/(Loss) (5) - (4e)	$ (178,279,235)	$ (29,557,353)	$ (2,360,616)	$ (210,197,204)
7. Net Actuarial Gain/(Loss) (3) + (6)	$ (291,291,732)	$ (32,624,959)	$ (426,042)	$ (324,342,733)

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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 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, 2019 actuarial valuation will be used to determine employer contribution rates to the Kansas Public Employees Retirement System for fiscal years beginning in 2022 (July 1, 2022 to June 30, 2023 for the State and calendar year 2022 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 applies.

State statute 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. Subsequent legislation passed by the 2019 Legislature repaid these contributions.

2017 Senate Substitute for Substitute HB 2052 (S Sub for Sub HB 2052) provided that a portion of the contributions for the School group for fiscal year 2017 (FY 2017) would be delayed so the total State/School contribution was $64.13 million less than the scheduled statutory contributions. The delayed employer contributions for fiscal year 2017 are to 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 provided that the repayment of the contribution reduction from FY 2016 with interest ($115 million), scheduled in FY 2018, would not be paid (subsequent legislation passed by the 2019 Legislature repaid these delayed contributions).

2017 Senate Substitute for HB 2002 contained 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 were made at the scheduled statutory rate of 12.01%. In addition, the first installment of $6.4 million on the 20-year amortization of the delayed contributions for FY 2017 was included.
- **FY 2019**: A portion of the employer contributions for School employers within the State/School group for fiscal year 2019 were delayed so the total employer contribution was $420 million, including the second installment of $6.4 million on the delayed contribution for FY 2017. This resulted in an expected delay of $194 million to be paid 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 was applied 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 delayed contributions in FY 2017 and $19.4 million amortization of the delayed contributions in FY 2019, was 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 applies for all subsequent years.

The 2018 Legislature passed House Substitute for Senate Bill 109 that provided for the following additional funding to the KPERS School group:

- An additional payment of $82 million in July 2018 (received by KPERS).
- A contingent additional payment of up to $56 million to be paid in FY 2018, if actual FY 2018 receipts exceed the consensus revenue estimates (full amount received in June 2018).

- A contingent additional payment of up to $56 million to be paid in FY 2019, if actual FY 2019 receipts exceed the consensus revenue estimates (this payment was changed by the 2019 Legislature to a transfer of $51 million in FY 2020 which was received by KPERS on July 1, 2019).

The 2019 Legislature passed two pieces of legislation that impacted contributions to KPERS. Senate Bill 9 provided for a transfer of $115 million from the State General Fund to KPERS in March, 2019. This payment covered the $97 million in missed KPERS School contributions for FY 2016 plus interest. The 2019 Legislature also passed House Substitute for Senate Bill 25. This legislation repealed the actions of the 2018 Legislature which provided for a contingent payment of up to $56 million in FY 2019, if actual FY 2019 receipts exceeded the consensus revenue estimates. Instead, this legislation directly transferred $51 million to the KPERS Trust Fund in FY 2020 (received by KPERS on July 1, 2019).

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 (13 years remaining in the December 31, 2019 valuation). Changes in the unfunded actuarial liability that result from assumption changes are amortized over a closed 25-year period. Changes in the unfunded actuarial liability that result from actuarial experience each year 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 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 (13 years in the December 31, 2019 valuation). Changes in the unfunded actuarial liability that result from assumption changes are 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 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 (13 years in the December 31, 2019 valuation). Changes in the unfunded actuarial liability that result from assumption changes are 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 Table 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, 2019 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, 2019 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 2021 and 2022 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 2022.

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 2022.

TABLE 9
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
NORMAL COST RATE
AS OF DECEMBER 31, 2019

	State	School	State/School	Local
1. Normal Cost Rate				
a. Retirement Benefits	4.46%	5.70%	5.45%	4.39%
b. Pre-Retirement Death Benefits	0.15%	0.08%	0.10%	0.16%
c. Termination Benefits	2.54%	1.89%	2.02%	2.55%
d. Disability Benefits	0.26%	0.13%	0.15%	0.15%
e. Administrative Expenses	0.18%	0.18%	0.18%	0.18%
f. Total	7.59%	7.98%	7.90%	7.43%

TABLE 9 (cont.)
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
NORMAL COST RATE
AS OF DECEMBER 31, 2019

	KP&F	Judges
1. Normal Cost Rate		
a. Retirement Benefits	10.51%	19.72%
b. Pre-Retirement Death Benefits	0.35%	0.35%
c. Termination Benefits	1.60%	0.00%
d. Disability Benefits	2.23%	0.00%
e. Administrative Expenses	0.18%	0.18%
f. Total	14.87%	20.25%

TABLE 10
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
UNFUNDED ACTUARIAL LIABILITY (UAL)
AS OF DECEMBER 31, 2019

	State	School	State/School	Local	KP&F	Judges
1. Actuarial Liability	$ 4,603,839,926	$ 15,900,876,965	$ 20,504,716,891	$ 5,704,514,304	$ 3,577,512,085	$ 195,593,331
2. Actuarial Value of Assets	3,641,509,766	10,318,132,870	13,959,642,636	4,202,428,554	2,628,140,348	185,323,804
3. Unfunded Actuarial Liability (UAL)	962,330,160	5,582,744,095	6,545,074,255	1,502,085,750	949,371,737	10,269,527
a. Other local employer UAL*	0	0	0	2,451,938	1,731,110	0
b. Remaining UAL	962,330,160	5,582,744,095	6,545,074,255	1,499,633,812	947,640,627	10,269,527

*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, 2022
EMPLOYERS CONTRIBUTING ON JUNE 30 FISCAL YEARS

	State	School*	State/School*	Judges
1. Unfunded Actuarial Liability at December 31, 2019	$962,330,160	$5,582,744,095	$6,545,074,255	$10,269,527
2. FY 2020 Expected Contribution Rate	15.49%	20.41%	20.41%	24.29%
3. Normal Cost Rate	7.59%	7.98%	7.90%	20.25%
4. Contribution Rate Applied to UAL for 2020 [(2) – (3)]	7.90%	12.43%	12.51%	4.04%
5. Expected Payroll for January to June, 2020	$497,959,342	$1,955,175,385	$2,453,134,727	$14,533,291
6. Statutory Excess State Contributions	$0	$24,499,600	$0	N/A
7. Expected UAL Contribution [(4) * (5)] + (6)	$39,338,788	$267,527,900	$306,887,154	$587,145
8. Projected UAL at June 30, 2020	$958,844,888	$5,522,471,884	$6,481,295,920	$10,061,842
9. FY 2021 Expected Contribution Rate	15.22%	20.23%	20.23%	22.91%
10. Normal Cost Rate	7.59%	7.98%	7.90%	20.25%
11. Contribution Rate Applied to UAL for 2021 [(9) – (10)]	7.63%	12.25%	12.33%	2.66%
12. Expected Payroll for FY 2021	$1,010,857,464	$3,969,006,032	$4,979,863,496	$29,066,581
13. Statutory Excess State Contributions	$0	$50,643,959	$0	N/A
14. Expected UAL Contribution [(11) * (12)] + (13)	$77,128,425	$536,847,198	$614,017,169	$773,171
15. Projected UAL at June 30, 2021	$953,093,981	$5,393,201,582	$6,346,229,970	$10,039,062
16. FY 2022 Expected Contribution Rate	15.97%	20.09%	20.09%	24.05%
17. Normal Cost Rate	7.59%	7.98%	7.90%	20.25%
18. Contribution Rate Applied to UAL for 2022 [(17) – (18)]	8.38%	12.11%	12.19%	3.80%
19. Expected Payroll for FY 2022	$1,041,183,188	$4,088,076,213	$5,129,259,401	$29,066,581
20. Statutory Excess State Contributions	$0	$42,896,747	$0	N/A
21. Expected UAL Contribution [(19) * (20)] + (21)	$87,251,151	$537,962,776	$625,256,721	$1,104,530
22. Projected UAL at June 30, 2022	$936,389,716	$5,252,754,832	$6,189,029,450	$9,670,557

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 the FY 2019 delayed contributions of $194.4M for the School group are to be repaid over 20 years with interest, it is treated as a long-term receivable and is reflected in total FY2019 contributions.

TABLE 11B
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
PROJECTED UNFUNDED ACTUARIAL LIABILITY AT DECEMBER 31, 2021
EMPLOYERS CONTRIBUTING ON DECEMBER 31 FISCAL YEARS

	KPERS - Local	KP&F
1. Unfunded Actuarial Liability at December 31, 2019	$1,499,633,812	$947,640,627
2. FY 2020 Expected Contribution Rate	14.61%	29.08%
3. Normal Cost Rate	7.43%	14.87%
4. Contribution Rate Applied to UAL for 2020 [(2) – (3)]	7.18%	14.21%
5. Expected Payroll for 2020	$1,846,129,228	$554,539,001
6. Expected UAL Contribution (4) * (5)	$132,552,079	$78,799,992
7. Projected UAL at December 31, 2020	$1,478,262,799	$939,286,258
8. FY 2021 Expected Contribution Rate	14.87%	29.95%
9. Normal Cost Rate	7.43%	14.87%
10. Contribution Rate Applied to UAL for 2021 [(8) – (9)]	7.44%	15.08%
11. Expected Payroll for FY 2021	$1,901,513,105	$571,175,171
12. Expected UAL Contribution (10) * (11)	$141,472,575	$86,133,216
13. Projected UAL at December 31, 2021	$1,445,975,817	$922,672,341

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

STATE

Amortization Base	Original Amount	Remaining Payments	Projected June 30, 2022 Balance	Annual Payment*
2015 Legacy UAL	$ 805,072,157	13	$ 755,818,002	$ 77,983,228
2016 Assumption Changes	138,527,291	22	140,866,722	10,246,206
2016 Experience	(30,061,574)	17	(29,598,963)	(2,530,085)
2017 Experience	(48,125,421)	18	(47,765,006)	(3,932,427)
2018 Experience	87,214,152	19	87,000,448	6,918,881
2019 Assumption Changes	(1,864,370)	25	(1,864,370)	(126,197)
2019 Data Refinement	(24,321,613)	20	(24,321,613)	(1,873,286)
2019 Experience	56,254,496	20	56,254,496	4,332,803
Total			**$ 936,389,716**	**$ 91,019,123**

* Payment amount reflects mid-year timing.

1. Total UAL Amortization Payments	$ 91,019,123
2. Projected Payroll for FY 2023	$ 1,072,418,684
3. UAL Amortization Payment Rate (1) / (2)	8.49%

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

SCHOOL

Amortization Base	Original Amount	Remaining Payments	Projected June 30, 2022 Balance	Annual Payment*
2015 Legacy UAL	$ 5,683,566,131	13	$ 5,335,846,689	$ 550,538,025
2016 Assumption Changes	311,625,331	22	316,888,022	23,049,446
2016 Experience	(67,865,818)	17	(66,821,444)	(5,711,819)
2017 Experience	(380,457,726)	18	(377,608,445)	(31,087,981)
2018 Experience	85,786,454	19	85,576,248	6,805,619
2019 Assumption Changes	(49,065,546)	25	(49,065,546)	(3,321,182)
2019 Data Refinement	(31,800,380)	20	(31,800,380)	(2,449,311)
2019 Experience	39,739,688	20	39,739,688	3,060,808
Total			**$ 5,252,754,832**	**$ 540,883,605**

* Payment amount reflects mid-year timing.

1. Total UAL Amortization Payments	$	540,883,605
2. Projected Payroll for FY 2023	$	4,210,718,499
3. UAL Amortization Payment Rate (1) / (2)		12.85%

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

STATE/SCHOOL

Amortization Base	Original Amount	Remaining Payments	Projected June 30, 2022 Balance	Annual Payment*
2015 Legacy UAL	$ 6,489,108,272	13	$ 6,092,105,922	$ 628,566,778
2016 Assumption Changes	451,174,445	22	458,793,824	33,371,231
2016 Experience	(98,610,703)	17	(97,093,201)	(8,299,413)
2017 Experience	(429,833,140)	18	(426,614,081)	(35,122,547)
2018 Experience	172,578,779	19	172,155,903	13,691,035
2019 Assumption Changes	(50,929,916)	25	(50,929,916)	(3,447,379)
2019 Data Refinement	(56,121,993)	20	(56,121,993)	(4,322,597)
2019 Experience	96,732,992	20	96,732,992	7,450,515
Total			**$ 6,189,029,450**	**$ 631,887,623**

* 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	$ 631,887,623
2. Projected Payroll for FY 2023	$ 5,283,137,183
3. UAL Amortization Payment Rate (1) / (2)	11.96%

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

LOCAL

Amortization Base	Original Amount	Remaining Payments	Projected December 31, 2021 Balance	Annual Payment*
2015 Legacy UAL	$ 1,467,792,387	13	$ 1,377,993,141	$ 142,177,552
2016 Assumption Changes	107,171,397	22	108,981,294	7,926,959
2016 Experience	(68,664,163)	17	(67,607,504)	(5,779,010)
2017 Experience	(60,452,753)	18	(60,000,018)	(4,939,719)
2018 Experience	63,978,893	19	63,822,123	5,075,579
2019 Assumption Changes	(4,516,228)	25	(4,516,228)	(305,698)
2019 Data Refinement	(23,437,259)	20	(23,437,259)	(1,805,172)
2019 Experience	50,740,268	20	50,740,268	3,908,089
Total			**$ 1,445,975,817**	**$ 146,258,580**

* Payment amount reflects mid-year timing.

1. Total UAL Amortization Payments	$	146,258,580
2. Projected Payroll for FY 2022	$	1,958,558,498
3. UAL Amortization Payment Rate (1) / (2)		7.47%

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

KP&F

Amortization Base	Original Amount	Remaining Payments	Projected December 31, 2021 Balance	Annual Payment*
2015 Legacy UAL	$ 770,980,567	13	$ 723,812,131	$ 74,680,950
2016 Assumption Changes	90,081,927	22	91,603,219	6,662,932
2016 Plan Changes	801,442	17	789,109	67,452
2016 Experience	(6,054,297)	17	(5,961,129)	(509,550)
2017 Experience	5,430,585	18	5,389,914	443,744
2018 Experience	81,326,658	19	81,127,380	6,451,814
2019 Assumption Changes	(5,098,584)	25	(5,098,584)	(345,116)
2019 Data Refinement	7,499,453	20	7,499,453	577,619
2019 Experience	23,510,848	20	23,510,848	1,810,839
Total			**$ 922,672,341**	**$ 89,840,684**

* Payment amount reflects mid-year timing.

1. Total UAL Amortization Payments	$	89,840,684
2. Projected Payroll for FY 2022	$	588,310,426
3. UAL Amortization Payment Rate (1) / (2)		15.27%

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

JUDGES

Amortization Base	Original Amount	Remaining Payments	Projected June 30, 2022 Balance	Annual Payment*
2015 Legacy UAL	$ 2,439,245	13	$ 2,108,817	$ 253,514
2016 Assumption Changes	12,158,838	22	11,600,225	1,073,961
2016 Experience	(2,548,598)	17	(2,363,181)	(245,437)
2017 Experience	(3,798,326)	18	(3,621,055)	(365,789)
2018 Experience	3,150,713	19	3,079,933	303,422
2019 Assumption Changes	(603,799)	25	(603,799)	(53,332)
2019 Experience	(530,383)	20	(530,383)	(51,077)
Total			**$ 9,670,557**	**$ 915,262**

* Payment amount reflects mid-year timing.

1. Total UAL Amortization Payments	$	915,262
2. Projected Payroll for 2020	$	29,066,581
3. UAL Amortization Payment Rate (1) / (2)		3.15%

TABLE 13
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
ACTUARIAL EMPLOYER CONTRIBUTION RATES
FISCAL YEAR COMMENCING IN 2022

	Total Normal Cost	Employee Normal Cost	Employer Normal Cost	Unfunded Actuarial Liability	Total Employer Contribution*
State	7.59%	6.00%	1.59%	8.49%	10.08%
Correctional Employees - Age 55	7.87%	6.00%	1.87%	8.49%	10.36%
Correctional Employees - Age 60	8.57%	6.00%	2.57%	8.49%	11.06%
School	7.98%	6.00%	1.98%	12.85%	14.83%
State/School	7.90%	6.00%	1.90%	11.96%	13.86%
Local	7.43%	6.00%	1.43%	7.47%	8.90%
KP&F Uniform Contribution Rate					
State **	14.87%	7.15%	7.72%	15.27%	22.99%
Local **	14.87%	7.15%	7.72%	15.27%	22.99%
Judges	20.25%	5.63%	14.62%	3.15%	17.77%

* 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 2022

Employer	Year Affiliated	Projected 2022 Annual Payroll	Projected 1/1/2022 Unfunded Actuarial Liability	Payment on 1/1/2022 Unfunded Liability	Payment on Unfunded Liability as % of Payroll	Total Rate for Years Commencing[1] in 2022
St. Francis Housing Authority	1999	$26,643	$7,863	$818	3.07%	11.97%
City of Burden	1999	113,078	15,544	1,611	1.42%	10.32%
City of Longton	1999	73,085	18,852	1,960	2.68%	11.58%
Bourbon County RWD#2	1999	248,731	109,319	11,359	4.57%	13.47%
Towanda Township	1999	58,492	8,961	926	1.58%	10.48%
Hays Housing Authority	2000	59,044	1,673	187	0.32%	9.22%
Haysville Community Library	2000	195,713	198,779	20,627	10.54%	19.44%
Hamilton County Library	2000	109,970	13,155	1,366	1.24%	10.14%
Ellis Public Library	2000	34,083	4,999	519	1.52%	10.42%
Bucklin Public Library	2000	37,182	12,403	1,293	3.48%	12.38%
Elkhart Cemetery District	2000	34,556	1,712	185	0.54%	9.44%
City of Linn Valley	2000	91,624	970	102	0.11%	9.01%
City of Blue Mound	2000	83,482	2,887	284	0.34%	9.24%
Kansas Workers' Risk Coop for Counties	2000	366,738	50,773	5,222	1.42%	10.32%
Lindsborg Community Library	2002	31,983	3,701	356	1.11%	10.01%
City of North Newton	2002	535,834	165,309	16,406	3.06%	11.96%
City of Arcadia	2002	47,846	16,187	1,603	3.35%	12.25%
City of Linwood	2003	54,489	2,416	241	0.44%	9.34%
Basehor Community Library	2003	377,274	57,301	5,686	1.51%	10.41%
City of Gypsum	2003	109,453	4,861	484	0.44%	9.34%
City of Bentley	2004	118,069	35,733	4,046	3.43%	12.33%
Mulvane Public Library	2004	201,026	12,807	1,451	0.72%	9.62%
The Center for Counseling and Consultation	2004	2,575,103	1,076,802	121,981	4.74%	13.64%
Doniphan County RFD #2	2005	147,453	8,563	968	0.66%	9.56%
City of Denison	2005	31,596	18,879	2,139	6.77%	15.67%
Stanton County Recreation Commission	2005	74,527	23,264	2,633	3.53%	12.43%
Total		$5,837,074	$1,873,713	$204,453		

[1] Basic local employer contribution rates excluding Death and Disability contribution: FY 2021: 8.87% FY 2022: 8.90%

TABLE 14B
LOCAL KPERS AFFILIATION COST FACTORS - AFFILIATION AFTER 1/1/06
FOR FISCAL YEAR BEGINNING IN 2022

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, 2022 to Amortize Unfunded Liability	Final Payment Year
City of Vermillion	2006	3,950	338	2032
Stockton Recreation Commission	2010	1,245	113	2032
Johnson Co. Fire District No. 2	2018	503,527	53,765	2033

TABLE 15
KP&F
EMPLOYER CONTRIBUTION RATES FOR FISCAL YEARS COMMENCING IN CALENDAR YEARS 2021 AND 2022

Employer	Total Rate for Fiscal Year Commencing in 2021	Recommended Total Rate for Fiscal Year Commencing in 2022
Douglas County Law Enforcement	25.30 %	25.49 %
Ford County	22.80	22.99
Franklin County Sheriff's Dept	22.80	22.99
Gray County Sheriff's Dept.	22.80	22.99
Harvey County Sheriff's Dept.	22.80	22.99
Johnson County Fire Dept.	22.80	22.99
Johnson County Fire No. 1	22.80	22.99
Johnson County Fire No. 2	22.80	22.99
Johnson County Park Commission	22.80	22.99
Johnson County Sheriff's Dept.	22.80	22.99
Labette County Sheriff's Dept.	24.98	25.00
Reno County Sheriff's Dept.	22.80	22.99
Riley County Law Enforcement	22.80	22.99
Sedgwick County Fire No. 1	22.80	22.99
Sedgwick County Sheriff's Dept.	22.80	22.99
Sedgwick County EMT's	22.80	22.99
Shawnee County Sheriff's Dept.	22.80	22.99
Sumner County Sheriff's Dept.	22.80	22.99
Unified Gov't of Wyandotte County	22.80	22.99
City of Abilene	22.80	22.99
City of Arkansas City	22.80	22.99
City of Atchison	22.80	22.99
City of Bonner Springs	22.80	22.99
City of Chanute	22.80	22.99
City of Cimarron	22.80	22.99
City of Coffeyville	22.80	22.99
City of Concordia	22.80	22.99
City of Derby	22.80	22.99
City of Dodge City	28.24	28.55
City of Emporia	22.80	22.99
City of Erie	22.80	22.99
City of Eudora	22.80	22.99
City of Fairway	22.80	22.99
City of Fort Scott	22.80	22.99
City of Herington	22.80	22.99
City of Hutchinson	22.80	22.99
City of Junction City	22.80	22.99

TABLE 15 (cont.)
KP&F
EMPLOYER CONTRIBUTION RATES FOR FISCAL YEARS COMMENCING IN CALENDAR YEARS 2021 AND 2022

Employer	Total Rate for Fiscal Year Commencing in 2021	Recommended Total Rate for Fiscal Year Commencing in 2022
City of Lawrence	22.80 %	22.99 %
City of Leavenworth	22.80	22.99
City of Leawood	22.80	22.99
City of Lenexa	22.80	22.99
City of Manhattan	22.80	22.99
City of Merriam	22.80	22.99
City of McPherson	22.80	22.99
City of Mission	22.80	22.99
City of Newton EMTs	29.94	22.99
City of Newton	22.80	22.99
City of Olathe	22.80	22.99
City of Ottawa	22.80	22.99
City of Parsons	22.80	22.99
City of Pittsburg	22.80	22.99
City of Salina	22.80	22.99
City of Shawnee	22.80	22.99
City of Topeka	22.80	22.99
City of Wellington	22.80	22.99
City of Westwood	22.80	22.99
City of Winfield	22.80	22.99
Board of Regents Campus Police	22.80	22.99
Kansas Bureau of Investigation	22.80	22.99
Kansas Highway Patrol	22.80	22.99
Cowley County Sheriff's Dept	22.80	22.99
City of Gardner Public Safety Officers	22.80	22.99
City of Liberal Police & Firemen	22.80	22.99
City of Oswego	22.80	22.99
Leavenworth County	22.80	22.99
Pottawatomie County	22.80	22.99
City of Roeland Park	22.80	22.99
City of Edwardsville Police	24.51	24.51
City of Garden City	22.80	22.99
City of Lake Quivira	22.80	22.99
City of Paola	22.80	22.99
City of Winfield (EMS)	22.80	22.99
Miami County	22.80	22.99
Atchinson County	22.80	22.99

TABLE 15 (cont.)
KP&F
EMPLOYER CONTRIBUTION RATES FOR FISCAL YEARS COMMENCING IN CALENDAR YEARS 2021 AND 2022

Employer	Total Rate for Fiscal Year Commencing in 2021	Recommended Total Rate for Fiscal Year Commencing in 2022
City of Park City	22.80 %	22.99 %
Dickinson County	22.80	22.99
Leavenworth County (EMS)	22.80	22.99
City of Basehor	22.80	22.99
City of Edwardsville Firemen	26.34	26.62
City of Marion	22.80	22.99
City of Overbrook	22.80	22.99
Leavenworth County Fire District #1	22.80	22.99
Shawnee Heights Fire District	22.80	22.99
City of Lansing	22.80	22.99
State Fire Marshall	22.80	22.99
Seward County	22.80	22.99
City of Hays	22.80	22.99
Ellis County	22.80	22.99
City of Baldwin City	22.80	22.99
McPherson County Rural Fire District #9	22.80	22.99
City of Spring Hill	22.80	22.99
City of Andover	22.80	22.99
Kearny County	22.80	22.99
Neosho County	22.80	22.99
Clark County	22.80	22.99
City of Wakefield	22.80	22.99
Russell County	22.80	22.99
City of Rossville	22.80	22.99
City of Goddard	22.80	22.99
City of El Dorado	22.80	22.99
Northwest Consolidated Fire District	22.80	22.99
City of Girard	22.80	22.99
City of Overland Park	22.80	22.99
City of Victoria	22.80	22.99
City of Burden	22.80	22.99
City of Augusta	22.80	22.99
Ottawa County	22.80	22.99
Johnson Co. Fire District No. 2	22.80	22.99
City of Minneola	22.80	22.99
Riley County	22.80	22.99
City of Moundridge	22.80	22.99

TABLE 15 (cont.)
KP&F
EMPLOYER CONTRIBUTION RATES FOR FISCAL YEARS COMMENCING IN CALENDAR YEARS 2021 AND 2022

Employer	Total Rate for Fiscal Year Commencing in 2021	Recommended Total Rate for Fiscal Year Commencing in 2022
City of Belleville	22.80 %	22.99 %
Cherokee County	22.80	22.99
Pottawatomie County (EMT)	22.80	22.99
Jefferson County	22.80	22.99
Republic County	22.80	22.99
City of Linn Valley	22.80	22.99
Soldier Township	22.80	22.99

TABLE 16A
KP&F EMPLOYER ADDITIONAL CONTRIBUTION RATES
PRIOR SERVICE LIABILITY
FOR FISCAL YEARS BEGINNING IN 2022

Employer	1/1/2020 Unfunded Prior Service Liability	Payment on Unfunded Liability
Douglas County Law Enforcement	$ 322,895	$ 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.	136,189	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.	0	0
Sumner County Sheriff's Dept.	0	0
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	739,627	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 2022

Employer	1/1/2020 Unfunded Prior Service Liability	Payment on Unfunded Liability
City of Lawrence	$ 0	$ 0
City of Leavenworth	0	0
City of Leawood	0	0
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	0	0
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	207,144	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 2022

Employer	1/1/2020 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	325,255	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
McPherson County Rural Fire District #9	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 Burden	0	0
City of Augusta	0	0
Ottawa County	0	0
Johnson Co. Fire District No. 2	0	0
City of Minneola	0	0
Riley County	0	0
City of Moundridge	0	0

TABLE 16A (cont.)
KP&F EMPLOYER ADDITIONAL CONTRIBUTION RATES
PRIOR SERVICE LIABILITY
FOR FISCAL YEARS BEGINNING IN 2022

Employer	1/1/2020 Unfunded Prior Service Liability	Payment on Unfunded Liability
City of Belleville	$ 0	$ 0
Cherokee County	0	0
Pottawatomie County (EMT)	0	0
Jefferson County	0	0
Republic County	0	0
City of Linn Valley	0	0
Soldier Township	0	0
Total	$ 1,731,110	$ 470,068

TABLE 16B
KP&F EMPLOYER ADDITIONAL CONTRIBUTION RATES
PRIOR SERVICE LIABILITY - AFFILIATION AFTER 1/1/06
FOR FISCAL YEAR BEGINNING IN 2022

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, 2021 to Amortize Unfunded Liability	Final Payment Year
None				

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 2022

Employer	Number of Employees	Total Estimated 2022 Payroll	Payment on Unfunded Liability (Table 16)	As Percent of Payroll
Douglas County Law Enforcement	80	$7,233,539	$181,138	2.50 %
Ford County	53	3,195,163	0	0.00
Franklin County Sheriff's Dept	49	3,143,512	0	0.00
Gray County Sheriff's Dept.	10	595,191	0	0.00
Harvey County Sheriff's Dept.	22	1,409,655	0	0.00
Johnson County Fire Dept.	156	13,402,204	0	0.00
Johnson County Fire No. 1	42	2,929,416	0	0.00
Johnson County Fire No. 2	66	6,563,698	0	0.00
Johnson County Park Commission	25	1,586,514	0	0.00
Johnson County Sheriff's Dept.	465	38,921,135	0	0.00
Labette County Sheriff's Dept.	16	825,552	16,582	2.01
Reno County Sheriff's Dept.	35	2,303,260	0	0.00
Riley County Law Enforcement	107	8,376,374	0	0.00
Sedgwick County Fire No. 1	139	10,120,548	0	0.00
Sedgwick County Sheriff's Dept.	212	16,924,245	0	0.00
Sedgwick County EMT's	151	9,593,899	0	0.00
Shawnee County Sheriff's Dept.	110	8,636,442	0	0.00
Sumner County Sheriff's Dept.	22	1,090,981	0	0.00
Unified Gov't of Wyandotte County	805	72,250,572	0	0.00
City of Abilene	21	1,196,870	0	0.00
City of Arkansas City	45	2,803,269	0	0.00
City of Atchison	42	2,088,872	0	0.00
City of Bonner Springs	24	1,592,933	0	0.00
City of Chanute	32	2,090,446	0	0.00
City of Cimarron	0	0	0	0.00
City of Coffeyville	43	3,018,531	0	0.00
City of Concordia	19	890,195	0	0.00
City of Derby	69	4,359,903	0	0.00
City of Dodge City	64	3,876,984	215,432	5.56
City of Emporia	88	5,633,167	0	0.00
City of Erie	3	166,769	0	0.00
City of Eudora	14	878,827	0	0.00
City of Fairway	7	581,582	0	0.00
City of Fort Scott	34	1,616,150	0	0.00
City of Herington	7	370,494	0	0.00
City of Hutchinson	154	10,920,896	0	0.00
City of Junction City	92	6,705,347	0	0.00
City of Lawrence	279	26,678,835	0	0.00
City of Leavenworth	104	6,424,391	0	0.00
City of Leawood	108	9,823,360	0	0.00

TABLE 17 (cont.)
KP&F EMPLOYER ADDITIONAL CONTRIBUTION RATES
FOR FISCAL YEARS BEGINNING IN 2022

Employer	Number of Employees	Total Estimated 2022 Payroll	Payment on Unfunded Liability (Table 16)	As Percent of Payroll
City of Lenexa	175	$14,686,358	$0	0.00 %
City of Manhattan	78	5,752,367	0	0.00
City of Merriam	29	2,148,666	0	0.00
City of McPherson	50	3,193,097	0	0.00
City of Mission	29	2,115,517	0	0.00
City of Newton EMTs	1	116,891	0	0.00
City of Newton	86	5,819,876	0	0.00
City of Olathe	325	29,241,986	0	0.00
City of Ottawa	45	3,149,485	0	0.00
City of Parsons	39	1,885,740	0	0.00
City of Pittsburg	79	4,411,846	0	0.00
City of Salina	166	12,376,770	0	0.00
City of Shawnee	165	13,902,879	0	0.00
City of Topeka	497	41,033,803	0	0.00
City of Wellington	34	2,080,954	0	0.00
City of Westwood	7	511,982	0	0.00
City of Winfield	52	3,318,345	0	0.00
Board of Regents Campus Police	178	11,013,390	0	0.00
Kansas Bureau of Investigation	88	6,594,003	0	0.00
Kansas Highway Patrol	507	39,465,041	0	0.00
Cowley County Sheriff's Dept	24	1,333,094	0	0.00
City of Gardner Public Safety Officers	33	2,572,465	0	0.00
City of Liberal Police & Firemen	55	3,177,873	0	0.00
City of Oswego	4	200,375	0	0.00
Leavenworth County	60	3,912,232	0	0.00
Pottawatomie County	29	1,710,522	0	0.00
City of Roeland Park	14	960,756	0	0.00
City of Edwardsville Police	17	1,249,523	18,952	1.52
City of Garden City	95	6,011,988	0	0.00
City of Lake Quivira	1	115,806	0	0.00
City of Paola	15	1,010,561	0	0.00
City of Winfield (EMS)	0	0	0	0.00
Miami County	56	3,771,799	0	0.00
Atchinson County	31	1,560,206	0	0.00
City of Park City	14	802,651	0	0.00
Dickinson County	20	1,140,720	0	0.00
Leavenworth County (EMS)	45	2,765,901	0	0.00
City of Basehor	14	807,973	0	0.00
City of Edwardsville Firemen	16	1,045,529	37,963	3.63
City of Marion	5	211,467	0	0.00

TABLE 17 (cont.)
KP&F EMPLOYER ADDITIONAL CONTRIBUTION RATES
FOR FISCAL YEARS BEGINNING IN 2022

Employer	Number of Employees	Total Estimated 2022 Payroll	Payment on Unfunded Liability (Table 16)	As Percent of Payroll
City of Overbrook	2	$88,996	$0	0.00 %
Leavenworth County Fire District #1	10	661,940	0	0.00
Shawnee Heights Fire District	10	741,443	0	0.00
City of Lansing	18	1,157,319	0	0.00
State Fire Marshall	11	620,787	0	0.00
Seward County	30	1,723,913	0	0.00
City of Hays	58	3,525,426	0	0.00
Ellis County	45	2,901,706	0	0.00
City of Baldwin City	10	599,920	0	0.00
McPherson County Rural Fire District #9	1	26,974	0	0.00
City of Spring Hill	12	925,444	0	0.00
City of Andover	42	2,783,505	0	0.00
Kearny County	16	996,273	0	0.00
Neosho County	14	639,797	0	0.00
Clark County	5	267,142	0	0.00
City of Wakefield	1	43,073	0	0.00
Russell County	8	414,423	0	0.00
City of Rossville	2	101,643	0	0.00
City of Goddard	13	796,918	0	0.00
City of El Dorado	41	2,497,956	0	0.00
Northwest Consolidated Fire District	26	1,585,364	0	0.00
City of Girard	9	317,754	0	0.00
City of Overland Park	195	12,516,624	0	0.00
City of Victoria	2	170,290	0	0.00
City of Burden	0	0	0	0.00
City of Augusta	21	1,294,626	0	0.00
Ottawa County	5	331,728	0	0.00
Johnson Co. Fire District No. 2	47	3,588,873	0	0.00
City of Minneola	1	91,043	0	0.00
Riley County	32	2,322,079	0	0.00
City of Moundridge	9	531,879	0	0.00
City of Belleville	5	222,894	0	0.00
Cherokee County	23	1,068,133	0	0.00
Pottawatomie County (EMT)	31	1,938,891	0	0.00
Jefferson County	33	1,883,407	0	0.00
Republic County	7	348,696	0	0.00
City of Linn Valley	3	139,872	0	0.00
Soldier Township	7	443,513	0	0.00
Total	7,797	$588,310,426	$470,068	

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, 2019. 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)
12/31/2005	$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%
12/31/2017	19,246,613	28,153,827	8,907,214	68%	6,744,301	132%
12/31/2018	19,898,330	29,100,136	9,201,807	68%	7,048,621	131%
12/31/2019	20,975,535	29,982,337	9,006,801	70%	7,336,004	123%

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

Short Term Solvency Test

Actuarial Valuation Date	Member Contributions (A)	Retirants and Beneficiaries (B)	Active Member Employer Financed Portion (C)	Actuarial Value of Assets	Portions of Accrued Liabilities Covered by Assets (A)	(B)	(C)
12/31/2010	$5,017,361,438	$9,090,575,924	$7,745,845,940	$13,589,658,118	100%	96%	0%
12/31/2011	5,334,463,714	9,923,555,011	7,349,151,307	13,379,020,161	100%	81%	0%
12/31/2012	5,448,296,911	10,585,891,383	7,497,235,156	13,278,490,294	100%	74%	0%
12/31/2013	5,636,937,795	11,298,180,557	7,393,551,786	14,562,764,625	100%	79%	0%
12/31/2014	5,791,313,287	12,361,327,805	6,977,825,595	15,662,009,783	100%	80%	0%
12/31/2015	5,942,762,790	13,095,276,871	6,909,740,897	17,408,577,508	100%	88%	0%
12/31/2016	6,008,633,568	14,095,278,126	7,213,842,679	18,256,373,273	100%	87%	0%
12/31/2017	6,008,405,879	14,751,711,502	7,393,709,608	19,246,613,272	100%	90%	0%
12/31/2018	6,132,527,315	15,401,874,720	7,565,734,390	19,898,329,527	100%	89%	0%
12/31/2019	6,298,997,993	15,982,142,480	7,701,196,138	20,975,535,342	100%	92%	0%

TABLE 20
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% *
2017	920,789,000	80.9%
2018	937,808,000	87.2%
2019	921,045,000	98.7%

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 paid in FY 2019, with interest (2019 SB 9).

TABLE 21
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
HISTORICAL FUNDING INFORMATION

Historical Contribution Rates

Valuation	State/School		Local		KP&F*	Judges*
Date	Actuarial	Statutory	Actuarial	Statutory		
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%(6)	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%
12/31/2017	14.23%	14.23%(6)	8.61%	8.61%	21.93%	17.26%
12/31/2018	14.09%	14.09%	8.87%	8.87%	22.80%	18.40%
12/31/2019	13.86%	13.86%	8.90%	8.90%	22.99%	17.77%

* 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.

(6) First actuarial valuation where the actuarial and the statutory contribution rate are equal (i.e., the ARC date).

TABLE 22
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
PROJECTED BENEFIT PAYMENTS

Year	State	School	Local	Total KPERS	KP&F	Judges	Total
2020	$359,448,000	$1,047,553,000	$367,784,000	$1,774,785,000	$226,962,000	$15,706,000	$2,017,453,000
2021	364,395,000	1,080,482,000	379,087,000	1,823,964,000	235,334,000	15,845,000	2,075,143,000
2022	373,507,000	1,117,097,000	396,241,000	1,886,845,000	244,533,000	16,444,000	2,147,822,000
2023	380,458,000	1,152,039,000	410,896,000	1,943,393,000	254,268,000	17,283,000	2,214,944,000
2024	386,477,000	1,186,968,000	426,413,000	1,999,858,000	264,511,000	17,788,000	2,282,157,000
2025	393,161,000	1,224,904,000	443,517,000	2,061,582,000	276,958,000	18,403,000	2,356,943,000
2026	399,376,000	1,262,392,000	461,570,000	2,123,338,000	283,482,000	18,819,000	2,425,639,000
2027	404,714,000	1,298,596,000	477,695,000	2,181,005,000	293,336,000	19,120,000	2,493,461,000
2028	409,071,000	1,334,231,000	494,242,000	2,237,544,000	301,978,000	19,356,000	2,558,878,000
2029	412,566,000	1,370,557,000	509,009,000	2,292,132,000	312,589,000	19,902,000	2,624,623,000
2030	415,041,000	1,404,279,000	523,809,000	2,343,129,000	323,465,000	19,868,000	2,686,462,000
2031	417,221,000	1,438,590,000	537,280,000	2,393,091,000	333,633,000	20,309,000	2,747,033,000
2032	418,695,000	1,472,514,000	550,621,000	2,441,830,000	343,626,000	20,269,000	2,805,725,000
2033	418,458,000	1,506,404,000	561,515,000	2,486,377,000	354,868,000	20,400,000	2,861,645,000
2034	417,775,000	1,537,094,000	572,270,000	2,527,139,000	365,433,000	20,201,000	2,912,773,000
2035	416,258,000	1,569,285,000	582,267,000	2,567,810,000	377,300,000	20,375,000	2,965,485,000
2036	414,237,000	1,601,342,000	591,079,000	2,606,658,000	388,282,000	20,311,000	3,015,251,000
2037	411,743,000	1,629,125,000	599,113,000	2,639,981,000	398,159,000	20,440,000	3,058,580,000
2038	407,968,000	1,652,916,000	605,501,000	2,666,385,000	408,130,000	20,001,000	3,094,516,000
2039	404,204,000	1,676,779,000	611,730,000	2,692,713,000	417,550,000	20,181,000	3,130,444,000
2040	399,558,000	1,693,710,000	616,655,000	2,709,923,000	427,195,000	19,853,000	3,156,971,000
2041	394,621,000	1,706,367,000	619,375,000	2,720,363,000	435,929,000	19,696,000	3,175,988,000
2042	390,456,000	1,719,463,000	624,086,000	2,734,005,000	443,403,000	19,371,000	3,196,779,000
2043	385,197,000	1,731,096,000	625,529,000	2,741,822,000	451,104,000	19,197,000	3,212,123,000
2044	380,036,000	1,740,785,000	627,441,000	2,748,262,000	458,558,000	18,711,000	3,225,531,000

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.

SECTION 7

RISK CONSIDERATIONS

Actuarial Standards of Practice are issued by the Actuarial Standards Board and are binding on credentialed actuaries practicing in the United States. These standards generally identify what the actuary should consider, document and disclose when performing an actuarial assignment. In September, 2017, Actuarial Standard of Practice Number 51, *Assessment and Disclosure of Risk in Measuring Pension Obligations*, (ASOP 51) was issued as final with application to measurement dates on or after November 1, 2018. This ASOP, which applies to funding valuations, actuarial projections, and actuarial cost studies of proposed plan changes, was first applicable for the December 31, 2018 actuarial valuation for the Kansas Public Employees Retirement System (KPERS).

A typical retirement plan faces many different risks, but the greatest risk is the inability to make benefit payments when due. The term “risk” is most commonly associated with an outcome with undesirable results. However, in the actuarial world, risk can simply be translated as uncertainty. The actuarial valuation process uses many actuarial assumptions to project how future contributions and investment returns will meet the cash flow needs for expected future benefit payments. Of course, we know that actual experience will not unfold exactly as anticipated by the assumptions and that uncertainty, whether favorable or unfavorable, creates risk. ASOP 51 defines risk as the potential of actual future measurements to deviate from expected results due to actual experience that is different than the actuarial assumptions.

The various risk factors for a given plan can have a significant impact – positive or negative – on the actuarial projection of liability and contribution rates. There are a number of risks inherent in the funding of a defined benefit plan. These include:

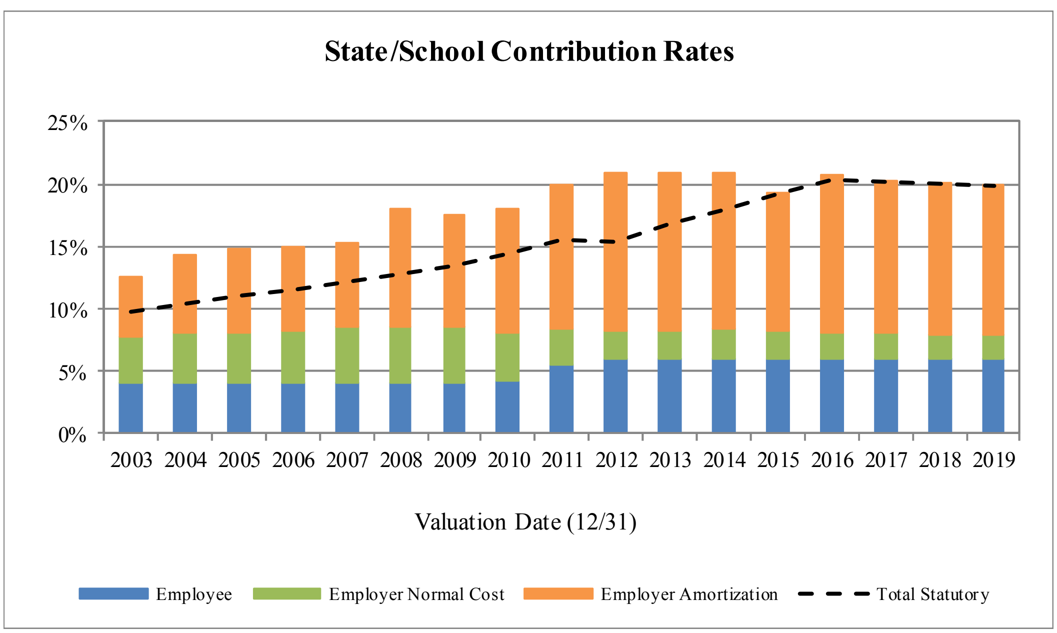
- economic risks, such as investment return, salary increases, and price inflation;
- demographic risks, such as mortality, payroll growth, aging population including impact of baby boomers, and retirement ages;
- contribution risk, i.e., the potential for contribution rates to be higher than expected due to population changes or other factors (note ASOP 51 does not require the actuary to opine on the willingness or ability of the plan sponsor/employer to pay the contribution rate); and
- external risks, such as the regulatory and political environment (which are not included in the risks to be assessed under ASOP 51).

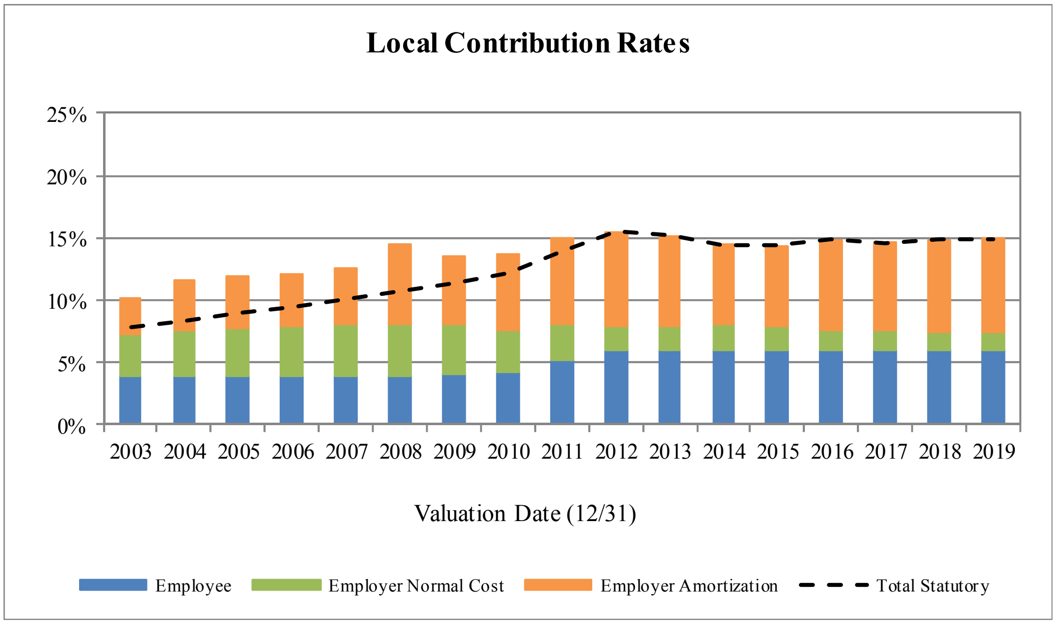
Impact of Funding Policy

One of the most important factors in the funding of any retirement system is consistently making contributions that are at least equal to the actuarial required contribution rate. With respect to this practice, there is a significant difference in the funding policy for KPERS (State/School and Local) and KP&F and Judges. KP&F and Judges have historically contributed the full actuarial contribution rate. However, there is a long history of contributing less than the full actuarial contribution rate for KPERS, particularly the School group.

The Kansas School Retirement System (KSRS) was created by the Kansas Legislature in 1940 and provided for a service annuity and a savings annuity (funded by employee contributions). The service annuity was not actuarially funded in advance, but rather was funded by general appropriations from the State General Fund for the amount necessary to fund the benefits each year (pay as you go). The Legislature explored options and eventually decided to merge KSRS into KPERS on January 1, 1971. At that time, any KSRS members who were not retired became KPERS members, with the provision for benefits on their years of service in the KSRS. Any KSRS member who was retired was not made a KPERS member at that time. In lieu of employer contributions in 1970, the State Permanent School Fund was abolished and all proceeds were transferred to the KPERS Trust Fund. Employer contribution for 1971 were set at 5.05% (4.55% Pension and 0.50% death and disability). Beginning in 1973, School group employer contributions were certified by the Board of Trustees and paid from the State General Fund. In 1972, a bill was passed to fund the remaining unfunded actuarial liability of $68.4 million over eleven years with level payments of $5.0 million per year starting in July, 1973. Due to increases in the unfunded actuarial liability from post-retirement benefit adjustments, the State contribution amount was increased to $10 million in 1973 which was paid from FY 1974 through FY 1984 (11 total payments). The 1984 Legislature made the remaining KSRS retirees special KPERS members and rolled the remaining unfunded actuarial liability into the KPERS unfunded actuarial liability. The remaining KSRS unfunded actuarial liability at that time was estimated to be $22.3 million (June, 1983). Rather than make the final two payments on the KSRS unfunded actuarial liability, the Legislature amortized the remaining $22.3 million over 27 years, the years remaining on the KPERS unfunded actuarial liability in 1984. Since the State funds the contributions for both the State and School group, one valuation was performed to set the contribution rate for the combined State/School group. Legislation passed in 2004 (effective with the December 31, 2003 valuation) split the actuarial valuation into two separate groups, although the statutory contribution rate has continued to be determined on a combined basis. By statute, any excess of the statutory contribution over the actuarial required contribution for the State group is allocated to fund the School group.

The State, School and Local employers do not necessarily contribute the full actuarial contribution rate. Due to legislation passed in 1993, the employer contribution rates certified by the Board may not increase over the prior year by more than the statutory cap. The statutory cap has changed over time, but the current cap is 1.20%. Due to this cap, the statutory contribution rate was below the actuarial contribution for many years (25 years for the State/School group and 21 for the Local group). The following graphs show the contribution rates for the State/School and Local groups over the last 17 years. Note these are the rates developed in the valuations which apply to later fiscal years.





Over the last two decades, there have been multiple efforts to address the long-term funding of KPERS and some significant changes have occurred. As was discussed earlier, the statutory cap, which was 0.10% for State/School and 0.05% for Local when established in 1993, has been increased several times and is currently 1.20% for all groups. In addition, the Legislature approved the issuance of bonds in 2004 and 2015, resulting in combined proceeds of about $1.4 billion to the KPERS trust fund. Different benefit structures with lower costs were created for members hired after July 1, 2009 (KPERS 2) and then again for members hired after January 1, 2015 (KPERS 3). The plan design for KPERS 3 members is intended to share the pre-retirement investment risk directly with the members by adjusting the interest crediting rate when actual investment experience is different than expected, thereby effectively lowering the benefits to be paid to members. Over the very long term, this change in the benefit structure will reduce some of the investment risk for KPERS.

However, in some of the more recent years, there have been times when the Legislature and Governor have not paid the full statutory contribution rate (which was already lower than the actuarial contribution rate). 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, 2015 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, to reflect the impact of the bond proceeds on the current year's contribution rates.

The 2016 Legislature passed legislation to permit a delay of contributions of up to $100 million in State and School contributions for fiscal year 2016, but 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. Legislation in the 2017 session then provided that the repayment of these contributions would not be paid (subsequent legislation passed by the 2019 Legislature repaid these delayed contributions).

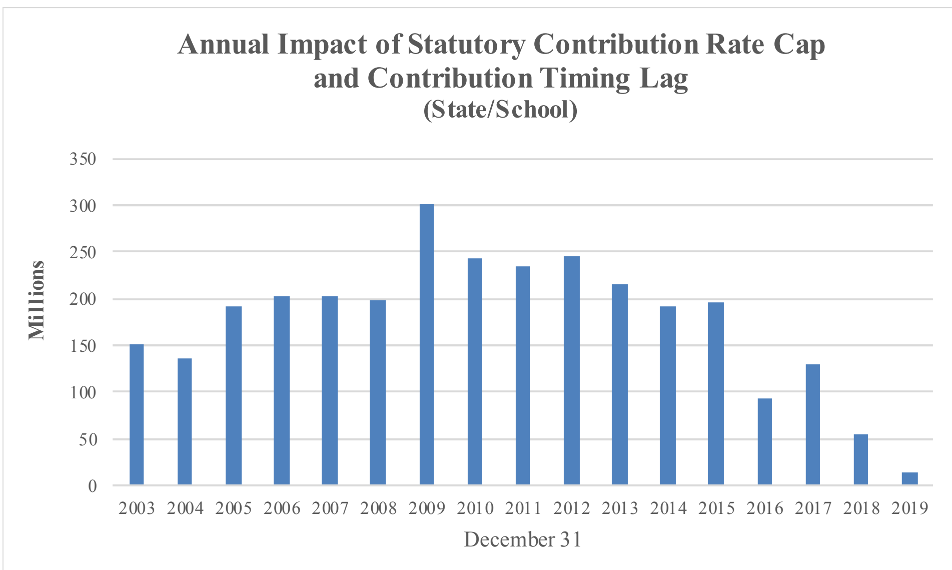
The 2017 Legislature passed bills that provided for a delay of $64.13 million of the total FY 2017 State/School statutory contributions. The delayed employer contributions for fiscal year 2017 are repaid in level-dollar annual installments of $6.4 million over twenty years beginning in fiscal year 2018. A portion of the employer contributions for School employers within the State/School group for fiscal year 2019 ($194 million) were also delayed with repayment by the School group, as a level dollar amount over 20 years beginning in FY 2020.

The 2018 and 2019 Legislatures passed bills to contribute additional funding to the KPERS School group:

- $82 million in July 2018 (received July 2018)
- $56 million in FY 2018 (received June 2018)
- $51 million in FY 2020 (received July 2019)

In addition, the 2019 Legislature passed Senate Bill 9 which provided for a transfer of $115 million from the State General Fund to KPERS in March, 2019. This payment covers the $97 million in missed KPERS School contributions for FY 2016 plus interest.

While there has been significant activity over the last 25 years by the Legislature to address the funding of the State/School group, contributions have been significantly less than the full actuarial rate since 1994. The contribution shortfall results in an increase in the actual unfunded actuarial liability compared to that expected, based on the actuarial funding policy. A graph of the shortfall between the actuarial and statutory contributions over the last 17 years is shown below:



Other Risk Factors

The most significant risk factor for KPERS is investment return because of the volatility of returns and the size of plan assets compared to payroll (see Table 23). A perusal of historical returns over 10-20 years reveals that the actual return each year is rarely close to the expected return for the same period. This is to be expected, given the underlying capital market assumptions and the System's asset allocation.

A key demographic risk for all retirement systems, including the Kansas Public Employees Retirement System, is improvements in mortality (longevity) greater than anticipated. While the actuarial assumptions reflect small, continuous improvements in mortality experience over time and these assumptions are refined every experience study (triennially), the risk arises because there is a possibility of some sudden shift, perhaps from a significant medical breakthrough that could quickly increase liabilities. Likewise, there is some possibility of a significant public health crisis that could result in a significant number of additional deaths in a short time period, which would also be significant, although more easily absorbed. While either of these events could happen, it represents a small probability and thus represents much less risk than the volatility associated with investment returns.

Finally, the unfunded actuarial liability is amortized as a level percentage of payroll for all groups, with the exception of the Judges group. The underlying assumption used in developing the payment schedule assumes an increasing payroll over time which is dependent on a stable employment level, i.e., active member count remains the same. When payroll does not grow as expected, the unfunded actuarial liability contribution rate will be higher than expected even if the dollar amount of the payment is the same as scheduled. With the statutory employer contribution cap for the State/School and Local groups, stagnant growth in covered payroll together with investment returns far below the expected return, could create a situation in the future where the statutory contribution rate is less than the actuarial contribution rate.

Many of the public retirement systems were created shortly after the end of World War II. Although KPERS (established in 1962) is younger than many of its peers, it has still been in existence for more than fifty years. In addition, the merger of KSRS into KPERS impacted the demographics of the System. In general, the aging of the population, including the retirement of the baby boomers, along with earlier retirement eligibility has created a shift in the demographics of most retirement systems. This change is not unexpected and has, in fact, been anticipated in the funding of the retirement systems. Even though it was anticipated, the demographic shift and maturing of the plans have increased the risk associated with funding the system. The following exhibits summarize certain historical information that indicates how certain key risk metrics have changed over time due to the maturing of the retirement system.

TABLE 23
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
ASSET VOLATILITY RATIOS

As a retirement system matures, the size of the market value of assets increases relative to the covered payroll of active members, on which the System is funded. The size of the plan assets relative to covered payroll, sometimes referred to as the asset volatility ratio, is an important indicator of the contribution risk for the System. The higher this ratio, the more sensitive a plan's contribution rate is to investment return volatility. In other words, it will be harder to recover from investment losses with increased contributions.

Group	Market Value of Assets	Covered Payroll	Asset Volatility Ratio	Increase in ARC with a Return 10% Lower than Assumed*
Local	4,323,027,610	1,846,129,228	2.34	1.80%
State/School	14,333,922,636	4,906,269,452	2.92	2.25%
KP&F	2,696,650,789	554,539,001	4.86	3.74%
Judges	189,825,166	29,066,581	6.53	5.03%

*The impact of asset smoothing is not reflected in the impact on the Actuarial Required Contribution Rate (ARC).

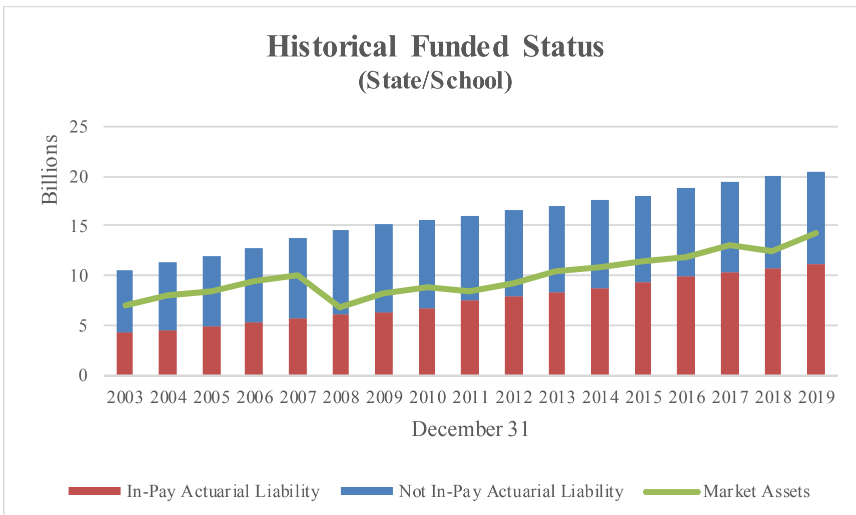
	Asset Volatility Ratio	Increase in ARC with a Return 10% Lower than Assumed*
	1.00	0.77%
	2.00	1.54%
Local ->	2.34	1.80%
	3.00	2.31%
State/School ->	2.92	2.25%
	4.00	3.08%
	5.00	3.85%
KP&F ->	4.86	3.74%
	6.00	4.62%
Judges ->	6.53	5.03%
	7.00	5.39%

The assets for the State/School group at December 31, 2019 are 292% of payroll, so underperforming the investment return assumption by 10.00% (i.e., earn -2.25% for one year) is equivalent to an actuarial loss of 29.2% of payroll. The impact on the employer contribution rate varies by group because of the difference in the Asset Volatility Ratio. While the actual impact in the first year is mitigated by the asset smoothing method and amortization of the unfunded actuarial liability, this exhibit illustrates the contribution risk associated with volatile investment returns.

TABLE 24
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
HISTORICAL FUNDED STATUS

Another key measurement is whether, and by how much, the current market value of assets exceeds the liability for current retirees and beneficiaries. This also provides an indication of the maturity of the retirement system.

The general trend line of the market value of assets is similar for both the State/School and Local groups, but the assets of the Local group have been well above the in-pay liability in all years while that has not been the case for the State/School group.



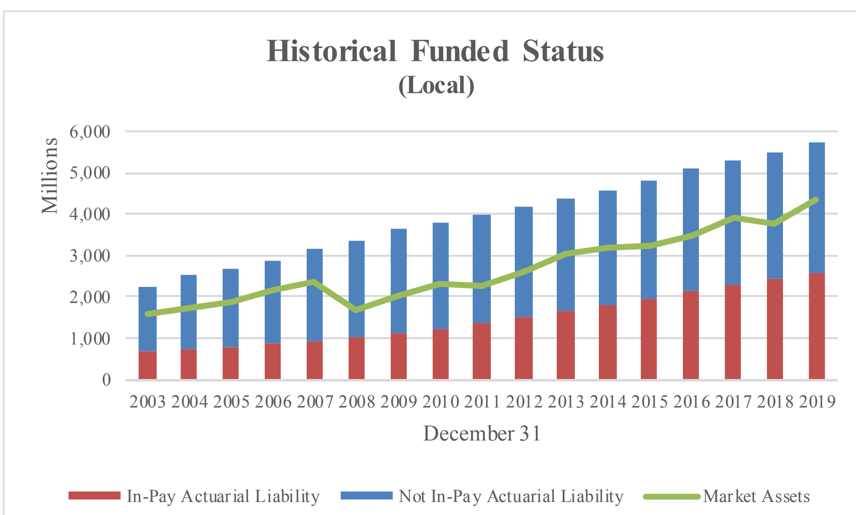
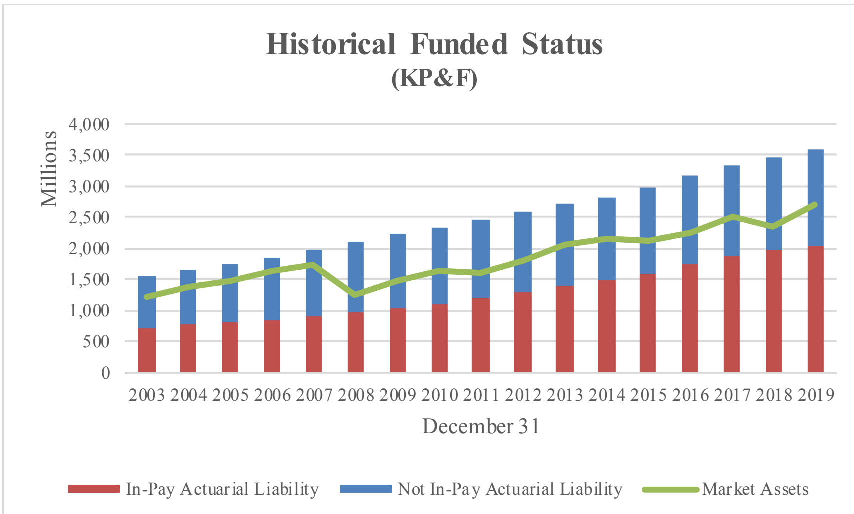


TABLE 24 (cont.)
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
HISTORICAL FUNDED STATUS

The fact that the Kansas Police and Fire (KP&F) system has been funded with contributions equal to the full actuarial rate has contributed to the fact the market value of assets has historically been higher than the inactive liability. KP&F is currently about 75% funded on a market value basis.



The Judges System has also been funded with contributions equal to the actuarial contribution rate. Over the last fifteen years, the funded status of the system declined due to the Great Recession in 2008 and 2009, but has recovered and is currently about 97% funded on a market value basis.

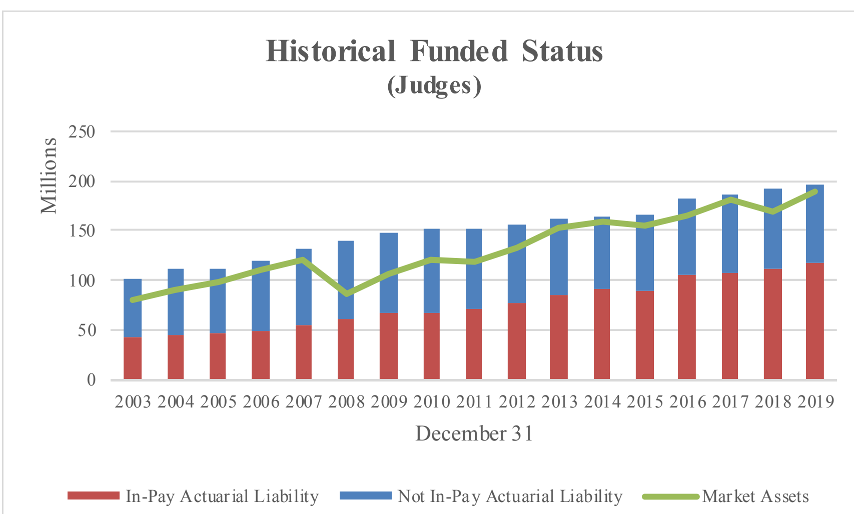
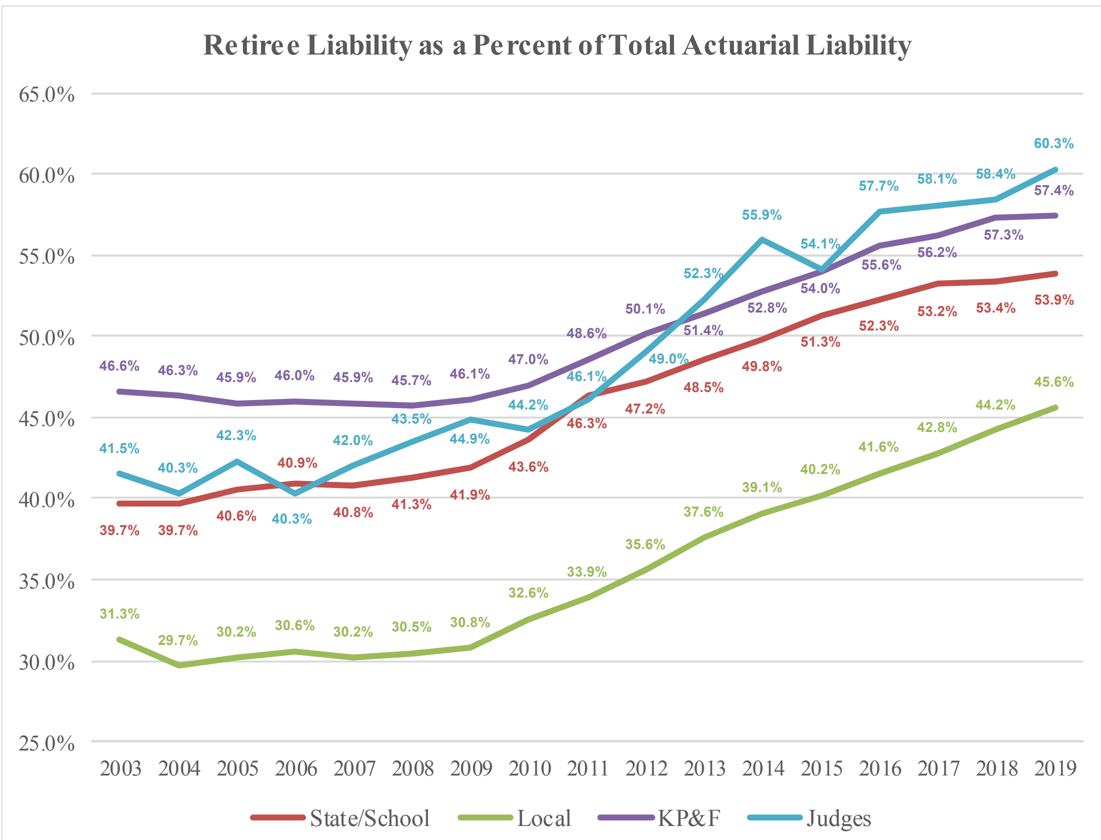


TABLE 25
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
LIABILITY MATURITY MEASUREMENTS

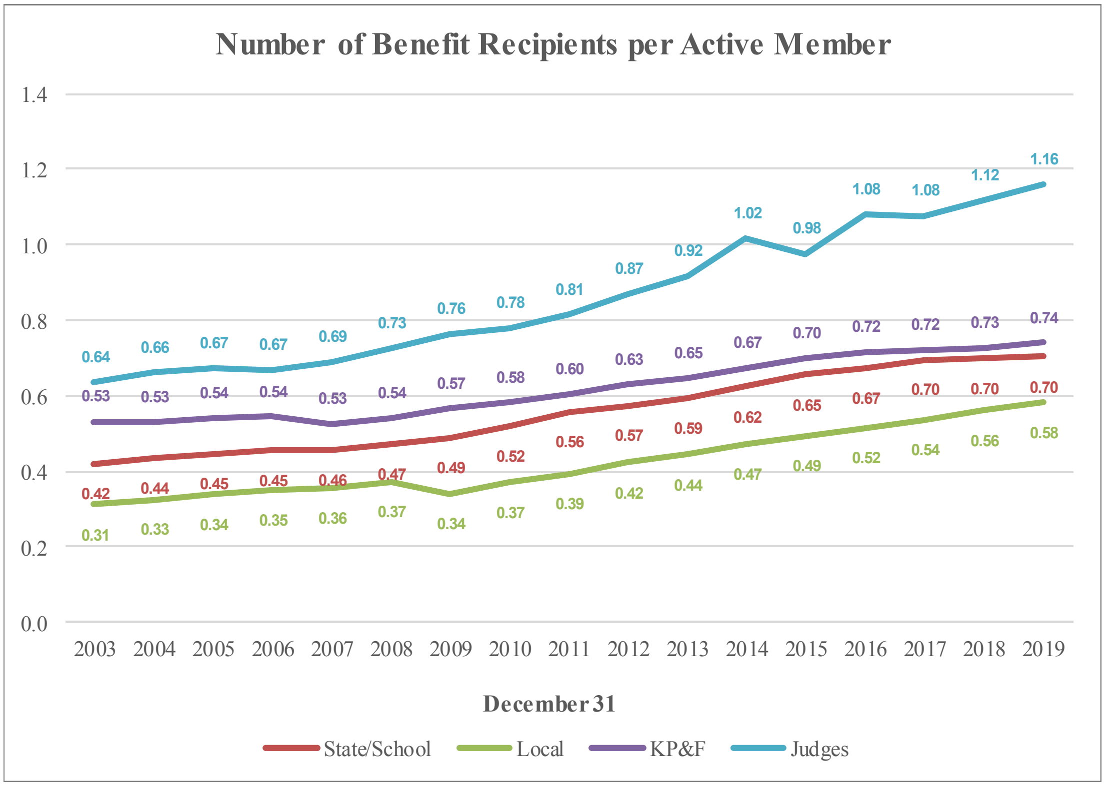
Most public sector retirement systems have been in operation for many years. As a result, they have aging plan populations, and in some cases declining active populations, resulting in a growing percentage of retiree liability. With more of the total liability residing with retirees, investment volatility has a greater impact on the funding of the system since it is more difficult to restore the system financially after losses occur when there is comparatively less payroll to spread costs over.



As the graph above illustrates, the relative percentage of total liability attributable to retirees has varied over time and different patterns exist for the different groups. However, for all groups, the trend has been an increase in the percentage over the last 17 years, indicating retirees are a growing portion of the membership of the System.

TABLE 26
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
NUMBER OF BENEFIT RECIPIENTS PER ACTIVE MEMBER

In the past 17 years, KPERS has become more mature, as indicated by a continual increase in the ratio of benefit recipients (retirees and beneficiaries) to active members, shown in the graph below. The increase in the ratio is significant from a funding perspective because any increase in the unfunded actuarial liability due to unfavorable future investment or non-investment experience for a larger group of non-active members has to be amortized and funded using the payroll of a smaller group of active members.



There has been a general increasing trend of benefit recipients to active members over the last 17 years, indicating a maturation of the systems. The increase has been more dramatic for the Judges system due to the size and demographics of the group.

TABLE 27

KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
SCENARIO TESTING - STATE/SCHOOL GROUP

KPERS is subject to various risks that may impact the funded status and employer contribution rates. As past experience has demonstrated, investment performance is one of the most impactful risks. Any variance in actual experience, including but not limited to members living longer or shorter than expected, future salary increases more or less than assumed, and members leaving active employment earlier or later than assumed will also impact the liabilities and contribution rates. It is because of these possible, and often likely, annual variances from expectations that an actuarial valuation is performed annually to assess and measure the variances and update the employer contribution rates.

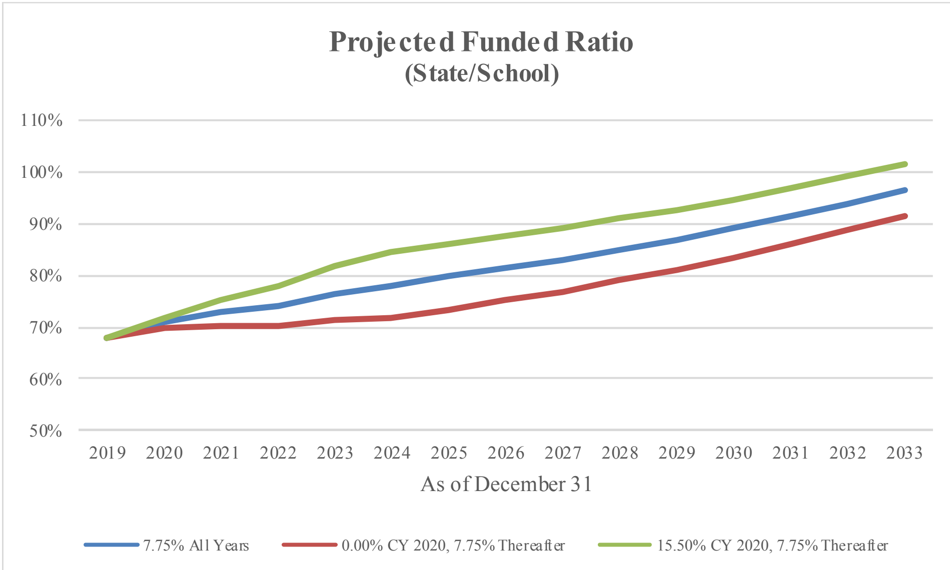
To measure the investment risk, a “Scenario Test” is included to study the change in funded status and employer contribution rates if KPERS were to earn market returns higher or lower than 7.75% in the first year following the December 31, 2019 valuation (calendar year 2020) and then earn the assumed return in all other years. This section of the valuation report contains three deterministic projections of actuarial valuation results to illustrate the impact of variance in the investment return for a single year. The projections assume the actual return on assets for the year ending December 31, 2019 will be as follows:

- Scenario 1: 7.75% return in all years (the current assumption)
- Scenario 2: 0.00% return in CY 2020, then 7.75% thereafter
- Scenario 3: 15.50% return in CY 2020, then 7.75% thereafter

Impact on the Future Valuation Results

The following graphs show the impact of each scenario on the State/School funded ratio and the State/School employer contribution rate. The blue line reflects the expected path for the funded ratio if all assumptions are met in the future, including the 7.75% assumed rate of return. The funded ratio improves steadily as deferred asset gains are realized and then continues to improve as the System is expected to contribute the full actuarial contribution rate until reaching 97% in 2033. If the actual investment return for calendar year 2020 is 0%, followed by returns of 7.75% in all subsequent years, the funded ratio would hold steady around 71% for a few years as the deferred asset experience flows through the asset smoothing method and then steadily increase (red line). Under the third scenario (green line), the return for calendar year 2020 is 15.50%, followed by 7.75% and the funded ratio increases steadily reaching 101% by 2033. The purpose of the scenario testing is to illustrate the long term impact of one year where the investment return is significantly better or worse than expected.

Similarly, for the State/School employer contribution rate, the blue line indicates the projection of the employer contribution rate, if all assumptions are met, which remains level once the deferred investment experience works through the asset smoothing method. If the return in calendar year 2020 is 0% (red line), the employer contribution rate increases to around 15% as the investment experience is recognized in the actuarial value of assets and then remains at that level for the remainder of the period. Under the third scenario (green line), where the return in calendar year 2020 is 15.50%, the employer contribution rate decreases to around 10.5%.


Projected Funded Ratio
(State/School)
110%
100%
90%
80%
70%
60%
50%
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
As of December 31
7.75% All Years
0.00% CY 2020, 7.75% Thereafter
15.50% CY 2020, 7.75% Thereafter

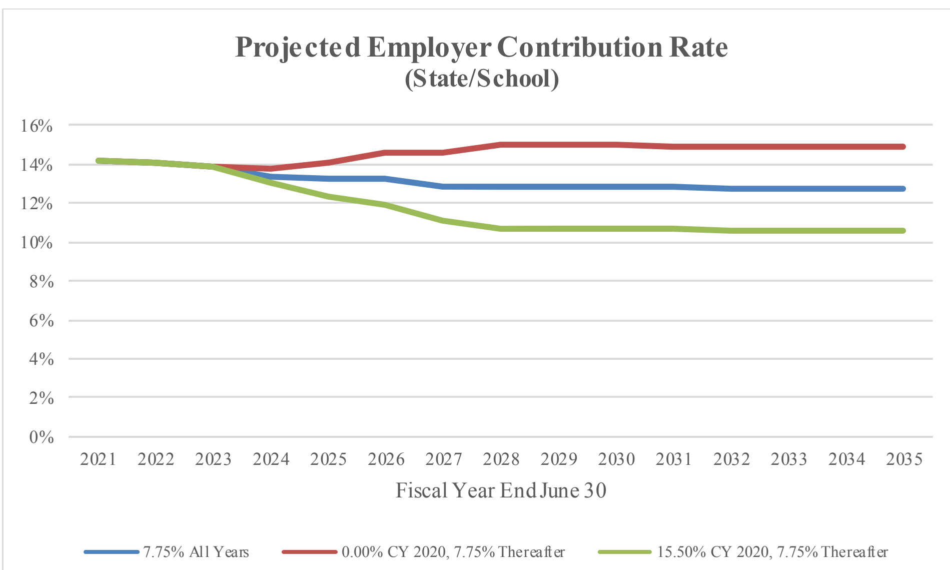

Projected Employer Contribution Rate
(State/School)
16%
14%
12%
10%
8%
6%
4%
2%
0%
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
2034
2035
Fiscal Year End June 30
7.75% All Years
0.00% CY 2020, 7.75% Thereafter
15.50% CY 2020, 7.75% Thereafter

TABLE 28A
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
COMPARISON OF VALUATION RESULTS UNDER ALTERNATE INVESTMENT RETURN ASSUMPTIONS

STATE/SCHOOL
($ in millions)

This exhibit compares the key December 31, 2019 valuation results under five (5) different investment return assumptions to illustrate the impact of different assumptions on the funding of the System. Note that only the investment return assumption is changed, as identified in the heading below. All other assumptions, including PLSO factors, annuity factors and interest crediting rate, are unchanged for purposes of this analysis.

Investment Return Assumption	**7.25%**	**7.50%**	**7.75%**	**8.00%**	**8.25%**
Actuarial Liability	$21,611	$21,046	$20,505	$19,986	$19,488
Actuarial Value of Assets	13,960	13,960	13,960	13,960	13,960
Unfunded Actuarial Liability (UAL)	$7,651	$7,086	$6,545	$6,026	$5,528
Funded Ratio	64.6%	66.3%	68.1%	69.8%	71.6%
Contribution Rates					
- Total Normal Cost Rate	8.82%	8.34%	7.90%	7.49%	7.11%
- Member Contribution Rate	(6.00%)	(6.00%)	(6.00%)	(6.00%)	(6.00%)
- Employer Normal Cost Rate	2.82%	2.34%	1.90%	1.49%	1.11%
- Amortization of the UAL	13.30%	12.63%	11.96%	11.28%	10.59%
Actuarial Contribution Rate	16.12%	14.97%	13.86%	12.77%	11.70%
Statutory Employer Contribution Rate*	15.29%	14.97%	13.86%	12.77%	11.70%

Note: Totals may not add due to rounding.
*Employer contribution rates may be impacted by the statutory cap.

TABLE 28B
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
COMPARISON OF VALUATION RESULTS UNDER ALTERNATE INVESTMENT RETURN ASSUMPTIONS

LOCAL
($ in millions)

This exhibit compares the key December 31, 2019 valuation results under five (5) different investment return assumptions to illustrate the impact of different assumptions on the funding of the System. Note that only the investment return assumption is changed, as identified in the heading below. All other assumptions, including PLSO factors, annuity factors and the interest crediting rate, are unchanged for purposes of this analysis.

Investment Return Assumption	7.25%	7.50%	7.75%	8.00%	8.25%
Actuarial Liability	$6,023	$5,860	$5,705	$5,555	$5,412
Actuarial Value of Assets	4,202	4,202	4,202	4,202	4,202
Unfunded Actuarial Liability (UAL)	$1,821	$1,658	$1,502	$1,353	$1,210
Funded Ratio	69.8%	71.7%	73.7%	75.6%	77.6%
Contribution Rates					
- Total Normal Cost Rate	8.19%	7.79%	7.43%	7.08%	6.76%
- Member Contribution Rate	(6.00%)	(6.00%)	(6.00%)	(6.00%)	(6.00%)
- Employer Normal Cost Rate	2.19%	1.79%	1.43%	1.08%	0.76%
- Amortization of the UAL	8.52%	8.00%	7.47%	6.93%	6.39%
Actuarial Contribution Rate	10.71%	9.79%	8.90%	8.01%	7.15%
Statutory Employer Contribution Rate*	10.07%	9.79%	8.90%	8.01%	7.15%

Note: Totals may not add due to rounding.
*Employer contribution rates may be impacted by the statutory cap.

TABLE 28C
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
COMPARISON OF VALUATION RESULTS UNDER ALTERNATE INVESTMENT RETURN ASSUMPTIONS

KP&F
($ in millions)

This exhibit compares the key December 31, 2019 valuation results under five (5) different investment return assumptions to illustrate the impact of different assumptions on the funding of the System. Note that only the investment return assumption is changed, as identified in the heading below.

Investment Return Assumption	**7.25%**	**7.50%**	**7.75%**	**8.00%**	**8.25%**
Actuarial Liability	$3,775	$3,674	$3,578	$3,485	$3,397
Actuarial Value of Assets	2,628	2,628	2,628	2,628	2,628
Unfunded Actuarial Liability (UAL)	$1,146	$1,046	$949	$857	$769
Funded Ratio	69.6%	71.5%	73.5%	75.4%	77.4%
Contribution Rates					
- Total Normal Cost Rate	16.49%	15.66%	14.87%	14.14%	13.45%
- Member Contribution Rate	(7.15%)	(7.15%)	(7.15%)	(7.15%)	(7.15%)
- Employer Normal Cost Rate	9.34%	8.51%	7.72%	6.99%	6.30%
- Amortization of the UAL	17.42%	16.35%	15.27%	14.18%	13.08%
Actuarial Contribution Rate	26.76%	24.86%	22.99%	21.17%	19.38%
Statutory Employer Contribution Rate	26.76%	24.86%	22.99%	21.17%	19.38%

Note: Totals may not add due to rounding.

TABLE 28D
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
COMPARISON OF VALUATION RESULTS UNDER ALTERNATE INVESTMENT RETURN ASSUMPTIONS

JUDGES

This exhibit compares the key December 31, 2019 valuation results under five (5) different investment return assumptions to illustrate the impact of different assumptions on the funding of the System. Note that only the investment return assumption is changed, as identified in the heading below.

Investment Return Assumption	**7.25%**	**7.50%**	**7.75%**	**8.00%**	**8.25%**
Actuarial Liability	$204,005,840	$199,724,218	$195,593,331	$191,606,292	$187,756,587
Actuarial Value of Assets	185,323,804	185,323,804	185,323,804	185,323,804	185,323,804
Unfunded Actuarial Liability (UAL)	$18,682,036	$14,400,414	$10,269,527	$6,282,488	$2,432,783
Funded Ratio	90.8%	92.8%	94.7%	96.7%	98.7%
Contribution Rates					
- Total Normal Cost Rate	22.00%	21.10%	20.25%	19.43%	18.66%
- Member Contribution Rate	(5.63%)	(5.63%)	(5.63%)	(5.63%)	(5.63%)
- Employer Normal Cost Rate	16.37%	15.47%	14.62%	13.80%	13.03%
- Amortization of the UAL	6.32%	4.75%	3.15%	1.52%	(0.12%)
Actuarial Contribution Rate	22.69%	20.22%	17.77%	15.32%	12.91%
Statutory Employer Contribution Rate	22.71%	20.23%	17.77%	15.31%	12.89%

Note: Totals may not add due to rounding.

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
2017	296,383	143,947	45.3	34.2	11.1	43,128	1.6%	1,904	56,402	94,130	1.53
2018	302,735	146,104	45.1	34.1	11.0	44,404	3.0%	1,771	58,008	96,852	1.51
2019	309,154	148,199	45.0	34.2	10.8	45,563	2.6%	1,650	59,746	99,559	1.49

*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
2017	14,533	7,481	39.1	27.8	11.3	67,875	2.2%	200	1,454	5,398	1.39
2018	15,001	7,695	38.8	27.8	11.0	69,184	1.9%	192	1,519	5,595	1.38
2019	15,412	7,797	38.8	27.9	10.9	71,122	2.8%	192	1,660	5,763	1.35

*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
2017	544	259	58.0	46.6	11.4	109,391	1.6%	6	279	0.93
2018	547	256	58.5	46.8	11.7	111,465	1.9%	5	286	0.90
2019	564	257	58.1	47.0	11.1	113,100	1.5%	9	298	0.86

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	122,353
Removed deaths prior to 12/31/19	(16,712)
Records removed because the member has received all benefits or is not eligible for KPERS benefits	(652)
Removed certain periods ending within six months	(19)
Added new retirees from supplemental file	650
Records used in the valuation	105,620
Records on the not-in-pay data file	251,592
Missing records added	17
Records removed because the member has received all benefits or is not eligible for KPERS benefits	(31,509)
Records removed because the member began receiving benefits	(590)
Records used in the valuation	219,510

These records are allocated as follows:

	State	School	Local	KP&F	Judges
Active members*	21,239	88,953	38,007	7,797	257
Inactive vested members	3,744	13,103	6,806	224	9
Inactive nonvested members	5,329	18,651	12,113	1,436	0
Deferred disabled members	500	659	491	192	0
Total	30,812	121,366	57,417	9,649	266
Retirees and beneficiaries	20,844	56,616	22,099	5,763	298
GRAND TOTAL	51,656	177,982	79,516	15,412	564

* For KP&F, includes 25 current DROP participants.

SUMMARY OF MEMBERSHIP DATA

KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
ACTIVE MEMBER DATA

	12/31/2019	12/31/2018	Change
State			
Number	21,239	20,893	1.7%
KPERS 1	9,329	10,156	(8.1%)
KPERS 2	4,640	4,806	(3.5%)
KPERS 3	7,270	5,931	22.6%
Average Current Age	46.09	46.46	(0.8%)
Average Service	11.53	11.92	(3.3%)
Average Pay	$46,891	$45,669	2.7%
School			
Number	88,953	87,245	2.0%
KPERS 1	36,705	39,225	(6.4%)
KPERS 2	17,809	19,173	(7.1%)
KPERS 3	34,439	28,847	19.4%
Average Current Age	44.66	44.75	(0.2%)
Average Service	10.95	11.06	(1.0%)
Average Pay	$43,960	$42,876	2.5%
State/School			
Number	110,192	108,138	1.9%
KPERS 1	46,034	49,381	(6.8%)
KPERS 2	22,449	23,979	(6.4%)
KPERS 3	41,709	34,778	19.9%
Average Current Age	44.94	45.08	(0.3%)
Average Service	11.06	11.23	(1.5%)
Average Pay	$44,525	$43,416	2.6%
Local			
Number	38,007	37,966	0.1%
KPERS 1	14,961	16,327	(8.4%)
KPERS 2	7,093	7,796	(9.0%)
KPERS 3	15,953	13,843	15.2%
Average Current Age	45.30	45.32	(0.0%)
Average Service	10.16	10.21	(0.5%)
Average Pay	$48,573	$47,221	2.9%

SUMMARY OF MEMBERSHIP DATA

KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
ACTIVE MEMBER DATA

	12/31/2019	12/31/2018	Change
KPERS Total			
Number	148,199	146,104	1.4%
KPERS 1	60,995	65,708	(7.2%)
KPERS 2	29,542	31,775	(7.0%)
KPERS 3	57,662	48,621	18.6%
Average Current Age	45.03	45.14	(0.2%)
Average Service	10.83	10.96	(1.2%)
Average Pay	$45,563	$44,404	2.6%
KP&F			
Number	7,797	7,695	1.3%
Tier 1	41	73	(43.8%)
Tier 2	7,731	7,622	1.4%
DROP	25	13	92.3%
Average Current Age	38.80	38.82	(0.1%)
Average Service	10.92	10.99	(0.6%)
Average Pay	$71,122	$69,184	2.8%
Judges			
Number	257	256	0.4%
Average Current Age	58.09	58.48	(0.7%)
Average Service	11.11	11.74	(5.4%)
Average Pay	$113,100	$111,465	1.5%
System Total			
Number	156,253	154,055	1.4%
Average Current Age	44.74	44.85	(0.2%)
Average Service	10.84	10.96	(1.1%)
Average Pay	$46,950	$45,754	2.6%

SUMMARY OF MEMBERSHIP DATA

KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
INACTIVE MEMBER DATA

	12/31/2019	12/31/2018	Change
State			
Inactive Vested	3,744	3,708	1.0%
Inactive Nonvested	5,329	5,096	4.6%
Deferred Disabled	500	542	(7.7%)
School			
Inactive Vested	13,103	12,575	4.2%
Inactive Nonvested	18,651	18,128	2.9%
Deferred Disabled	659	706	(6.7%)
Local			
Inactive Vested	6,806	6,525	4.3%
Inactive Nonvested	12,113	11,976	1.1%
Deferred Disabled	491	523	(6.1%)
KPERS Total			
Inactive Vested	23,653	22,808	3.7%
Inactive Nonvested	36,093	35,200	2.5%
Deferred Disabled	1,650	1,771	(6.8%)
KP&F			
Inactive Vested	224	197	13.7%
Inactive Nonvested	1,436	1,322	8.6%
Deferred Disabled	192	192	0.0%
Judges			
Inactive Vested	9	5	80.0%
Inactive Nonvested	0	0	0.0%
Deferred Disabled	0	0	0.0%
System Total			
Inactive Vested	23,886	23,010	3.8%
Inactive Nonvested	37,529	36,522	2.8%
Deferred Disabled	1,842	1,963	(6.2%)

SUMMARY OF MEMBERSHIP DATA

KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
RETIREE MEMBER DATA

	12/31/2019	12/31/2018	Change
State			
Number	18,845	18,514	1.8%
Average Benefit	$15,294	$15,058	1.6%
Average Age	72.55	72.33	0.3%
School			
Number	53,557	52,083	2.8%
Average Benefit	$16,235	$16,003	1.4%
Average Age	72.63	72.41	0.3%
Local			
Number	19,957	19,235	3.8%
Average Benefit	$13,485	$13,038	3.4%
Average Age	72.15	72.06	0.1%
KPERS Total			
Number	92,359	89,832	2.8%
Average Benefit	$15,449	$15,173	1.8%
Average Age	72.51	72.32	0.3%
KP&F			
Number	4,773	4,625	3.2%
Average Benefit	$38,535	$37,651	2.3%
Average Age	65.41	65.25	0.2%
Judges			
Number	233	223	4.5%
Average Benefit	$46,849	$46,508	0.7%
Average Age	74.90	74.81	0.1%
System Total			
Number	97,365	94,680	2.8%
Average Benefit	$16,656	$16,345	1.9%
Average Age	72.17	71.98	0.3%

SUMMARY OF MEMBERSHIP DATA

KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
BENEFICIARY MEMBER DATA

	12/31/2019	12/31/2018	Change
State			
Number	1,999	2,008	(0.4%)
Average Benefit	$9,551	$9,365	2.0%
Average Age	76.78	76.63	0.2%
School			
Number	3,059	2,944	3.9%
Average Benefit	$9,702	$9,534	1.8%
Average Age	76.87	76.67	0.3%
Local			
Number	2,142	2,068	3.6%
Average Benefit	$7,992	$7,766	2.9%
Average Age	75.56	75.20	0.5%
KPERS Total			
Number	7,200	7,020	2.6%
Average Benefit	$9,151	$8,965	2.1%
Average Age	76.46	76.23	0.3%
KP&F			
Number	990	970	2.1%
Average Benefit	$18,211	$17,840	2.1%
Average Age	69.43	69.12	0.4%
Judges			
Number	65	63	3.2%
Average Benefit	$29,105	$29,292	(0.6%)
Average Age	77.00	77.38	(0.5%)
System Total			
Number	8,255	8,053	2.5%
Average Benefit	$10,395	$10,193	2.0%
Average Age	75.62	75.38	0.3%

SUMMARY OF MEMBERSHIP DATA

KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
RETIREE AND BENEFICIARY MEMBER DATA

	12/31/2019	12/31/2018	Change
State			
Number	20,844	20,522	1.6%
Average Benefit	$14,743	$14,501	1.7%
Average Age	72.95	72.75	0.3%
School			
Number	56,616	55,027	2.9%
Average Benefit	$15,882	$15,657	1.4%
Average Age	72.86	72.64	0.3%
Local			
Number	22,099	21,303	3.7%
Average Benefit	$12,952	$12,526	3.4%
Average Age	72.48	72.37	0.2%
KPERS Total			
Number	99,559	96,852	2.8%
Average Benefit	$14,993	$14,723	1.8%
Average Age	72.79	72.60	0.3%
KP&F			
Number	5,763	5,595	3.0%
Average Benefit	$35,043	$34,217	2.4%
Average Age	66.10	65.92	0.3%
Judges			
Number	298	286	4.2%
Average Benefit	$42,978	$42,716	0.6%
Average Age	75.36	75.37	(0.0%)
System Total			
Number	105,620	102,733	2.8%
Average Benefit	$16,166	$15,863	1.9%
Average Age	72.43	72.24	0.3%

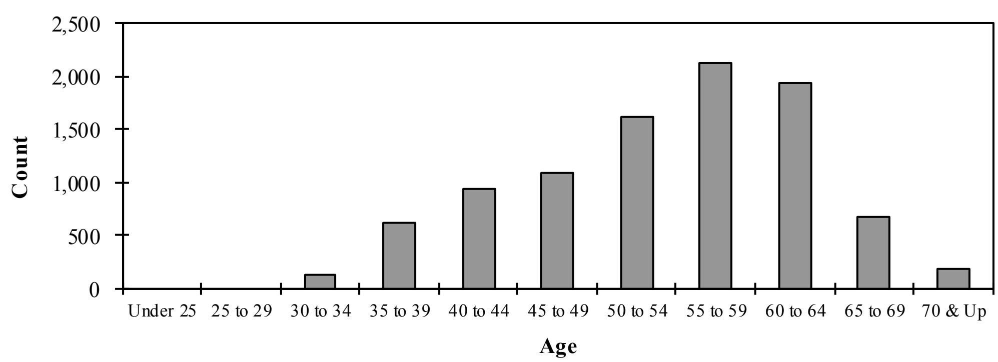
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF ACTIVE MEMBERS
as of December 31, 2019

STATE - KPERS 1*

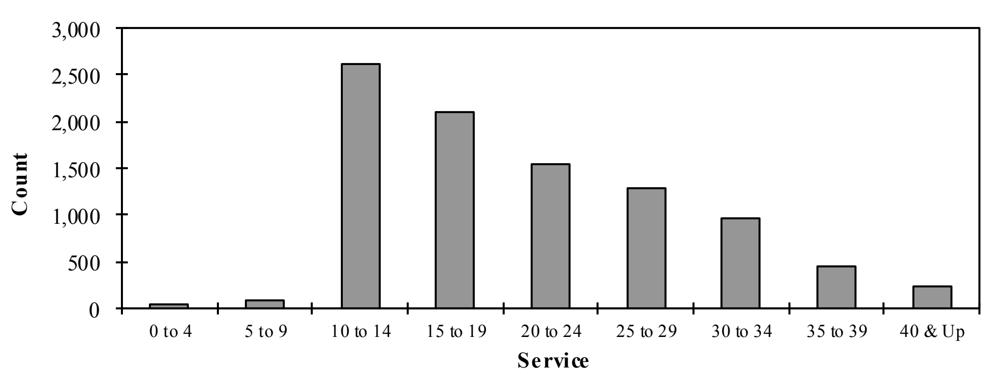
	Service									
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & Up	Total
Under 25	0	0	0	0	0	0	0	0	0	0
25 to 29	0	0	0	0	0	0	0	0	0	0
30 to 34	1	6	128	1	0	0	0	0	0	136
35 to 39	0	15	487	117	0	0	0	0	0	619
40 to 44	0	11	446	383	90	1	0	0	0	931
45 to 49	2	7	323	342	327	96	1	0	0	1,098
50 to 54	4	11	330	352	366	392	165	2	0	1,622
55 to 59	13	12	372	390	340	404	414	163	19	2,127
60 to 64	15	9	354	354	300	275	286	225	121	1,939
65 to 69	2	4	128	131	88	85	80	64	84	666
70 & Up	0	3	49	32	29	26	22	9	21	191
Total	37	78	2,617	2,102	1,540	1,279	968	463	245	9,329

* Closed effective July 1, 2009.

Age Distribution



Service Distribution



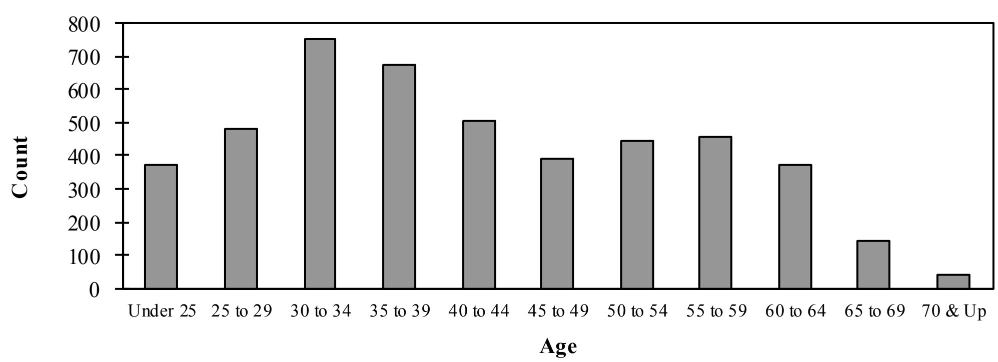
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF ACTIVE MEMBERS
as of December 31, 2019

STATE - KPERS 2*

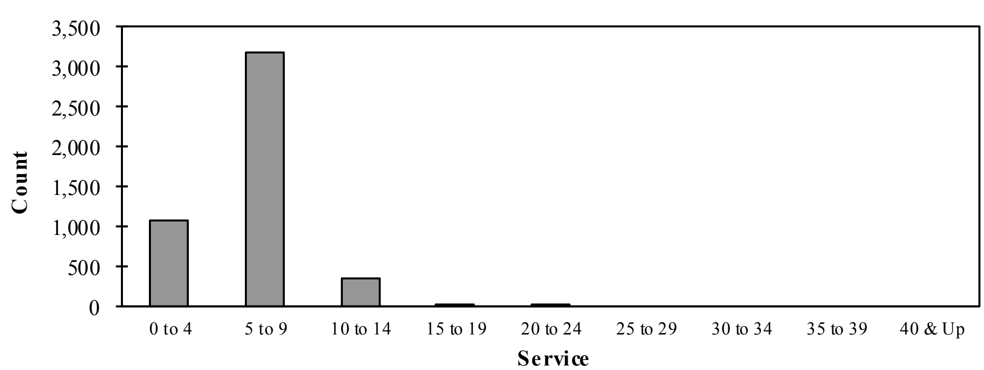
	Service									
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & Up	Total
Under 25	366	5	0	0	0	0	0	0	0	371
25 to 29	249	231	2	0	0	0	0	0	0	482
30 to 34	165	557	33	0	0	0	0	0	0	755
35 to 39	84	525	63	0	0	0	0	0	0	672
40 to 44	61	386	55	3	0	0	0	0	0	505
45 to 49	52	287	47	4	0	0	0	0	0	390
50 to 54	43	357	37	6	1	0	0	0	0	444
55 to 59	35	381	36	5	1	0	0	0	0	458
60 to 64	24	303	41	5	0	0	0	0	0	373
65 to 69	3	117	25	1	0	0	0	0	0	146
70 & Up	1	37	6	0	0	0	0	0	0	44
Total	1,083	3,186	345	24	2	0	0	0	0	4,640

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

Age Distribution



Service Distribution



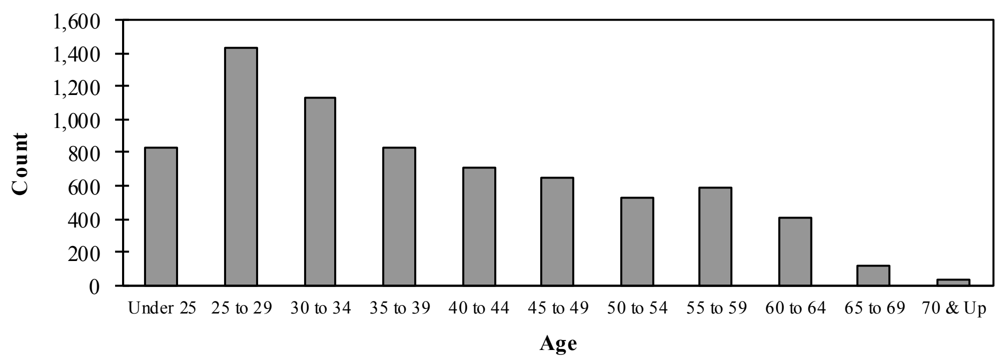
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF ACTIVE MEMBERS
as of December 31, 2019

STATE - KPERS 3*

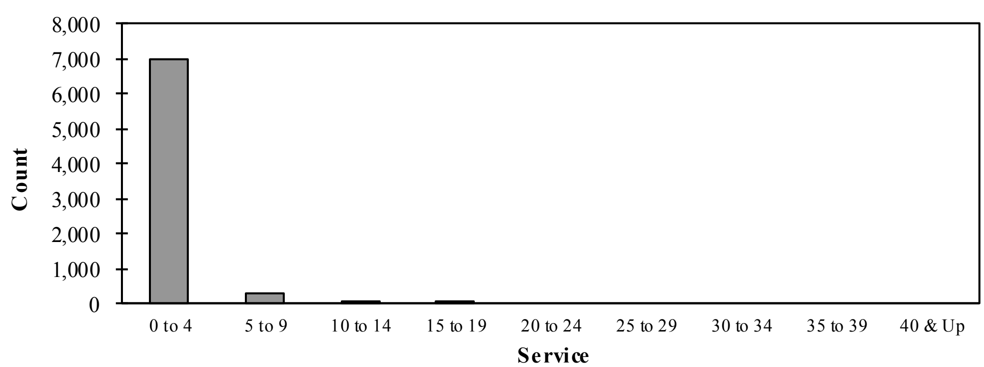
	Service									
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & Up	Total
Under 25	834	1	0	0	0	0	0	0	0	835
25 to 29	1,395	39	0	0	0	0	0	0	0	1,434
30 to 34	1,070	58	0	0	0	0	0	0	0	1,128
35 to 39	795	30	1	0	0	0	0	0	0	826
40 to 44	683	26	1	0	0	0	0	0	0	710
45 to 49	622	25	0	0	0	0	0	0	0	647
50 to 54	502	32	0	0	0	0	0	0	0	534
55 to 59	560	28	2	1	0	0	0	0	0	591
60 to 64	382	24	0	0	0	0	0	0	0	406
65 to 69	117	7	0	0	0	0	0	0	0	124
70 & Up	32	3	0	0	0	0	0	0	0	35
Total	6,992	273	4	1	0	0	0	0	0	7,270

* Effective date of KPERS 3 was January 1, 2015

Age Distribution



Service Distribution



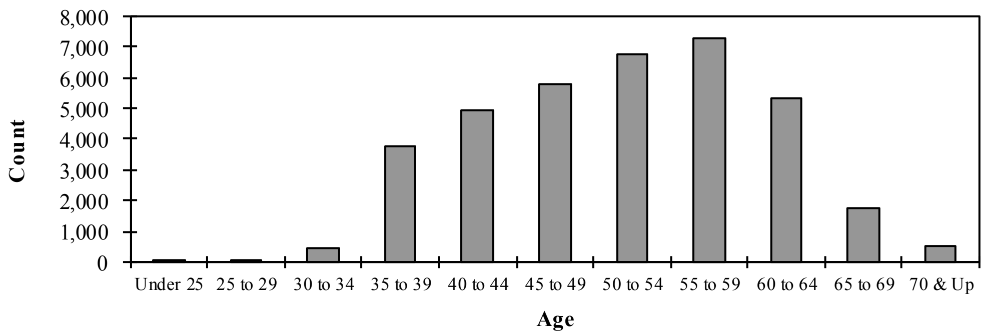
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF ACTIVE MEMBERS
as of December 31, 2019

SCHOOL - KPERS 1*

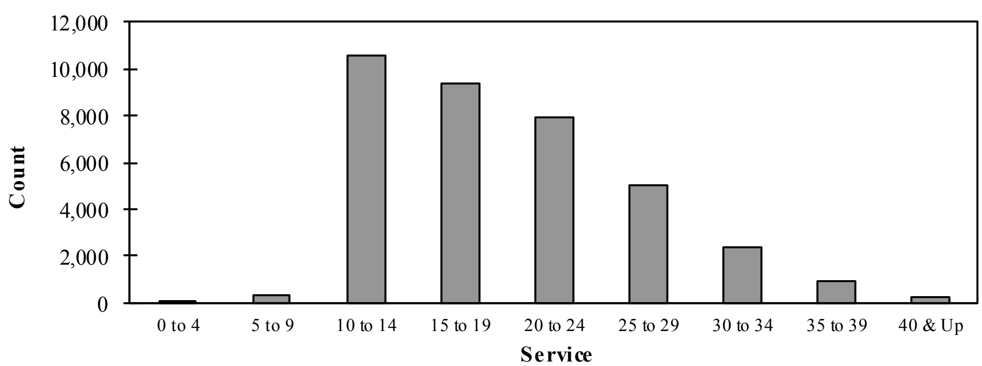
	Service									
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & Up	Total
Under 25	2	0	0	0	0	0	0	0	0	2
25 to 29	3	0	2	0	0	0	0	0	0	5
30 to 34	1	23	452	3	0	0	0	0	0	479
35 to 39	2	104	2,899	775	3	0	0	0	0	3,783
40 to 44	0	83	1,548	2,718	625	1	0	0	0	4,975
45 to 49	0	46	1,383	1,407	2,446	482	3	0	0	5,767
50 to 54	8	34	1,418	1,361	1,523	2,038	418	0	0	6,800
55 to 59	6	44	1,349	1,537	1,588	1,253	1,252	276	4	7,309
60 to 64	1	29	972	1,052	1,292	850	490	504	123	5,313
65 to 69	1	3	344	389	345	292	172	86	107	1,739
70 & Up	0	1	169	104	84	76	41	28	30	533
Total	24	367	10,536	9,346	7,906	4,992	2,376	894	264	36,705

* Closed effective July 1, 2009.

Age Distribution



Service Distribution



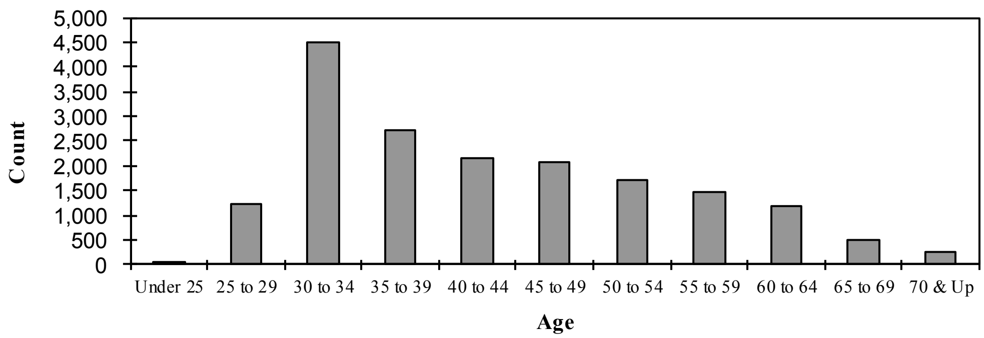
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF ACTIVE MEMBERS
as of December 31, 2019

SCHOOL - KPERS 2*

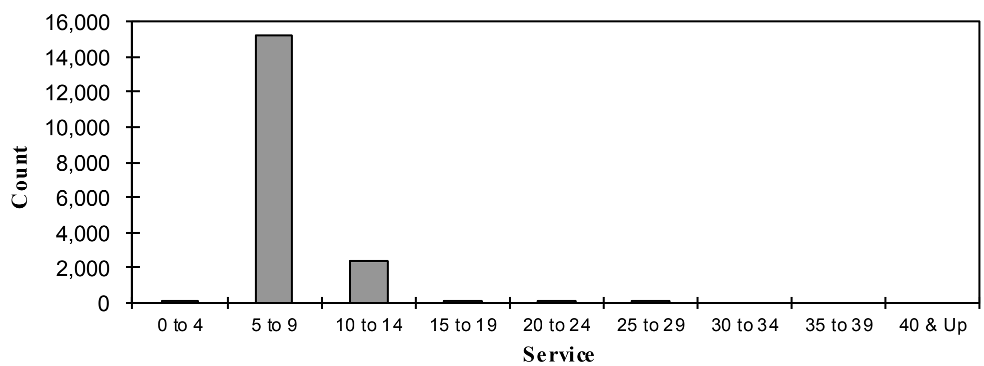
	Service									
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & Up	Total
Under 25	4	18	0	0	0	0	0	0	0	22
25 to 29	16	1,209	5	0	0	0	0	0	0	1,230
30 to 34	20	4,044	437	0	0	0	0	0	0	4,501
35 to 39	8	2,128	558	6	0	0	0	0	0	2,700
40 to 44	8	1,767	327	39	0	0	0	0	0	2,141
45 to 49	9	1,743	292	36	1	0	0	0	0	2,081
50 to 54	6	1,430	258	23	0	1	0	0	0	1,718
55 to 59	9	1,223	217	20	2	0	0	0	0	1,471
60 to 64	1	1,004	160	17	2	1	0	0	0	1,185
65 to 69	4	436	70	4	0	0	0	0	0	514
70 & Up	2	223	20	1	0	0	0	0	0	246
Total	87	15,225	2,344	146	5	2	0	0	0	17,809

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

Age Distribution



Service Distribution

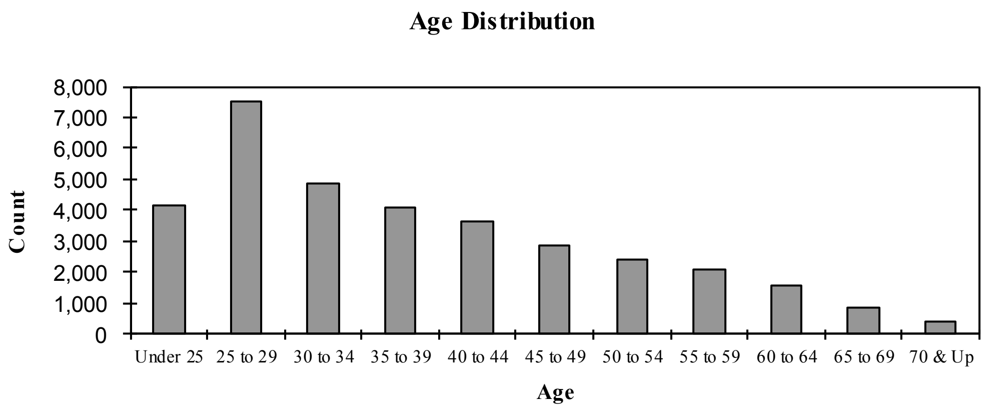


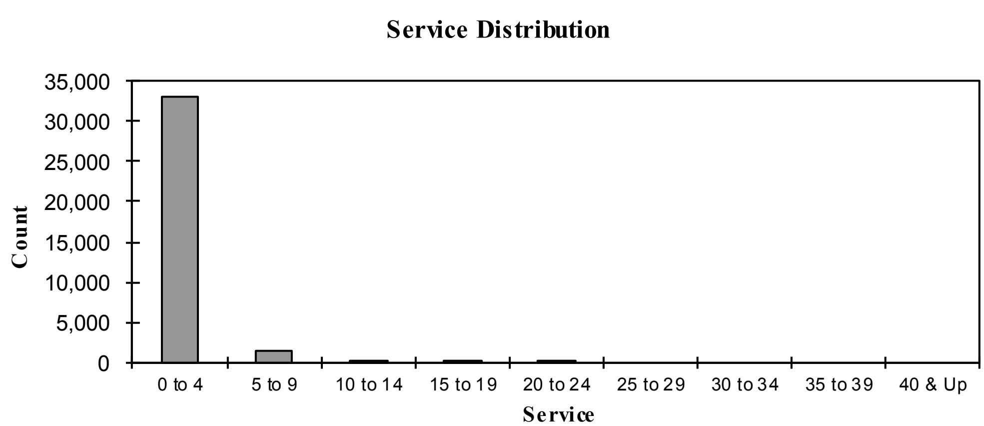
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF ACTIVE MEMBERS
as of December 31, 2019

SCHOOL - KPERS 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	4,128	6	0	0	0	0	0	0	0	4,134
25 to 29	7,296	211	0	0	0	0	0	0	0	7,507
30 to 34	4,453	387	0	0	0	0	0	0	0	4,840
35 to 39	3,891	220	0	0	0	0	0	0	0	4,111
40 to 44	3,442	173	0	0	0	0	0	0	0	3,615
45 to 49	2,701	163	4	0	0	0	0	0	0	2,868
50 to 54	2,268	122	2	0	1	0	0	0	0	2,393
55 to 59	1,999	109	3	1	1	0	0	0	0	2,113
60 to 64	1,530	58	3	0	0	0	0	0	0	1,591
65 to 69	804	35	2	0	1	0	0	0	0	842
70 & Up	407	17	1	0	0	0	0	0	0	425
Total	32,919	1,501	15	1	3	0	0	0	0	34,439

* Effective date of KPERS 3 was January 1, 2015





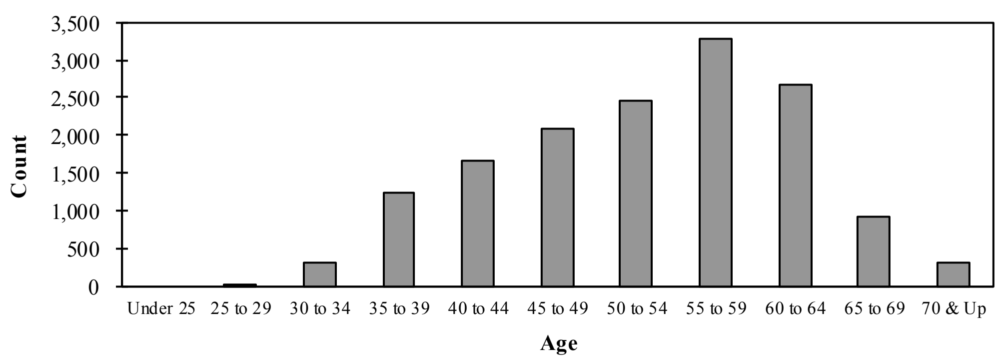
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF ACTIVE MEMBERS
as of December 31, 2019

LOCAL - KPERS 1*

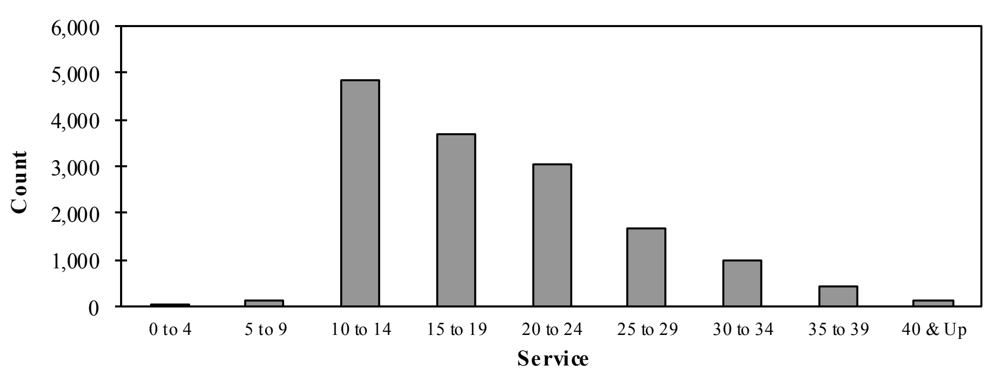
	Service									
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & Up	Total
Under 25	0	0	0	0	0	0	0	0	0	0
25 to 29	0	3	3	0	0	0	0	0	0	6
30 to 34	1	16	281	2	0	0	0	0	0	300
35 to 39	2	34	952	249	5	0	0	0	0	1,242
40 to 44	2	24	741	679	217	1	0	0	0	1,664
45 to 49	5	14	666	624	636	145	5	0	0	2,095
50 to 54	1	15	622	588	642	435	159	4	0	2,466
55 to 59	1	17	684	688	763	539	401	169	8	3,270
60 to 64	0	18	532	581	538	432	301	207	71	2,680
65 to 69	0	2	256	196	189	111	81	55	35	925
70 & Up	0	2	104	71	42	33	25	16	20	313
Total	12	145	4,841	3,678	3,032	1,696	972	451	134	14,961

* Closed effective July 1, 2009.

Age Distribution



Service Distribution

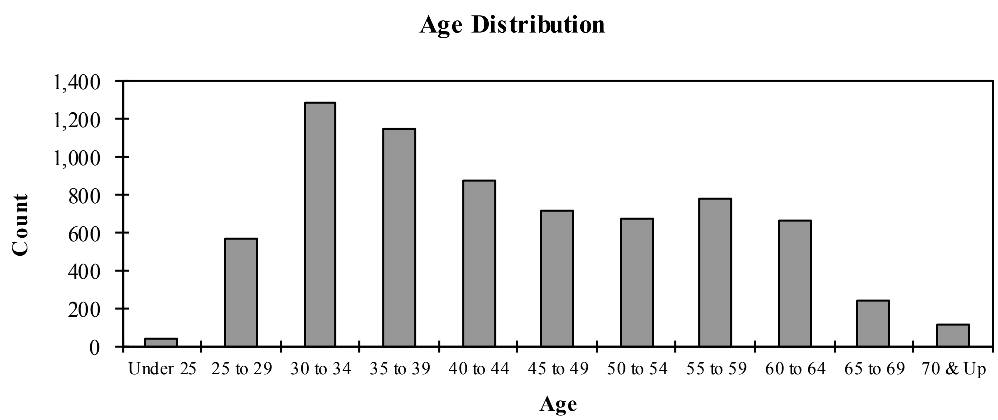


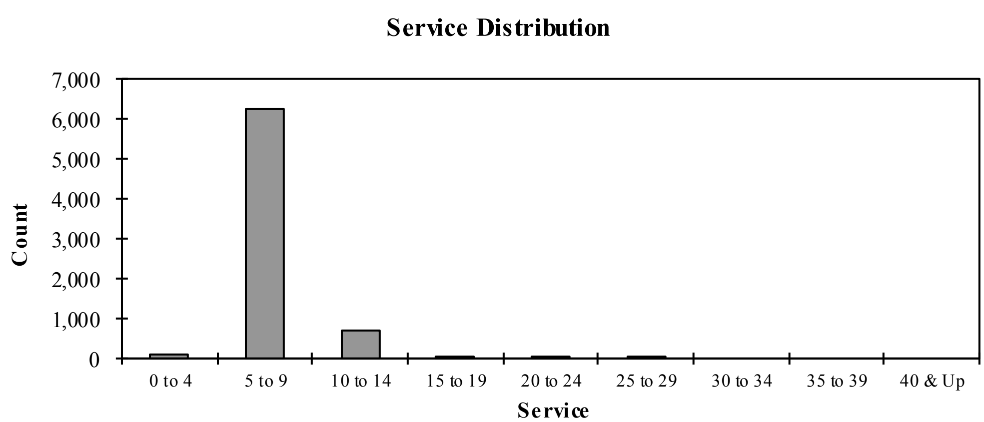
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF ACTIVE MEMBERS
as of December 31, 2019

LOCAL - KPERS 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	27	13	0	0	0	0	0	0	0	40
25 to 29	25	536	5	0	0	0	0	0	0	566
30 to 34	22	1,175	88	0	0	0	0	0	0	1,285
35 to 39	10	1,007	125	1	1	0	0	0	0	1,144
40 to 44	8	755	103	5	0	0	0	0	0	871
45 to 49	10	612	87	1	1	0	0	0	0	711
50 to 54	2	597	67	9	2	0	0	0	0	677
55 to 59	3	687	87	5	1	0	0	0	0	783
60 to 64	1	573	83	3	1	1	0	0	0	662
65 to 69	6	206	30	2	0	0	0	0	0	244
70 & Up	0	95	14	1	0	0	0	0	0	110
Total	114	6,256	689	27	6	1	0	0	0	7,093

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



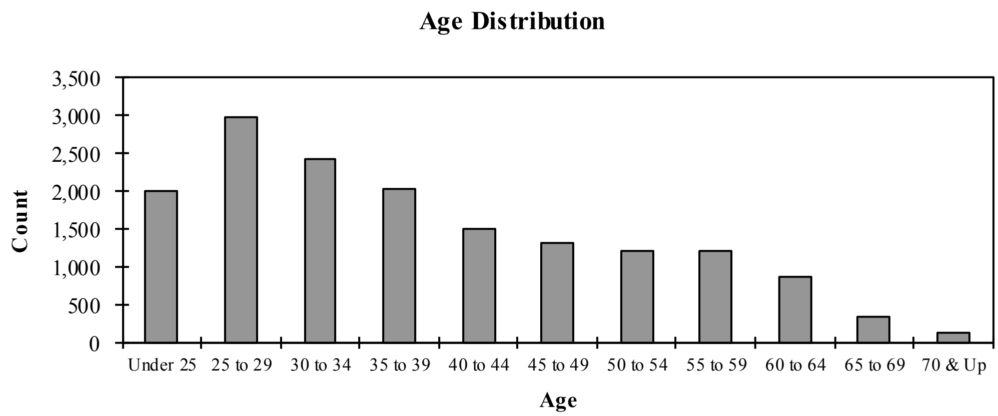


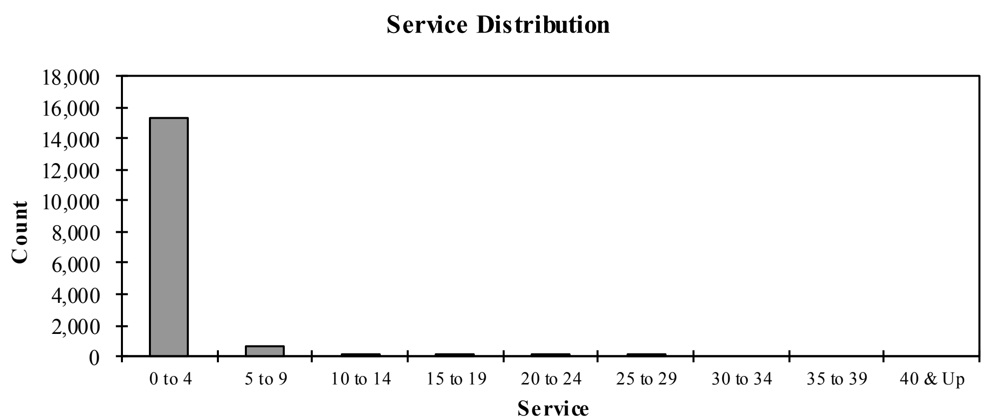
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF ACTIVE MEMBERS
as of December 31, 2019

LOCAL - KPERS 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	2,008	4	0	0	0	0	0	0	0	2,012
25 to 29	2,880	91	0	0	0	0	0	0	0	2,971
30 to 34	2,277	146	0	0	0	0	0	0	0	2,423
35 to 39	1,922	94	0	0	0	0	0	0	0	2,016
40 to 44	1,436	68	0	0	0	0	0	0	0	1,504
45 to 49	1,250	55	0	0	0	0	0	0	0	1,305
50 to 54	1,129	65	1	1	0	0	0	0	0	1,196
55 to 59	1,121	77	0	0	0	1	0	0	0	1,199
60 to 64	800	55	2	0	0	0	0	0	0	857
65 to 69	301	27	1	0	1	0	0	0	0	330
70 & Up	130	10	0	0	0	0	0	0	0	140
Total	15,254	692	4	1	1	1	0	0	0	15,953

* Effective date of KPERS 3 was January 1, 2015





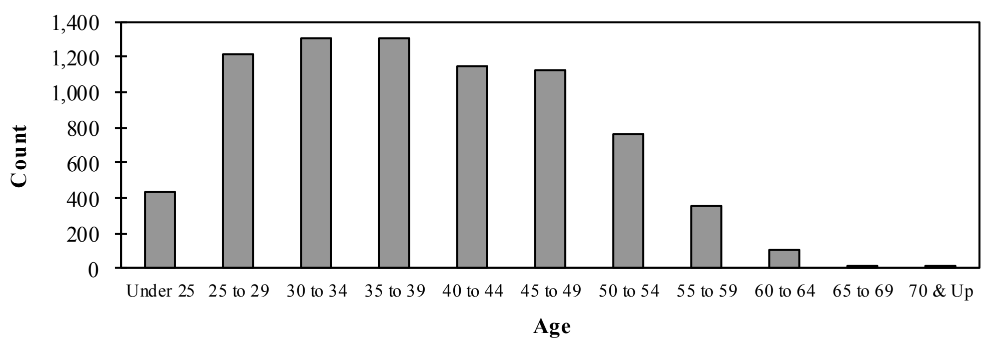
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF ACTIVE MEMBERS*
as of December 31, 2019

KP&F

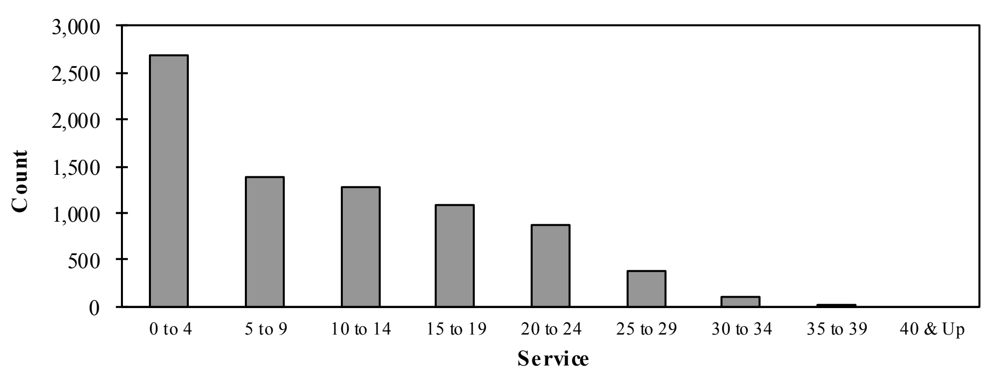
	Service									
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & Up	Total
Under 25	437	0	0	0	0	0	0	0	0	437
25 to 29	1,011	201	0	0	0	0	0	0	0	1,212
30 to 34	574	555	175	0	0	0	0	0	0	1,304
35 to 39	302	341	507	157	2	0	0	0	0	1,309
40 to 44	149	135	282	456	120	3	0	0	0	1,145
45 to 49	88	72	148	272	444	100	0	0	0	1,124
50 to 54	70	44	86	130	226	176	41	0	0	773
55 to 59	33	17	51	58	62	83	55	6	0	365
60 to 64	14	16	18	16	15	18	15	2	0	114
65 to 69	2	0	3	3	1	1	1	2	0	13
70 & Up	0	0	0	1	0	0	0	0	0	1
Total	2,680	1,381	1,270	1,093	870	381	112	10	0	7,797

* Includes 25 KP&F members currently participating in DROP.

Age Distribution



Service Distribution

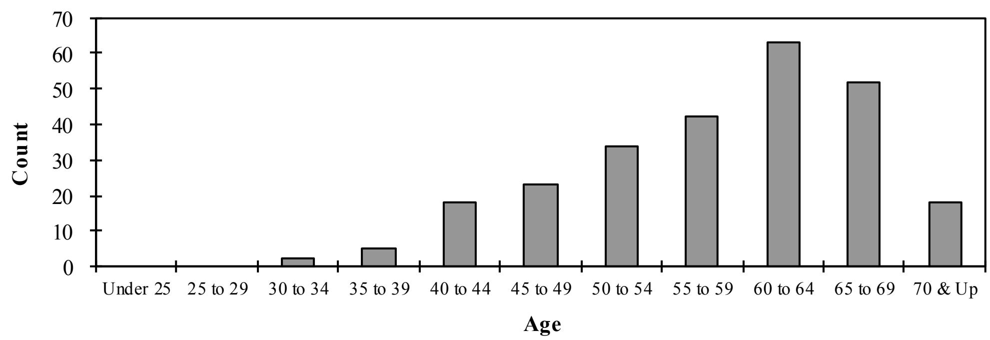


KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF ACTIVE MEMBERS
as of December 31, 2019

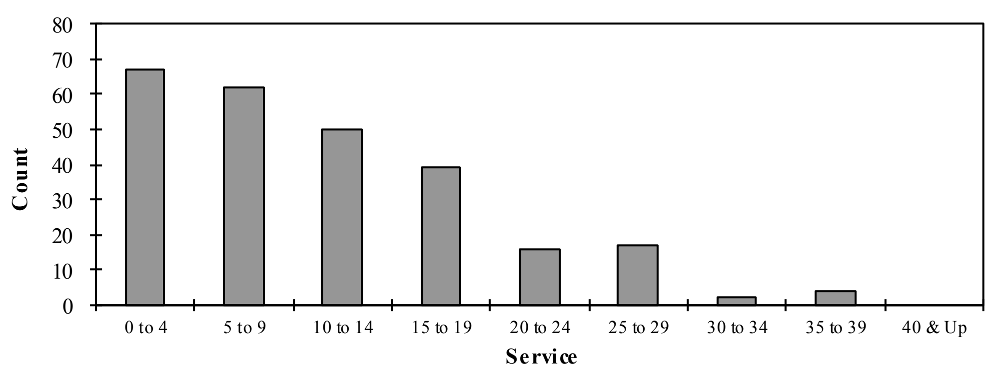
JUDGES

	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	1	1	0	0	0	0	0	0	0	2
35 to 39	4	1	0	0	0	0	0	0	0	5
40 to 44	10	8	0	0	0	0	0	0	0	18
45 to 49	13	8	1	0	1	0	0	0	0	23
50 to 54	12	10	7	4	1	0	0	0	0	34
55 to 59	10	10	15	7	0	0	0	0	0	42
60 to 64	11	13	12	14	7	5	1	0	0	63
65 to 69	5	9	11	12	6	6	1	2	0	52
70 & Up	1	2	4	2	1	6	0	2	0	18
Total	67	62	50	39	16	17	2	4	0	257

Age Distribution



Service Distribution



KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF RETIREES AND BENEFICIARIES
as of December 31, 2019

STATE

Retirees

Count:	18,845	Average age:	72.6	Average benefit:	$15,294

Beneficiaries

Count:	1,999	Average age:	76.8	Average benefit:	$9,551

KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF RETIREES AND BENEFICIARIES
as of December 31, 2019

SCHOOL

Retirees

Count: 53,557 Average age: 72.6 Average benefit: $16,235

Beneficiaries

Count: 3,059 Average age: 76.9 Average benefit: $9,702

KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF RETIREES AND BENEFICIARIES
as of December 31, 2019

LOCAL

Retirees

Count:	19,957	Average age:	72.2	Average benefit:	$13,485

Beneficiaries

Count:	2,142	Average age:	75.6	Average benefit:	$7,992

KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF RETIREES AND BENEFICIARIES
as of December 31, 2019

TOTAL KPERS

Retirees

Count: 92,359 Average age: 72.5 Average benefit: $15,449

Beneficiaries

Count: 7,200 Average age: 76.5 Average benefit: $9,151

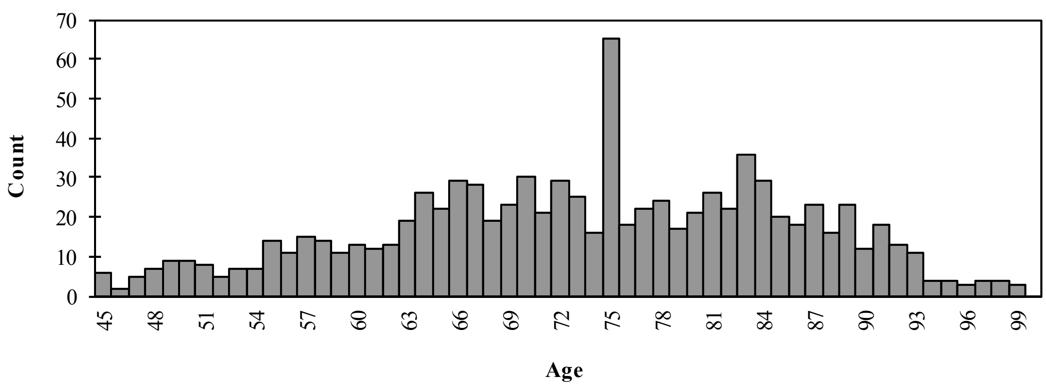
KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF RETIREES AND BENEFICIARIES
as of December 31, 2019

KP&F

Retirees

Count: 4,773 Average age: 65.4 Average benefit: $38,535

Beneficiaries

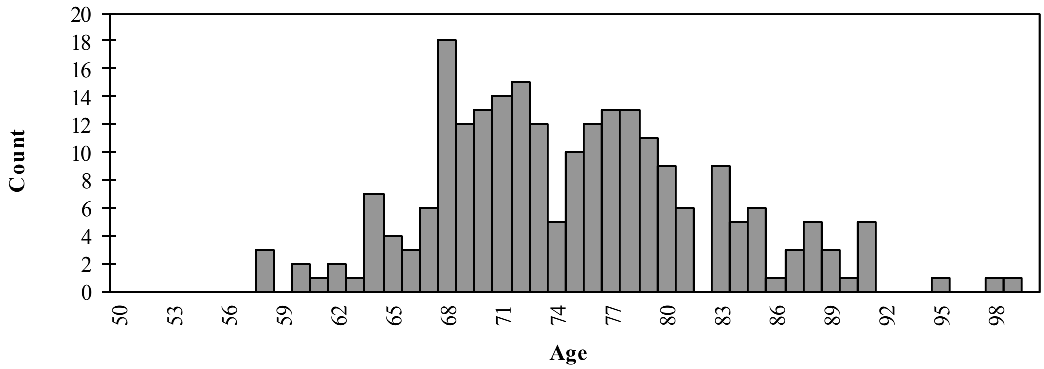


Count: 990 Average age: 69.4 Average benefit: $18,211

KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF RETIREES AND BENEFICIARIES
as of December 31, 2019

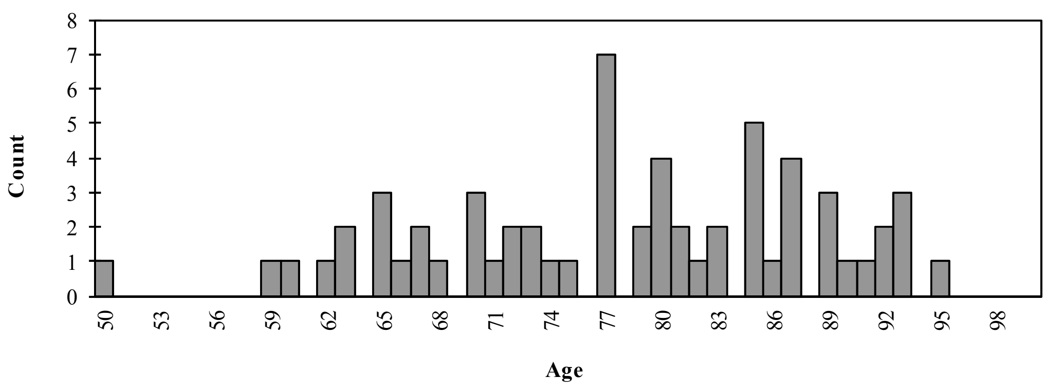
JUDGES

Retirees



Count:	233	Average age:	74.9	Average benefit:	$46,849

Beneficiaries



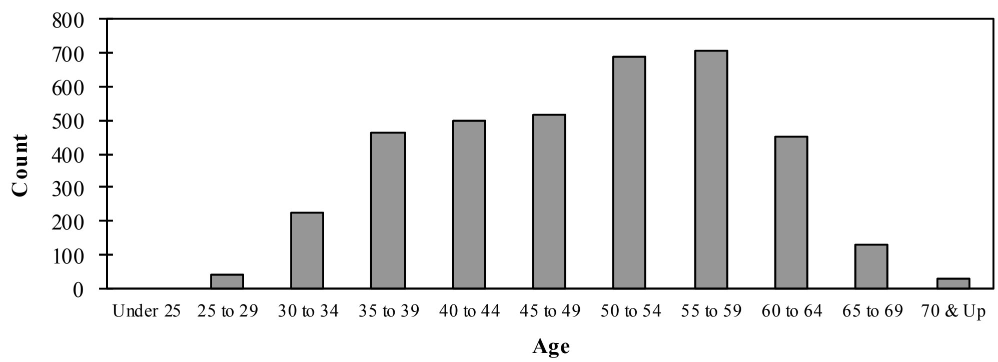
Count:	65	Average age:	77.0	Average benefit:	$29,105

KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF INACTIVE VESTED MEMBERS
as of December 31, 2019

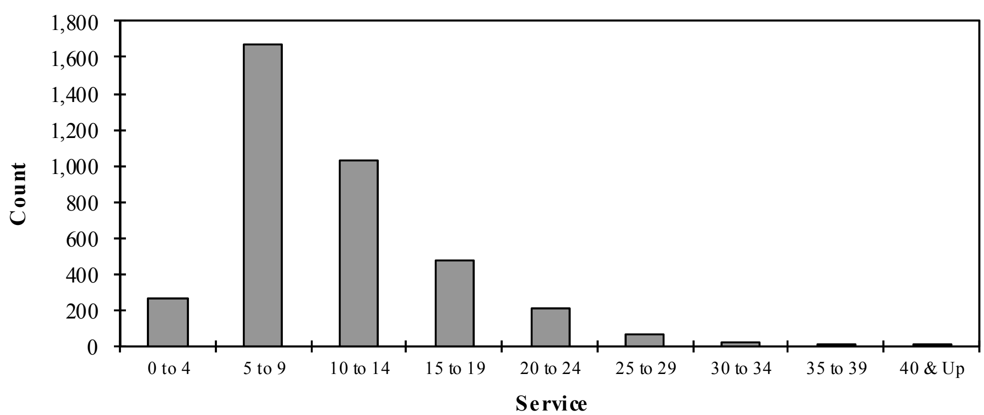
STATE

	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	0	0	0	0	0	0	0	0	0	0
25 to 29	9	33	0	0	0	0	0	0	0	42
30 to 34	44	172	9	0	0	0	0	0	0	225
35 to 39	54	323	79	5	0	0	0	0	0	461
40 to 44	35	289	144	30	1	0	0	0	0	499
45 to 49	32	203	159	90	28	2	0	0	0	514
50 to 54	16	219	237	125	70	17	4	0	0	688
55 to 59	23	195	230	140	80	31	6	1	0	706
60 to 64	8	202	135	65	25	11	4	0	1	451
65 to 69	29	36	28	20	8	5	3	1	0	130
70 & Up	15	3	5	2	2	1	0	0	0	28
Total	265	1,675	1,026	477	214	67	17	2	1	3,744

Age Distribution



Service Distribution

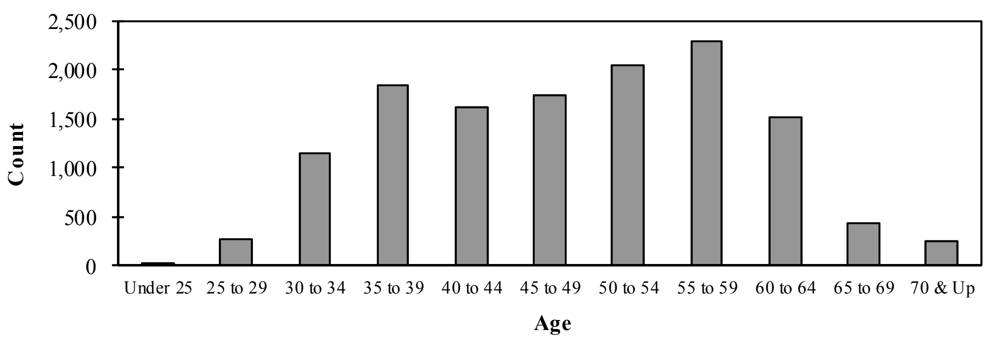


KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF INACTIVE VESTED MEMBERS
as of December 31, 2019

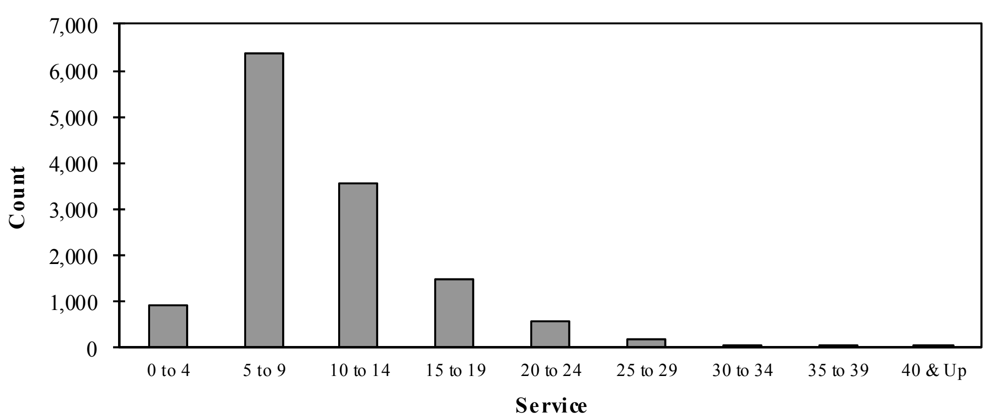
SCHOOL

	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	7	1	0	0	0	0	0	0	0	8
25 to 29	68	193	0	0	0	0	0	0	0	261
30 to 34	122	959	54	0	0	0	0	0	0	1,135
35 to 39	141	1,257	416	25	0	0	0	0	0	1,839
40 to 44	81	824	515	185	9	0	0	0	0	1,614
45 to 49	84	726	543	279	91	5	0	0	0	1,728
50 to 54	89	724	675	314	173	65	5	0	0	2,045
55 to 59	81	761	764	386	205	84	3	0	0	2,284
60 to 64	69	684	443	226	79	20	0	2	0	1,523
65 to 69	31	178	134	53	17	4	3	0	1	421
70 & Up	151	44	34	9	4	2	1	0	0	245
Total	924	6,351	3,578	1,477	578	180	12	2	1	13,103

Age Distribution



Service Distribution

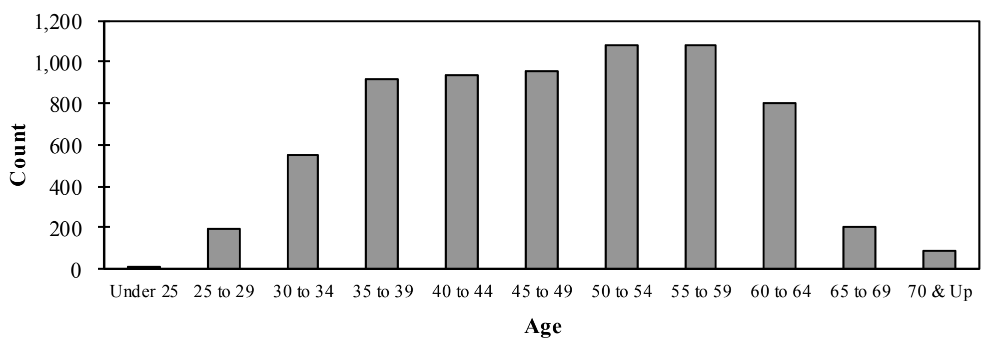


KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF INACTIVE VESTED MEMBERS
as of December 31, 2019

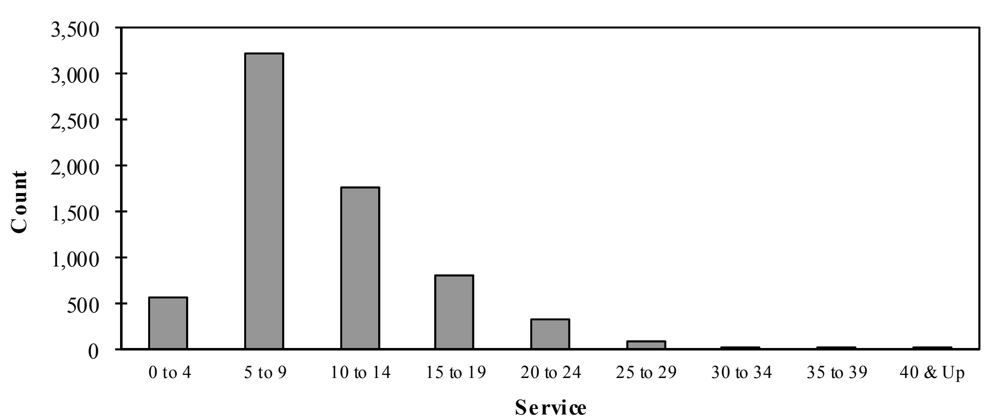
LOCAL

	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	3	2	0	0	0	0	0	0	0	5
25 to 29	68	128	0	0	0	0	0	0	0	196
30 to 34	101	416	35	0	0	0	0	0	0	552
35 to 39	98	635	170	10	0	0	0	0	0	913
40 to 44	64	483	275	99	11	0	0	0	0	932
45 to 49	39	384	300	171	55	6	0	0	0	955
50 to 54	37	349	362	197	95	36	2	0	0	1,078
55 to 59	52	346	328	199	114	33	9	1	0	1,082
60 to 64	39	370	229	96	45	15	5	1	1	801
65 to 69	23	80	55	27	8	10	1	0	0	204
70 & Up	42	24	10	6	4	1	1	0	0	88
Total	566	3,217	1,764	805	332	101	18	2	1	6,806

Age Distribution



Service Distribution

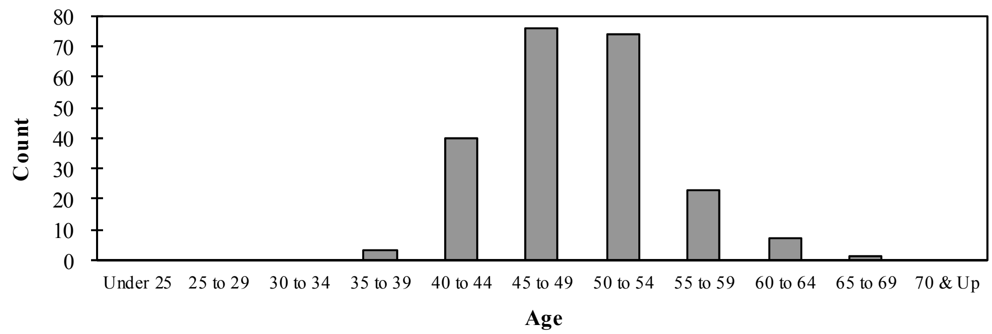


KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF INACTIVE VESTED MEMBERS
as of December 31, 2019

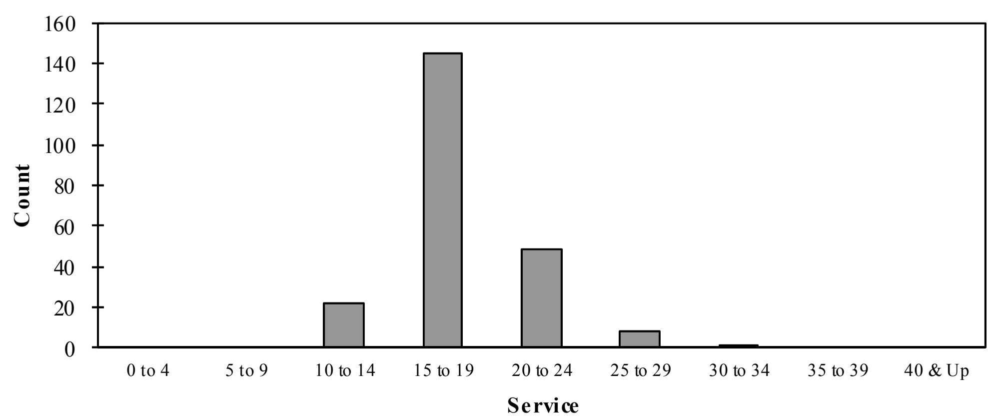
KP&F

	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	2	1	0	0	0	0	0	3
40 to 44	0	0	3	35	2	0	0	0	0	40
45 to 49	0	0	6	45	20	5	0	0	0	76
50 to 54	0	0	10	40	21	3	0	0	0	74
55 to 59	0	0	0	20	2	0	1	0	0	23
60 to 64	0	0	1	4	2	0	0	0	0	7
65 to 69	0	0	0	0	1	0	0	0	0	1
70 & Up	0	0	0	0	0	0	0	0	0	0
Total	0	0	22	145	48	8	1	0	0	224

Age Distribution



Service Distribution

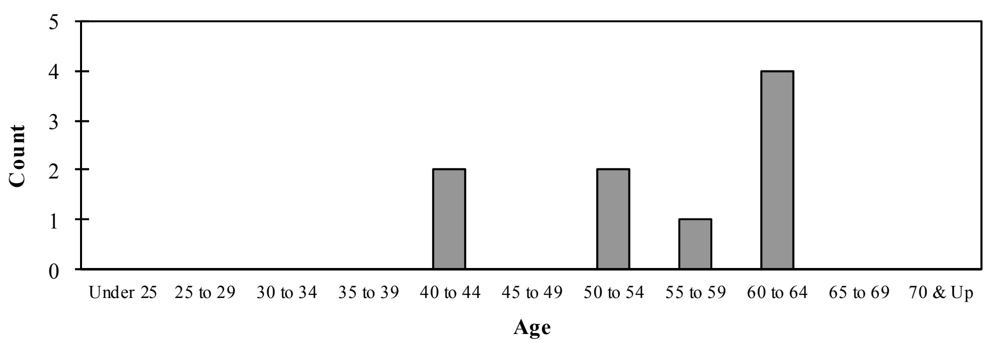


KANSAS PUBLIC EMPLOYEES RETIREMENT SYSTEM
DISTRIBUTION OF INACTIVE VESTED MEMBERS
as of December 31, 2019

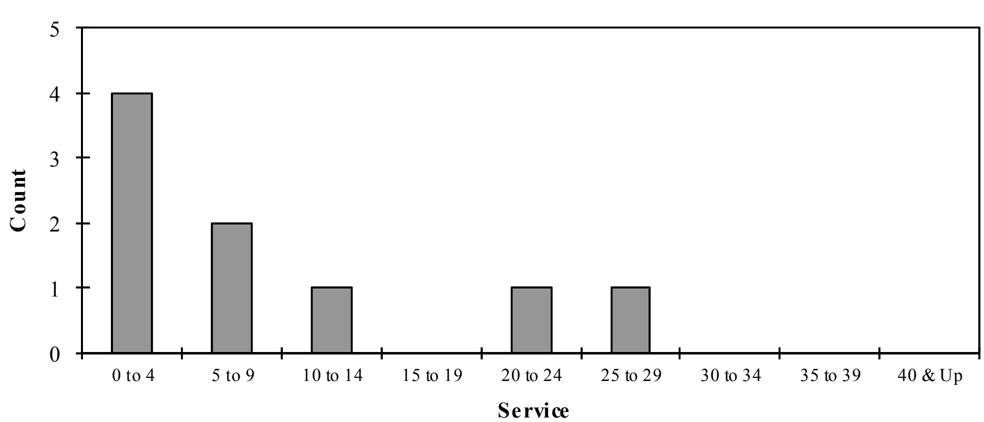
JUDGES

	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	1	1	0	0	0	0	0	0	0	2
45 to 49	0	0	0	0	0	0	0	0	0	0
50 to 54	2	0	0	0	0	0	0	0	0	2
55 to 59	1	0	0	0	0	0	0	0	0	1
60 to 64	0	1	1	0	1	1	0	0	0	4
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	2	1	0	1	1	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 *

* KPERS 2 refers to members who either began their participation or rehired on or after July 1, 2009, but before January 1, 2015. KPERS 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 KPERS 3.

This valuation reflects the benefit structure in place as of December 31, 2019.

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 –

KPERS 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.

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

Benefit –

KPERS 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, (KPERS 2), Final Average Salary equals the average of the five highest years of salary, excluding additional compensation.

KPERS 3: KPERS 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. The interest rate used to calculate the current annuity factors is 5.75% (7.75% assumed investment return, minus 2.00%), and the mortality table used is a set of blended mortality rates from the current post-retirement mortality assumptions for KPERS members. The blended mortality rates are projected to 2030 using improvement scale MP-2016. The weighting used to blend the mortality rates is shown in the following table:

	Members	Beneficiaries
State – Males	17.5%	42.5%
State – Females	42.5%	17.5%
School – Males	7.5%	8.5%
School – Females	8.5%	7.5%
Local – Males	12.5%	11.5%
Local– Females	11.5%	12.5%

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 6.0%. 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%	0.000%
2016	8.5%	4.3%	0.000%
2017	14.0%	7.4%	1.100%
2018	(2.9%)	4.7%	0.000%
2019	17.1%	7.1%	0.825%

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 –

KPERS 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.

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

KPERS 3: Not applicable for the Cash Balance Plan.

Early Retirement

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

Benefit –

KPERS 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.

KPERS 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).

KPERS 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 –

KPERS 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.

KPERS 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 –

KPERS 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.

KPERS 3: For any KPERS 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) –

KPERS 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.

KPERS 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 KPERS 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

KPERS 1: Prior to January 1, 2014, member contributions were 4% of compensation for KPERS 1. 2012 HB 2333 established an election by KPERS 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, KPERS 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.

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

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

Interest on Member Contributions

KPERS 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.

KPERS 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.

KPERS 3: Interest credited varies by years of service. Please refer to the KPERS 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.

KPERS 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.

KPERS 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)

KPERS 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 KPERS 2 members will not receive a COLA.

KPERS 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 0.008% 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)

Upon attaining normal retirement age, members of the Kansas Highway Patrol (KHP) and Kansas Bureau of Investigation (KBI) 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, equaling 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: 0.18% of covered payroll

Rate 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:	2.50%	School:	0.50%
Local:	2.00%	KPF:	7.50%
C55/C60:	2.50%		

Rates of Termination:

	School		State		Local	
Duration	Male	Female	Male	Female	Male	Female
0	20.75%	23.00%	21.00%	21.50%	23.00%	25.00%
1	17.25%	18.00%	18.00%	19.00%	19.00%	22.00%
2	13.75%	14.50%	15.25%	16.50%	16.50%	19.00%
3	10.75%	11.25%	13.50%	14.00%	13.50%	15.75%
4	8.75%	9.75%	12.00%	12.00%	11.75%	13.50%
5	7.50%	8.25%	10.75%	10.00%	10.00%	12.10%
6	6.75%	7.25%	9.50%	9.00%	9.00%	10.25%
7	6.00%	6.50%	8.50%	8.25%	8.00%	9.30%
8	5.25%	5.50%	7.50%	7.50%	7.00%	8.50%
9	5.00%	5.00%	6.50%	7.00%	6.30%	7.50%
10	4.60%	4.50%	5.50%	6.50%	5.60%	6.70%
11	4.30%	4.00%	5.00%	6.00%	5.20%	6.25%
12	4.00%	3.50%	4.50%	5.50%	4.90%	5.75%
13	3.75%	3.25%	4.25%	5.00%	4.60%	5.25%
14	3.50%	3.00%	4.00%	4.60%	4.00%	4.75%
15	3.25%	2.75%	3.80%	4.20%	3.80%	4.50%
16	3.00%	2.50%	3.60%	3.90%	3.60%	4.25%
17	2.75%	2.25%	3.40%	3.70%	3.40%	4.00%
18	2.50%	2.00%	3.20%	3.20%	3.20%	3.80%
19	2.25%	1.90%	3.00%	3.00%	3.00%	3.60%
20	2.00%	1.80%	2.80%	2.80%	2.80%	3.40%
21	1.75%	1.70%	2.60%	2.60%	2.60%	3.20%
22	1.50%	1.60%	2.40%	2.40%	2.40%	3.00%
23	1.25%	1.50%	2.20%	2.20%	2.20%	2.70%
24	1.00%	1.40%	2.00%	2.00%	2.00%	2.40%
25	1.00%	1.30%	1.80%	1.80%	1.80%	2.00%
26	1.00%	1.20%	1.60%	1.60%	1.60%	1.75%
27	1.00%	1.10%	1.40%	1.40%	1.40%	1.50%
28	1.00%	1.00%	1.20%	1.20%	1.20%	1.25%
29	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%
30	1.00%	1.00%	0.80%	0.80%	0.80%	0.80%
30+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Retirement Rates

School Members:

	Early Retirement			Normal Retirement			Rule of 85 (Tier 1 Only)	
Age	Tier 1	Tier 2	Tier 3	Tier 1	Tier 2	Tier 3	1St Year With 85 Points	After 1st Year With 85 Points
53							20.0%	
54							20.0%	15.0%
55	3.0%	3.0%	3.0%				20.0%	15.0%
56	3.0%	3.0%	3.0%				22.0%	15.0%
57	3.0%	3.0%	3.0%				24.0%	15.0%
58	3.0%	3.0%	3.0%				26.0%	15.0%
59	5.0%	5.0%	5.0%				28.0%	20.0%
60	10.0%	10.0%	5.0%		35.0%	20.0%	35.0%	22.0%
61	15.0%	15.0%	5.0%		22.0%	15.0%	25.0%	22.0%
62		25.0%	5.0%	25.0%	25.0%	15.0%		25.0%
63		22.0%	5.0%	22.0%	22.0%	15.0%		22.0%
64		22.0%	5.0%	22.0%	22.0%	15.0%		22.0%
65				35.0%	35.0%	30.0%		35.0%
66				35.0%	35.0%	30.0%		35.0%
67-74				30.0%	30.0%	35.0%		30.0%
75				100.0%	100.0%	100.0%		100.0%

State Members:

	Early Retirement			Normal Retirement			Rule of 85 (Tier 1 Only)	
Age	Tier 1	Tier 2	Tier 3	Tier 1	Tier 2	Tier 3	1St Year With 85 Points	After 1st Year With 85 Points
53							18.0%	
54							18.0%	10.0%
55	4.0%	4.0%	3.0%				18.0%	10.0%
56	4.0%	4.0%	3.0%				18.0%	10.0%
57	4.0%	4.0%	3.0%				18.0%	10.0%
58	5.0%	5.0%	3.0%				18.0%	10.0%
59	5.0%	5.0%	5.0%				18.0%	10.0%
60	5.0%	5.0%	5.0%		18.0%	15.0%	18.0%	10.0%
61	10.0%	10.0%	5.0%		18.0%	10.0%	18.0%	15.0%
62		15.0%	5.0%	18.0%	18.0%	10.0%		18.0%
63		15.0%	5.0%	18.0%	18.0%	10.0%		18.0%
64		15.0%	5.0%	18.0%	18.0%	10.0%		18.0%
65				30.0%	30.0%	25.0%		30.0%
66				30.0%	30.0%	25.0%		30.0%
67-72				27.0%	27.0%	25.0%		27.0%
73				20.0%	20.0%	25.0%		20.0%
74				20.0%	20.0%	25.0%		20.0%
75				100.0%	100.0%	100.0%		100.0%

Local Members:

	Early Retirement			Normal Retirement			Rule of 85 (Tier 1 Only)	
Age	Tier 1	Tier 2	Tier 3	Tier 1	Tier 2	Tier 3	1St Year With 85 Points	After 1st Year With 85 Points
53							15.0%	
54							15.0%	8.0%
55	3.0%	3.0%	3.0%				15.0%	8.0%
56	3.0%	3.0%	3.0%				15.0%	8.0%
57	3.0%	3.0%	3.0%				15.0%	8.0%
58	3.0%	3.0%	3.0%				15.0%	10.0%
59	6.0%	6.0%	5.0%				15.0%	10.0%
60	6.0%	6.0%	5.0%		15.0%	15.0%	15.0%	10.0%
61	10.0%	10.0%	5.0%		20.0%	10.0%	25.0%	20.0%
62		20.0%	5.0%	20.0%	20.0%	10.0%		20.0%
63		20.0%	5.0%	20.0%	20.0%	10.0%		20.0%
64		20.0%	5.0%	20.0%	20.0%	10.0%		20.0%
65				30.0%	30.0%	25.0%		30.0%
66				30.0%	30.0%	25.0%		30.0%
67-70				30.0%	30.0%	30.0%		30.0%
71-74				22.0%	22.0%	30.0%		22.0%
75				100.0%	100.0%	100.0%		100.0%

Inactive vested members: Earliest unreduced retirement age.

Correctional employees with an age 55 normal retirement date:

Age	Rate
55-59	10%
60	15%
61-63	20%
64	35%
65	100%

Correctional employees with an age 60 normal retirement date:

Age	Rate
60	20%
61	20%
62	35%
63	20%
64	20%
65	45%
66	45%
67	45%
68	100%

TIAA employees: Age 66

Rates of Disability:

Age	School	State	Local
25	0.017%	0.015%	0.015%
30	0.019%	0.043%	0.033%
35	0.023%	0.067%	0.049%
40	0.039%	0.130%	0.072%
45	0.075%	0.195%	0.126%
50	0.123%	0.260%	0.182%
55	0.166%	0.325%	0.217%
60	0.238%	0.358%	0.266%

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

Probability of Vested Members Leaving Contributions with System:

KPERS 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%

KPERS 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).

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

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

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

PLSO Factors: Interest Rate: 7.75%
Mortality: SOA 1983 Group Annuity Mortality Table, blended 50% male and 50% female.

KPF

Rate of Investment Return: 7.75%

Price Inflation: 2.75%

Payroll Growth: 3.00%

Administrative Expenses: 0.18% 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		Normal Retirement	
Age	Rate	Age	Rate
50	5%	55	35%
51	7%	56	30%
52	7%	57	30%
53	15%	58	35%
54	30%	59	30%
		60	30%
		61	35%
		62	100%

Tier 2

Early Retirement		Normal Retirement	
Age	Rate	Age	Rate
50	10%	50	30%
51	10%	51	25%
52	10%	52	25%
53	10%	53	25%
54	20%	54	25%
		55	25%
		56	25%
		57	25%
		58	20%
		59	30%
		60	25%
		61	25%
		62	30%
		63	30%
		64	30%
		65	100%

Inactive Vested Earliest unreduced retirement age

Rates of Disability:

Age	Rate*
22	0.04%
27	0.07%
32	0.15%
37	0.35%
42	0.56%
47	0.76%
52	0.96%
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 and Kansas Bureau of Investigation members are assumed to enter DROP for the maximum DROP period. It is assumed that no members enter DROP with less than 25 years of service.
Interest Credited on DROP Accounts:	3.00%, compounded annually.

Judges

Rate of Investment Return:	7.75%
Price Inflation:	2.75%
Administrative Expenses:	0.18% of covered payroll
Rates of Mortality:	Mortality rates are projected into the future used 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
Disabled Life Mortality:	RP-2014 Disabled Retiree Table, set back two years
Rates of Salary Increase:	4.00%
Rates of Termination:	None assumed
Rates of Disability:	None assumed

Retirement Rates:

Age	Rate
62	15%
63-64	10%
65-66	33%
67-69	15%
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.

KPERS 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 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 (13 years in the December 31, 2019 valuation). The change in the unfunded actuarial liability, resulting from the assumption changes reflected in the 2016 and 2019 valuations, was amortized over a closed 25-year period. Changes in the unfunded actuarial liability that result from actuarial experience each year (gains and losses) are amortized over a closed 20-year period that begins with the fiscal year in which the contribution rates will apply.

The unfunded actuarial liability 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 net rate of return) on the market value of assets is calculated each year and recognized equally over a five-year period.

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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.