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The Public School Retirement System of The School District of Kansas City, Missouri

Actuarial Valuation Report
as of January 1, 2019

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May 30, 2019

Board of Trustees
Public School Retirement System of the
School District of Kansas City, Missouri
3100 Broadway, Suite 1211
Kansas City, MO 64111

Dear Members of the Board:

In accordance with your request, we have completed the annual actuarial valuation of the Public School Retirement System of the School District of Kansas City, Missouri as of January 1, 2019. The major findings of the valuation are contained in this report, including the actuarial required contribution rate for the 2019 plan year. The 2018, the Missouri General Assembly passed legislation that changed the contribution policy for funding the System. The employer contribution rate increased to 10.50%, effective January 1, 2019, and will increase again January 1, 2020 to 12.00%. Effective July 1, 2021, the employer contribution rate will be set based on the actuarial contribution rate. There were no changes to the actuarial assumptions or actuarial methods since the prior valuation.

In preparing this 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, plan provisions, member data, and financial information. We found this information to be reasonably consistent and comparable with information for the last valuation. The valuation results depend on the integrity of the data provided. If any of this information is inaccurate or incomplete, our valuation results may be different and our calculations may need to be revised.

We further certify that all costs, liabilities, and other factors for the System have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of the System and reasonable expectations); and which, in combination, offer our best estimate of anticipated experience affecting the System. Nevertheless, the emerging costs will vary from those presented in this report to the extent actual experience differs from that projected by the actuarial assumptions. The Board of Trustees has the final decision regarding the selection of assumptions and adopted the set indicated in Appendix C of this report. In our opinion, the set of assumptions and methods used for funding purposes in this report meet the parameters set by applicable Actuarial Standards of Practice.

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; 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); and changes in plan provisions or applicable law. Due to the limited scope of our assignment, we did not perform an analysis of the potential range of future measurements.

Actuarial computations presented in this report are for purposes of determining the actuarial contribution rates for funding the System. The calculations in the enclosed report have been made on a basis consistent with our understanding of the System's funding requirements and goals. Determinations for purposes other than meeting these requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes. For example, actuarial computations for purposes of fulfilling financial accounting requirements for the System under Governmental Accounting Standards No. 67 and No. 68 are provided in separate reports.

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

This is to certify that the independent consulting actuaries are members of the American Academy of Actuaries and have experience in performing valuations for public retirement plans, that the valuation was prepared in accordance with standards of practice prescribed by the Actuarial Standards Board, and that the actuarial calculations were performed by qualified actuaries in accordance with accepted actuarial procedures, based on the current provisions of the retirement plan and on actuarial assumptions that are internally consistent and reasonably based on the actual experience of the System. The Board of Trustees has the final decision regarding the appropriateness of the assumptions and adopted them as indicated in Appendix C.

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

Sincerely,

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

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

SECTION I: EXECUTIVE SUMMARY

This report presents the results of the January 1, 2019 actuarial valuation of the Public School Retirement System of the School District of Kansas City, Missouri (System). The primary purposes of performing a valuation are to:

- estimate the liabilities for future benefits expected to be paid by the System;
- determine the actuarial contribution rate based on the Board's funding policy and evaluate the sufficiency of the current contribution rates;
- disclose certain asset and liability measurements as of the valuation date;
- assess and disclose the key risks associated with funding the System;
- monitor any deviation between actual plan experience and experience anticipated by the actuarial assumptions; and
- analyze and report on any significant trends in assets, liabilities, and contributions over the past several years.

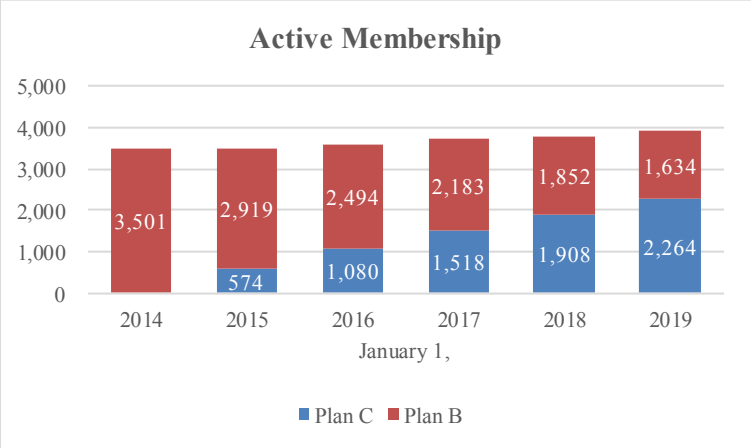
The 2018, the Missouri General Assembly passed legislation that increased the employer contribution rate from 9.0% to 10.5% of pay, effective January 1, 2019, and to 12.00% of pay, effective January 1, 2020. Beginning July 1, 2021, the employer contribution rate will be the greater of (1) the actuarial required contribution rate, as determined in the valuation prepared for the prior calendar year, less the member contribution rate, or (2) 12.00% of pay, until the System is fully funded. More detail on the new contribution provisions can be found in Appendix B of this report. These changes, particularly the move to set employer contributions based on the actuarial contribution rate, are expected to improve the funded status of the System in the future and provide a more sustainable path toward reaching full funding.

The actuarial valuation results provide a "snapshot" view of the System's financial condition on January 1, 2019, which reflects net unfavorable experience for the past plan year as demonstrated by an unfunded actuarial accrued liability that was greater than expected, based on the actuarial assumptions. Favorable experience on liabilities resulted in a small gain of $0.4 million, primarily due to lower salary amounts than expected. This favorable experience was offset by unfavorable experience on the actuarial value of assets. The rate of return on the market value of assets for calendar year 2018 was -5.3%. When combined with other deferred investment experience from prior years, there was an actuarial loss of $26.5 million. The net impact of all experience combined was an actuarial loss of $26.1 million. The System's unfunded actuarial accrued liability increased from $302.1 million in the January 1, 2018 valuation to $334.0 million in the January 1, 2019 valuation. A detailed analysis of the change in the unfunded actuarial accrued liability is shown on page 5.

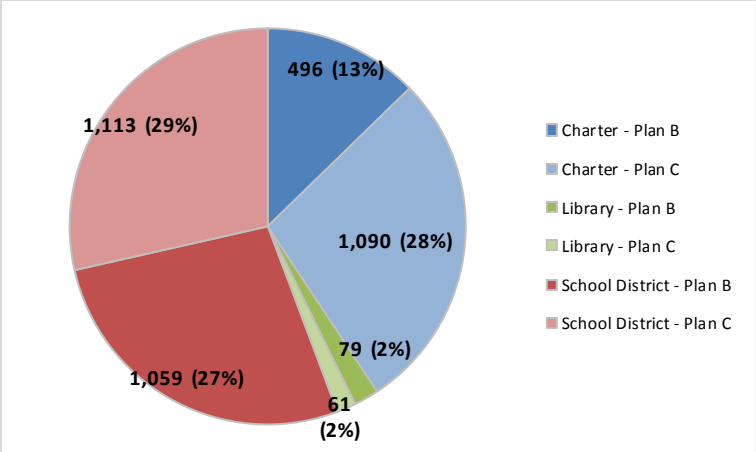
In the following pages, changes in the membership, assets, liabilities, and contributions of the System over the last year are discussed in more detail.

MEMBERSHIP

The size of the active membership increased about 3.7%, from 3,760 in the 2018 valuation to 3,898 in the current valuation. There are different benefit provisions applicable to the current active membership. The number of actives covered by Plan C, which was effective for members hired on and after January 1, 2014, increased from 1,908 last year (about 51%) to 2,264 in the 2019 valuation (about 58%). The following graphs shows the historical number of active members, split between Plan B and Plan C:



The System covers employees of the Kansas City School District, the Kansas City Library and Charter Schools in Kansas City. The current allocation of active membership among these groups, by plan, is shown below:



Group	Count	Average Reported Salary	Average Age	Average Service
KC School District	2,172	$45,752	45.9	8.9
Charter Schools	1,586	43,348	38.1	4.8
Library	140	46,497	46.3	9.5
Total	3,898	$44,801	42.7	7.2

Total covered payroll (on which contributions are paid) increased by 3.6% from the prior valuation (the assumption is 3%). When the actual increase in covered payroll is more than expected, it results in a decrease in UAAL contribution rate for the current valuation since the actual payroll is higher than the expected payroll and the UAAL rate is determined as a percent of payroll.

The number of terminated members increased by 11.6% from the 2018 valuation. The largest increase in count was in the terminated non-vested group, which increased by 335 (13.7%). The number of members receiving benefits remained steady, increasing by one from 4,112 in the 2018 valuation to 4,113 in the 2019 valuation.

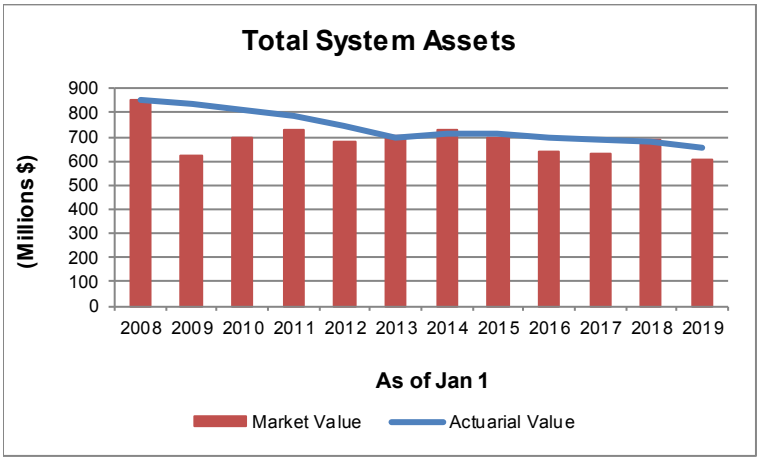
ASSETS

As of January 1, 2019, the System had total assets of $602.8 million when measured on a market value basis, a decrease of $83.0 million from the January 1, 2018 value of $685.8 million. The market value of assets is not used directly in the calculation of the System's funded status and the actuarial contribution rate. An asset valuation method, which smoothes the effect of market fluctuations, is used to determine the value of assets used in the valuation, called the "actuarial value of assets". Gains and losses, determined as the difference between the actual and expected value of assets, are recognized equally over a five-year period. See Table 3 for a detailed development of the actuarial value of assets. The rate of return on the market value of assets was -5.3%, but due to the asset smoothing method the return on the actuarial value of assets was +3.7%. Because the investment return on the actuarial value of assets was lower than the actuarial assumed rate of return (7.75%), an actuarial loss on assets occurred. Due to the unfavorable investment experience during 2018 along with the recognition of deferred gains on the actuarial value of assets, the net deferred asset gain of $7.5 million in the January 1, 2018 valuation has become a net deferred asset loss of $51.5 million in the January 1, 2019 valuation.

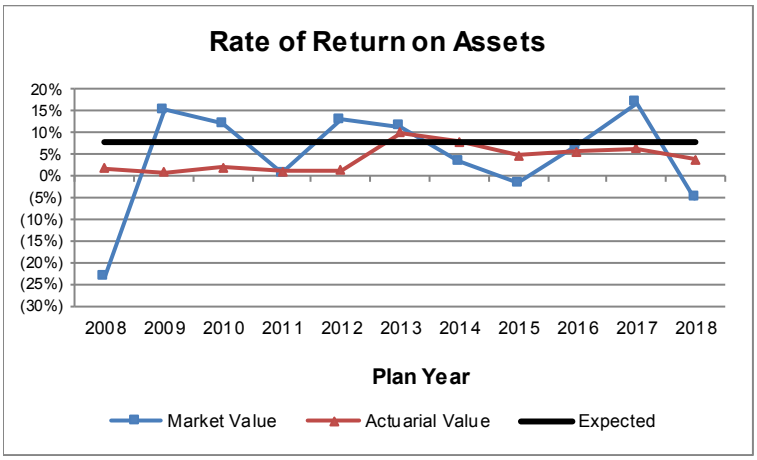
The components of the change in the market and actuarial value of assets for the System (in millions) are set forth below:

	Market Value ($M)	Actuarial Value ($M)
Assets, January 1, 2018	$685.8	$678.3
- Employers and Member Contributions	35.1	35.1
- Benefit Payments and Refunds	(83.4)	(83.4)
- Investment, Depreciation and Administrative Expenses	(6.3)	(6.3)
- Investment Income	(28.4)	30.6
Assets, January 1, 2019	$602.8	$654.3
Estimated Rate of Return	(5.3%)	3.7%

The unrecognized net asset loss represents about 9% of the market value of assets. Unless offset by future investment gains or other favorable experience, the recognition of the $51.5 million net loss will flow through the asset smoothing method over the next four years and negatively impact the funded ratio and actuarial contribution rate. If the net deferred loss was recognized immediately in the actuarial value of assets, the funded percentage would decrease from 66% to 61% and the actuarial contribution rate for the System would increase from 19.8% to 21.8% of payroll.



The actuarial value of assets has been equal to or greater than the market value of assets over most of this period. However, over the longer term we expect the actuarial value of assets to be both higher and lower than the market value of assets.



The rate of return on the actuarial value of assets has been less volatile than the market value return, which is the main reason for using an asset smoothing method

LIABILITIES

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

The Actuarial Accrued Liability and Unfunded Actuarial Accrued Liability for the System as of January 1, 2019 are:

Actuarial Accrued Liability	$988,234,763
Actuarial Value of Assets	654,259,324
Unfunded Actuarial Accrued Liability	$333,975,439

The existence of an unfunded actuarial accrued liability means that the System has actuarial assets below the target amount for an ongoing plan using the actuarial cost method. Consequently, contributions in excess of the normal cost will be needed in order for the System to reach fully funded status, assuming all assumptions are met in the future. Because the actuarial accrued liability includes projections of future salary increases and years of service, this measure does not provide a reliable indication of the level of funding relative to actual benefits earned to date. In addition, note that if the market value of assets were used instead of the actuarial value of assets, the amount of UAAL would be different. This information is shown on page 9 of this report.

Between January 1, 2018 and January 1, 2019, the change in the unfunded actuarial accrued liability for the System was as follows (in millions):

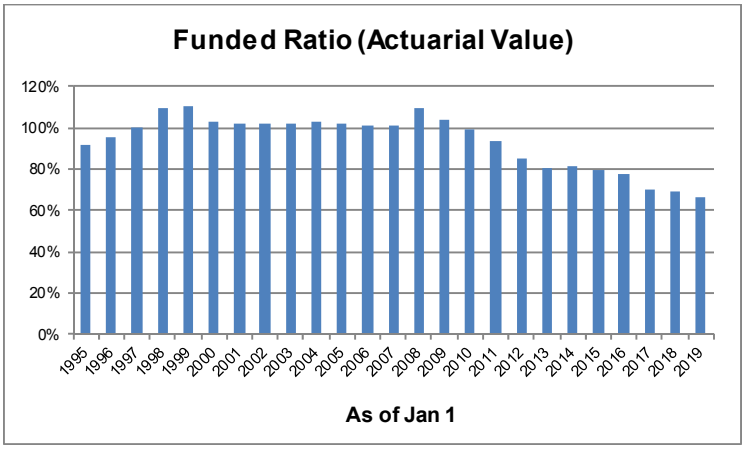
	($ Millions)
Unfunded Actuarial Accrued Liability, January 1, 2018	$ 302.1
- Expected increase from amortization method	3.7
- Actual versus actuarial contributions	1.7
- Investment experience	26.5
- Liability experience	(0.4)
- Other experience	0.4
Unfunded Actuarial Accrued Liability, January 1, 2019	$ 334.0

The experience loss for the 2018 plan year of $26.1 million reflects the net impact of a small actuarial gain of $0.4 million on System liabilities, and an actuarial loss of $26.5 million on System assets (actuarial value). The largest source of gain on the liability experience was from salary increases that were lower than expected, based on the actuarial assumptions.

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

	1/1/2015	1/1/2016	1/1/2017*	1/1/2018	1/1/2019
Actuarial Accrued Liability ($M)	$891.5	$895.2	$981.5	$980.4	$988.2
Actuarial Value of Assets ($M)	$712.4	$694.6	$684.4	$678.3	$654.3
Funded Ratio (Actuarial Value)	79.9%	77.6%	69.7%	69.2%	66.2%
Market Value of Assets ($M)	$698.5	$636.1	$631.4	$685.8	$602.8
Funded Ratio (Market Value)	78.4%	71.1%	64.3%	70.0%	61.0%

*Results reflects the impact of changes to the actuarial assumptions, including a decrease in the investment return assumption from 8.00% to 7.75%.



The System's funded ratio was very strong (around 100%) in the early part of the period. Funded ratios declined from 2009 to 2013 as the market downturn of 2008 was fully reflected in the smoothing method. Future investment experience will continue to be the largest driver of the System's funded ratio in future years. However, changes to the contribution rates, beginning in 2019, are expected to improve the System's long-term funding.

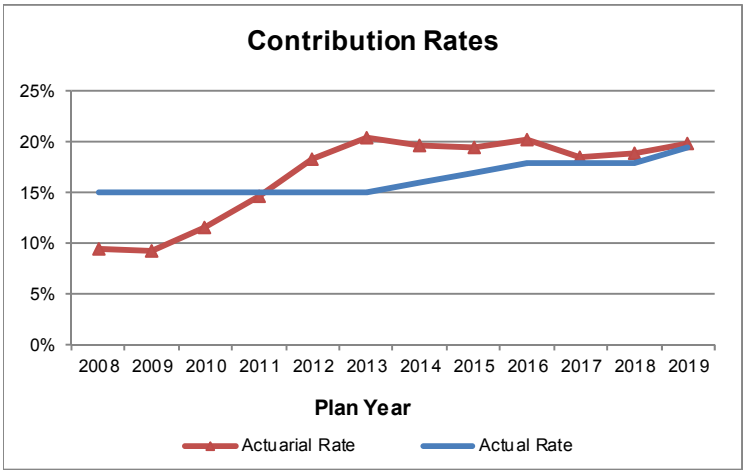
As mentioned earlier in this report, due to the asset smoothing method there is currently a $51.5 million difference between the market value and the actuarial value of assets. To the extent there is not favorable investment experience to offset the net deferred investment loss of $51.5 million, it will be recognized in future years and the System's funded status will decrease. The System's funded status will continue to be heavily dependent on future investment experience.

CONTRIBUTION RATES

Generally, contributions to the System consist of:

- A "normal cost" for the portion of projected liabilities allocated to service of members during the year following the valuation date by the actuarial cost method, and
- An "unfunded actuarial accrued liability contribution" for the excess of the portion of projected liabilities allocated to service to date over the actuarial value of assets.

Over the last five years, the System's contribution rates have increased to address higher funding needs:



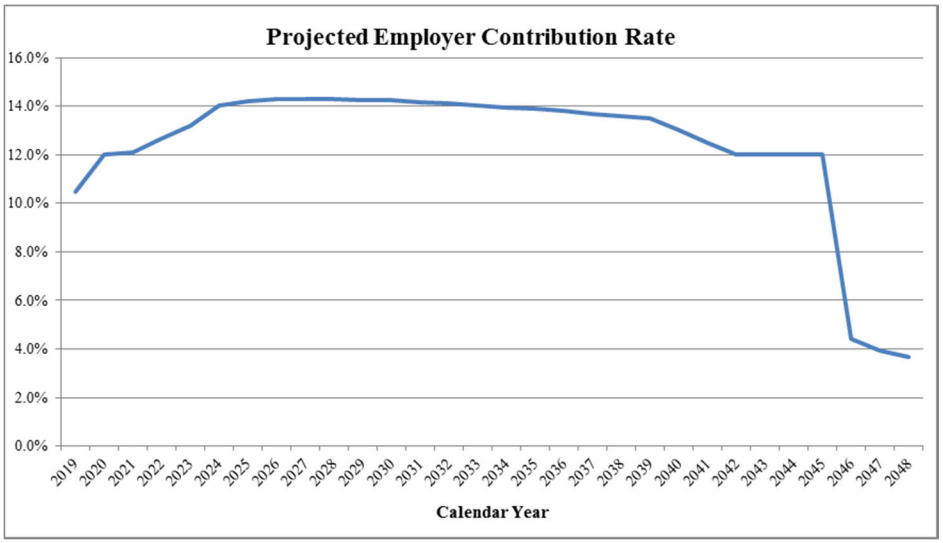
The actuarial contribution rate increased dramatically from 2009 to 2013 due to the recognition of the large asset loss from 2008 in the asset smoothing method. The contribution shortfall has been reduced due to increases in the member and employer contribution rates. Based on legislation passed in 2018, the employer contribution rate is scheduled to increase to 12% and then be equal to the actuarial contribution rate beginning July 1, 2021.

As of January 1, 2019, the actuarial accrued liability exceeds the actuarial value of assets so an unfunded actuarial accrued liability (UAAL) exists. The January 1, 2017 UAAL is amortized over a closed 30-year period and subsequent pieces of UAAL, determined each year in the valuation process, are amortized over a separate, closed 20-year period. The amortization payments on each of the UAAL bases are determined as a level percentage of payroll. The resulting UAAL contribution rate is 10.67% of pay. The System's actuarial contribution rate is the sum of the normal cost and the UAAL amortization contribution or 19.82% of pay (9.15% normal cost plus 10.67% UAAL contribution).

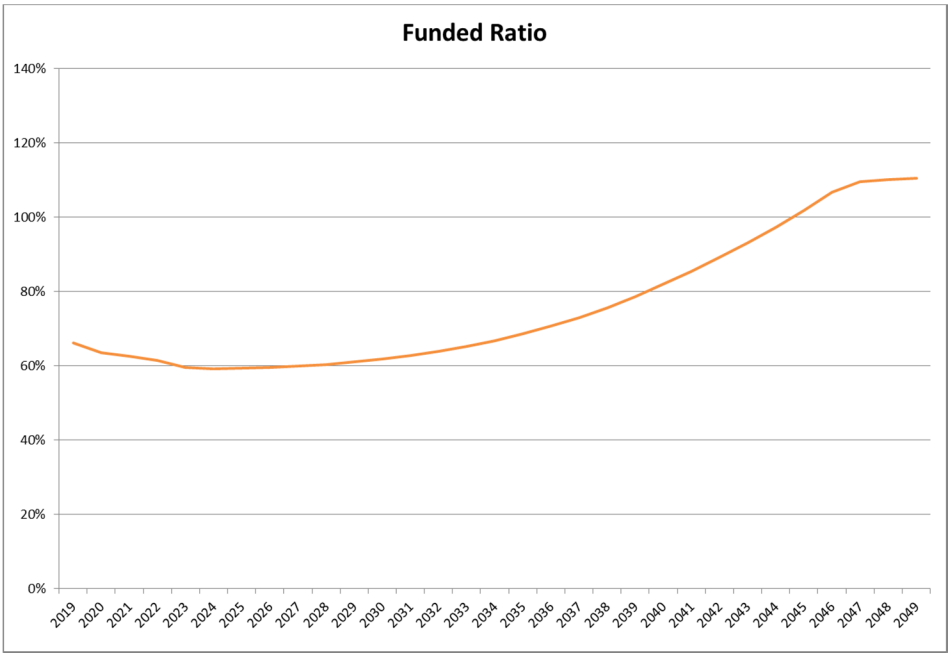
The various factors contributing to the change in the actuarial contribution rate from the January 1, 2018 valuation to the January 1, 2019 valuation are shown in the following table:

Given the current contribution rate of 19.50% of pay (9.00% for employee and 10.50% employer), the resulting contribution shortfall, as of January 1, 2019, is 0.32% which translates to about $0.7 million. The 2018, the Missouri General Assembly passed legislation that increased the employer contribution rate to 10.50% of pay, effective January 1, 2019, and then 12.00% of pay, effective January 1, 2020. Beginning July 1, 2021, the employer contribution rate will be the greater of (1) the actuarial required contribution rate less the member contribution rate, or (2) 12.00% of pay, until the System is fully funded. Once the System is fully funded, the employer contribution rate may increase or decrease in subsequent years, depending on the valuation results and the employee contribution rate may decrease from 9.00% depending on valuation results. However, such changes are subject to statutory limitations. These changes to the determination of the employer contribution rate are a significant step in strengthening the long-term funding of the System and providing a sustainable path towards full funding.

As mentioned earlier, the System is currently funded with a fixed contribution rate of 19.50% of payroll (moving to 21.00% in 2020). In the current valuation, 9.15% is needed to fund the normal cost for current active members and the remainder, 10.35% of payroll, is available to finance the UAAL. The following graphs reflects the projected employer contribution rate and funded ratio, assuming all assumptions are met in the future, including a 7.75% return on the market value of assets each year. To the extent actual experience is different than that assumed, the actual valuation results of the System will vary from these projections, perhaps significantly.



As the current deferred investment loss is recognized in the future, the actuarial employer contribution rate increases, resulting in an increase in the statutory contribution rate. Once the investment experience is fully recognized, the employer contribution rate holds steady until the current amortization bases begin to be paid off.



The funded ratio remains below 80% for over twenty years and then rather quickly moves to 100%. This is typical of funding the UAAL with payments that are a level percent of payroll (dollar amounts increase 3% per year). Such a payment schedule results in much higher dollar amounts in the later years of the amortization period and lower amounts in the shorter term. As a result, the UAAL payment is often less than the interest on the UAAL in the earlier part of the amortization period and the funded ratio does not increase significantly.

COMMENTS

The major driver of the results of the January 1, 2019 actuarial valuation, and resulting projections, was the actual return for calendar year 2018 of -5.3%. The projected employer contribution rate and full funding date have changed significantly since the January 1, 2018 valuation. Compared to the expected return of 7.75%, the actual experience was more than 13% lower than projected last year. That difference of about $80 million will be offset over time with higher contributions, but because of the asset smoothing method and amortization period, it will take 25 years before the higher contributions and future investment income on those contributions replace the "lost" earnings. As a result, the funded ratio of the System is projected to be lower during this time period.

The System does not use the actual market value of assets in developing the actuarial contribution rate, but utilizes an asset valuation method to smooth out the peaks and valleys in investment returns from year to year. Due to the current year's recognition of prior investment experience, the System experienced an actuarial loss on assets of $26.5 million. The unfavorable experience on the actuarial value of assets was slightly offset by a net gain on liabilities of $0.4 million. The net impact of the asset and the liability experience was an actuarial loss of $26.1 million.

The System's actuarial required contribution rate increased from 18.82% in the January 1, 2018 valuation to 19.82% in this valuation, largely due to unfavorable experience on the actuarial value of assets. The actuarial required contribution rate to be paid by the System has been, and will continue to be, heavily impacted by investment returns from year to year. Despite the use of an asset smoothing method, actual returns that are significantly different from the 7.75% assumption, such as occurred in 2018, will create volatility in the System's actuarial required contribution rate.

The net deferred investment loss (actuarial value less market value of assets) is $51.5 million, about 9% of market value. Absent investment gains in future years, this net deferred investment loss will eventually be reflected in the actuarial value of assets. While the use of an asset smoothing method is a common procedure for public retirement systems, it is important to identify the potential impact of the deferred investment experience. This is accomplished by comparing the key valuation results from the January 1, 2019 actuarial valuation using both the actuarial and market value of assets.

	Using Actuarial Value of Assets	Using Market Value of Assets
Actuarial Accrued Liability	$988,234,763	$988,234,763
Asset Value	$654,259,324	$602,762,479
Unfunded Actuarial Accrued Liability	$333,975,439	$385,472,284
Funded Ratio	66.2%	61.0%
Normal Cost Rate	9.15%	9.15%
UAAL Contribution Rate	10.67%	12.62%
Total Contribution Rate	19.82%	21.77%
Employee Contribution Rate	(9.00%)	(9.00%)
Employer Contribution Rate	(10.50%)	(10.50%)
Contribution Shortfall	0.32%	2.27%

A typical retirement plan faces many different risks. The term "risk" is most commonly associated with an outcome with undesirable results. However, in the actuarial world risk can 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 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. Actuarial Standard of Practice Number 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. Risk evaluation is an important part of managing a defined benefit plan. Please see Section VII of this report for an in-depth discussion of the specific risks facing the Public School Retirement System of the School District of Kansas City, Missouri.

Summary of Principal Valuation Results

	1/1/2019 Valuation	1/1/2018 Valuation	% Change
1. PARTICIPANT DATA			
Number of:			
Active Members			
- Plan B	1,634	1,852	(11.77%)
- Plan C	2,264	1,908	18.66%
Total	3,898	3,760	3.67%
Retirees, Disableds, and Beneficiaries	4,113	4,112	0.02%
Terminated Members			
- Vested Members	531	522	1.72%
- Non-Vested Members	2,784	2,449	13.68%
Total	3,315	2,971	11.58%
Total Members	11,326	10,843	4.45%
Projected Annual Salaries of Active Members	$ 203,310,599	$ 196,277,971	3.58%
Annual Retirement Payments for Retirees, Disableds, and Beneficiaries	$ 80,128,728	$ 79,297,152	1.05%
2. ASSETS AND LIABILITIES			
a. Market Value of Assets	$ 602,762,479	$ 685,801,998	(12.11%)
b. Actuarial Value of Assets	654,259,324	678,288,805	(3.54%)
c. Total Actuarial Accrued Liability	988,234,763	980,436,626	0.80%
d. Unfunded Actuarial Accrued Liability [c - b]	$ 333,975,439	$ 302,147,821	10.53%
e. Funded Ratio (Actuarial Value of Assets) [b / c]	66.20%	69.18%	(4.31%)
f. Funded Ratio (Market Value of Assets) [a / c]	60.99%	69.95%	(12.81%)
g. Projected Benefit Obligation	$ 964,326,783	$ 956,679,971	0.80%
3. CONTRIBUTION RATES AS A PERCENT OF PAYROLL			
Normal Cost	9.15%	9.16%	(0.11%)
Amortization of Unfunded Actuarial Accrued Liability	10.67%	9.66%	10.46%
Actuarial Required Contribution Rate	19.82%	18.82%	5.31%
Member Contribution Rate	(9.00%)	(9.00%)	0.00%
Employer Contribution Rate	(10.50%)	(9.00%)	16.67%
Contribution Rate Shortfall	0.32%	0.82%	(60.98%)
Contribution Shortfall	$ 650,594	$ 1,609,479	(59.58%)

SECTION II: SCOPE OF THE REPORT

This report presents the actuarial valuation of the Public School Retirement System of the School District of Kansas City, Missouri as of January 1, 2019. This valuation was prepared at the request of the System's Board of Trustees. The report is based on the plan provisions, actuarial assumptions and actuarial methods in effect as of January 1, 2019.

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

A summary of the findings 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 includes additional information regarding the System's funding history. Section 7 includes a number of risks 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 the valuation date.
- Appendix C A summary of the actuarial methods and assumptions used to estimate liabilities and determine contribution rates.
- Appendix D A glossary of actuarial terms.

In many respects, an actuarial valuation can be thought of as an inventory process. The inventory is taken as of the actuarial valuation date, which for this valuation is January 1, 2019. On that date, the assets available for the payment of benefits are appraised. The assets are compared with the liabilities of the System. The actuarial process then leads to a method of determining the contributions needed by members and the employer in the future to balance the System assets and liabilities.

MARKET VALUE OF ASSETS

The current market value represents the "snapshot" or "cash-out" value of System assets as of the valuation date. In addition, the market value of assets provides a basis for measuring investment performance over time. On January 1, 2019, the market value of assets for the System was $602.8 million. Table 1 summarizes the market value of assets by asset category. Table 2 summarizes the changes in the market value of assets between January 1, 2018 and January 1, 2019.

ACTUARIAL VALUE OF ASSETS

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

To arrive at a suitable value for the actuarial valuation, a technique for determining the actuarial value of assets is used which dampens swings in the market value while still indirectly recognizing market values. This methodology smoothes the difference between the actual return and the expected return (based on the actuarial assumption) on the market value of assets equally over a five-year period. Table 3 shows the development of the actuarial value of assets (AVA) as of January 1, 2019.

TABLE 1

Net Assets at Fair (Market) Value as of January 1, 2019

INVESTMENTS, AT MARKET VALUE		
Cash and short term investments	$	24,796,954
Commingled domestic fixed income		61,188,366
High yield fixed income		17,469,725
Global fixed income		30,098,964
Domestic equity		141,290,033
International equity		136,723,419
Pooled real estate funds		59,819,417
Alternative equity fund		98,610,742
Private equity		30,956,507
Commodities		0
Total Investments, at Market Value	$	600,954,127
RECEIVABLES		
Plan member contributions	$	211,283
Employer contributions		211,283
Securities sold		170,533
Accrued interest and dividends		508,016
Total Receivables	$	1,101,115
OTHER ASSETS		
Cash	$	1,877,215
Fixed assets		27,707
Other assets		44,631
Total Other Assets	$	1,949,553
TOTAL ASSETS	$	604,004,795
LIABILITIES		
Due to broker for securities purchased	$	610,735
Accounts payable		533,053
Accrued payroll expenses		98,528
Total Liabilities	$	1,242,316
NET ASSETS AVAILABLE FOR BENEFITS	$	602,762,479

Note: Based on unaudited asset information.

TABLE 2

Statement of Changes in Net Assets as of January 1, 2019

ADDITIONS TO NET ASSETS		
Contributions		
Plan members	$	17,619,145
Employers		17,527,854
Total Contributions	$	35,146,999
Investment Income		
Net appreciation (depreciation) in fair value of investments	$	(35,336,447)
Interest/Dividends		6,849,753
Other income		0
Investment income before expenses	$	(28,486,694)
Less: investment expenses		(4,764,220)
Net investment income	$	(33,250,914)
TOTAL ADDITIONS TO NET ASSETS	$	1,896,085
DEDUCTIONS FROM NET ASSETS		
Benefits paid directly to participants	$	79,333,689
Refunds of contributions		4,084,837
Depreciation expense		17,150
Administrative expenses		1,499,928
TOTAL DEDUCTION FROM ASSETS	$	84,935,604
NET INCREASE (DECREASE)	$	(83,039,519)
NET ASSETS AVAILABLE FOR BENEFITS		
Beginning of year	$	685,801,998
End of year	$	602,762,479

Note: Based on unaudited asset information.

TABLE 3

Development of Actuarial Value of Assets as of January 1, 2019

1. Deferral of Investment Return for 2018		
a. Market Value, January 1, 2018	$	685,801,998
b. Contributions for 2018		35,146,999
c. Benefit Payments for 2018		83,418,526
d. Actual Investment Return, Net of All Expenses	$	(34,767,992)
e. Expected Return Rate		7.75%
f. Expected Return - Weighted for Timing* (a. x e.) + [(b. - c.) x (((1 + e.)$^{.5}$) - 1)]	$	51,314,035
g. Investment Gain/(Loss) for the Year (d. - f.)	$	(86,082,027)
h. Deferred Investment Return (g. x 80%)	$	(68,865,622)
2. Actuarial Value, January 1, 2019		
a. Market Value, January 1, 2019	$	602,762,479
b. Total Deferred Investment Gain/(Loss)		(51,496,845)
c. Actuarial Value, January 1, 2019 (a. - b.)	$	654,259,324
d. Ratio of Actuarial Value of Assets to Market Value of Assets		108.5%
e. Approximate Actuarial Value Rate of Return for 2018, Net of All Expenses		3.7%

* Contributions and benefit payments are assumed to occur mid-year.

The table below shows the development of gain/(loss) to be recognized in the current year.

Plan Year Ended	Asset Gain/(Loss)	Gain/(Loss) Recognized in Prior Years	Gain/(Loss) Recognized This Year	Gain/(Loss) Deferred to Future Years
12/31/2014	$(32,229,392)	$(25,783,512)	$(6,445,880)	$ 0
12/31/2015	(65,826,115)	(39,495,669)	(13,165,223)	(13,165,223)
12/31/2016	(6,337,217)	(2,534,886)	(1,267,443)	(2,534,888)
12/31/2017	55,114,812	11,022,962	11,022,962	33,068,888
12/31/2018	(86,082,027)	0	(17,216,405)	(68,865,622)
Total	$(135,359,939)	$(56,791,105)	$(27,071,989)	$(51,496,845)

SECTION IV: SYSTEM LIABILITIES

In the previous section, an actuarial valuation was compared with an inventory process, and an analysis was given of the inventory of assets of the System as of the valuation date, January 1, 2019. In this section, the discussion will focus on the commitments of the System, which are referred to as its liabilities.

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

All liabilities reflect the benefit provisions in place as of January 1, 2019.

ACTUARIAL ACCRUED LIABILITY

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

1. that which is attributable to the past, and

2. that which is attributable to the future.

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

Table 6 develops the experience gain/(loss) for the year ended December 31, 2018.

Table 7 shows the liability gain/(loss) by source.

Table 8 shows the actuarial balance sheet.

PENSION BENEFIT OBLIGATION

Table 9 shows the System's liability on a Pension Benefit Obligation (PBO) basis.

TABLE 4

Present Value of Future Benefits as of January 1, 2019

1. Active Members		
a. Retirement Benefits	$	292,715,515
b. Disability Benefits		4,541,055
c. Death Benefits		6,822,870
d. Withdrawal Benefits		46,030,254
e. Subtotal	$	350,109,694
2. Benefit Recipients		
a. Retiree Benefits	$	680,131,733
b. Survivor Benefits		22,521,861
c. Disability Benefits		7,457,837
d. Subtotal	$	710,111,431
3. Inactive Members		
a. Vested Retirement Benefits	$	23,859,815
b. Non-vested Account Balance		10,488,526
c. Subtotal	$	34,348,341
4. Total (1e. + 2d. + 3c.)	$	1,094,569,466

TABLE 5

Actuarial Accrued Liability as of January 1, 2019

1. Present Value of Future Benefits (PVFB)	$	1,094,569,466
2. Present Value of Future Normal Costs (PVFNC)		
a. Retirement benefits	$	53,803,002
b. Disability benefits		1,564,419
c. Death benefits		2,665,136
d. Withdrawal benefits		48,302,146
e. Total	$	106,334,703
3. Actuarial Accrued Liability (AAL) (1. - 2e.)	$	988,234,763
4. Actuarial Value of Assets (AVA)	$	654,259,324
5. Unfunded Actuarial Accrued Liability (UAAL) (3. - 4.)	$	333,975,439
6. Funded Ratio (AVA / AAL) (4. / 3.)		66.2%

TABLE 6

Actuarial Gain/(Loss) for 2018

Liabilities			
1.	Actuarial accrued liability as of January 1, 2018	$	980,436,626
2.	Normal cost for 2018		15,771,275
3.	Interest at 7.75% on (1) and (2) to December 31, 2018		77,206,112
4.	Benefit payments during 2018		(83,418,526)
5.	Interest on benefit payments		(3,172,154)
6.	Updated mortality assumption		1,793,200
7.	Expected actuarial accrued liability as of December 31, 2018	$	988,616,533
8.	Actuarial accrued liability as of December 31, 2018		988,234,763
9.	Actuarial gain / (loss) on actuarial accrued liability (7. – 8.)	$	381,770
Assets			
10.	Actuarial value of assets as of January 1, 2018	$	678,288,805
11.	Contributions during 2018		35,146,999
12.	Benefit payments during 2018		(83,418,526)
13.	Interest at 7.75% on (10), (11) and (12) to December 31, 2018		50,731,762
14.	Expected actuarial value of assets as of December 31, 2018	$	680,749,040
15.	Actuarial value of assets as of December 31, 2018		654,259,324
16.	Actuarial gain / (loss) on actuarial assets (15. – 14.)	$	(26,489,716)
17.	Total actuarial gain / (loss) (9. + 16.)	$	(26,107,946)

TABLE 7

Gain/(Loss) Analysis by Source

Liability Sources		Gain/(Loss)
Retirement	$	(1,708,000)
Termination		1,222,000
Disability		14,000
Mortality		1,568,000
Salary		3,489,000
New Entrants/Rehires		(3,719,000)
Miscellaneous		(484,000)
Total Liability Gain/(Loss)	$	382,000
Asset Gain/(Loss)	$	(26,490,000)
Net Actuarial Gain/(Loss)	$	(26,108,000)

TABLE 8

Actuarial Balance Sheet

Assets

Current assets (actuarial value)	$	654,259,324
Present value of future normal costs		106,334,703
Present value of future contributions to fund unfunded actuarial accrued liability		333,975,439
Total Assets	$	1,094,569,466

Liabilities

Present value of future retirement benefits for:		
Active employees	$	350,109,694
Members currently receiving a benefit		710,111,431
Terminated vested members		23,859,815
Inactive employees due refunds		10,488,526
Total Liabilities	$	1,094,569,466

TABLE 9

Pension Benefit Obligation Funded Status

The Pension Benefit Obligation (PBO) is statutorily required to be used in the determination of whether a cost-of-living allowance can be granted to retirees. If the funded ratio, after reflecting the effect of the proposed increase, exceeds 100%, and other safeguards are met, a cost-of-living allowance may be provided. See Appendix B for additional details.

Projected Benefit Obligation		January 1, 2019	January 1, 2018
1.	Retired members and beneficiaries currently receiving benefits and terminated members not yet receiving benefits	$ 744,459,772	$ 739,004,732
2.	Current active participants		
a.	Accumulated member contributions, including interest	106,618,062	103,069,314
b.	Employer-financed vested benefits	113,248,949	114,605,925
Total Projected Benefit Obligation (PBO)		$ 964,326,783	$ 956,679,971
Projected Benefit Obligation funded status			
1.	Actuarial Value of Assets (AVA)	$ 654,259,324	$ 678,288,805
a.	Unfunded Projected Benefit Obligation	310,067,459	278,391,166
b.	Funding Ratio (AVA / PBO)	68%	71%
2.	Market Value of Assets (MVA)	$ 602,762,479	$ 685,801,998
a.	Unfunded Projected Benefit Obligation	361,564,304	270,877,973
b.	Funding Ratio (MVA / PBO)	63%	72%

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

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

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

DESCRIPTION OF CONTRIBUTION RATE COMPONENTS

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

The calculation of the employer contribution rate is outlined in Appendix B.

As of January 1, 2019, the valuation assets were less than the actuarial accrued liability so an unfunded actuarial accrued liability exists. The System's funding policy is to amortize the UAAL, as a level percent of pay amount, using a "layered" approach with the legacy UAAL amortized over a closed 30-year period commencing January 1, 2017 and new bases over a closed 20-year period.

CONTRIBUTION RATE SUMMARY

Table 10 develops the normal cost rate for the System. In Table 11, the amortization payment related to the unfunded actuarial accrued liability, as of January 1, 2019, is developed. In Table 12, the contribution rate for the System is calculated.

The actuarial required contribution rate shown in this report is based on the actuarial assumptions and cost methods described in Appendix C.

TABLE 10

Normal Cost Rate

1. Normal Cost		
a. Retirement Benefits	$	8,555,065
b. Disability Benefits		230,667
c. Death Benefits		454,036
d. Termination Benefits		7,098,783
e. Total	$	16,338,551
2. Expected Payroll for Current Actives	$	178,528,351
3. Normal Cost Rate for 2019		9.15%

TABLE 11

Amortization of the Unfunded Actuarial Accrued Liability

Amortization Bases	Original Amount	1/1/2019 Remaining Payments	Date of Last Payment	Outstanding Balance as of Jan. 1, 2019	Annual Contribution*
2017 UAAL Base	$ 297,102,390	28	1/1/2046	$ 304,822,968	$ 19,453,711
2018 Experience Base	1,054,285	19	1/1/2037	1,051,701	83,639
2019 Experience Base	28,100,770	20	1/1/2038	28,100,770	2,164,362
Total				**$ 333,975,439**	**$ 21,701,712**

* Contribution amount reflects mid-year timing.

1. Total UAAL Amortization Payments	$ 21,701,712
2. Projected Payroll for plan year ending December 31, 2019	$ 203,310,599
3. UAAL Amortization Payment Rate	10.67%

TABLE 12

Development of
2019 Actuarial Required Contribution (ARC)

1. Normal Cost Rate (See Table 10)	9.15%
2. UAAL Contribution Rate (See Table 11)	10.67%
3. Actuarial Recommended Contribution Rate (1) + (2)	19.82%
4. Statutory Contribution Rate:	
(a) Member	9.00%
(b) Employer	10.50%
(c) Total	19.50%
5. Contribution Shortfall (3) - (4c)	0.32%

HISTORICAL FUNDING AND OTHER INFORMATION

In this section, we provide some historical information regarding the funding progress of the System. These exhibits retain some of the information that used to be required for accounting purposes and are included because they help explain the System's funding history.

TABLE 13

Schedule of Funding Progress

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

Actuarial Valuation Date	Actuarial Value of Assets (AVA) (a)	Actuarial Accrued Liabilities (AAL) (b)	Unfunded AAL (UAAL) (b - a)	Funded Ratio (a / b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll [(b - a) / c]
1/1/1995	$ 353,329,957	$ 386,874,780	$ 33,544,823	91.3%	$ 185,374,096	18.1%
1/1/1996	389,103,803	409,428,594	20,324,791	95.0%	171,262,008	11.9%
1/1/1997	428,419,710	429,517,108	1,097,398	99.7%	161,802,480	0.7%
1/1/1998	482,599,919	442,614,693	(39,985,225)	102.3%	168,328,728	(23.8%)
1/1/1999	624,225,667	564,056,509	(60,169,158)	110.7%	153,733,920	(39.1%)
1/1/2000	660,830,255	640,614,688	(20,215,567)	103.2%	151,091,616	(13.4%)
1/1/2001	696,071,310	682,531,577	(13,539,734)	102.0%	165,795,367	(8.2%)
1/1/2002	718,703,692	701,725,938	(16,977,755)	102.4%	171,523,233	(9.9%)
1/1/2003	717,681,067	701,114,370	(16,566,697)	102.4%	168,391,474	(9.8%)
1/1/2004	738,612,110	716,126,707	(22,485,404)	103.1%	186,528,530	(12.1%)
1/1/2005	763,684,602	747,711,194	(15,973,408)	102.1%	195,866,663	(8.2%)
1/1/2006	788,788,666	780,663,389	(8,125,277)	101.0%	187,445,140	(4.3%)
1/1/2007	824,302,795	818,027,315	(6,275,480)	100.8%	199,221,110	(3.2%)
1/1/2008	854,123,580	781,284,025	(72,839,554)	109.3%	202,311,837	(36.0%)
1/1/2009	832,609,879	804,623,080	(27,986,799)	103.5%	205,326,108	(13.6%)
1/1/2010	814,536,473	819,534,391	4,997,918	99.4%	194,474,437	2.6%
1/1/2011	786,297,998	844,232,490	57,934,492	93.1%	162,417,257	35.7%
1/1/2012	742,279,611	874,286,498	132,006,887	84.9%	155,893,016	84.7%
1/1/2013	697,028,072	868,663,383	171,635,311	80.2%	157,303,005	109.1%
1/1/2014	710,828,744	875,451,114	164,622,370	81.2%	157,014,537	104.8%
1/1/2015	712,390,611	891,543,036	179,152,425	79.9%	170,845,124	104.9%
1/1/2016	694,641,248	895,230,295	200,589,047	77.6%	179,013,516	112.1%
1/1/2017	684,412,437	981,514,827	297,102,390	69.7%	194,132,739	153.0%
1/1/2018	678,288,805	980,436,626	302,147,821	69.2%	196,277,971	153.9%
1/1/2019	654,259,324	988,234,763	333,975,439	66.2%	203,310,599	164.3%

Note: Years prior to 1/1/2014 were provided by prior Actuary

TABLE 14

Historical Contribution Rates

Actuarial Valuation Date	Actuarial Contribution Rate	Actual Contribution Rate	Contribution Shortfall/(Margin)
1/1/2005	14.02%	15.00%	(0.98%)
1/1/2006	13.78%	15.00%	(1.22%)
1/1/2007	13.28%	15.00%	(1.72%)
1/1/2008	9.39%	15.00%	(5.61%)
1/1/2009	9.35%	15.00%	(5.65%)
1/1/2010	11.50%	15.00%	(3.50%)
1/1/2011	14.64%	15.00%	(0.36%)
1/1/2012	18.30%	15.00%	3.30%
1/1/2013	20.52%	15.00%	5.52%
1/1/2014	19.68%	16.00%	3.68%
1/1/2015	19.56%	17.00%	2.56%
1/1/2016	20.18%	18.00%	2.18%
1/1/2017	18.61%	18.00%	0.61%
1/1/2018	18.82%	18.00%	0.82%
1/1/2019	19.82%	19.50%	0.32%

Note: Years prior to 1/1/2014 were provided by prior Actuary.

Summary of Actuarial Methods and Assumptions

Valuation Date	January 1, 2019
Actuarial Cost Method	Entry Age Normal
Amortization Method	Level-Percent of Pay, layered
Remaining Amortization Period	January 1, 2017 UAAL – 28 years Subsequent layers of amortization – See Table 11
Asset Valuation Method	5-Year Smoothed Market Value
Actuarial Assumptions:	
Investment Rate of Return*	7.75%
Projected Salary Increases*	5.00%
No future COLAs	

*Includes Inflation at 2.75%

TABLE 15

Solvency Test

In a system that has been following the discipline of level percent of payroll financing, the liabilities for active participant accumulated contributions (liability 1) and the liabilities for future benefits to retirees, beneficiaries, and inactive participants (liability 2) will be fully covered by assets if all assumptions are met. In addition, the liabilities for service already rendered by active participants (liability 3) are normally partially covered by the remainder of the present assets. Generally, if the system has been using level percent of payroll financing, the funded portion of liability 3 will increase over time. The schedule below illustrates the history of the liabilities of the system and is indicative of the system following the discipline of level percent of compensation funding.

Valuation Date January 1,	Active Participants' Accumulated Contributions (1)	Retirees, Beneficiaries and Inactive Participants (2)	Active Participants (Employer Financed) (3)	Valuation Assets	Percent Covered By Valuation Assets (1)	(2)	(3)
1990	$ 77,843,936	$ 79,855,895	$ 52,384,902	$ 220,844,765	100%	100%	121%
1991	86,392,672	77,212,948	62,859,420	241,369,537	100%	100%	124%
1992	91,688,784	101,408,720	69,055,820	278,065,508	100%	100%	123%
1993	98,482,791	102,336,338	61,479,865	307,050,085	100%	100%	173%
1994	99,547,061	123,475,760	121,674,513	336,466,320	100%	100%	93%
1995	110,658,079	144,027,489	124,562,502	353,451,344	100%	100%	79%
1996	108,123,636	177,617,507	117,169,151	389,103,803	100%	100%	88%
1997	104,554,877	231,762,583	91,329,968	428,419,710	100%	100%	101%
1998	115,847,655	228,328,855	108,592,620	482,599,919	100%	100%	127%
1999	117,478,379	274,442,924	172,607,724	624,225,667	100%	100%	135%
2000	113,334,820	343,382,932	184,049,309	660,830,255	100%	100%	111%
2001	115,781,706	389,055,603	184,779,937	696,071,310	100%	100%	103%
2002	119,968,776	406,094,033	187,309,245	718,703,692	100%	100%	103%
2003	112,468,027	435,548,298	165,766,206	717,681,067	100%	100%	102%
2004	125,754,562	430,145,689	179,264,397	738,612,110	100%	100%	102%
2005	127,221,118	431,366,177	201,836,083	763,684,602	100%	100%	102%
2006	133,811,729	477,844,206	177,531,611	788,788,666	100%	100%	100%
2007	136,978,872	498,841,373	187,966,845	824,302,795	100%	100%	100%
2008	140,844,707	492,273,102	156,840,245	854,123,580	100%	100%	141%
2009	140,096,771	503,450,518	161,075,791	832,609,879	100%	100%	117%
2010	139,860,248	524,692,426	154,981,717	814,536,473	100%	100%	97%
2011	110,538,745	611,806,997	121,886,748	786,297,998	100%	100%	52%
2012	99,513,420	654,828,752	119,944,326	742,279,611	100%	98%	0%
2013	100,767,726	653,949,421	113,946,236	697,028,072	100%	91%	0%
2014	98,272,633	660,003,861	117,174,620	710,828,744	100%	93%	0%
2015	98,966,336	674,794,654	117,782,046	712,390,611	100%	91%	0%
2016	101,173,695	677,295,366	116,761,234	694,641,248	100%	88%	0%
2017	105,887,868	717,052,296	158,574,663	684,412,437	100%	81%	0%
2018	103,069,314	739,004,732	138,362,580	678,288,805	100%	78%	0%
2019	106,618,062	744,459,772	137,156,929	654,259,324	100%	74%	0%

Note: Years prior to 1/1/2014 were provided by prior Actuary.

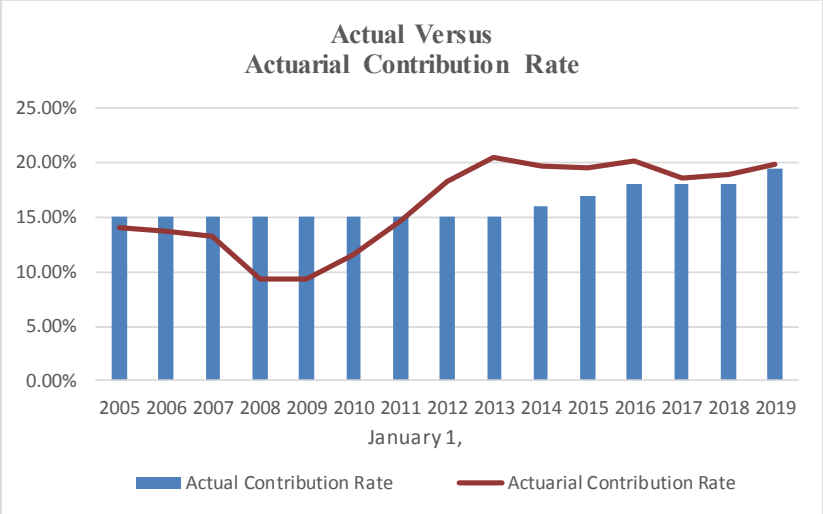
Actuarial Standards of Practice are issued by the Actuarial Standards Board and are binding on credentialed actuaries practicing in the United States. These standards generally identify what the actuary should consider, document and disclose when performing an actuarial assignment. In September, 2017, 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, is first applicable for the January 1, 2019 actuarial valuation for the Public School Retirement System of Kansas City, Missouri (System).

While actuarial assumptions allow for a projection of how future contributions and investment returns will meet the cash flow needs for future benefit payments, actual experience will not unfold exactly as anticipated by the assumptions. In this section, we discuss some of the risk factors that 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 and inflation;
- demographic risks such as mortality, payroll growth, aging population including the impact of baby boomers, and retirement ages;
- contribution risk; and
- external risks such as the regulatory and political environment.

There is a direct correlation between healthy, well-funded plans and consistent contributions equal to the full actuarial contribution rate each year. For many years, the Public School Retirement System of the School District of Kansas City, Missouri was funded by fixed contribution rates for both the member and the employers. While this approach worked well for many years, the investment experience during the Great Recession created a significant unfunded actuarial liability. Around the same time, the active membership of the System declined by nearly 30% (going from 4,862 in 2008 to 3,493 in 2015). As the following graph shows, less than the full actuarial contribution rate has been contributed to the System in each of the past 8 years, despite increases in the contribution rate for both members and employers. The System currently contributes a fixed contribution rate, however, funding will move to an actuarial contribution rate beginning July 1, 2021. This change will improve the funding risk for the System.



The most significant risk factor is investment return because of the volatility of the returns and the size of plan assets compared to payroll (see Table 16). A perusal of historical rates over 10-20 years reveals that

the actual return each year is rarely close to the average return for the same period. This is an expected result given the underlying capital market assumptions and the asset allocation. However, the valuation is a measurement based on a single investment return, usually around the median of the distribution of returns. The magnitude of variations in investment returns and the short timeframe in which they occur makes the management of this risk very challenging.

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/volatility 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 because of the magnitude of the increase. In the January 1, 2019 valuation, the asset volatility ratio was 2.96. Given the standard deviation of the portfolio, around 12%, the rate of return in any given year is expected to be within one standard deviation of the expected return (higher or lower) roughly two-thirds of the time. That means there is a one in three chance the return will more than one standard deviation (12%) from the expected return. To put that in context, a return 12% different than the expected return of 7.75% translates to about $72 million and a change of 2.74% in the contribution rate (without asset smoothing). The distribution of returns would indicate that such an event would be expected to happen once every three years (half higher than 19.75% and half lower than -4.25). While the asset smoothing method would spread the increase in the contribution rate over five years, the ultimate impact would be as shown in the table below:

	One Standard Deviation	
	Above 7.75%	Below 7.75%
1. Rate of Return	19.75%	-4.25%
2. Ratio of Assets to Payroll	2.96	2.96
3. Asset Gain/Loss as a Percent of Payroll [(1) - 7.75%] * (2)	36%	36%
4. Initial Impact on Contribution Rate	-2.74%	2.74%

A key demographic risk for all retirement systems, including KCPSRS, is improvements in mortality (longevity) greater than anticipated. While the mortality assumption used in the valuation reflects some improvement in mortality experience and this assumption is evaluated and refined in each experience study, 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, 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 accrued liability is amortized as a level percentage of payroll. 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. We would note that the active population declined significantly for about a decade from a high of 5,090 in 2004 to 3,493 in 2015. The active population has started to increase over the past few years (see Table 17). When payroll does not grow as expected, the UAAL contribution rate will be higher than expected even if the dollar amount of the payment is the same as scheduled.

As plan demographics change over time, along with the funded status, the risk factors may also change. The following exhibits summarize certain historical information that provide an indication as to how key risk metrics have changed over time.

TABLE 16

HISTORICAL ASSET VOLATILITY RATIO

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 contribution. In the January 1, 2019 valuation, the asset volatility ratio was 2.96. Therefore, underperforming the investment return assumption by 1.00% (i.e., earn 6.75% for one year) is equivalent to $6 million or 2.96% of payroll. This ratio tends to grow over time as plans become better funded, so this is an important metric to monitor over time.

Valuation Date	Market Value of Assets	Covered Payroll	Asset Volatility Ratio	Increase in ACR with a Return 12% Lower than Assumed*
1/1/2008	$853,722,741	$202,311,837	4.22	0.78%
1/1/2009	624,647,065	205,326,108	3.04	0.56%
1/1/2010	693,934,794	194,474,437	3.57	0.66%
1/1/2011	730,278,733	162,417,257	4.50	0.83%
1/1/2012	681,930,607	155,893,016	4.37	0.81%
1/1/2013	702,966,521	157,303,005	4.47	0.83%
1/1/2014	726,553,301	157,014,537	4.63	0.86%
1/1/2015	698,523,480	170,845,124	4.09	0.76%
1/1/2016	636,109,506	179,013,516	3.55	0.66%
1/1/2017	631,442,613	194,132,739	3.25	0.60%
1/1/2018	685,801,998	196,277,971	3.49	0.65%
1/1/2019	602,762,479	203,310,599	2.96	0.55%

* The impact on the Actuarial Contribution Rate (ACR) reflects five-year asset smoothing and a 20-year amortization of the actuarial loss.

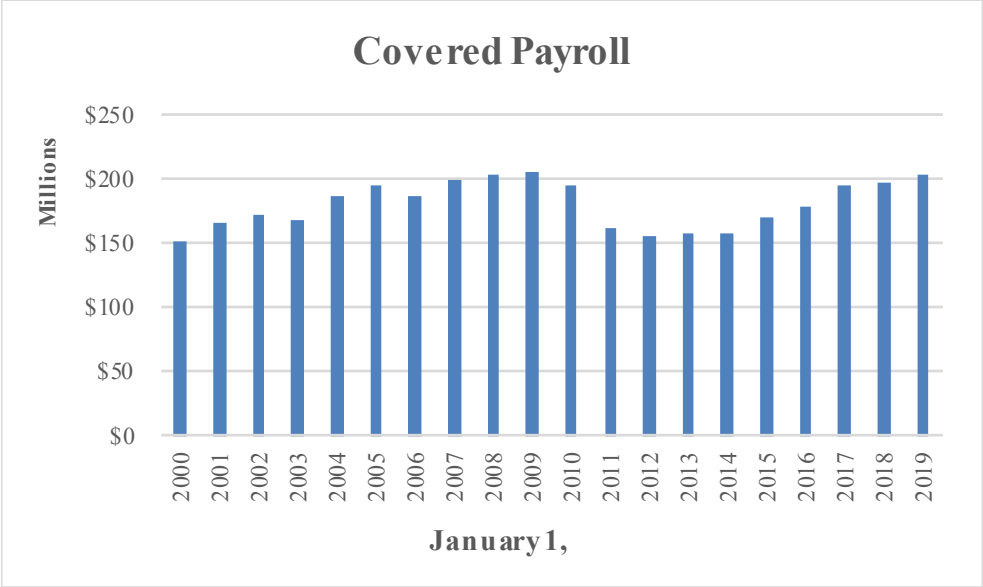
TABLE 17

COVERED PAYROLL VOLATILITY

Member and employer contributions to the System are made based on covered payroll. In addition, the payment on the unfunded actuarial accrued liability is calculated anticipating covered payroll increases each year in the future. To the extent actual payroll does not meet the assumed rate of increase (currently 3%), a higher rate of pay is necessary to collect the same dollar amount of payment on the unfunded actuarial accrued liability. A reduction in the number of active members usually results in a decline in the dollar amount of covered payroll, as can be seen in the table below. Over the last 20 years, the number of active members has declined significantly which creates challenges for funding the System.

Actuarial	Number of Active Members				Covered	Number of	Active/
Valuation Date	Charter Schools	School District	Library	Total	Payroll	Retired Members	Retired
1/1/2000				4,666	$151,091,616	2,806	1.66
1/1/2001				5,012	165,795,367	2,865	1.75
1/1/2002				5,014	171,523,233	2,861	1.75
1/1/2003				4,891	168,391,474	3,058	1.60
1/1/2004				5,090	186,528,530	3,042	1.67
1/1/2005	539	4,336	130	5,005	195,866,663	2,951	1.70
1/1/2006	462	4,228	118	4,808	187,445,140	3,140	1.53
1/1/2007	588	4,030	139	4,757	199,221,110	3,198	1.49
1/1/2008	784	3,937	141	4,862	202,311,837	3,283	1.48
1/1/2009	820	3,680	148	4,648	205,326,108	3,247	1.43
1/1/2010	973	3,222	141	4,336	194,474,437	3,317	1.31
1/1/2011	1,061	2,296	133	3,490	162,417,257	3,670	0.95
1/1/2012	1,133	2,022	129	3,284	155,893,016	3,829	0.86
1/1/2013	1,108	2,152	136	3,396	157,303,005	3,859	0.88
1/1/2014	1,147	2,215	139	3,501	157,014,537	3,885	0.90
1/1/2015	1,245	2,112	136	3,493	170,845,124	4,011	0.87
1/1/2016	1,336	2,095	143	3,574	179,013,516	4,049	0.88
1/1/2017	1,481	2,076	144	3,701	194,132,739	4,032	0.92
1/1/2018	1,555	2,065	140	3,760	196,277,971	4,112	0.91
1/1/2019	1,586	2,172	140	3,898	203,310,599	4,113	0.95

This table shows the change in active membership among the participating employers over the last 15 years. Charter Schools has become a much larger portion of the total active membership. To the extent the demographic behavior of Charter School members is different than other KCPSRS members, the actuarial assumptions will need to be modified or actuarial gains/losses are likely to be created each year.



From 2005 to 2012, the System experienced a significant decline in the number of active members, as shown in the graph below. As a result, the covered payroll of the membership declined for a period and the ratio of actives to retirees declined significantly. This had significant impact on the System's funding as the contributions were fixed for most of the period and, therefore, did not respond to the impact of the investment losses from calendar year 2008. As a result, the funded ratio of the System declined rather dramatically. The size of the active membership has stabilized in recent years and has actually grown since 2015. In addition, the contribution rates are increasing, moving to an actuarial contribution rate, effective July 1, 2021. This will address a significant risk factor for the System that has existed in the past.

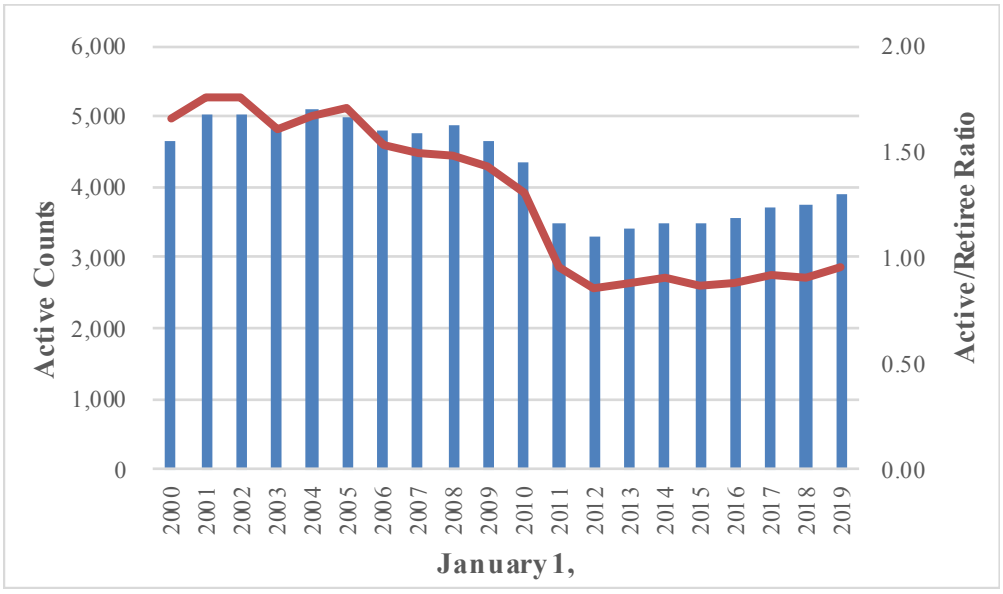


TABLE 18

HISTORICAL CASH FLOWS

Plans with negative cash flows will experience increased sensitivity to investment return volatility. Cash flows, for this purpose, are measured as contributions less benefit payments. If the System has negative cash flows and then experiences returns below the assumed rate, there are fewer assets to be reinvested to earn the higher returns that typically follow. Negative cash flows can also impact the system's asset allocation and is a consideration in setting the investment policy of the system. KCPSRS has higher negative cash flows than many public retirement systems and so this metric should be closely monitored, as it is for KCPSRS. The higher the net cash flow is as a percent of the market value of assets, the greater the risk to the system's funding.

Fiscal Year End	Market Value of Assets (MVA)	Contributions	Benefit Payments	Net Cash Flow	Net Cash Flow as a Percent of MVA
12/31/07	$853,722,741	$30,420,687	$59,789,249	($29,368,562)	(3.44%)
12/31/08	624,647,065	31,501,230	63,870,255	(32,369,025)	(5.18%)
12/31/09	693,934,794	42,652,068	63,243,063	(20,590,995)	(2.97%)
12/31/10	730,278,733	27,094,752	71,323,384	(44,228,632)	(6.06%)
12/31/11	681,930,607	24,054,927	76,133,226	(52,078,299)	(7.64%)
12/31/12	702,966,521	22,948,176	76,813,694	(53,865,518)	(7.66%)
12/31/13	726,553,301	24,404,265	77,412,174	(53,007,909)	(7.30%)
12/31/14	698,523,480	26,646,322	78,535,383	(51,889,061)	(7.43%)
12/31/15	636,109,506	29,145,161	79,634,189	(50,489,028)	(7.94%)
12/31/16	631,442,613	32,808,515	80,168,978	(47,360,463)	(7.50%)
12/31/17	685,801,998	33,890,913	81,762,722	(47,871,809)	(6.98%)
12/31/18	602,762,479	35,146,999	83,418,526	(48,271,527)	(8.01%)

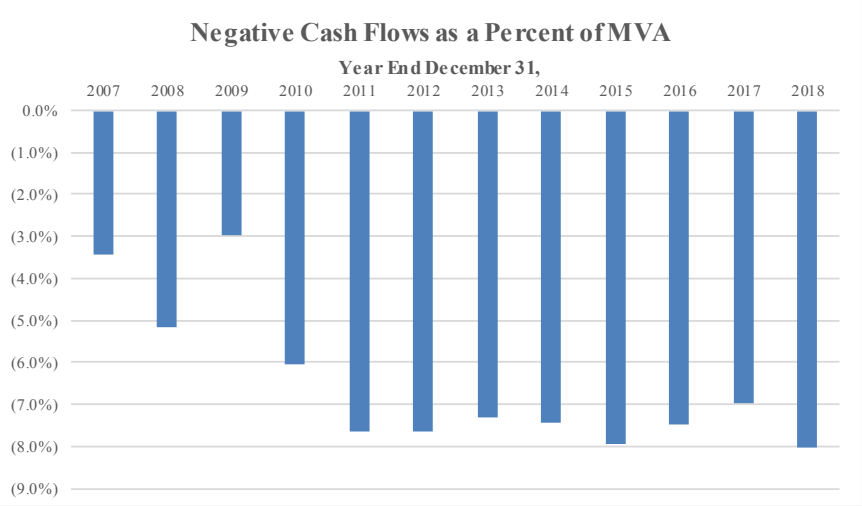


TABLE 19

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 an increasing ratio of retirees to active members and a growing percentage of retiree liability. The retirement of the baby boomers over the next decade is expected to further exacerbate the aging of the retirement system population. 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 over which to spread the cost.

Fiscal Year End	Retiree Liability (a)	Total Actuarial Accrued Liability (b)	Retiree Percentage (a) / (b)	Covered Payroll (c)	Ratio (b) / (c)
12/31/07	$484,041,632	$781,284,025	62.0%	$202,311,837	3.86
12/31/08	477,828,410	804,623,080	59.4%	205,326,108	3.92
12/31/09	498,921,369	819,534,391	60.9%	194,474,437	4.21
12/31/10	580,324,640	844,232,490	68.7%	162,417,257	5.20
12/31/11	622,135,967	874,286,498	71.2%	155,893,016	5.61
12/31/12	620,358,237	868,663,383	71.4%	157,303,005	5.52
12/31/13	621,249,525	875,451,114	71.0%	157,014,537	5.58
12/31/14	645,100,053	891,543,036	72.4%	170,845,124	5.22
12/31/15	648,136,960	895,230,295	72.4%	179,013,516	5.00
12/31/16	684,767,536	981,514,827	69.8%	194,132,739	5.06
12/31/17	704,534,913	980,436,626	71.9%	196,277,971	5.00
12/31/18	710,111,431	988,234,763	71.9%	203,310,599	4.86

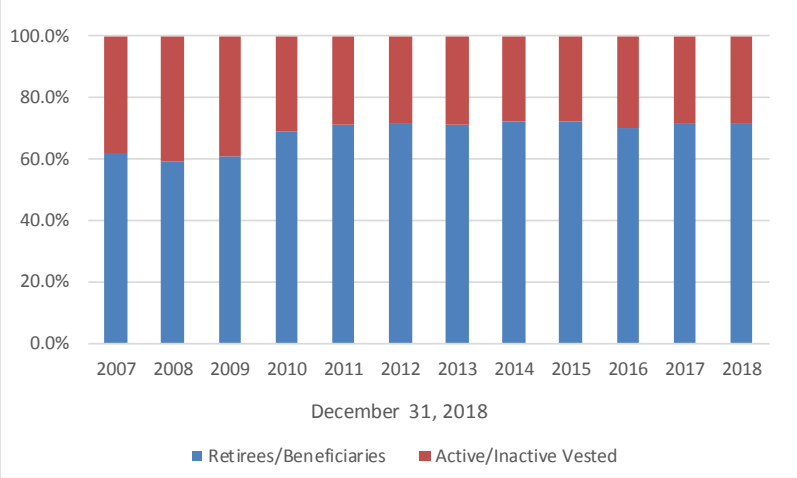


TABLE 20

COMPARISON OF VALUATION RESULTS UNDER ALTERNATE INVESTMENT RETURN ASSUMPTIONS

This exhibit compares the key January 1, 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 are unchanged for purposes of this analysis.

Investment Return Assumption	**7.25%**	**7.50%**	**7.75%**	**8.00%**	**8.25%**
Contributions					
Total Normal Cost	9.83%	9.48%	9.15%	8.85%	8.56%
Amortization of UAAL	11.85%	11.26%	10.67%	10.09%	9.51%
Actuarial Required Contribution	21.68%	20.74%	19.82%	18.94%	18.07%
Member Contribution	(9.00%)	(9.00%)	(9.00%)	(9.00%)	(9.00%)
Employer Contribution	(10.50%)	(10.50%)	(10.50%)	(10.50%)	(10.50%)
Contribution Rate Shortfall/(Margin)	2.18%	1.24%	0.32%	(0.56%)	(1.43%)
Actuarial Value of Assets ($ in thousands)	$654,259	$654,259	$654,259	$654,259	$654,259
Actuarial Accrued Liability	$1,035,262	$1,011,257	$988,235	$966,144	$944,935
Funded Ratio	63.2%	64.7%	66.2%	67.7%	69.2%

Note: All other assumptions are unchanged for purposes of this sensitivity analysis.

MEMBER CENSUS INFORMATION

A. ACTIVE MEMBERS	January 1, 2019	January 1, 2018	% Change
1. Number of Active Members			
(a) Plan B	1,634	1,852	(11.8%)
(b) Plan C	2,264	1,908	18.7%
(c) Total	3,898	3,760	3.7%
2. Active Member Averages			
(a) Age	42.7	42.8	(0.2%)
(b) Service	7.2	7.5	(4.0%)
(c) Expected Annual Pay	$ 52,158	$ 52,202	(0.1%)
B. TERMINATED VESTED MEMBERS			
1. Number of Terminated Vested Members	531	522	1.7%
2. Terminated Vested Members Averages			
(a) Age	48.6	49.8	(2.4%)
(b) Estimated Monthly Benefit	$ 647	$ 678	(4.6%)
C. TERMINATED NON-VESTED MEMBERS			
1. Number of Terminated Non-Vested Members	2,784	2,449	13.7%
2. Terminated Non-Vested Members Averages			
(a) Age	44.5	44.1	0.9%
(b) Account Balance	$ 3,767	$ 3,610	4.3%
D. RETIREES, DISABLEDS, AND BENEFICIARIES			
1. Number of Members			
(a) Retired	3,817	3,809	0.2%
(b) Disabled	79	84	(6.0%)
(c) Beneficiaries	217	219	(0.9%)
(e) Total	4,113	4,112	0.0%
2. Average Age			
(a) Retired	72.6	72.3	0.4%
(b) Disabled	68.6	67.9	1.0%
(c) Beneficiaries	74.1	74.3	(0.3%)
(e) Total	72.5	72.3	0.3%
3. Average Monthly Benefit			
(a) Retired	$ 1,665	$ 1,648	1.0%
(b) Disabled	996	1,000	(0.4%)
(c) Beneficiaries	1,128	1,121	0.6%
(e) Total	$ 1,625	$ 1,607	1.1%

MEMBER DATA RECONCILIATION

January 1, 2018 to January 1, 2019

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

	Active Members	Terminated Vested	Non-vested with Balance	Retirees	Beneficiaries*	Disabled	Total
Total as of January 1, 2018	3,760	522	2,449	3,809	219	84	10,843
New Entrants	784	0	182	0	15	0	981
Rehires/Transfers	50	(13)	(37)	0	0	0	0
Retirements	(104)	(34)	0	138	0	0	0
Disablements	0	0	0	0	0	0	0
Deaths	(1)	(8)	0	(130)	(14)	(6)	(159)
Vested Terminations	(86)	86	0	0	0	0	0
Non-vested Terminations	(293)	0	293	0	0	0	0
Refunds Paid	(210)	(21)	(104)	0	(2)	0	(337)
Payments Ended	0	0	0	0	(1)	0	(1)
Data Adjustments	(2)	(1)	1	0	0	1	(1)
Total as of January 1, 2019	3,898	531	2,784	3,817	217	79	11,326

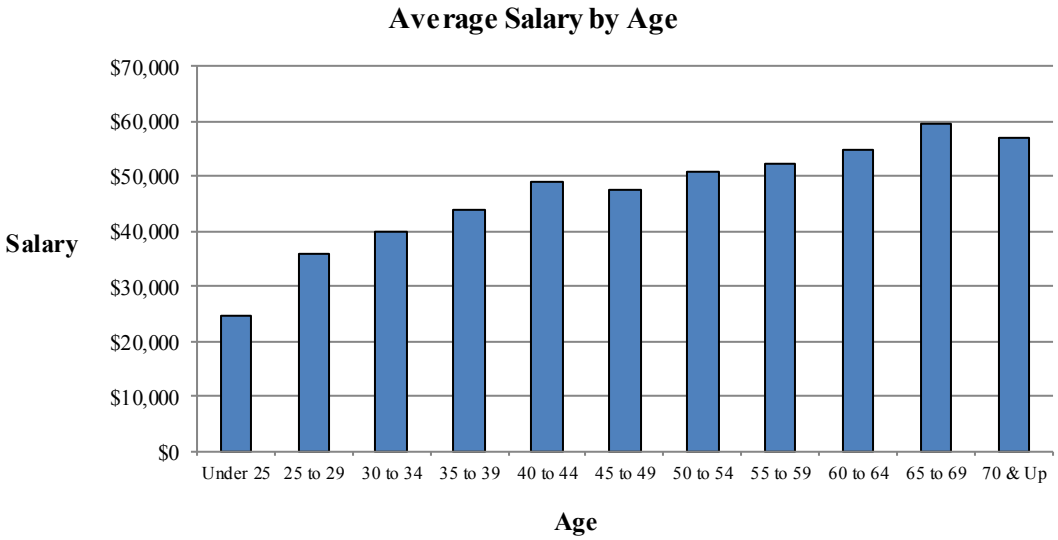
* Includes beneficiaries who were owed a single lump sum payment and were not paid prior to the valuation date.

SUMMARY OF ACTIVE MEMBERS
as of January 1, 2019

Total – All Plans

	Number			2018 Reported Compensation*		
Age	Male	Female	Total	Male	Female	Total
Under 25	40	192	232	$ 914,036	$ 4,780,536	$ 5,694,572
25 to 29	149	478	627	5,010,759	17,354,141	22,364,900
30 to 34	142	357	499	5,637,056	14,279,534	19,916,590
35 to 39	139	344	483	6,302,443	14,823,288	21,125,731
40 to 44	112	298	410	6,121,011	13,933,445	20,054,456
45 to 49	98	279	377	4,987,314	12,925,915	17,913,229
50 to 54	107	281	388	5,272,875	14,421,046	19,693,921
55 to 59	119	298	417	6,144,068	15,663,298	21,807,366
60 to 64	82	244	326	4,785,276	13,072,590	17,857,866
65 to 69	36	78	114	2,362,631	4,421,256	6,783,887
70 & Up	8	17	25	360,352	1,059,897	1,420,249
Total	1,032	2,866	3,898	$47,897,821	$126,734,946	$174,632,767

* Partial year pay amounts have not been annualized.

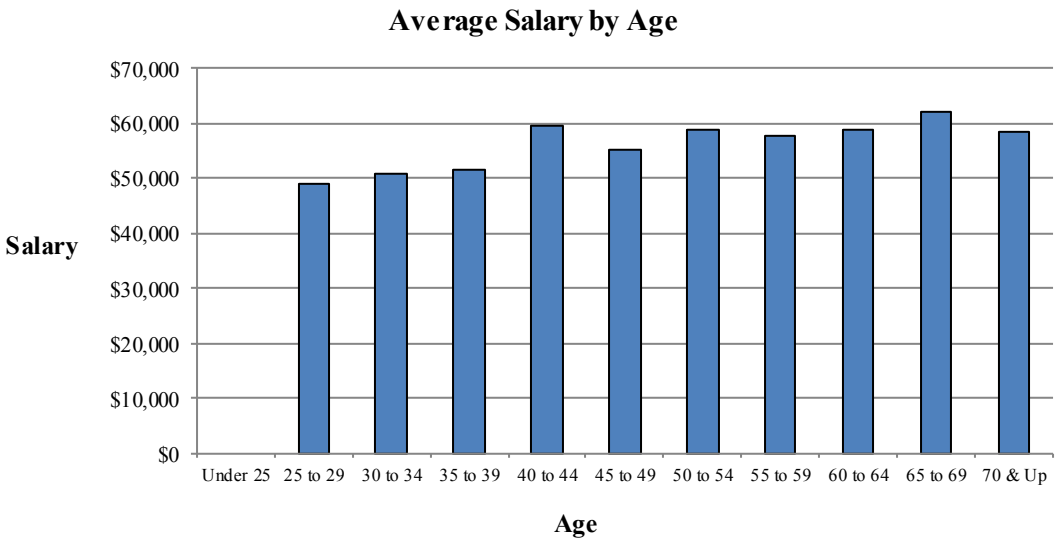


SUMMARY OF ACTIVE MEMBERS
as of January 1, 2019

Total – Plan B

Age	Number			2018 Reported Compensation*		
	Male	Female	Total	Male	Female	Total
Under 25	0	0	0	$ 0	$ 0	$ 0
25 to 29	18	63	81	882,093	3,073,823	3,955,916
30 to 34	42	91	133	2,141,651	4,593,306	6,734,957
35 to 39	52	146	198	2,977,438	7,241,275	10,218,713
40 to 44	44	137	181	2,959,165	7,784,271	10,743,436
45 to 49	44	144	188	2,702,506	7,635,653	10,338,159
50 to 54	64	161	225	3,794,897	9,439,599	13,234,496
55 to 59	79	208	287	4,618,832	11,977,785	16,596,617
60 to 64	63	173	236	4,092,965	9,732,858	13,825,823
65 to 69	23	64	87	1,530,862	3,863,015	5,393,877
70 & Up	6	12	18	289,397	759,811	1,049,208
Total	435	1,199	1,634	$25,989,806	$66,101,396	$92,091,202

* Partial year pay amounts have not been annualized.

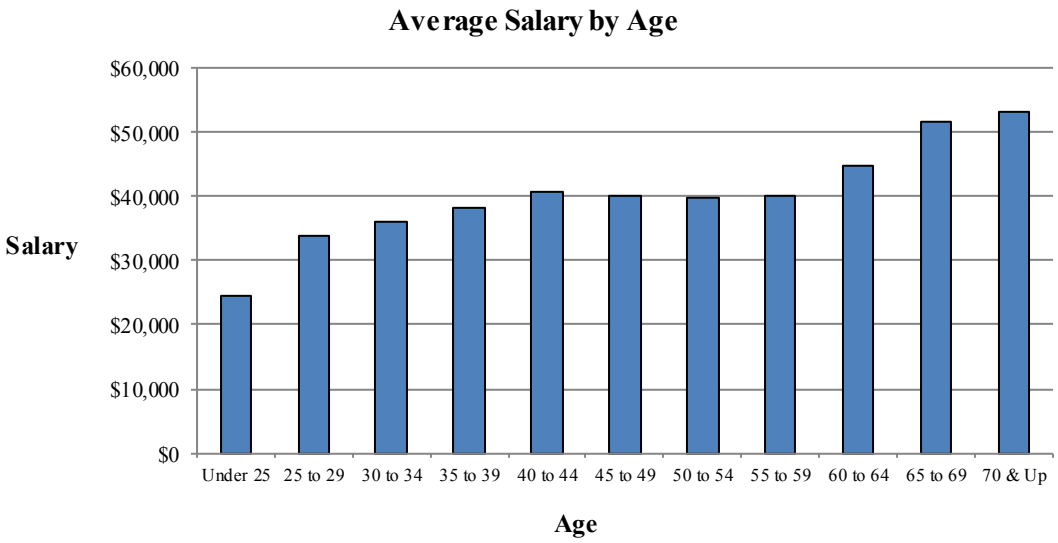


SUMMARY OF ACTIVE MEMBERS
as of January 1, 2019

Total – Plan C

	Number			2018 Reported Compensation*		
Age	Male	Female	Total	Male	Female	Total
Under 25	40	192	232	$ 914,036	$ 4,780,536	$ 5,694,572
25 to 29	131	415	546	4,128,666	14,280,318	18,408,984
30 to 34	100	266	366	3,495,405	9,686,228	13,181,633
35 to 39	87	198	285	3,325,005	7,582,013	10,907,018
40 to 44	68	161	229	3,161,846	6,149,174	9,311,020
45 to 49	54	135	189	2,284,808	5,290,262	7,575,070
50 to 54	43	120	163	1,477,978	4,981,447	6,459,425
55 to 59	40	90	130	1,525,236	3,685,513	5,210,749
60 to 64	19	71	90	692,311	3,339,732	4,032,043
65 to 69	13	14	27	831,769	558,241	1,390,010
70 & Up	2	5	7	70,955	300,086	371,041
Total	597	1,667	2,264	$21,908,015	$60,633,550	$82,541,565

* Partial year pay amounts have not been annualized.

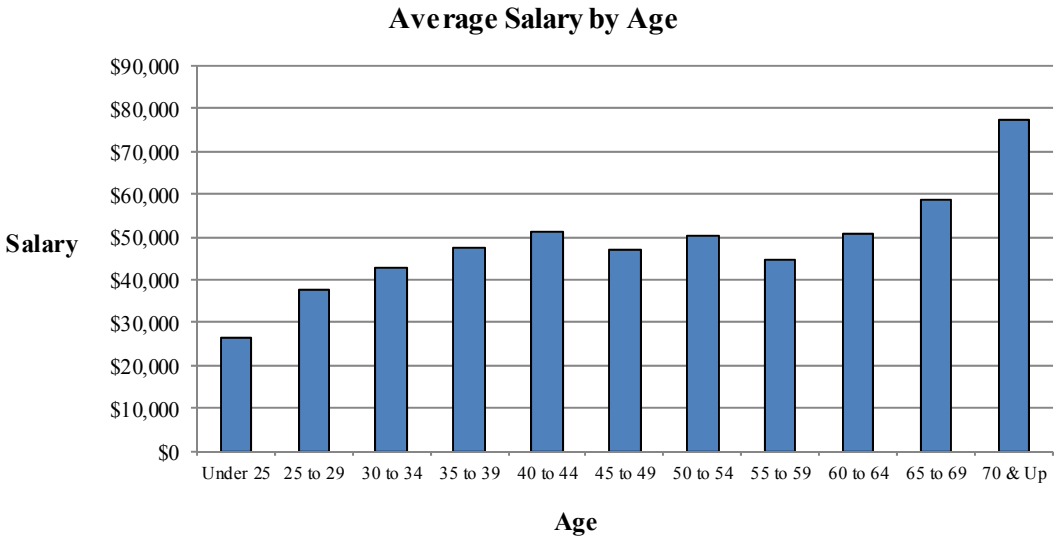


SUMMARY OF ACTIVE MEMBERS
as of January 1, 2019

Charter Schools – All Plans

	Number			2018 Reported Compensation*		
Age	Male	Female	Total	Male	Female	Total
Under 25	24	116	140	$ 554,640	$ 3,117,568	$ 3,672,208
25 to 29	73	294	367	2,485,565	11,267,450	13,753,015
30 to 34	70	211	281	3,021,124	9,046,243	12,067,367
35 to 39	56	161	217	2,673,100	7,594,433	10,267,533
40 to 44	48	120	168	2,655,061	5,916,354	8,571,415
45 to 49	40	88	128	1,987,708	4,013,706	6,001,414
50 to 54	28	76	104	1,482,144	3,767,966	5,250,110
55 to 59	30	47	77	1,359,643	2,094,921	3,454,564
60 to 64	20	47	67	1,103,238	2,288,346	3,391,584
65 to 69	11	18	29	735,010	965,938	1,700,948
70 & Up	3	5	8	172,581	446,453	619,034
Total	403	1,183	1,586	$18,229,814	$50,519,378	$68,749,192

* Partial year pay amounts have not been annualized.

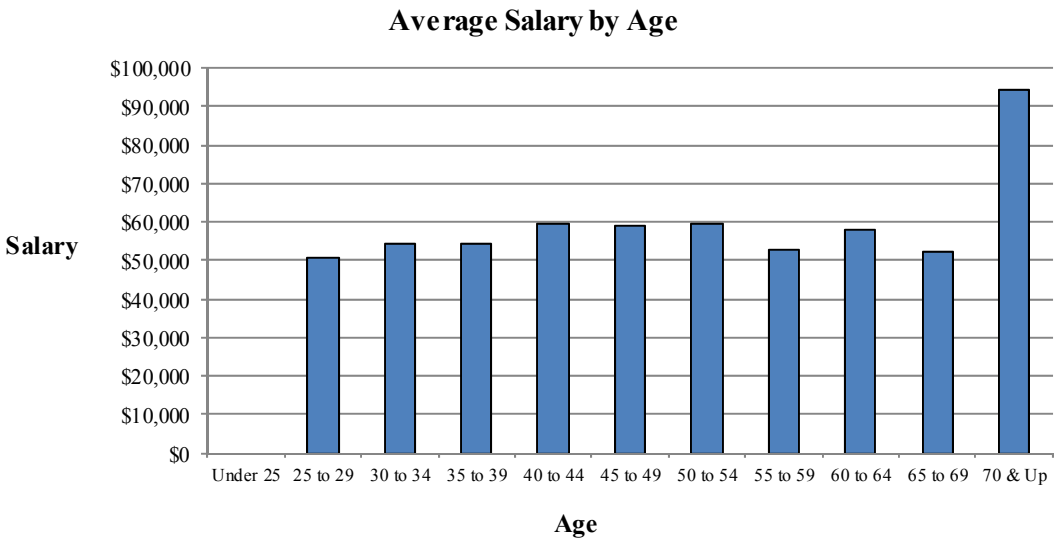


SUMMARY OF ACTIVE MEMBERS
as of January 1, 2019

Charter Schools – Plan B

	Number			2018 Reported Compensation*		
Age	Male	Female	Total	Male	Female	Total
Under 25	0	0	0	$ 0	$ 0	$ 0
25 to 29	9	42	51	448,200	2,139,675	2,587,875
30 to 34	23	57	80	1,193,441	3,157,715	4,351,156
35 to 39	19	73	92	1,085,556	3,888,178	4,973,734
40 to 44	20	56	76	1,347,688	3,173,588	4,521,276
45 to 49	18	38	56	1,115,904	2,180,747	3,296,651
50 to 54	12	38	50	893,822	2,076,097	2,969,919
55 to 59	17	18	35	892,501	948,803	1,841,304
60 to 64	13	26	39	809,853	1,446,100	2,255,953
65 to 69	4	10	14	138,748	595,194	733,942
70 & Up	2	1	3	106,832	176,477	283,309
Total	137	359	496	$8,032,545	$19,782,574	$27,815,119

* Partial year pay amounts have not been annualized.



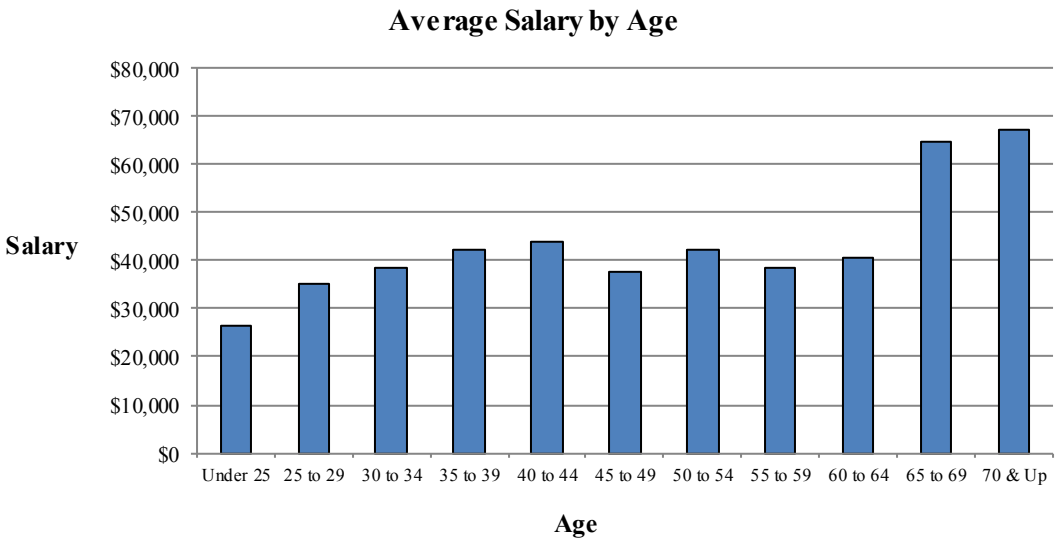
SUMMARY OF ACTIVE MEMBERS

as of January 1, 2019

Charter Schools – Plan C

	Number			2018 Reported Compensation*		
Age	Male	Female	Total	Male	Female	Total
Under 25	24	116	140	$ 554,640	$ 3,117,568	$ 3,672,208
25 to 29	64	252	316	2,037,365	9,127,775	11,165,140
30 to 34	47	154	201	1,827,683	5,888,528	7,716,211
35 to 39	37	88	125	1,587,544	3,706,255	5,293,799
40 to 44	28	64	92	1,307,373	2,742,766	4,050,139
45 to 49	22	50	72	871,804	1,832,959	2,704,763
50 to 54	16	38	54	588,322	1,691,869	2,280,191
55 to 59	13	29	42	467,142	1,146,118	1,613,260
60 to 64	7	21	28	293,385	842,246	1,135,631
65 to 69	7	8	15	596,262	370,744	967,006
70 & Up	1	4	5	65,749	269,976	335,725
Total	266	824	1,090	$10,197,269	$30,736,804	$40,934,073

* Partial year pay amounts have not been annualized.

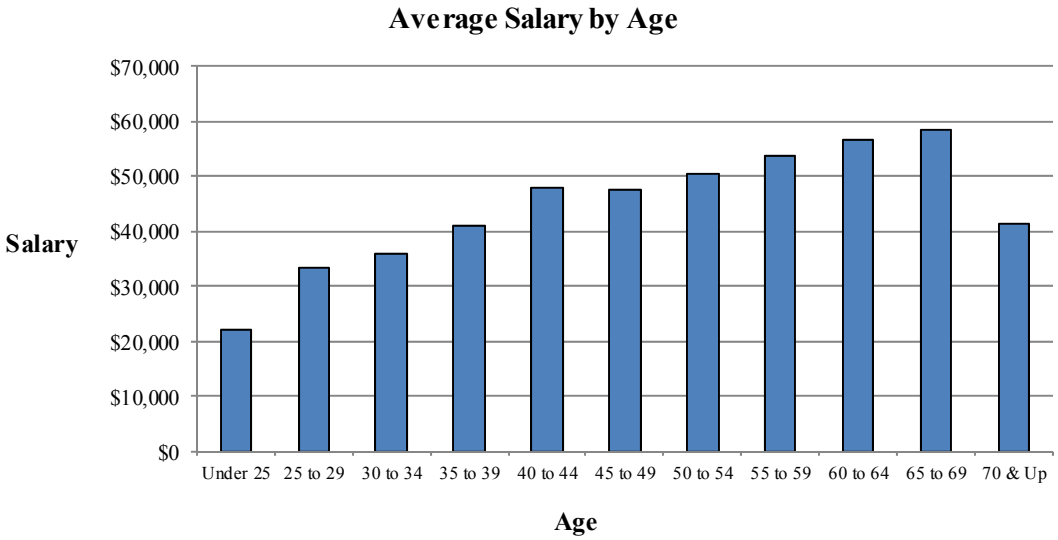


SUMMARY OF ACTIVE MEMBERS
as of January 1, 2019

School District & Retirement System – All Plans

	Number			2018 Reported Compensation*		
Age	Male	Female	Total	Male	Female	Total
Under 25	16	72	88	$ 359,396	$ 1,590,974	$ 1,950,370
25 to 29	74	177	251	2,463,565	5,932,046	8,395,611
30 to 34	67	133	200	2,422,025	4,772,234	7,194,259
35 to 39	77	169	246	3,381,662	6,681,023	10,062,685
40 to 44	59	168	227	3,307,314	7,530,856	10,838,170
45 to 49	51	178	229	2,620,107	8,282,174	10,902,281
50 to 54	74	200	274	3,497,677	10,343,160	13,840,837
55 to 59	82	236	318	4,419,289	12,633,974	17,053,263
60 to 64	55	189	244	3,396,456	10,442,700	13,839,156
65 to 69	22	59	81	1,316,755	3,404,409	4,721,164
70 & Up	5	9	14	187,771	388,423	576,194
Total	582	1,590	2,172	$27,372,017	$72,001,973	$99,373,990

* Partial year pay amounts have not been annualized.

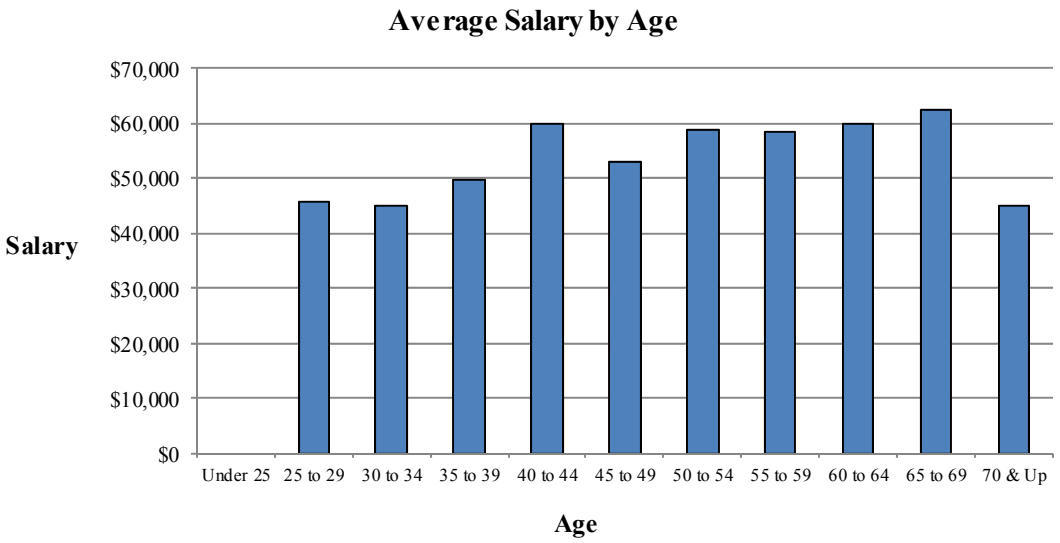


SUMMARY OF ACTIVE MEMBERS
as of January 1, 2019

School District & Retirement System – Plan B

	Number			2018 Reported Compensation*		
Age	Male	Female	Total	Male	Female	Total
Under 25	0	0	0	$ 0	$ 0	$ 0
25 to 29	9	21	30	433,893	934,148	1,368,041
30 to 34	18	33	51	898,864	1,388,553	2,287,417
35 to 39	31	67	98	1,792,485	3,088,118	4,880,603
40 to 44	22	76	98	1,526,785	4,333,988	5,860,773
45 to 49	21	97	118	1,267,823	4,989,071	6,256,894
50 to 54	47	120	167	2,608,021	7,191,106	9,799,127
55 to 59	55	177	232	3,361,195	10,195,048	13,556,243
60 to 64	44	140	184	3,028,745	7,977,474	11,006,219
65 to 69	16	53	69	1,081,248	3,216,912	4,298,160
70 & Up	4	8	12	182,565	358,313	540,878
Total	267	792	1,059	$16,181,624	$43,672,731	$59,854,355

* Partial year pay amounts have not been annualized.

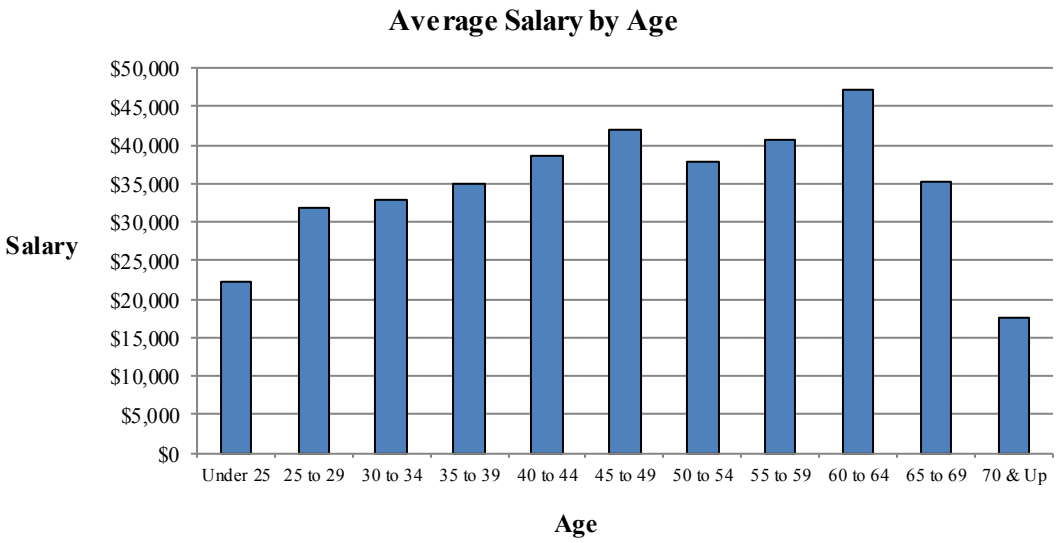


SUMMARY OF ACTIVE MEMBERS
as of January 1, 2019

School District & Retirement System – Plan C

	Number			2018 Reported Compensation*		
Age	Male	Female	Total	Male	Female	Total
Under 25	16	72	88	$ 359,396	$ 1,590,974	$ 1,950,370
25 to 29	65	156	221	2,029,672	4,997,898	7,027,570
30 to 34	49	100	149	1,523,161	3,383,681	4,906,842
35 to 39	46	102	148	1,589,177	3,592,905	5,182,082
40 to 44	37	92	129	1,780,529	3,196,868	4,977,397
45 to 49	30	81	111	1,352,284	3,293,103	4,645,387
50 to 54	27	80	107	889,656	3,152,054	4,041,710
55 to 59	27	59	86	1,058,094	2,438,926	3,497,020
60 to 64	11	49	60	367,711	2,465,226	2,832,937
65 to 69	6	6	12	235,507	187,497	423,004
70 & Up	1	1	2	5,206	30,110	35,316
Total	315	798	1,113	$11,190,393	$28,329,242	$39,519,635

* Partial year pay amounts have not been annualized.

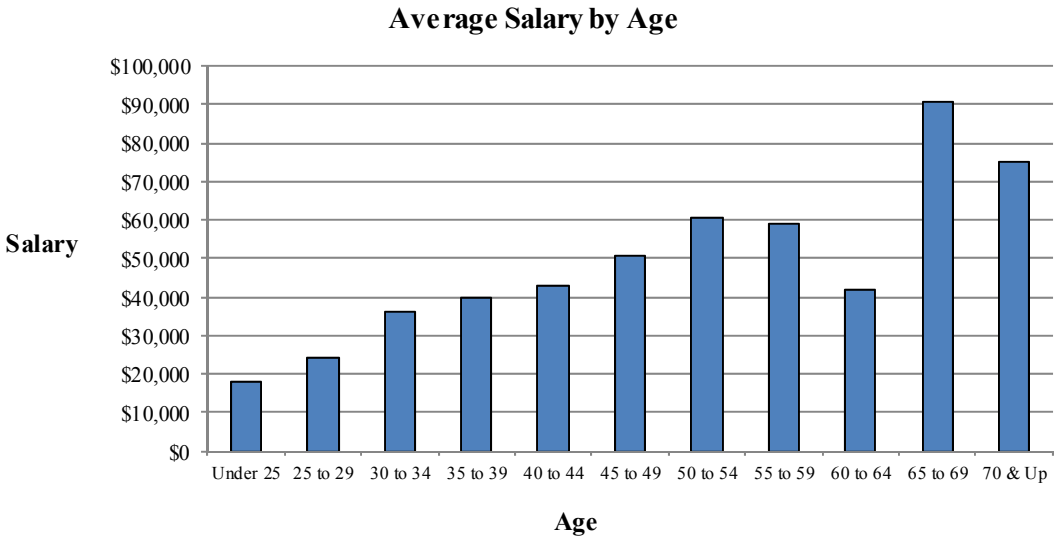


SUMMARY OF ACTIVE MEMBERS
as of January 1, 2019

Library – All Plans

	Number			2018 Reported Compensation*		
Age	Male	Female	Total	Male	Female	Total
Under 25	0	4	4	$ 0	$ 71,994	$ 71,994
25 to 29	2	7	9	61,629	154,645	216,274
30 to 34	5	13	18	193,907	461,057	654,964
35 to 39	6	14	20	247,681	547,832	795,513
40 to 44	5	10	15	158,636	486,235	644,871
45 to 49	7	13	20	379,499	630,035	1,009,534
50 to 54	5	5	10	293,054	309,920	602,974
55 to 59	7	15	22	365,136	934,403	1,299,539
60 to 64	7	8	15	285,582	341,544	627,126
65 to 69	3	1	4	310,866	50,909	361,775
70 & Up	0	3	3	0	225,021	225,021
Total	47	93	140	$2,295,990	$4,213,595	$6,509,585

* Partial year pay amounts have not been annualized.

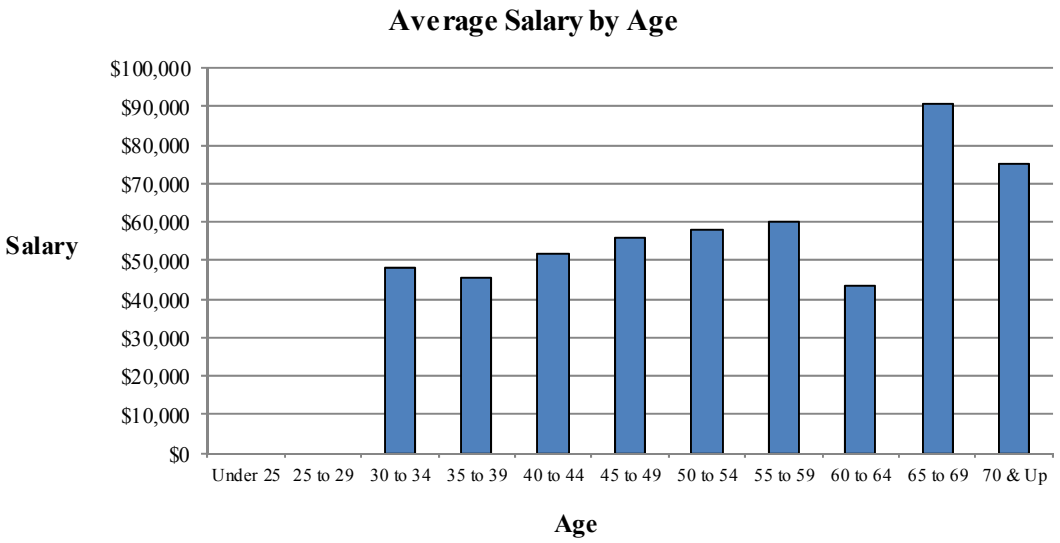


SUMMARY OF ACTIVE MEMBERS
as of January 1, 2019

Library – Plan B

Age	Number			2018 Reported Compensation*		
	Male	Female	Total	Male	Female	Total
Under 25	0	0	0	$ 0	$ 0	$ 0
25 to 29	0	0	0	0	0	0
30 to 34	1	1	2	49,346	47,038	96,384
35 to 39	2	6	8	99,397	264,979	364,376
40 to 44	2	5	7	84,692	276,695	361,387
45 to 49	5	9	14	318,779	465,835	784,614
50 to 54	5	3	8	293,054	172,396	465,450
55 to 59	7	13	20	365,136	833,934	1,199,070
60 to 64	6	7	13	254,367	309,284	563,651
65 to 69	3	1	4	310,866	50,909	361,775
70 & Up	0	3	3	0	225,021	225,021
Total	31	48	79	$1,775,637	$2,646,091	$4,421,728

* Partial year pay amounts have not been annualized.

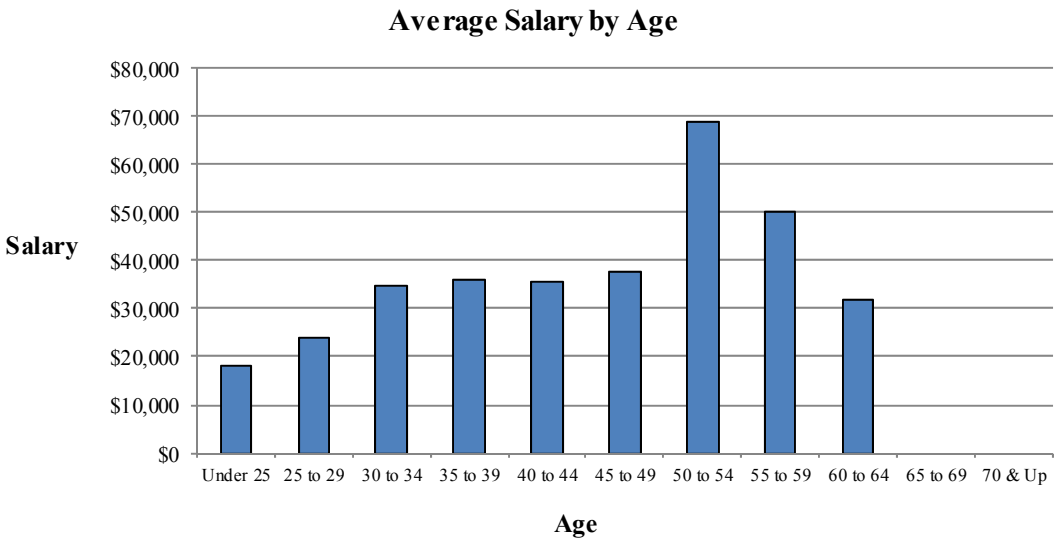


SUMMARY OF ACTIVE MEMBERS
as of January 1, 2019

Library – Plan C

	Number			2018 Reported Compensation*		
Age	Male	Female	Total	Male	Female	Total
Under 25	0	4	4	$ 0	$ 71,994	$ 71,994
25 to 29	2	7	9	61,629	154,645	216,274
30 to 34	4	12	16	144,561	414,019	558,580
35 to 39	4	8	12	148,284	282,853	431,137
40 to 44	3	5	8	73,944	209,540	283,484
45 to 49	2	4	6	60,720	164,200	224,920
50 to 54	0	2	2	0	137,524	137,524
55 to 59	0	2	2	0	100,469	100,469
60 to 64	1	1	2	31,215	32,260	63,475
65 to 69	0	0	0	0	0	0
70 & Up	0	0	0	0	0	0
Total	16	45	61	$ 520,353	$1,567,504	$2,087,857

* Partial year pay amounts have not been annualized.



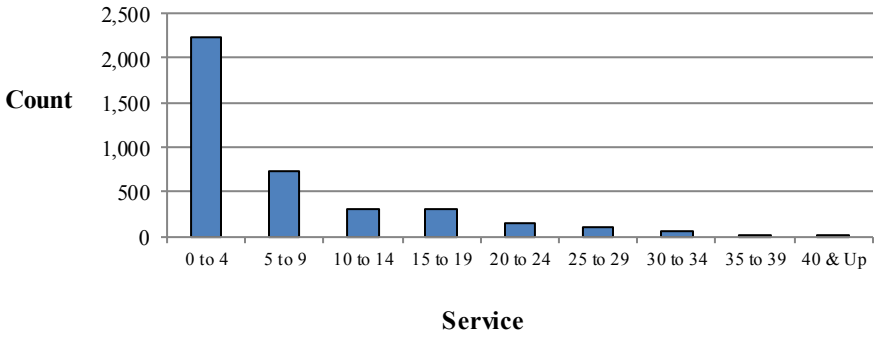
DISTRIBUTION OF ACTIVE MEMBERS

as of January 1, 2019

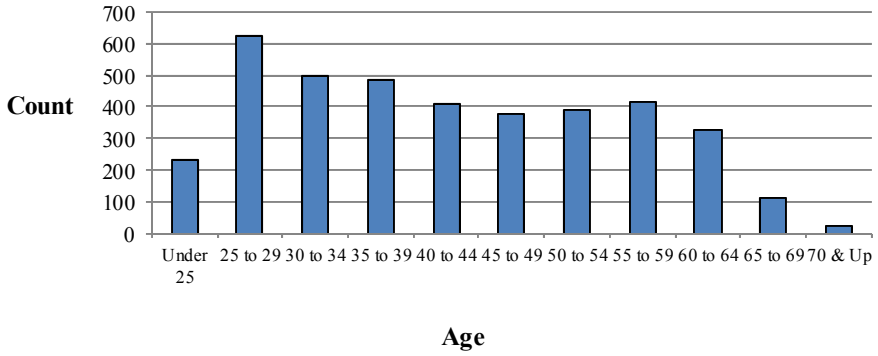
Total – All Plans

	Years of 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	232	0	0	0	0	0	0	0	0	232
25 to 29	540	87	0	0	0	0	0	0	0	627
30 to 34	355	131	13	0	0	0	0	0	0	499
35 to 39	282	126	60	15	0	0	0	0	0	483
40 to 44	225	84	39	58	4	0	0	0	0	410
45 to 49	185	70	42	39	34	7	0	0	0	377
50 to 54	160	73	34	51	33	27	10	0	0	388
55 to 59	130	70	51	58	35	39	25	9	0	417
60 to 64	91	62	49	51	28	13	22	6	4	326
65 to 69	28	19	14	23	6	12	6	1	5	114
70 & Up	9	2	2	5	2	2	0	0	3	25
Total	2,237	724	304	300	142	100	63	16	12	3,898

Service Distribution



Age Distribution

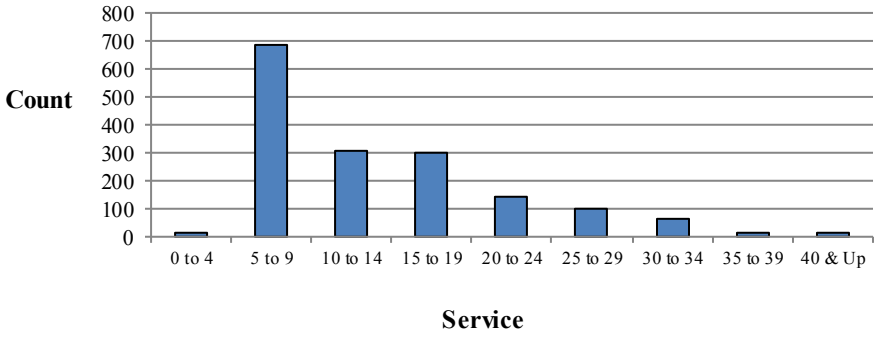


DISTRIBUTION OF ACTIVE MEMBERS
as of January 1, 2019

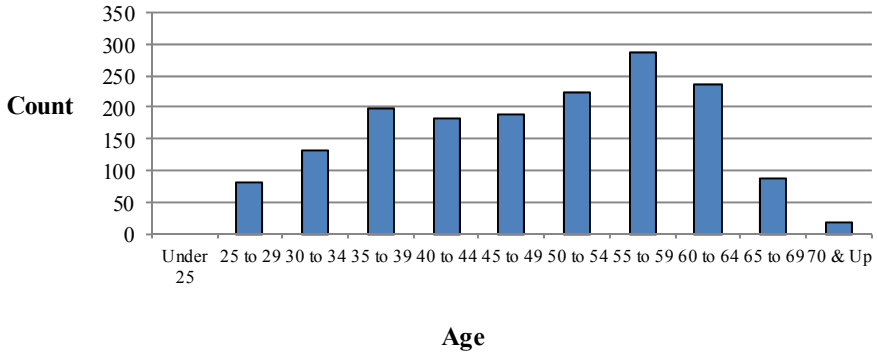
Total – Plan B

	Years of 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	81	0	0	0	0	0	0	0	81
30 to 34	1	119	13	0	0	0	0	0	0	133
35 to 39	1	122	60	15	0	0	0	0	0	198
40 to 44	0	80	39	58	4	0	0	0	0	181
45 to 49	0	66	42	39	34	7	0	0	0	188
50 to 54	0	70	34	51	33	27	10	0	0	225
55 to 59	2	68	51	58	35	39	25	9	0	287
60 to 64	4	59	49	51	28	13	22	6	4	236
65 to 69	4	16	14	23	6	12	6	1	5	87
70 & Up	2	2	2	5	2	2	0	0	3	18
Total	14	683	304	300	142	100	63	16	12	1,634

Service Distribution



Age Distribution

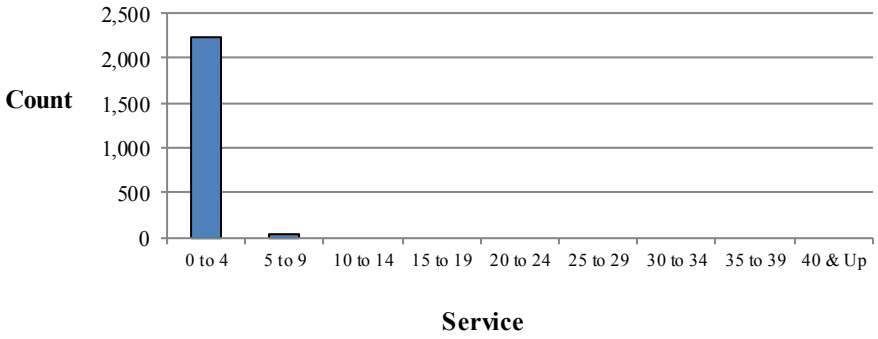


DISTRIBUTION OF ACTIVE MEMBERS
as of January 1, 2019

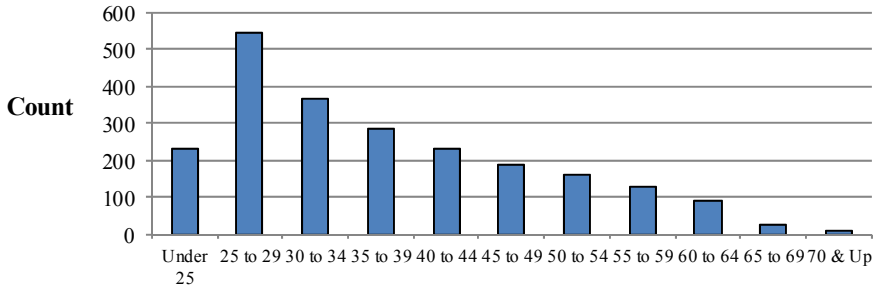
Total – Plan C

	Years of 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	232	0	0	0	0	0	0	0	0	232
25 to 29	540	6	0	0	0	0	0	0	0	546
30 to 34	354	12	0	0	0	0	0	0	0	366
35 to 39	281	4	0	0	0	0	0	0	0	285
40 to 44	225	4	0	0	0	0	0	0	0	229
45 to 49	185	4	0	0	0	0	0	0	0	189
50 to 54	160	3	0	0	0	0	0	0	0	163
55 to 59	128	2	0	0	0	0	0	0	0	130
60 to 64	87	3	0	0	0	0	0	0	0	90
65 to 69	24	3	0	0	0	0	0	0	0	27
70 & Up	7	0	0	0	0	0	0	0	0	7
Total	2,223	41	0	0	0	0	0	0	0	2,264

Service Distribution



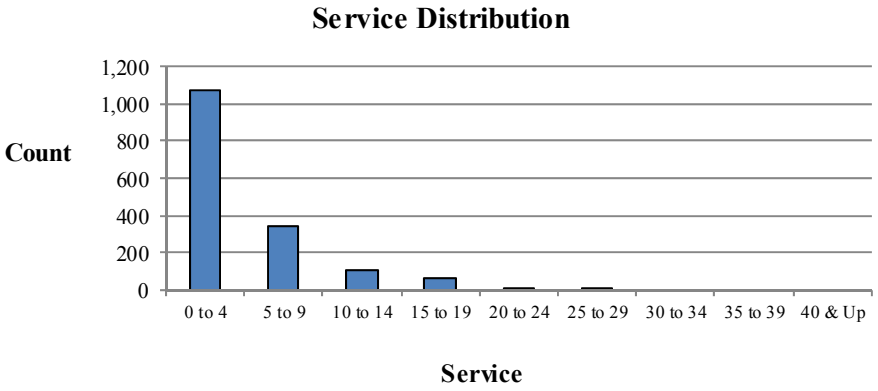
Age Distribution

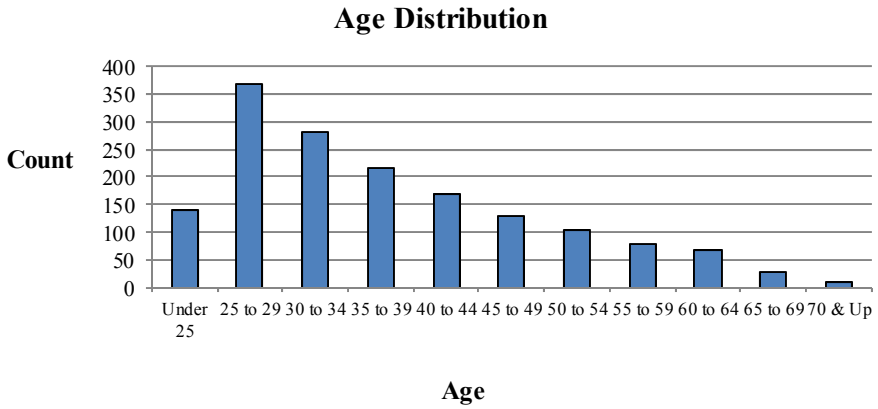


DISTRIBUTION OF ACTIVE MEMBERS
as of January 1, 2019

Charter Schools – All Plans

	Years of 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	140	0	0	0	0	0	0	0	0	140
25 to 29	310	57	0	0	0	0	0	0	0	367
30 to 34	193	82	6	0	0	0	0	0	0	281
35 to 39	121	66	27	3	0	0	0	0	0	217
40 to 44	91	41	15	20	1	0	0	0	0	168
45 to 49	71	29	14	13	1	0	0	0	0	128
50 to 54	54	28	12	9	1	0	0	0	0	104
55 to 59	42	17	12	5	0	1	0	0	0	77
60 to 64	28	18	10	8	2	1	0	0	0	67
65 to 69	14	5	3	6	0	1	0	0	0	29
70 & Up	6	1	1	0	0	0	0	0	0	8
Total	1,070	344	100	64	5	3	0	0	0	1,586





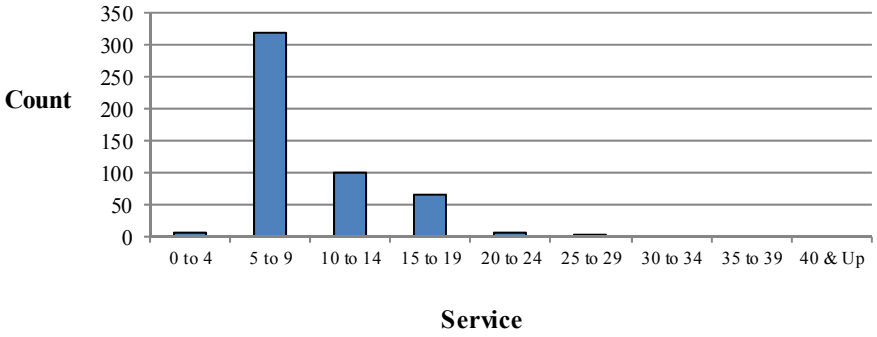
DISTRIBUTION OF ACTIVE MEMBERS

as of January 1, 2019

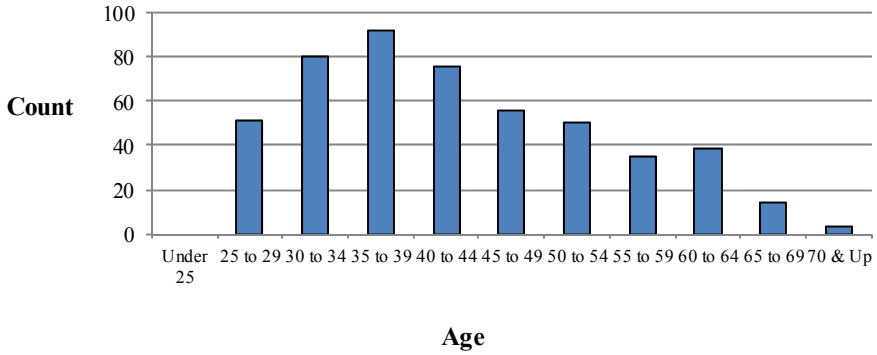
Charter Schools – Plan B

	Years of 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	51	0	0	0	0	0	0	0	51
30 to 34	1	73	6	0	0	0	0	0	0	80
35 to 39	0	62	27	3	0	0	0	0	0	92
40 to 44	0	40	15	20	1	0	0	0	0	76
45 to 49	0	28	14	13	1	0	0	0	0	56
50 to 54	0	28	12	9	1	0	0	0	0	50
55 to 59	0	17	12	5	0	1	0	0	0	35
60 to 64	1	17	10	8	2	1	0	0	0	39
65 to 69	2	2	3	6	0	1	0	0	0	14
70 & Up	1	1	1	0	0	0	0	0	0	3
Total	5	319	100	64	5	3	0	0	0	496

Service Distribution



Age Distribution



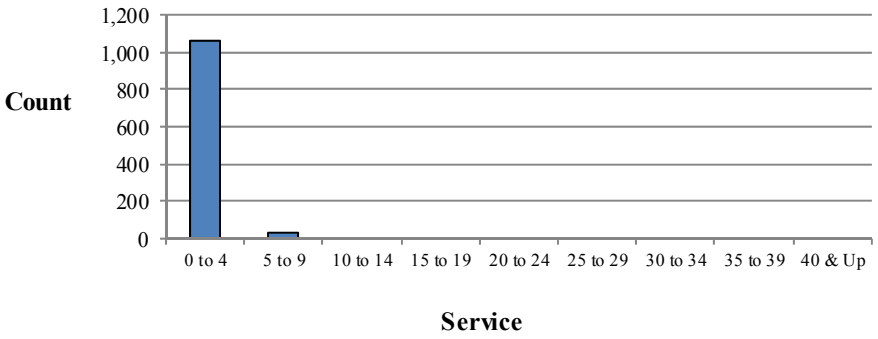
DISTRIBUTION OF ACTIVE MEMBERS

as of January 1, 2019

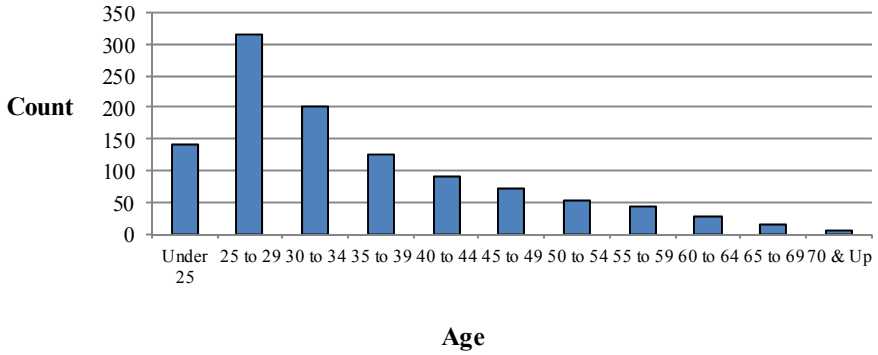
Charter Schools – Plan C

	Years of 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	140	0	0	0	0	0	0	0	0	140
25 to 29	310	6	0	0	0	0	0	0	0	316
30 to 34	192	9	0	0	0	0	0	0	0	201
35 to 39	121	4	0	0	0	0	0	0	0	125
40 to 44	91	1	0	0	0	0	0	0	0	92
45 to 49	71	1	0	0	0	0	0	0	0	72
50 to 54	54	0	0	0	0	0	0	0	0	54
55 to 59	42	0	0	0	0	0	0	0	0	42
60 to 64	27	1	0	0	0	0	0	0	0	28
65 to 69	12	3	0	0	0	0	0	0	0	15
70 & Up	5	0	0	0	0	0	0	0	0	5
Total	1,065	25	0	0	0	0	0	0	0	1,090

Service Distribution



Age Distribution

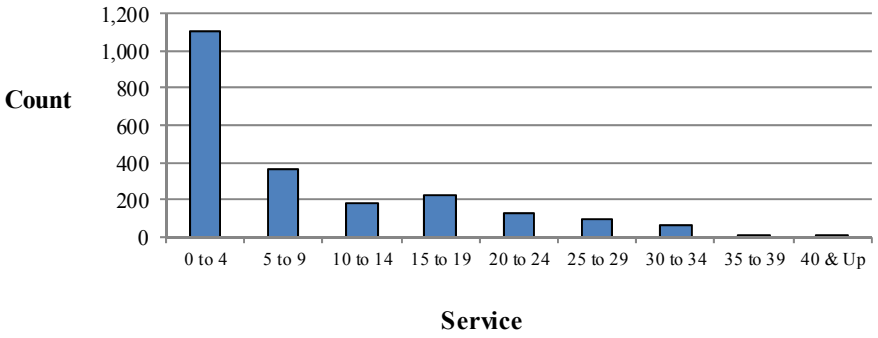


DISTRIBUTION OF ACTIVE MEMBERS
as of January 1, 2019

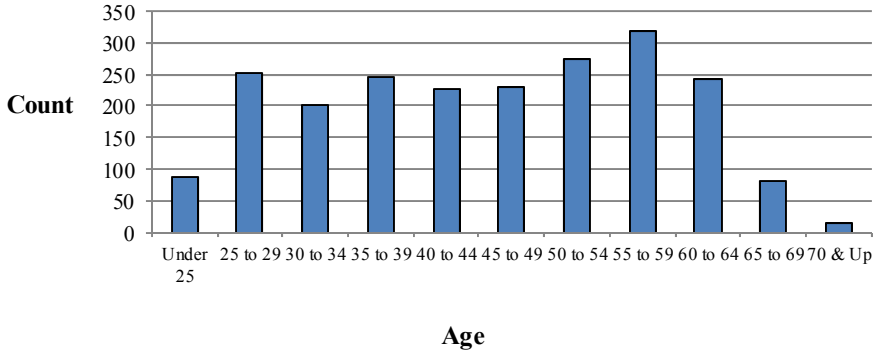
School District & Retirement System – All Plans

	Years of 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	88	0	0	0	0	0	0	0	0	88
25 to 29	221	30	0	0	0	0	0	0	0	251
30 to 34	147	46	7	0	0	0	0	0	0	200
35 to 39	148	56	31	11	0	0	0	0	0	246
40 to 44	126	41	21	36	3	0	0	0	0	227
45 to 49	108	35	23	24	32	7	0	0	0	229
50 to 54	104	44	20	40	30	26	10	0	0	274
55 to 59	86	49	31	51	33	38	25	5	0	318
60 to 64	61	43	33	41	24	10	22	6	4	244
65 to 69	14	13	10	15	6	11	6	1	5	81
70 & Up	3	1	1	5	2	1	0	0	1	14
Total	1,106	358	177	223	130	93	63	12	10	2,172

Service Distribution



Age Distribution

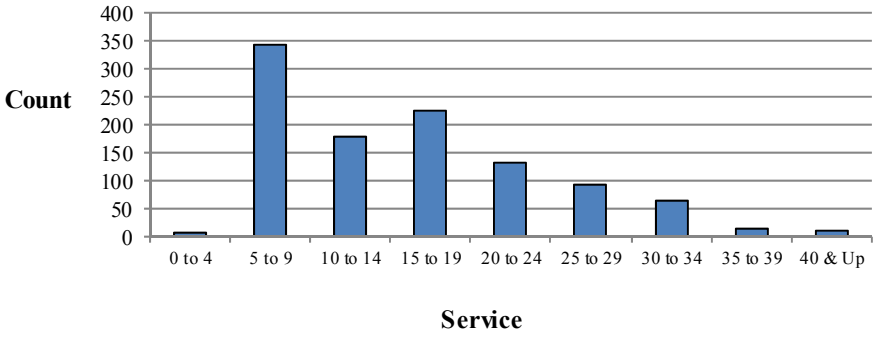


DISTRIBUTION OF ACTIVE MEMBERS
as of January 1, 2019

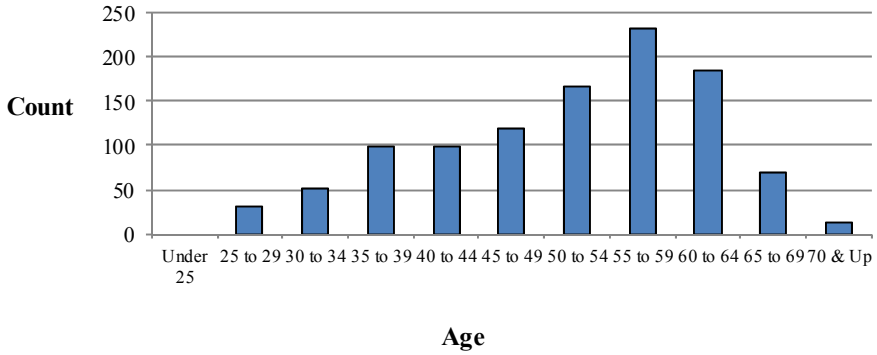
School District & Retirement System – Plan B

	Years of 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	30	0	0	0	0	0	0	0	30
30 to 34	0	44	7	0	0	0	0	0	0	51
35 to 39	0	56	31	11	0	0	0	0	0	98
40 to 44	0	38	21	36	3	0	0	0	0	98
45 to 49	0	32	23	24	32	7	0	0	0	118
50 to 54	0	41	20	40	30	26	10	0	0	167
55 to 59	2	47	31	51	33	38	25	5	0	232
60 to 64	3	41	33	41	24	10	22	6	4	184
65 to 69	2	13	10	15	6	11	6	1	5	69
70 & Up	1	1	1	5	2	1	0	0	1	12
Total	8	343	177	223	130	93	63	12	10	1,059

Service Distribution



Age Distribution



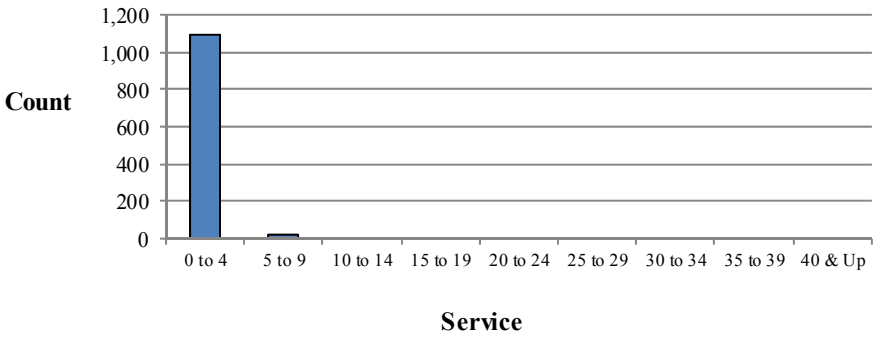
DISTRIBUTION OF ACTIVE MEMBERS

as of January 1, 2019

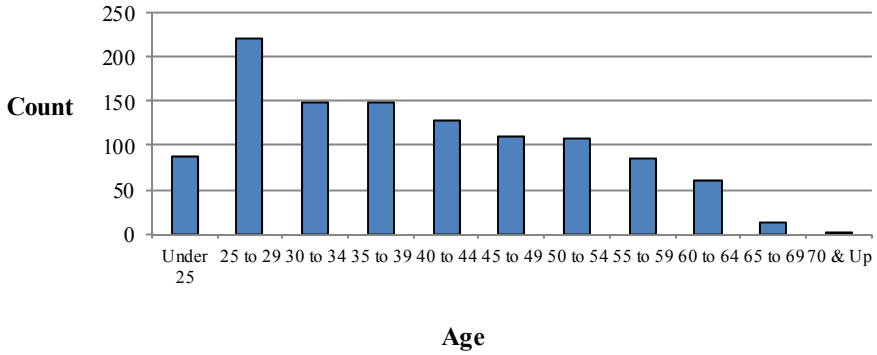
School District & Retirement System – Plan C

	Years of 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	88	0	0	0	0	0	0	0	0	88
25 to 29	221	0	0	0	0	0	0	0	0	221
30 to 34	147	2	0	0	0	0	0	0	0	149
35 to 39	148	0	0	0	0	0	0	0	0	148
40 to 44	126	3	0	0	0	0	0	0	0	129
45 to 49	108	3	0	0	0	0	0	0	0	111
50 to 54	104	3	0	0	0	0	0	0	0	107
55 to 59	84	2	0	0	0	0	0	0	0	86
60 to 64	58	2	0	0	0	0	0	0	0	60
65 to 69	12	0	0	0	0	0	0	0	0	12
70 & Up	2	0	0	0	0	0	0	0	0	2
Total	1,098	15	0	0	0	0	0	0	0	1,113

Service Distribution



Age Distribution



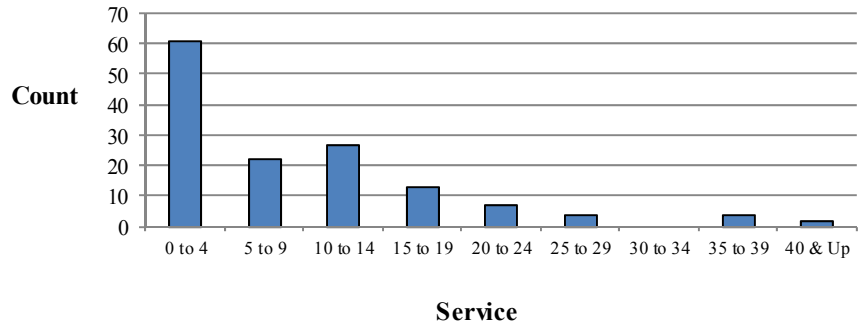
DISTRIBUTION OF ACTIVE MEMBERS

as of January 1, 2019

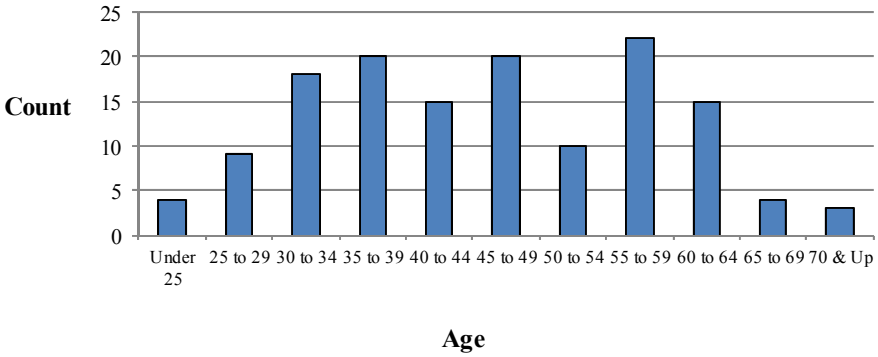
Library – All Plans

	Years of 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	0	0	0	0	0	0	0	0	4
25 to 29	9	0	0	0	0	0	0	0	0	9
30 to 34	15	3	0	0	0	0	0	0	0	18
35 to 39	13	4	2	1	0	0	0	0	0	20
40 to 44	8	2	3	2	0	0	0	0	0	15
45 to 49	6	6	5	2	1	0	0	0	0	20
50 to 54	2	1	2	2	2	1	0	0	0	10
55 to 59	2	4	8	2	2	0	0	4	0	22
60 to 64	2	1	6	2	2	2	0	0	0	15
65 to 69	0	1	1	2	0	0	0	0	0	4
70 & Up	0	0	0	0	0	1	0	0	2	3
Total	61	22	27	13	7	4	0	4	2	140

Service Distribution



Age Distribution



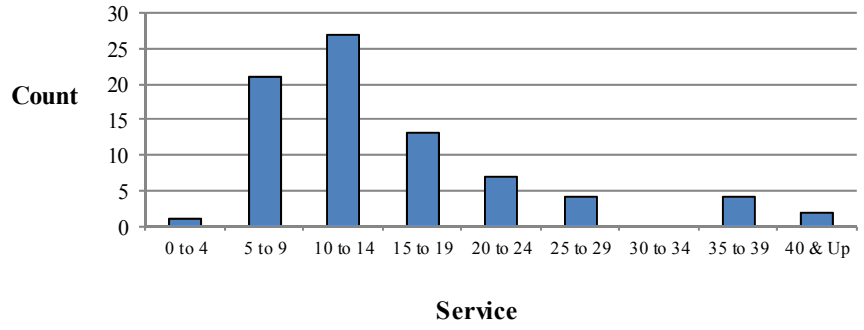
DISTRIBUTION OF ACTIVE MEMBERS

as of January 1, 2019

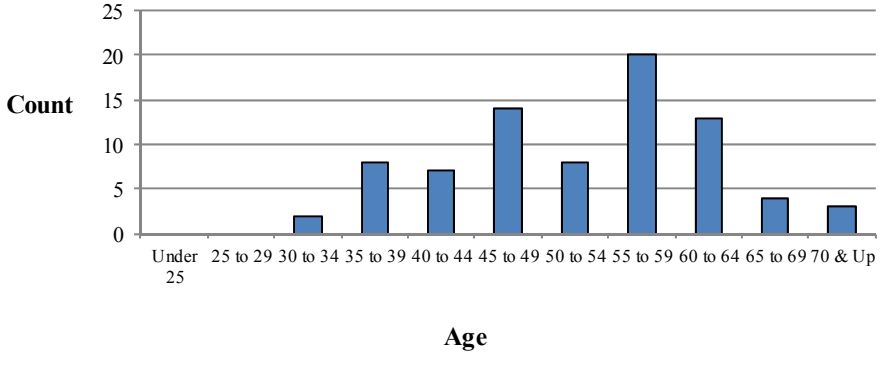
Library – Plan B

	Years of 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	2	0	0	0	0	0	0	0	2
35 to 39	1	4	2	1	0	0	0	0	0	8
40 to 44	0	2	3	2	0	0	0	0	0	7
45 to 49	0	6	5	2	1	0	0	0	0	14
50 to 54	0	1	2	2	2	1	0	0	0	8
55 to 59	0	4	8	2	2	0	0	4	0	20
60 to 64	0	1	6	2	2	2	0	0	0	13
65 to 69	0	1	1	2	0	0	0	0	0	4
70 & Up	0	0	0	0	0	1	0	0	2	3
Total	1	21	27	13	7	4	0	4	2	79

Service Distribution



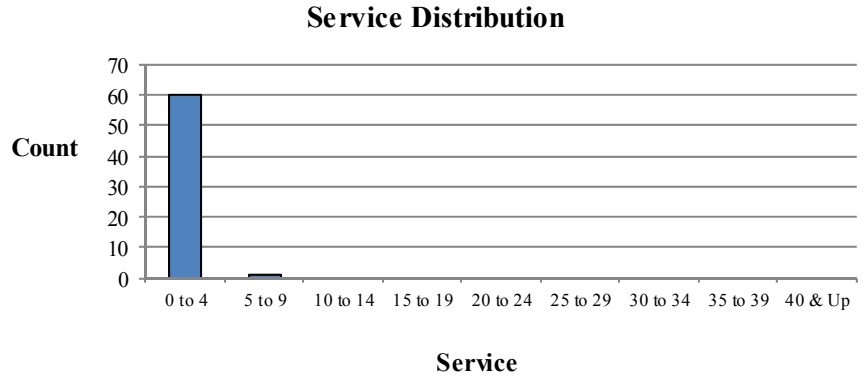
Age Distribution

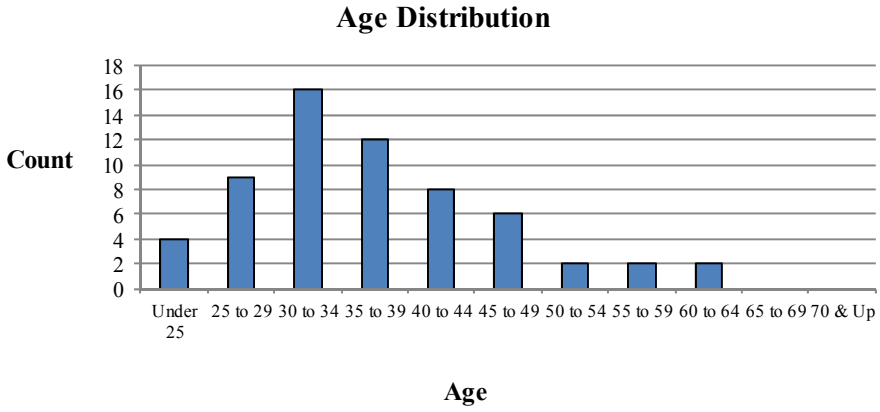


DISTRIBUTION OF ACTIVE MEMBERS
as of January 1, 2019

Library – Plan C

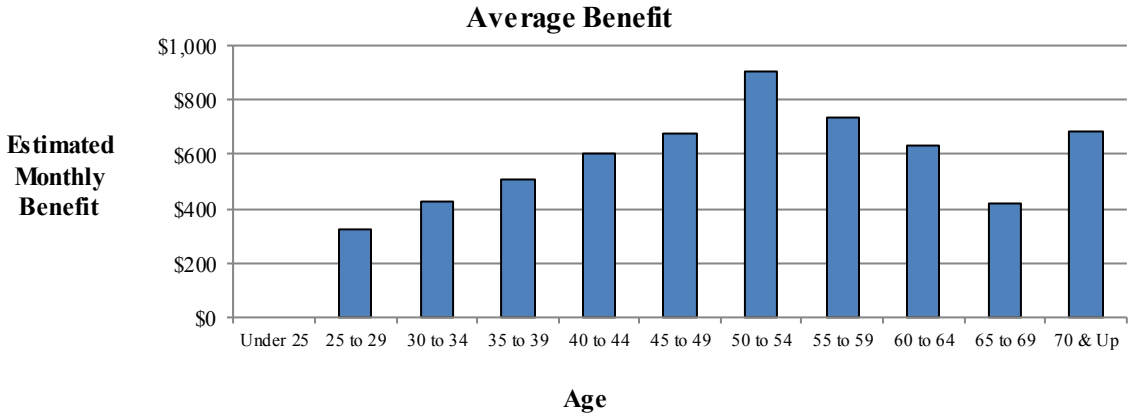
	Years of Service									
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & Up	Total
Under 25	4	0	0	0	0	0	0	0	0	4
25 to 29	9	0	0	0	0	0	0	0	0	9
30 to 34	15	1	0	0	0	0	0	0	0	16
35 to 39	12	0	0	0	0	0	0	0	0	12
40 to 44	8	0	0	0	0	0	0	0	0	8
45 to 49	6	0	0	0	0	0	0	0	0	6
50 to 54	2	0	0	0	0	0	0	0	0	2
55 to 59	2	0	0	0	0	0	0	0	0	2
60 to 64	2	0	0	0	0	0	0	0	0	2
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	60	1	0	0	0	0	0	0	0	61

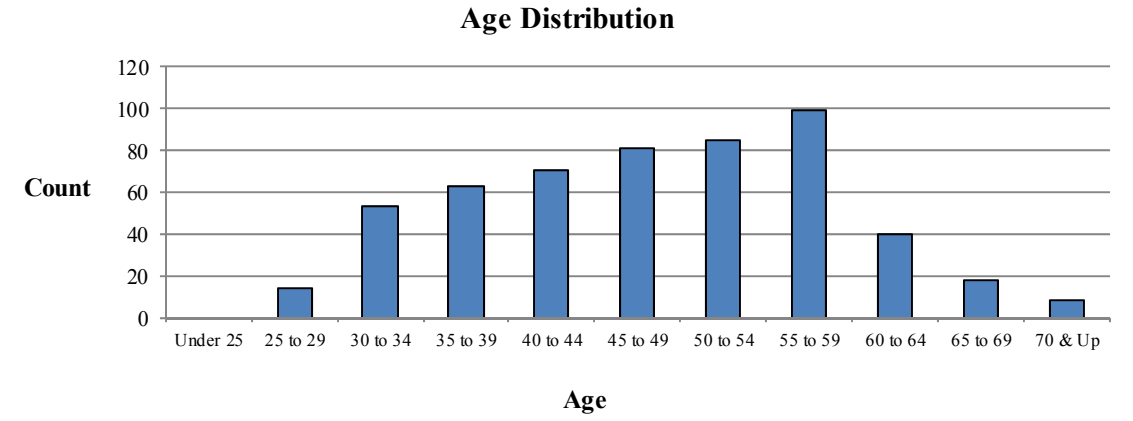




SUMMARY OF TERMINATED VESTED MEMBERS
as of January 1, 2019

	Number			Estimated Monthly Benefit		
Age	Male	Female	Total	Male	Female	Total
Under 25	0	0	0	$ 0	$ 0	$ 0
25 to 29	3	11	14	848	3,726	4,574
30 to 34	10	43	53	4,228	18,274	22,502
35 to 39	19	44	63	10,622	21,213	31,835
40 to 44	19	51	70	12,027	30,440	42,467
45 to 49	24	57	81	13,622	40,899	54,521
50 to 54	23	62	85	20,636	55,979	76,615
55 to 59	35	64	99	30,956	41,928	72,884
60 to 64	10	30	40	4,203	21,086	25,289
65 to 69	5	13	18	2,051	5,556	7,607
70 & Up	4	4	8	4,036	1,457	5,493
Total	152	379	531	$103,229	$240,558	$343,787

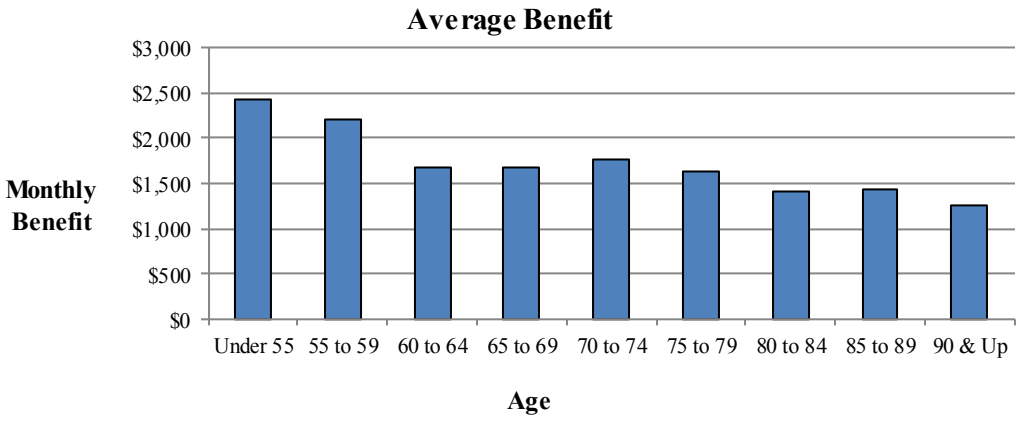


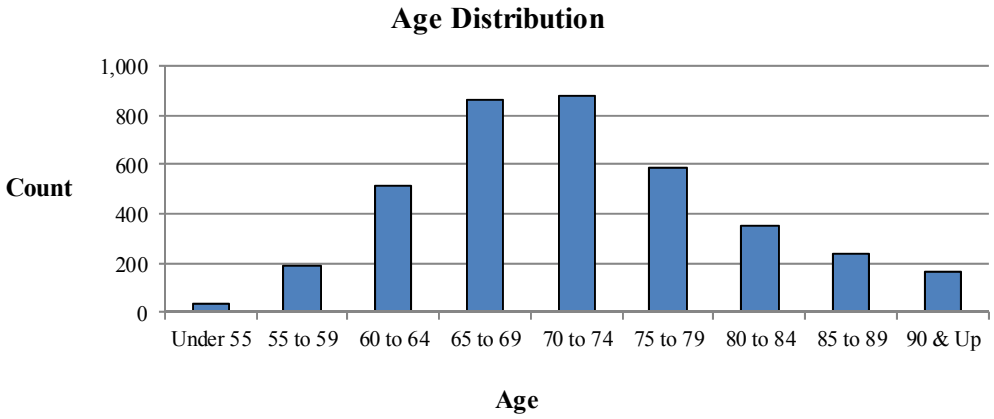


SUMMARY OF RETIRED MEMBERS

as of January 1, 2019

Age	Number			Monthly Benefit		
	Male	Female	Total	Male	Female	Total
Under 55	17	16	33	$ 40,156	$ 40,017	$ 80,173
55 to 59	54	136	190	109,246	308,668	417,914
60 to 64	144	372	516	227,792	633,587	861,379
65 to 69	202	660	862	305,297	1,147,528	1,452,825
70 to 74	234	646	880	367,656	1,184,072	1,551,728
75 to 79	138	448	586	214,192	740,915	955,107
80 to 84	95	253	348	148,800	344,403	493,203
85 to 89	56	180	236	93,390	244,117	337,507
90 & Up	35	131	166	55,234	152,135	207,369
Total	975	2,842	3,817	$ 1,561,763	$ 4,795,442	$ 6,357,205



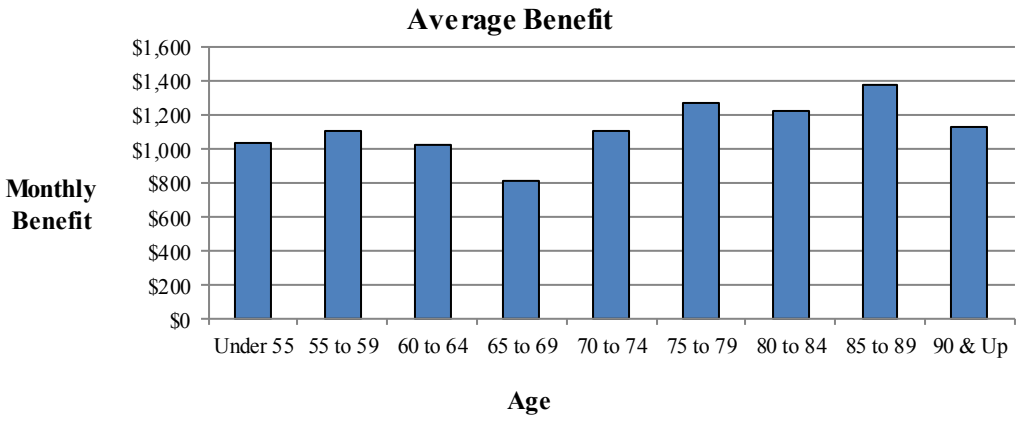


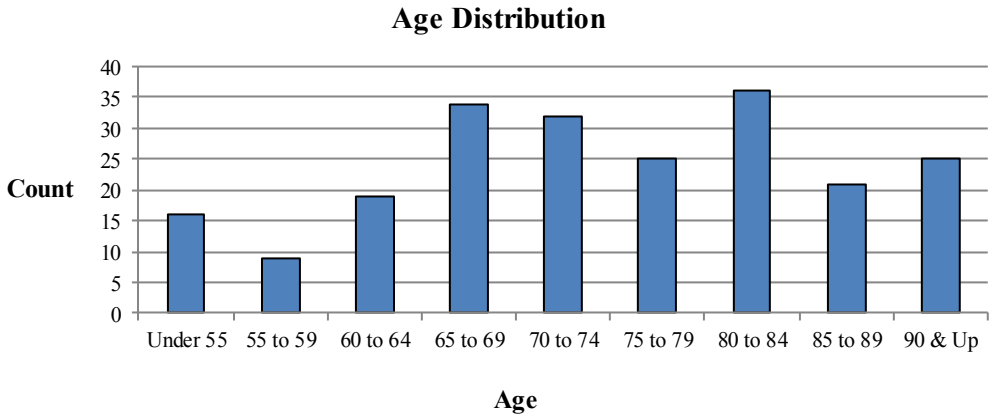
SUMMARY OF BENEFICIARIES*

as of January 1, 2019

Age	Number			Monthly Benefit		
	Male	Female	Total	Male	Female	Total
Under 55	9	7	16	$ 11,191	$ 5,396	$ 16,587
55 to 59	5	4	9	1,946	8,044	9,990
60 to 64	4	15	19	3,582	15,755	19,337
65 to 69	4	30	34	3,959	23,668	27,627
70 to 74	12	20	32	11,369	24,106	35,475
75 to 79	6	19	25	7,612	24,014	31,626
80 to 84	7	29	36	7,858	35,978	43,836
85 to 89	7	14	21	9,055	19,821	28,876
90 & Up	3	22	25	1,397	26,726	28,123
Total	57	160	217	$ 57,969	$ 183,508	$ 241,477

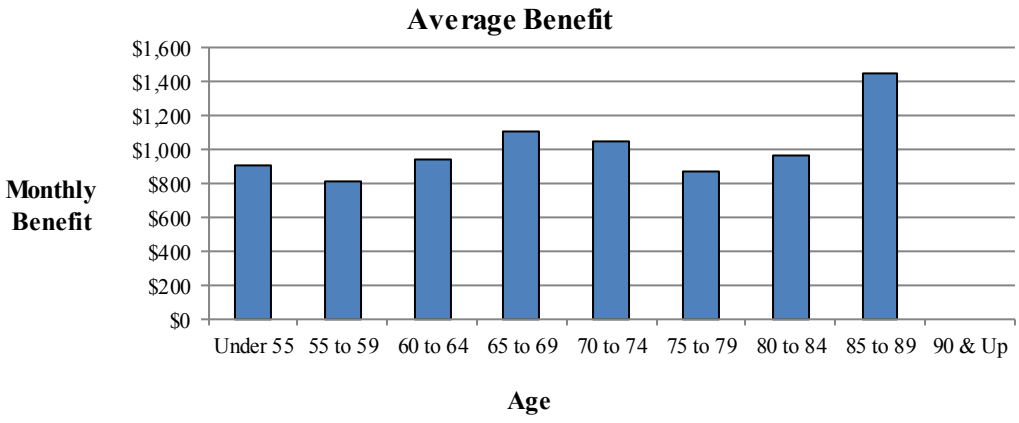
* Includes 3 beneficiaries who were owed a single lump sum payment and were not paid prior to the valuation date.

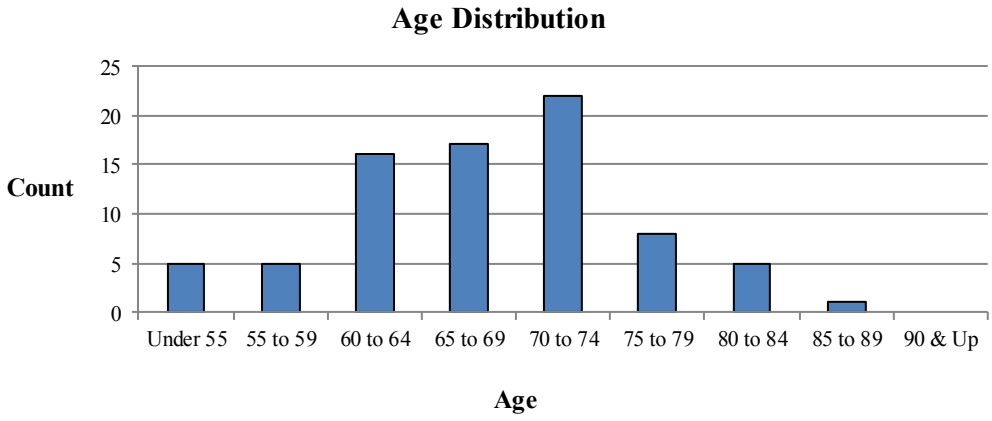




SUMMARY OF DISABLED MEMBERS
as of January 1, 2019

Age	Number			Monthly Benefit		
	Male	Female	Total	Male	Female	Total
Under 55	1	4	5	$ 826	$ 3,677	$ 4,503
55 to 59	2	3	5	2,023	2,057	4,080
60 to 64	5	11	16	3,781	11,261	15,042
65 to 69	3	14	17	3,781	15,081	18,862
70 to 74	9	13	22	9,668	13,316	22,984
75 to 79	0	8	8	0	6,990	6,990
80 to 84	1	4	5	704	4,098	4,802
85 to 89	0	1	1	0	1,449	1,449
90 & Up	0	0	0	0	0	0
Total	21	58	79	$ 20,783	$ 57,929	$ 78,712





Summary of Plan Provisions

Effective Date

January 1, 1944, most recently amended in 2018.

Plan Type

Plan B applies to anyone who retires on or after June 30, 1999 and was hired prior to January 1, 2014. Plan C applies to members hired on or after January 1, 2014. All members with Plan A benefits have terminated or retired.

Eligibility for coverage

All regular, full-time employees of the School District of Kansas City, Missouri, the Kansas City, Missouri Public Library District, the Retirement System, and the Charter Schools located within the boundaries of the Kansas City School District become members as a condition of employment. Regular employment means working at least five hours per day, five days per week, nine months per year. Temporary and part-time employees are excluded.

Service

Creditable service is member service, which is service for which required contributions have been made. There is no cap on creditable service. Prior to 1990, creditable service could not exceed 35 years. The Plan B maximum retirement benefit is 60% of Average final compensation, which will be reached upon attainment of 30 years of service. The Plan C maximum retirement benefit is 60% of Average final compensation, which will be reached upon attainment of 34.25 years of service.

Annual compensation

A member's annual compensation level will be the regular compensation shown on the employer's salary and wage schedules, excluding extra pay, overtime pay, or any pay not on the schedule.

Average final compensation

The average final compensation is the highest average annual compensation paid during any four consecutive years of service.

Normal retirement

Eligibility

Plan B: Members may retire after (a) the completion of five years of creditable service and the attainment of age 60, or (b) having a total of at least 75 credits, with each year of creditable service and year of age, both prorated for fractional years, equal to one credit.

Plan C: Members may retire after (a) the completion of five years of creditable service and the attainment of age 62, or (b) having a total of at least 80 credits, with each year of creditable service and year of age, both prorated for fractional years, equal to one credit.

Benefit

Plan B: The normal retirement benefit payable monthly equals one twelfth of 2.00% (1.75% for members who retired prior to June 30, 1999) of the member's average final compensation multiplied by years of creditable service, subject to a maximum of 60% of average final compensation. Any member whose years of creditable service exceed 34.25 years on August 28, 1993 shall have a maximum greater than 60%, which shall be equal to 1.75% times the member's years of creditable service on August 28, 1993.

Plan C: The normal retirement benefit payable monthly equals one twelfth of 1.75% of the member's average final compensation multiplied by years of creditable service, subject to a maximum of 60% of average final compensation.

Minimum benefit

Effective January 1, 1996, any member with at least 10 years of creditable service, but less than 20 years, is entitled to a minimum benefit of $150 per month, plus $15 for each year of creditable service in excess of 10 years, or the actuarial equivalent if an option was elected. Any member with at least 20 years of creditable service at retirement is entitled to a minimum benefit of $300 per month, or the actuarial equivalent of $300 if an option was elected. Beneficiaries of deceased members who retired with at least 10 years of creditable service and elected one of the optional plans for payment of benefits may receive the actuarial equivalent of the minimum benefit available for the option chosen.

Early retirement

Eligibility

Members may retire at any time after the completion of five years of creditable service and the attainment of age 55.

Benefit

Plan B: A member eligible for early retirement will receive a reduced benefit, with the reduction based on the number of months preceding eligibility for a normal retirement benefit. The reduction factors are as follows:

Age	Reduction Factor
59	0.91042
58	0.82985
57	0.75727
56	0.69175
55	0.63251

Plan C: A member eligible for early retirement will receive a reduced benefit, with the reduction based on the number of months preceding eligibility for a normal retirement benefit. The reduction factors are as follows:

Age	Reduction Factor
61	0.90799
60	0.82558
59	0.75162
58	0.68511
57	0.62518
56	0.57109
55	0.52219

Disability retirement

Eligibility

A member with at least five years of creditable service who is certified to be totally incapacitated for performance of duty by the Medical Board is eligible for a disability retirement.

Benefit

A disabled vested member will receive a benefit, calculated as for normal retirement, based on creditable service and average final compensation at actual disability retirement date, or the minimum disability benefit whichever is greater. The minimum disability retirement benefit will be the lesser of (a) 25% of the member's average final compensation, or (b) the member's service retirement benefit calculated on the member's average final compensation and the maximum number of years of creditable service the member would have earned had the member remained an employee until age 60. Disability benefits are payable immediately.

Vested termination benefits

Eligibility

A member who has at least five years of creditable service earns a vested interest in his or her accrued benefit, provided the member leaves his or her contributions in the System.

Benefit

The vested benefit is calculated as a normal retirement benefit based on service and average final compensation at date of termination and is payable at minimum normal retirement date.

Non-vested benefits

Benefit

If the member's termination is for reasons other than death or retirement and if the member has not met the vesting or retirement requirements, the member's contributions with interest will be refunded.

Death Benefit

Prior to retirement

For a member who dies before retirement and was either an active employee or an inactive vested member who met the other requirements (age or points) for either normal or early retirement, the member's designated beneficiary is entitled to receive either (a) the member's accumulated contributions and interest, or if the designated beneficiary is the member's spouse, dependent child or dependent parent, (b) a monthly retirement benefit calculated under Option 1 as if the deceased member had at least ten years of creditable service at time of death. If the beneficiary is a child, the optional monthly benefit is payable until the beneficiary reaches age nineteen.

For an inactive vested member who dies before retirement and has not met the other (age or points) requirements for retirement, the member's accumulated contributions and interest will be payable to the member's designated beneficiary.

All members are guaranteed to have their designated beneficiaries receive at least their accumulated contributions and interest, upon the member's death.

Postretirement

The benefit payment option selected by the retiree will determine what, if any, benefits are payable upon death after retirement.

Normal form of benefit payments

The normal form of benefit payment is the normal retirement benefit amount paid monthly for the life of the member. If the member should die before receiving payments totaling the amount of their contributions to the plan, the designated beneficiary shall receive a lump sum payment of the remaining amount.

Optional forms of benefit payments

Members may elect from the following optional forms of benefit payment:

Option 1

Option 1 provides a reduced retirement benefit that will continue on to a designated survivor. Upon a retiree's death, the retiree's designated survivor will receive for life, the same level of monthly retirement benefit. In the event the retiree's designated survivor predeceases the retiree, the retiree's monthly retirement benefit will be adjusted to the amount that would have been paid in the normal form of payment.

Option 2

Option 2 provides a reduced retirement benefit that will continue on to a designated survivor. Upon a retiree's death, the retiree's designated survivor will receive for life, a monthly benefit equal to one-half of the retiree's monthly retirement benefit. In the event the retiree's designated survivor predeceases the retiree, the retiree's monthly retirement benefit will be adjusted to the amount that would have been paid in the normal form of payment.

Option 3

Option 3 provides that upon a retiree's death, no benefits are payable to the retiree's estate or any beneficiary. Retirement benefits payable under this option will be actuarially increased from the normal form.

Each of the above options produces benefits which are actuarially equivalent to the normal form of benefit which is a monthly annuity payable for the lifetime of the retiree.

Cost-of-living allowances

The Board of Trustees shall determine annually whether or not the system can provide an increase in benefits for those retirees who, as of the January 1 preceding the date of such increase, have been retired at least one year. Any such increase also applies to optional retirement allowances paid to a retiree's survivor. The Board makes its determination as follows:

1. The actuary recommends to the Board what portion of the investment return is available for increases and the amount available to be paid on the first day of the 14th month following the end of the valuation year. The actuary's recommendation is subject to the following safeguards:

    a. The System's funded ratio as of the January 1st of the preceding year of the proposed increase must be at least 100% after adjusting for the effect of proposed increase. The funded ratio is the ratio of assets to the pension benefit obligation.

    b. The actuarially required contribution rate, after adjusting for the effect of the proposed increase, may not exceed the statutory contribution rate.

    c. The actuary must certify that the proposed increase will not impair the actuarial soundness of the System.

2. The Board reviews the actuary's recommendation and shall, in their discretion, determine if an increase may be granted. In accordance with Board policy, if an increase is permissible, the amount of the increase will be equal to the lesser of 3% or the percentage increase in the CPI for the preceding year, subject to a cumulative increase of 100% subsequent to December 31, 2000.

3. This provision does not guarantee an annual increase to any retired member.

Administration of the retirement system

The Board of Trustees is responsible for the general administration and proper operation of the retirement system. The Board consists of 12 members – four members appointed by the Board of Education, one member appointed by the Board of Trustees of the library district, four members elected by and from the active and terminated vested members of the retirement system, two members elected by and from the retirees of the retirement system, and the Superintendent of Schools of the School District of Kansas City, Missouri. Administrative expenses are paid out of the general reserve fund.

Employee contributions

Contributions for Employees are as follows;

- Effective July 1, 2021, if the System is at least 100% funded, the members contribute the lesser of (a) 9.00% or (b) one-half of the actuarial required contribution rate. If the System is less than 100% funded, the members contribute 9.00%.
- Effective January 1, 2016, members contribute 9.00%.
- Effective January 1, 2015, members contributed 8.50%.
- Effective January 1, 2014, members contributed 8.00%.
- Effective January 1, 1999, members contributed 7.50%.
- Prior to January 1, 1999, members contributed 5.90%.
- Prior to 1990, members contributed 5.00% of earnable annual compensation plus 2.00% of earnable compensation in excess of $6,500, the contribution earning base.

Employer contributions

Effective July 1, 2021 and for each subsequent twelve-month period beginning July 1 of each year, the employer contribution rate shall be the greater of (1) the actuarial required contribution rate, as determined in the valuation prepared for the prior calendar year, less the member contribution rate, or (2) 12.00% of pay, until the system is fully funded. Once the System is fully funded, the employer contribution rate may increase or decrease in subsequent years, depending on the actuarial contribution rate developed in the annual actuarial valuation and the applicable employee contribution rate. Effective July 1, 2021, the employer contribution rate shall not increase by more than 1.00% or decrease by more than 0.50% from the corresponding rate in effect immediately before such increase or decrease. An exception to the limitation on the magnitude of employer rate increases and decreases exists only when the system is fully funded and the total actuarial required contribution rate for employer and employee rate falls below 18%.

Prior to July 1, 2021, the employers of members contribute at the fixed rate of covered compensation as follows;

- Effective January 1, 2020, 12.00%.
- Effective January 1, 2019, 10.50%.
- Effective January 1, 2016, 9.00%.
- Effective January 1, 2015, 8.50%.
- Effective January 1, 2014, 8.00%.
- Effective January 1, 1999, 7.50%.
- Effective July 1, 1996, 5.99%.
- Effective July 1, 1995, 3.99%.
- Effective July 1, 1993, 1.99%.
- Prior to July 1, 1993, employer contributions were actuarially determined.

Changes from the Prior Valuation

The 2018 Missouri General Assembly passed a bill that changed the contribution policy beginning January 1, 2019 with respect to employers covered by the System. In accordance with the new legislation, the employer contribution rate increased to 10.50% of pay effective January 1, 2019 and will increase to 12.00% of pay effective January 1, 2020. Beginning July 1, 2021, the employer contribution rate will be the greater of (1) the actuarial required contribution rate, as determined in the valuation prepared for the prior calendar year, less the member contribution rate, or (2) 12.00% of pay, until the System is fully funded. Once the System is fully funded, the employer contribution rate may increase or decrease in subsequent years, depending on the valuation results and the employee contribution rate may decrease from 9.00% depending on valuation results. However, such changes are subject to statutory limitations. These changes to employer contributions are expected to improve the funding status of the System in the future.

ACTUARIAL COST METHOD

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

(i) The annual normal costs for each individual active member are sufficient to accumulate the value of the member's pension at time of retirement.

(ii) Each annual normal cost is a constant percentage of the member's year-by-year projected covered compensation.

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

The portion of the actuarial present value allocated to the valuation year is called the normal cost. The portion of the actuarial present value not provided for by the actuarial present value of future normal costs is called actuarial accrued liability. Deducting actuarial assets from the actuarial accrued liability determines the unfunded actuarial accrued liability or (surplus). Effective with the January 1, 2017 valuation, the existing UAAL on that date is amortized over a closed 30-year period and subsequent pieces of UAAL, arising from actuarial gains and losses each year, will be amortized over a closed 20-year period. The amortization payments on each of the UAAL bases will be determined on a level percentage of payroll basis.

CALCULATION OF THE ACTUARIAL VALUE OF ASSETS

The actuarial value of assets is based on a five-year smoothing method and is determined by spreading the effect of each year's investment return in excess of or below the expected return. The Market Value of assets on the valuation date is reduced by the sum of the following:

I. 80% of the return to be spread during the first year preceding the valuation date,
II. 60% of the return to be spread during the second year preceding the valuation date,
III. 40% of the return to be spread during the third year preceding the valuation date, and
IV. 20% of the return to be spread during the fourth year preceding the valuation date.

ACTUARIAL ASSUMPTIONS

System contribution requirements and actuarial present values are calculated by applying assumptions to the benefit provisions and membership information of the System, using the actuarial cost method.

The principal areas of risk which require assumptions about future activities of the System are:

(i) Long-term rates of investment return to be generated by the assets of the System

(ii) Patterns of pay increases to members

(iii) Rates of mortality among members, retirees and beneficiaries

(iv) Rates of withdrawal of active members

(v) Rates of disability among active members

(vi) The age patterns of actual retirements

In making a valuation, the monetary effect of each assumption is calculated for as long as a presently covered person survives – a period of time which can be as long as a century.

Actual experience of the System will not coincide exactly with assumed experience. Each valuation provides a complete recalculation of assumed future experience and takes into account all past differences between assumed and actual experiences. The result is a continual series of adjustments (usually small) to the computed contribution rate.

From time to time, one or more of the assumptions are modified to reflect experience trends (but not random or temporary year-to-year fluctuations).

Long-term Rate of Return: (net of administrative expenses): 7.75% per year, compounded annually (2.75% long-term price inflation and a 5.00% real rate of return).

Price Inflation: 2.75%

General Wage Growth (Wage Inflation): 3.50%

Payroll Growth Assumption: 3.00% per year.

Interest Crediting Rate on Member Accounts: 3.25% per year.

Salary Increase Rates: 5.00% per year.

Mortality Table: This assumption is used to measure the probabilities of members dying and the probabilities of each pension payment being made after retirement.

Healthy Retirees And Beneficiaries:	RP-2014 Healthy Annuitant Blue Collar Table with a one-year setback for females, projected 7 years from valuation date using Scale MP-2016
Disabled Retirees:	RP-2014 Disabled Table for Males and Females
Active Members:	RP-2014 Healthy Non-Annuitant Blue Collar Table with a one-year setback for females, projected 15 years from valuation date using Scale MP-2016

Rates of Retirement: These rates are used to measure the probability of eligible members retiring under the regular retirement provisions.

Retirements occur at rates based on the actual experience of the retirement system. The age-related rates used are shown in the tables below. The first year of normal retirement eligibility is the earlier of age 60 and 5 years of creditable service or 75 credits for Plan B members, and the earlier of age 62 and 5 years of creditable service or 80 credits for Plan C members.

Retirement Rates When Eligible for Unreduced Benefits		
Age	First Eligible Rate	Ultimate Rate
45 – 54	10%	12%
55 – 61	20	12
62	30	25
63	20	15
64	30	15
65 – 69	30	25
70 – 74	50	40
75	100	100

Retirement Rates When Eligible for Reduced Benefits	
Age	Rate
55 – 59	8%

Terminated vested members are assumed to begin receiving their benefits upon reaching age 60 if they participated in Plan B, and age 62 if they participated in Plan C.

Rates of Separation from Active Membership: This assumption measures the probabilities of a member terminating employment. The rates do not apply to members who are eligible to retire. Rates vary by service. Sample rates are as follows:

Years	Rate
<1	27%
1	25
5	17
10	8
15+	3

Forfeiture of Vested Benefits: Members terminating in vested status are given the option of taking a refund of their accumulated member contributions (and thereby forfeiting the employer-provided benefit) or deferring their vested benefit. Active members who terminate in the future with a vested benefit are assumed to take a deferred vested annuity, unless a refund of contributions and interest is greater than the actuarial present value of their vested deferred benefit.

Rates of Disability: This assumption measures the probabilities of a member becoming disabled.

Sample Ages	% of Active Members Becoming Disabled During Next Year
25	0.025%
30	0.050
35	0.050
40	0.050
45	0.075
50	0.125
55	0.200
60	0.250

Disability probabilities vary by age, however, not all ages are shown above.

Active Member Group Size: Assumed to remain constant.

Future Benefit Increases or Additional Benefits: When funding is adequate, the Board may authorize cost of living adjustments (COLAs), as noted in the summary of plan provisions. In the past, the Board has also sometimes granted an additional monthly payment to retirees (13th check.) This valuation assumes that no future COLAs and no future 13th checks will be awarded.

MISCELLANEOUS AND TECHNICAL ASSUMPTIONS

Marriage Assumption: All members are assumed to be married for purposes of death benefits. In each case, the male was assumed to be 4 years older than the female.

Decrement Timing: Decrements of all types are assumed to occur mid-year.

Other: The turnover decrement does not operate during retirement eligibility.

Missing Gender: Records that are missing a gender are assumed to be female if the record belongs to a member, and male if the record belongs to a beneficiary.

CHANGES FROM THE PRIOR VALUATION

There have been no changes to the actuarial assumptions or methods since the prior valuation.

Actuarial Accrued Liability	The difference between the actuarial present value of system benefits and the actuarial present value of future normal costs. Also referred to as "accrued liability" or "actuarial accrued 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 singe amount or series of amounts, computed on the basis of appropriate assumptions.
Actuarial Cost Method	A mathematical budgeting procedure for allocating the dollar amount of the actuarial present value of retirement system benefit between future normal cost and actuarial accrued liability; sometimes referred to as the "actuarial funding method".
Experience Gain (Loss)	The difference between actual experience and actuarial assumptions anticipated experience during the period between two actuarial valuation dates.
Actuarial Present Value	The amount of funds currently required to provide a payment or series of payments in the future. It is determined by discounting future payments at predetermined rates of interest and by probabilities of payment.
Amortization	Paying off an interest-discounted amount with periodic payments of interest and principal, as opposed to paying off with a lump sum payment.
Normal Cost	The actuarial present value of retirement system benefits allocated to the current year by the actuarial cost method.
Unfunded Actuarial Accrued Liability	The difference between actuarial accrued liability and the valuation assets. Most retirement systems have unfunded actuarial accrued liability. They arise each time new benefits are added and each time an actuarial loss is realized. The existence of unfunded actuarial accrued liability is not in itself bad, any more than a mortgage on a house is bad. Unfunded actuarial accrued liability does not represent a debt that is payable today. What is important is the ability to amortize the unfunded actuarial accrued liability and the trend in its amount.