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

Actuarial Valuation Report
as of January 1, 2021

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May 24, 2021

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, 2021. The major findings of the valuation are contained in this report, including the actuarial contribution rate for the 12-month period ending June 30, 2023. 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 12.00%, effective January 1, 2020. Beginning on July 1, 2021 and each year thereafter, the employer contribution rate will be determined based on the actuarial contribution rate in the actuarial valuation performed in the prior calendar year.

As a result of the most recent experience study, performed in 2020, several changes to the actuarial assumptions were recommended by the actuary and adopted by the Board. These changes are first reflected in the January 1, 2021 valuation. A summary of the assumption changes, as well as their impact on the current valuation results, can be found in the Executive Summary of this report.

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 provided for prior valuations. 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 of assumptions reflected in Appendix D 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.

In order to prepare the results in this report, we have utilized appropriate actuarial models that were developed for this purpose. These models use assumptions about future contingent events along with recognized actuarial approaches to develop the needed results. 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.

As we prepare this report, the world is still recovering from the COVID-19 pandemic. We have considered available information, but do not believe there is sufficient data yet to warrant the modification of any of our assumptions. We will continue to monitor the situation and advise the Board in the future of any adjustments we believe would be appropriate.

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.

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

Sincerely,

Patrice Beckham

Bryan K. Hoge

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

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

SECTION I: EXECUTIVE SUMMARY

This report presents the results of the January 1, 2021 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 System's funding policy and determine the contribution rates, effective July 1 of the calendar year following the valuation date;
- 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.

In 2018, the Missouri General Assembly passed legislation that increased the employer contribution rate from 9.00% to 10.50% of pay, effective January 1, 2019, and to 12.00% of pay, effective January 1, 2020. Beginning July 1, 2021, the employer contribution rate is the greater of (1) the actuarial contribution rate, as determined in the valuation prepared in 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 contribution policy can be found in Appendix C of this report. The results of the January 1, 2021 actuarial valuation are used to set the employer contribution rate for July 1, 2022 through June 30, 2023. A summary of the calculation of the employer contribution rate, effective July 1, 2022, is shown below.

Employer Contribution Rate Beginning July 1, 2022	
1. Actuarial Contribution Rate	19.49%
2. Member Contribution Rate	(9.00%)
3. Employer Actuarial Contribution Rate	10.49%
4. Funded Ratio on Valuation Date	66.48%
5. Minimum Employer Contribution Rate [If (4) < 100%, then 12.00%]	12.00%
6. Employer Contribution Rate Effective July 1, 2022 to June 30, 2023 [Maximum of (3) and (5)]	12.00%

The change to determine the employer contribution rate based on the actuarial contribution rate is expected to improve the funded status of the System over time and provide a more sustainable path toward full funding.

There were several changes to the System's actuarial methods and assumptions as the result of the comprehensive Experience Study completed in 2020. The most significant changes are outline below:

- The investment return assumption was lowered from 7.50% to 7.25%.
- The inflation assumption was lowered from 2.75% to 2.25%.
- The actuarial contribution rate includes a specific component for administrative expenses, based on the actual administrative expenses in the prior year.
- The assumed interest rate credited on employee account balances was lowered from 3.25% to 2.50%.

- The general wage increase assumption was lowered from 3.50% to 2.85%.
- The payroll growth assumption was lowered from 3.00% to 2.85%.
- The mortality assumption was changed to the Pub-2010 General Members (Below Median) Mortality Tables with a 1-year age setback for males and a 1-year age set-forward for females, projected using the most recent MP mortality improvement scale. Disabled retiree mortality rates do not reflect future mortality improvement.
- Retirement rates were modified to partially reflect observed experience.
- Termination rates were modified to partially reflect observed experience.
- The disability assumption was eliminated.
- Salary increase assumption was changed from a flat 5.00% for all years to a service-based assumption with salary increases declining with years of service.

The net impact of the changes on the January 1, 2021 valuation results is summarized in the following table (dollars in millions):

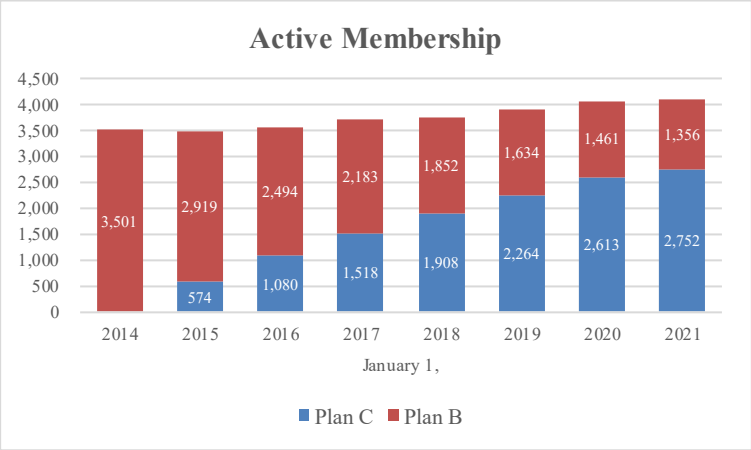
	Old Assumptions and Methods	New Assumptions and Methods	Difference
Actuarial Accrued Liability (AAL)	$1,021.5	$997.6	($23.9)
Actuarial Value of Assets	663.2	663.2	0.0
Unfunded AAL (UAAL)	$ 358.3	$334.4	($23.9)
Funded Ratio	64.9%	66.5%	1.6%
Normal Cost Rate	9.40%	9.63%	0.23%
Administrative Expense	0.00%	0.71%	0.71%
UAAL Rate	10.58%	9.15%	(1.43%)
Recommended Contribution Rate	19.98%	19.49%	(0.49%)

The actuarial valuation results provide a "snapshot" view of the System's financial condition on January 1, 2021, which reflects net favorable experience for the past plan year as demonstrated by an unfunded actuarial accrued liability that was lower than expected, after reflecting the impact of the change in assumptions. The net experience on liabilities resulted in a gain of $6.7 million. There was also favorable experience on the actuarial value of assets resulting in an actuarial gain of $10.4 million. The combined impact of asset and liability experience was an actuarial gain of $17.0 million. The System's unfunded actuarial accrued liability decreased from $374.7 million in the January 1, 2020 valuation to $334.4 million in the January 1, 2021 valuation. A detailed analysis of the change in the unfunded actuarial accrued liability is shown on page 6.

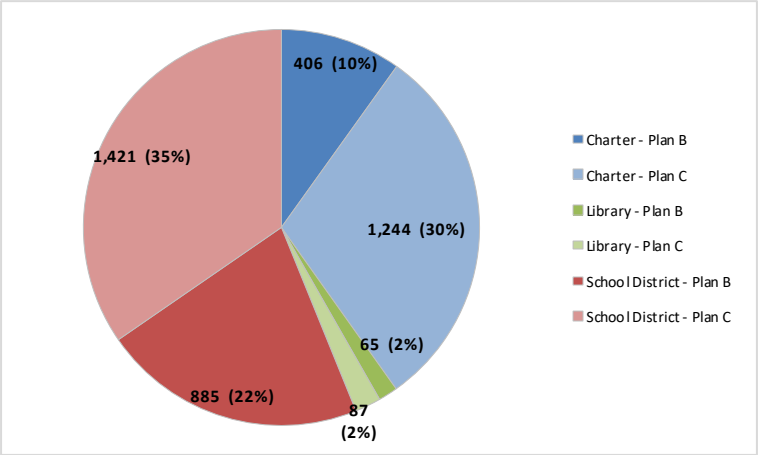
In the following pages, changes in the membership, assets, liabilities, and contributions of the System over the last year are discussed in more detail.

MEMBERSHIP

The size of the active membership increased about 0.8%, from 4,074 in the 2020 valuation to 4,108 in the current valuation. There are different benefit provisions applicable to the current active members. The number of actives covered by Plan C, which was effective for members hired on and after January 1, 2014, increased from 2,613 last year (about 64%) to 2,752 in the 2021 valuation (about 67%). 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	2,306	$48,344	45.6	8.7
Charter Schools	1,650	47,490	38.7	5.4
Library	152	53,264	46.0	8.9
Total	4,108	$48,183	42.8	7.4

Total covered payroll (on which contributions are expected to be paid) increased by 5.0% from the prior valuation (the assumption was 3.0% for 2020). When the actual increase in covered payroll is more than expected, it reduces the UAAL contribution rate for the current valuation since the UAAL payment is divided by higher payroll than expected.

The number of terminated members decreased by 1.6% from the 2020 valuation with most of the decrease in the number of non-vested members. The number of members in pay status decreased about 1%, from 4,145 in the 2020 valuation to 4,099 in the 2021 valuation.

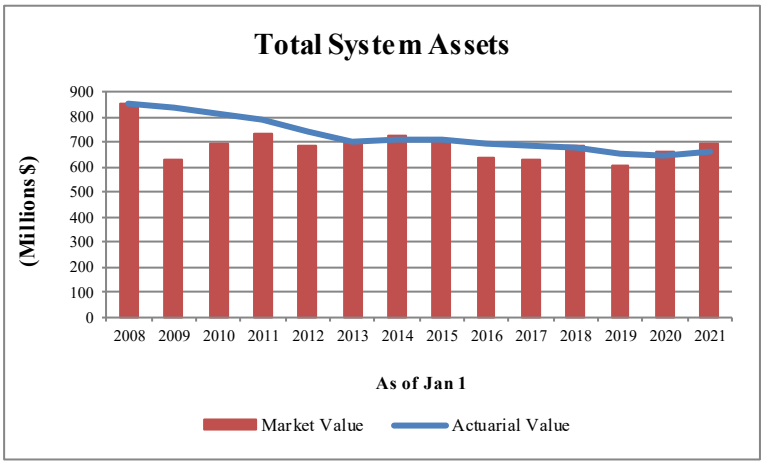
ASSETS

As of January 1, 2021, the System had total assets of $694.2 million when measured on a market value basis, an increase of over $32 million from the January 1, 2020 value of $662.1 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 11.2%, but due to the use of an asset smoothing method the return on the actuarial value of assets was 9.2%. Because the investment return on the actuarial value of assets was higher than the actuarial assumed rate of return (7.50% for 2020), an actuarial gain on assets occurred. Due to the favorable investment experience during 2020, along with the scheduled recognition of the deferred investment experience in the actuarial value of assets, the net deferred asset gain of $16.7 million in the January 1, 2020 valuation has increased to a net deferred asset gain of $31.0 million in the January 1, 2021 valuation.

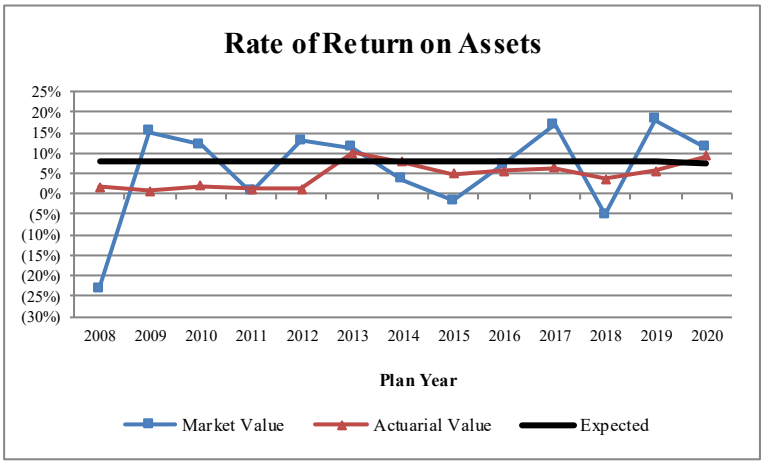
The components of the change in the market and actuarial value of assets for the System (in millions) are set forth below:

	Market Value ($M)	Actuarial Value ($M)
Assets, January 1, 2020	$662.1	$645.4
- Employers and Member Contributions	45.3	45.3
- Benefit Payments and Refunds	(84.8)	(84.8)
- Administrative Expenses	(1.6)	(1.6)
- Net Investment Income	73.2	58.9
Assets, January 1, 2021	$694.2	$663.2
Estimated Rate of Return	11.2%	9.2%

The market value of assets is about 4.5% higher than the actuarial value of assets indicating a net unrecognized asset gain exists. Unless offset by future investment losses or other unfavorable actuarial experience, the recognition of the $31.0 million net deferred gain will flow through the asset smoothing method over the next four years and positively impact the funded ratio and actuarial contribution rate. If the net deferred gain was recognized immediately in the actuarial value of assets, the funded percentage would increase from 66% to 70% and the actuarial contribution rate for the System would decrease from 19.49% to 18.41% 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, 2021 are:

Actuarial Accrued Liability	$997,587,405
Actuarial Value of Assets	663,210,594
Unfunded Actuarial Accrued Liability	$334,376,811

The existence of an unfunded actuarial accrued liability means that the System's assets on an actuarial basis are below the target amount for an ongoing plan using the actuarial cost method and actuarial assumptions in place. Consequently, contributions in excess of the normal cost will be needed in order for the System to reach fully funded status, if 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 11 of this report.

Between January 1, 2020 and January 1, 2021, the change in the unfunded actuarial accrued liability for the System was as follows (in millions):

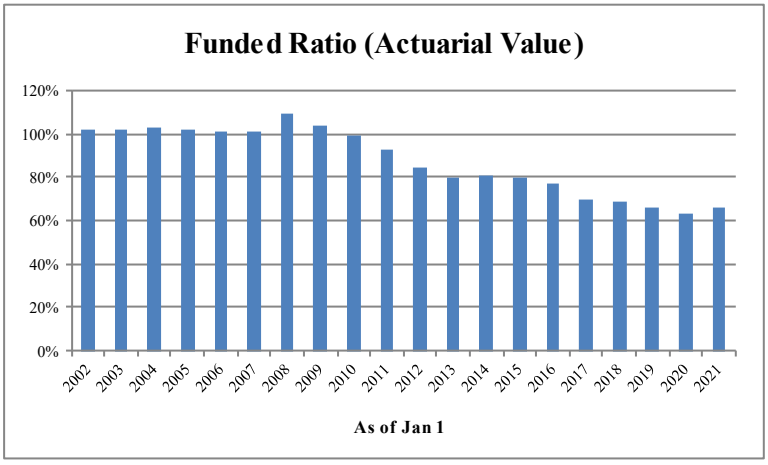
	($ Millions)
Unfunded Actuarial Accrued Liability, January 1, 2020	$ 374.7
- Expected increase from amortization method	2.6
- Actual versus actuarial contributions	(0.5)
- Investment experience	(10.4)
- Liability experience	(6.7)
- Assumption changes	(23.9)
- Other experience	(1.4)
Unfunded Actuarial Accrued Liability, January 1, 2021	$ 334.4

The experience gain for the 2020 plan year of $17.1 million reflects the combined impact of an actuarial gain of $6.7 million on System liabilities and an actuarial gain of $10.4 million on System assets (actuarial value). The largest source of the experience gain on the liabilities was more deaths than expected during 2020.

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:

	1/1/2017*	1/1/2018	1/1/2019	1/1/2020*	1/1/2021*
Actuarial Accrued Liability ($M)	$981.5	$980.4	$988.2	$1,020.1	$997.6
Actuarial Value of Assets ($M)	$684.4	$678.3	$654.3	$645.4	$663.2
Funded Ratio (Actuarial Value)	69.7%	69.2%	66.2%	63.3%	66.5%
Market Value of Assets ($M)	$631.4	$685.8	$602.8	$662.1	$694.2
Funded Ratio (Market Value)	64.3%	70.0%	61.0%	64.9%	69.6%

*Results reflects the impact of changes to the actuarial assumptions, including a decrease in the investment return assumption from 8.00% to 7.75% in 2017, from 7.75% to 7.50% in 2020, and from 7.50% to 7.25% in 2021.



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. Actual 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.

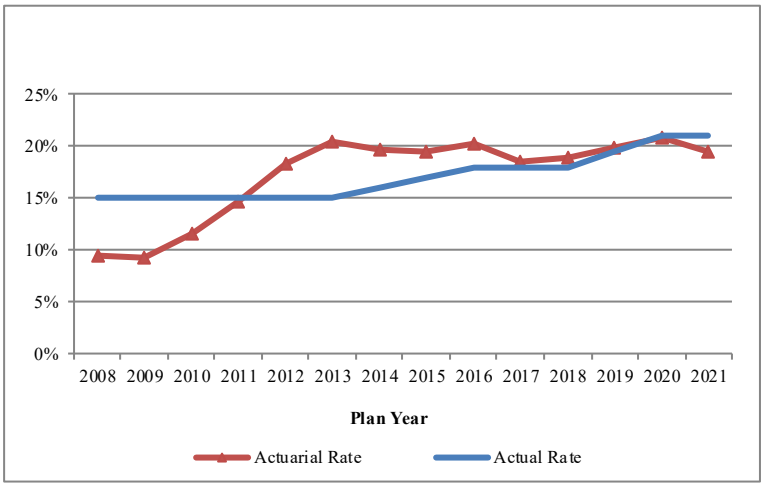
As mentioned earlier in this report, due to the asset smoothing method there is currently a $31.0 million difference between the market value and the actuarial value of assets. To the extent there is not unfavorable investment experience to offset the net deferred investment gain of $31.0 million, it will be recognized in future years and the System's funded status will improve. The System's funded status will continue to be heavily dependent on future investment experience.

CONTRIBUTION RATES

Contributions to the System consist of:

- The "normal cost" for the portion of projected liabilities allocated to service of members during the year following the valuation date by the actuarial cost method;
- An "administrative expense" component for the expenses expected to be paid from the trust for the year; 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 total 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 increased to 12% on January 1, 2020. Beginning July 1, 2021, the employer contribution rate will be based on the valuation results.

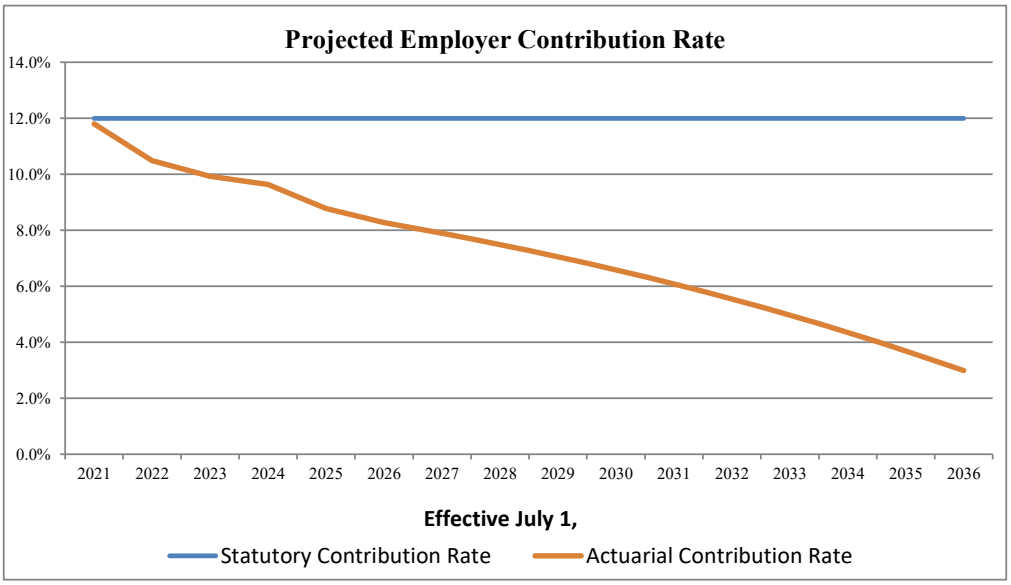
As of January 1, 2021, the actuarial accrued liability exceeds the actuarial value of assets, so an unfunded actuarial accrued liability (UAAL) exists. The "legacy UAAL", the January 1, 2017 UAAL, is amortized over a closed 30-year period and subsequent pieces of UAAL, determined each year in the valuation process, are amortized over separate, closed 20-year periods. The amortization payments on each of the UAAL bases are determined as a level percentage of payroll. The resulting UAAL contribution rate is 9.15% of pay. The System's actuarial contribution rate is the sum of the normal cost, the administrative expense cost, and the UAAL amortization contribution or 19.49% of pay (9.63% normal cost plus 0.71% administrative expense plus 9.15% UAAL contribution).

The various factors contributing to the change in the actuarial contribution rate from the January 1, 2020 valuation to the January 1, 2021 valuation are shown in the following table:

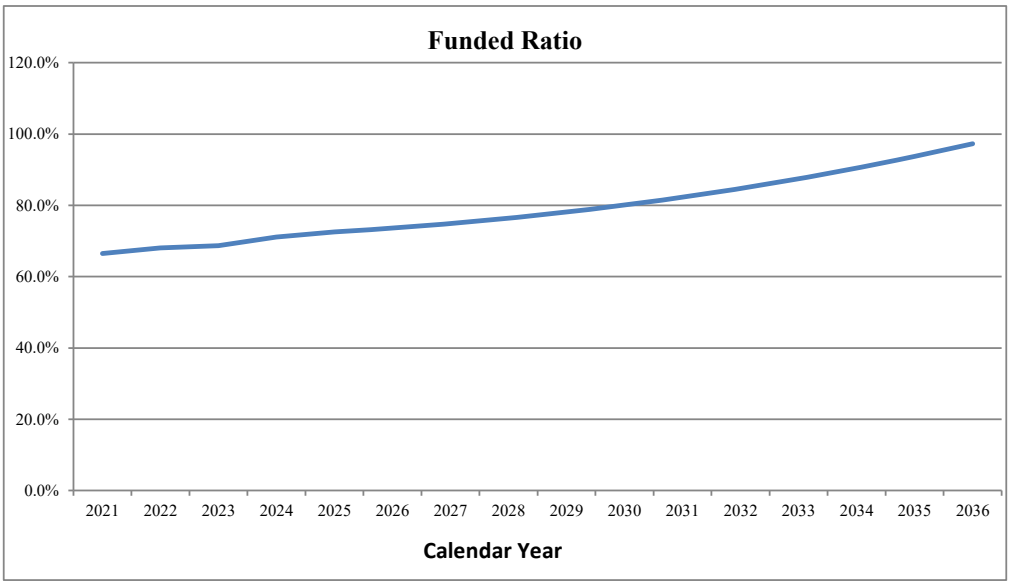
Total Actuarial Contribution Rate	
As of January 1, 2020	20.80%
- Change in normal cost rate	(0.06%)
- Actual versus actuarial contributions	(0.02%)
- Payroll growth greater than expected	(0.12%)
- Investment experience	(0.35%)
- Liability experience	(0.22%)
- Experience study changes	(0.49%)
- Other experience	(0.05%)
As of January 1, 2021	19.49%

In 2018, the Missouri General Assembly passed legislation that increased the employer contribution rate from 9.00% to 10.50% of pay, effective January 1, 2019, and 12.00% of pay, effective January 1, 2020. Beginning July 1, 2021, the employer contribution rate is the greater of (1) the actuarial required contribution rate less the member contribution rate, determined in the actuarial valuation in the prior calendar year 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 legislative changes to the determination of the employer contribution rate represent a significant step in strengthening the long-term funding of the System and providing a sustainable path to full funding.

The current contribution rate is 21.00% of pay (9.00% for employee and 12.00% employer). In the current valuation, 9.63% is needed to fund the normal cost for current active members and 0.71% is needed to fund the administrative expenses, for a total ongoing cost of 10.34% of payroll. The remainder, 10.66% of payroll, is available to fund the UAAL. The following graphs reflect the projected employer contribution rate and funded ratio, assuming all assumptions are met in the future, including a 7.25% 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 experience is recognized in the future, the actuarial employer contribution rate decreases, but under statutory provisions the employer contribution rate remains at a minimum of 12.00% until the System reaches full funding. By contributing more than the actuarial contribution rate, the System is funded more rapidly, assuming all assumptions are met.



The funded ratio is expected to steadily improve and reach 100% in 2037 (16 years), well ahead of the UAAL amortization schedule. This is due to the combined impact of (i) recognizing deferred asset gains over the next four years and (ii) making contributions above the actuarial required contribution amount (i.e., contribution surpluses). These contribution surpluses are an intentional feature of the System's current funding policy, which is designed to move the System's funding status to 100% and ultimately stabilize contribution rates.

COMMENTS

The System's actuarial required contribution rate decreased from 20.80% in the January 1, 2020 valuation to 19.49% in the January 1, 2021 valuation. The two major drivers of the 2021 valuation results were the actual return of 11.2% on the market value of assets in 2020 and the changes to the actuarial assumptions adopted as a result of the Experience Study in 2020. Due to the favorable investment experience during 2020 and the recognition of a portion of deferred investment experience in the actuarial value of assets this year, the net deferred investment gain of $16.7 million in the January 1, 2020 valuation increased to a net deferred investment gain of $31.0 million in the January 1, 2021 valuation. To the extent there is not unfavorable investment experience in the future to offset the net deferred investment gain of $31.0 million, it will be recognized in the next four years and the System's funded status will improve.

As mentioned earlier, there were several changes to the System's actuarial assumptions as a result of the Experience Study performed for the System in 2020. The Board of Trustees adopted the recommendations, which decreased the unfunded actuarial accrued liability by $23.9 million. The key changes from a cost impact were lowering the investment return from 7.50% to 7.25%, updating the mortality assumption to a recent table based on public plan data, and including an explicit component in the actuarial contribution rate for administrative expenses.

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 scheduled recognition of prior investment experience and the favorable investment experience during 2020, the System experienced an actuarial gain on assets of $10.4 million. In addition to the favorable experience on the actuarial value of assets, there was a net gain on liabilities of $6.7 million. The combined impact of the asset and the liability experience was an actuarial gain of $17.1 million.

The net deferred investment gain (market value greater than actuarial value of assets) is $31.0 million, about 4.5% of market value. Absent investment losses in future years, this net deferred investment gain 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, 2021 actuarial valuation using both the actuarial and market value of assets.

	Using Actuarial Value of Assets	Using Market Value of Assets
Actuarial Accrued Liability	$997,587,405	$997,587,405
Asset Value	663,210,594	694,237,740
Unfunded Actuarial Accrued Liability	$334,376,811	$303,349,665
Funded Ratio	66.5%	69.6%
Normal Cost Rate	9.63%	9.63%
Administrative Expenses	0.71%	0.71%
UAAL Contribution Rate	9.15%	8.07%
Total Contribution Rate	19.49%	18.41%
Employee Contribution Rate	(9.00%)	(9.00%)
Employer Contribution Rate	(12.00%)	(12.00%)
Contribution Shortfall/(Margin)	(1.51%)	(2.59%)

The actuarial required contribution rate has been, and will continue to be, heavily impacted by actual investment returns from year to year. Despite the use of an asset smoothing method, actual returns that are significantly different from the 7.25% assumption will create volatility in the System's actuarial required contribution rate although the statutory provisions regarding changes in the actual employer contribution rate should help to mitigate some of the volatility.

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.

As we prepare this report, the world starting to recover from the COVID-19 pandemic. We have considered available information, but do not believe there is sufficient data yet to warrant the modification of any of our assumptions. We will continue to monitor the situation and advise the Board in the future of any adjustments we believe would be appropriate.

Summary of Principal Valuation Results

	1/1/2021 Valuation	1/1/2020 Valuation	% Change
1. PARTICIPANT DATA			
Number of:			
Active Members			
- Plan B	1,356	1,461	(7.19%)
- Plan C	2,752	2,613	5.32%
Total	4,108	4,074	0.83%
Retirees, Disableds, and Beneficiaries	4,099	4,145	(1.11%)
Terminated Members			
- Vested Members	521	529	(1.51%)
- Non-Vested Members	2,590	2,631	(1.56%)
Total	3,111	3,160	(1.55%)
Total Members	11,318	11,379	(0.54%)
Projected Annual Salaries of Active Members	$ 228,084,635	$ 217,255,306	4.98%
Annual Retirement Payments for Retirees, Disableds, and Beneficiaries	$ 80,238,408	$ 81,095,184	(1.06%)
2. ASSETS AND LIABILITIES			
a. Market Value of Assets	$ 694,237,740	$ 662,085,840	4.86%
b. Actuarial Value of Assets	663,210,594	645,373,172	2.76%
c. Total Actuarial Accrued Liability	997,587,405	1,020,121,813	(2.21%)
d. Unfunded Actuarial Accrued Liability [c - b]	$ 334,376,811	$ 374,748,641	(10.77%)
e. Funded Ratio (Actuarial Value of Assets) [b / c]	66.48%	63.26%	5.09%
f. Funded Ratio (Market Value of Assets) [a / c]	69.59%	64.90%	7.23%
g. Projected Benefit Obligation	$ 972,625,564	$ 993,605,233	(2.11%)
3. CONTRIBUTION RATES AS A PERCENT OF PAYROLL			
Normal Cost	9.63%	9.46%	1.80%
Administrative Expense	0.71%	0.00%	N/A
Amortization of Unfunded Actuarial Accrued Liability	9.15%	11.34%	(19.31%)
Actuarial Required Contribution Rate	19.49%	20.80%	(6.30%)
Member Contribution Rate	(9.00%)	(9.00%)	0.00%
Employer Contribution Rate	(12.00%)	(12.00%)	0.00%
Contribution Rate Shortfall/(Margin)	(1.51%)	(0.20%)	655.00%
Contribution Shortfall/(Margin)	$ (3,444,078)	$ (434,511)	692.63%

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, 2021. 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, 2021.

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 Schedules of historical valuation data measurements utilized in the System's annual financial report.
- Appendix C A summary of the current benefit structure, as determined by the provisions of governing law on the valuation date.
- Appendix D A summary of the actuarial methods and assumptions used to estimate liabilities and determine contribution rates.
- Appendix E A glossary of actuarial terms.

SECTION III: ASSETS

In many respects, an actuarial valuation can be thought of as an inventory process. The inventory is taken as of the actuarial valuation date, which is January 1 of each year. 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, 2021, the market value of assets for the System was $694.2 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, 2020 and January 1, 2021.

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, 2021.

TABLE 1

Net Assets at Fair (Market) Value as of January 1, 2021

INVESTMENTS, AT MARKET VALUE		
Cash and short term investments	$	5,996,422
Commingled domestic fixed income		63,360,801
High yield fixed income		14,691,378
Global fixed income		34,550,614
Domestic equity		169,976,420
International equity		180,158,282
Pooled real estate funds		63,003,840
Alternative equity fund		114,891,293
Private equity		44,210,657
Commodities		0
Total Investments, at Market Value	$	690,839,707
RECEIVABLES		
Plan member contributions	$	785,395
Employer contributions		1,675,278
Securities sold		569,636
Accrued interest and dividends		424,154
Total Receivables	$	3,454,463
OTHER ASSETS		
Cash	$	1,270,156
Fixed assets		6,857
Other assets		68,747
Total Other Assets	$	1,345,760
TOTAL ASSETS	$	695,639,930
LIABILITIES		
Due to broker for securities purchased	$	689,004
Accounts payable		575,230
Accrued payroll expenses		137,957
Total Liabilities	$	1,402,190
NET ASSETS AVAILABLE FOR BENEFITS	$	694,237,740

Note: Based on unaudited asset information.

TABLE 2

Statement of Changes in Net Assets as of January 1, 2021

ADDITIONS TO NET ASSETS		
Contributions		
Plan members	$	19,531,341
Employers		25,771,854
Total Contributions	$	45,303,195
Investment Income		
Net appreciation (depreciation) in fair value of investments	$	73,874,684
Interest/Dividends		5,524,579
Other income		0
Investment income before expenses	$	79,399,263
Less: investment expenses		(6,135,294)
Net investment income	$	73,263,969
TOTAL ADDITIONS TO NET ASSETS	$	118,567,164
DEDUCTIONS FROM NET ASSETS		
Benefits paid directly to participants	$	80,473,732
Refunds of contributions		4,316,797
Depreciation expense		9,830
Administrative expenses		1,614,905
TOTAL DEDUCTION FROM ASSETS	$	86,415,264
NET INCREASE (DECREASE)	$	32,151,900
NET ASSETS AVAILABLE FOR BENEFITS		
Beginning of year	$	662,085,840
End of year	$	694,237,740

Note: Based on unaudited asset information.

TABLE 3

Development of Actuarial Value of Assets as of January 1, 2021

1. Deferral of Investment Return for 2020		
a. Market Value, January 1, 2020	$	662,085,840
b. Contributions for 2020		45,303,195
c. Benefit Payments for 2020		84,790,529
d. Actual Investment Return, Net of All Expenses	$	71,639,234
e. Expected Return Rate		7.50%
f. Expected Return - Weighted for Timing* (a. x e.) + [(b. - c.) x (((1 + e.)$^{.5}$) - 1)]	$	48,202,433
g. Investment Gain/(Loss) for the Year (d. - f.)	$	23,436,801
h. Deferred Investment Return (g. x 80%)	$	18,749,441
2. Actuarial Value, January 1, 2021		
a. Market Value, January 1, 2021	$	694,237,740
b. Total Deferred Investment Gain/(Loss)		31,027,146
c. Actuarial Value, January 1, 2021 (a. - b.)	$	663,210,594
d. Ratio of Actuarial Value of Assets to Market Value of Assets		95.5%
e. Approximate Actuarial Value Rate of Return for 2020, Net of All Expenses		9.2%

* 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
12/31/2016	$(6,337,217)	$(5,069,772)	$(1,267,445)	$ 0
12/31/2017	55,114,812	33,068,886	11,022,962	11,022,964
12/31/2018	(86,082,027)	(34,432,810)	(17,216,405)	(34,432,812)
12/31/2019	59,479,255	11,895,851	11,895,851	35,687,553
12/31/2020	23,436,801	0	4,687,360	18,749,441
Total	$ 45,611,624	$ 5,462,155	$ 9,122,323	$ 31,027,146

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, 2021. 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, 2021.

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, 2020.

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, 2021

1. Active Members		
a. Retirement Benefits	$	341,746,028
b. Death Benefits		7,595,302
c. Withdrawal Benefits		55,188,317
d. Subtotal	$	404,529,647
2. Benefit Recipients		
a. Retiree Benefits	$	665,454,939
b. Survivor Benefits		23,256,143
c. Disability Benefits		6,740,477
d. Subtotal	$	695,451,559
3. Inactive Members		
a. Vested Retirement Benefits	$	23,946,088
b. Non-vested Account Balance		10,947,337
c. Subtotal	$	34,893,425
4. Total (1d. + 2d. + 3c.)	$	1,134,874,631

TABLE 5

Actuarial Accrued Liability
as of January 1, 2021

1. Present Value of Future Benefits (PVFB)	$	1,134,874,631
2. Present Value of Future Normal Costs (PVFNC)		
a. Retirement benefits	$	76,904,830
b. Death benefits		3,647,277
c. Withdrawal benefits		56,735,119
d. Total	$	137,287,226
3. Actuarial Accrued Liability (AAL) (1. - 2d.)	$	997,587,405
4. Actuarial Value of Assets (AVA)	$	663,210,594
5. Unfunded Actuarial Accrued Liability (UAAL) (3. - 4.)	$	334,376,811
6. Funded Ratio (AVA / AAL) (4. / 3.)		66.5%

TABLE 6

Actuarial (Gain)/Loss for 2020

Liabilities			
1.	Actuarial accrued liability as of January 1, 2020	$	1,020,121,813
2.	Normal cost for 2020		18,048,195
3.	Interest at 7.50% on (1) and (2) to December 31, 2020		77,862,751
4.	Benefit payments during 2020		(84,790,529)
5.	Interest on benefit payments		(3,122,163)
6.	Assumption change		(23,876,243)
7.	Expected actuarial accrued liability as of December 31, 2020	$	1,004,243,824
8.	Actuarial accrued liability as of December 31, 2020		997,587,405
9.	Actuarial (gain) / loss on actuarial accrued liability (8. - 7.)	$	(6,656,419)
Assets			
10.	Actuarial value of assets as of January 1, 2020	$	645,373,172
11.	Contributions during 2020		45,303,195
12.	Benefit payments during 2020		(84,790,529)
13.	Interest at 7.50% on (10), (11) and (12) to December 31, 2020		46,948,983
14.	Expected actuarial value of assets as of December 31, 2020	$	652,834,821
15.	Actuarial value of assets as of December 31, 2020		663,210,594
16.	Actuarial (gain) / loss on actuarial assets (14. – 15.)	$	(10,375,773)
17.	Total actuarial (gain) / loss (9. + 16.)	$	(17,032,192)

TABLE 7

(Gain)/Loss Analysis by Source

The System experienced a net actuarial gain on liabilities of about $6.7 million during the plan year ended December 31, 2020. The major components of the actuarial experience are shown below:

Liability Sources		(Gain)/Loss
Retirement	$	(66,000)
Termination		2,138,000
Disability		(45,000)
Mortality		(8,285,000)
Salary		(3,212,000)
New Entrants/Rehires		3,478,000
Miscellaneous		(664,000)
Total Liability (Gain)/Loss	$	(6,656,000)
Asset (Gain)/Loss	$	(10,376,000)
Net Actuarial (Gain)/Loss	$	(17,032,000)

Comments

The purpose of conducting an actuarial valuation of a retirement system is to determine the costs and liabilities for the benefits under the system, to determine the annual level of contribution required to support these benefits and, finally, to analyze the system's overall experience as it compares with the actuarial assumptions used in the valuation. The costs and liabilities of a retirement system reported in the valuation depend not only upon the level of benefits provided, but also upon factors such as investment return on invested funds, mortality rates for active and retired members, withdrawal rates among active members, rates at which salaries increase, and rates of retirement for ages at which members retire. The actuarial assumptions employed as to these and other contingencies in the current valuation are set forth in Appendix D of this report.

Net demographic actuarial experience for the year was a gain of $6.7 million, about 0.7% of actuarial accrued liability. The largest source of favorable experience was a gain of $8.3 million due to more deaths than expected during 2020.

Another significant component of the experience for the year ending December 31, 2020 was the investment experience. Due to the current year's scheduled recognition of prior investment experience and the favorable investment experience during 2020, there was a gain on the actuarial value of assets of $10.4 million. As of January 1, 2021, there is a net deferred investment gain of $31.0 million. Absent unfavorable investment experience, the net deferred gain will flow through the valuation over the next few years and decrease both the UAAL and the actuarial contribution rate.

TABLE 8

Actuarial Balance Sheet

Assets

Current assets (actuarial value)	$	663,210,594
Present value of future normal costs		137,287,226
Present value of future contributions to fund unfunded actuarial accrued liability		334,376,811
Total Assets	$	1,134,874,631

Liabilities

Present value of future retirement benefits for:		
Active employees	$	404,529,647
Members currently receiving a benefit		695,451,559
Terminated vested members		23,946,088
Inactive employees due refunds		10,947,337
Total Liabilities	$	1,134,874,631

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 C for additional details.

Projected Benefit Obligation		January 1, 2021	January 1, 2020
1.	Retired members and beneficiaries currently receiving benefits and terminated members not yet receiving benefits	$ 730,344,984	$ 759,819,775
2.	Current active participants		
a.	Accumulated member contributions, including interest	121,889,145	112,913,289
b.	Employer-financed vested benefits	120,391,435	120,872,169
Total Projected Benefit Obligation (PBO)		$ 972,625,564	$ 993,605,233
Projected Benefit Obligation funded status			
1.	Actuarial Value of Assets (AVA)	$ 663,210,594	$ 645,373,172
a.	Unfunded Projected Benefit Obligation	309,414,970	348,232,061
b.	Funding Ratio (AVA / PBO)	68%	65%
2.	Market Value of Assets (MVA)	$ 694,237,740	$ 662,085,840
a.	Unfunded Projected Benefit Obligation	278,387,824	331,519,393
b.	Funding Ratio (MVA / PBO)	71%	67%

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 C.

As of January 1, 2021, the valuation assets were less than the actuarial accrued liability, so an unfunded actuarial accrued liability exists. The actuarial contribution rate, based on the January 1, 2021 actuarial valuation, will be used to determine the employer contribution rate for the year beginning July 1, 2022. 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. Table 11 projects the unfunded actuarial accrued liability to July 1, 2022. In Table 12, the amortization payment related to the unfunded actuarial accrued liability as of July 1, 2022 is developed. In Table 13, the actuarial contribution rate for the System is calculated.

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

TABLE 10

Normal Cost Rate

1. Normal Cost		
a. Retirement Benefits	$	11,303,775
b. Disability Benefits		0
c. Death Benefits		548,467
d. Termination Benefits		7,634,388
e. Total	$	19,486,630
2. Expected Payroll for Current Actives	$	202,344,287
3. Normal Cost Rate for 2021		9.63%

TABLE 11

Projected Unfunded Actuarial Accrued Liability at July 1, 2022

1. Unfunded Actuarial Accrued Liability at January 1, 2021	$	334,376,811
2. Total Contribution Rate for Year Ending June 30, 2021		21.00%
3. Normal Cost Rate		9.63%
4. Administrative Expense Rate		0.71%
5. Contribution Rate Applied to UAAL for 2021 [(2) - (3) - (4)]		10.66%
6. Expected Payroll for January to June, 2021	$	114,042,318
7. Expected UAAL Contribution [(5) * (6)]	$	12,156,911
8. Projected UAAL at July 1, 2021 [(1) * $1.0725^{.5}$ - (7) * $1.0725^{.25}$]	$	333,914,389
9. Total Contribution Rate for Year Ending June 30, 2022		21.00%
10. Normal Cost Rate		9.63%
11. Administrative Expense Rate		0.71%
12. Contribution Rate Applied to UAAL for Year Ending June 30, 2022 [(9) - (10) - (11)]		10.66%
13. Expected Payroll for Year Ending June 30, 2022	$	231,334,842
14. Expected UAAL Contribution [(12) * (13)]	$	24,660,294
15. Projected UAAL at July 1, 2022 [(8) * 1.0725 - (14) * $1.0725^{.5}$]	$	332,584,593

TABLE 12

Amortization of the Unfunded Actuarial Accrued Liability

Amortization Bases	Original Amount	Remaining Payments	Projected Balance as of July 1, 2022	Annual Contribution*
2017 UAAL Base	$ 297,102,390	26	$ 311,116,345	$ 19,922,063
2018 Experience Base	1,054,285	17	1,037,157	86,503
2019 Experience Base	28,100,770	18	27,866,524	2,235,841
2020 Assumption Change	23,365,556	19	23,288,784	1,802,839
2020 Experience Base	14,051,512	19	14,005,343	1,084,186
2021 Assumption Change	(26,519,293)	20	(26,519,293)	(1,985,946)
2021 Experience Base	(18,210,267)	20	(18,210,267)	(1,363,709)
Total			**$ 332,584,593**	**$ 21,781,777**

* Contribution amount reflects mid-year timing.

1. Total UAAL Amortization Payments	$ 21,781,777
2. Projected Payroll for Plan Year Ending June 30, 2023	$ 237,927,885
3. UAAL Amortization Payment Rate	9.15%

TABLE 13

Development of the Actuarial Contribution Rate

The contribution rate developed in this exhibit is based on the Funding Policy, the January 1, 2021 actuarial valuation and applies to the year beginning July 1, 2022 and ending June 30, 2023.

1. Normal Cost Rate (See Table 10)	9.63%
2. Administrative Expense Load	0.71%
3. UAAL Contribution Rate (See Table 12)	9.15%
4. Actuarial Recommended Contribution Rate (1) + (2) + (3)	19.49%
5. Funded Ratio as of January 1, 2021	66.48%
6. Member Contribution Rate Effective July 1, 2021	9.00%
7. Employer Contribution Rate Effective July 1, 2021	12.00%
8. Member Contribution Rate Effective July 1, 2022*	9.00%
9. Employer Contribution Rate Effective July 1, 2022**	12.00%
10. Contribution Shortfall/(Margin) (4) - (8) - (9)	(1.51%)

* If the System is at least 100% funded as of the current valuation, then the members contribute the lesser of (a) 9.00% or (b) one-half of the actuarial recommended contribution rate. If the System is less than 100% funded, then the members contribute 9.00%.

** The employer contribution rate is the greater of (1) the employer share of the actuarial contribution rate, or (2) 12.00% of pay, until the system is fully funded.

Once the System is fully funded, the member and employer contribution rates may increase or decrease in subsequent years, but they may not increase by more than 1.00% or decrease by more than 0.50% from the rate in effect for the previous year. An exception to the limitation on the magnitude of contribution 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 18.00%.

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 14

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]
1/1/1997	$ 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%
1/1/2020	645,373,172	1,020,121,813	374,748,641	63.3%	217,255,306	172.5%
1/1/2021	663,210,594	997,587,405	334,376,811	66.5%	228,084,635	146.6%

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

TABLE 15

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%
1/1/2020	20.80%	21.00%	(0.20%)
1/1/2021	19.49%	21.00%	(1.51%)

Note: Years prior to 1/1/2014 were provided by prior Actuary.
For valuations 1/1/2020 and after, contribution rates are effective July 1 of the following year.

TABLE 16

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 their relative funded status.

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)
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%
2020	112,913,289	759,819,775	147,388,749	645,373,172	100%	70%	0%
2021	121,889,145	730,344,984	145,353,276	663,210,594	100%	74%	0%

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

TABLE 17

Schedule of Changes in Plan Fiduciary Net Position

Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Additions:										
Member Contributions	12,082,175	11,577,924	12,310,320	13,358,180	14,645,901	16,280,327	16,964,351	17,619,145	18,524,657	19,531,341
City Contributions	11,972,752	11,370,252	12,093,945	13,288,142	14,499,260	16,528,188	16,926,562	17,527,854	21,488,838	25,771,854
Net Investment Income	5,502,704	76,761,126	78,598,783	25,936,419	(10,025,518)	44,337,774	103,767,714	(33,250,914)	106,033,718	73,263,969
Total Additions to Plan Net Positions	$29,557,631	$99,709,302	$103,003,048	$52,582,741	$19,119,643	$77,146,289	$137,658,627	$1,896,085	$146,047,213	$118,567,164
Deductions:										
Benefits	70,411,893	72,426,711	73,844,481	75,298,737	76,235,124	76,898,255	78,181,575	79,333,689	80,228,574	80,473,732
Refunds	5,721,334	4,386,983	3,567,693	3,236,645	3,399,065	3,270,723	3,581,147	4,084,837	4,937,877	4,316,797
Depreciation Expense	443,060	522,930	524,163	528,860	250,979	92,179	15,855	17,150	11,020	9,830
Administrative	1,283,444	1,336,764	1,479,931	1,548,320	1,648,449	1,552,025	1,520,665	1,499,928	1,546,381	1,614,905
Total Deductions from Plan Net Position	77,859,731	78,673,388	79,416,268	80,612,562	81,533,617	81,813,182	83,299,242	84,935,604	86,723,852	86,415,264
Change in Net Position	($48,302,100)	$21,035,914	$23,586,780	($28,029,821)	($62,413,974)	($4,666,893)	$54,359,385	($83,039,519)	$59,323,361	$32,151,900

SECTION VII: RISK CONSIDERATIONS

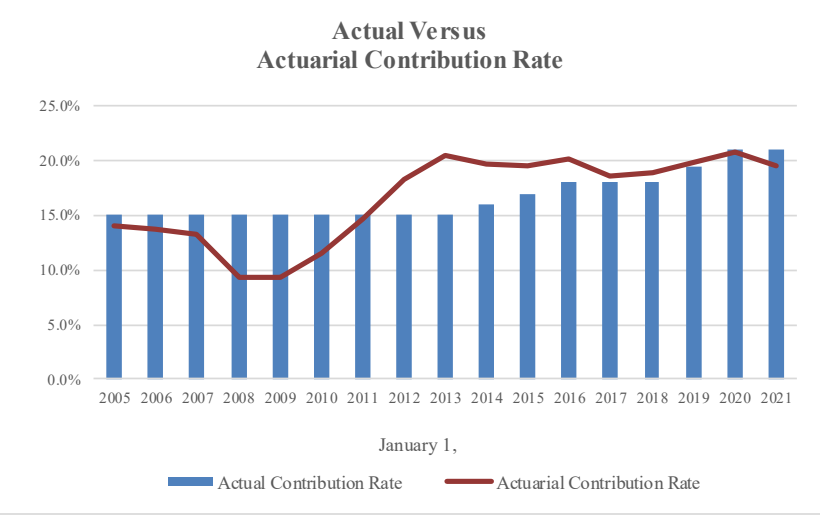
Actuarial Standards of Practice are issued by the Actuarial Standards Board and are binding on credentialed actuaries practicing in the United States. These standards generally identify what the actuary should consider, document and disclose when performing an actuarial assignment. In September, 2017,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

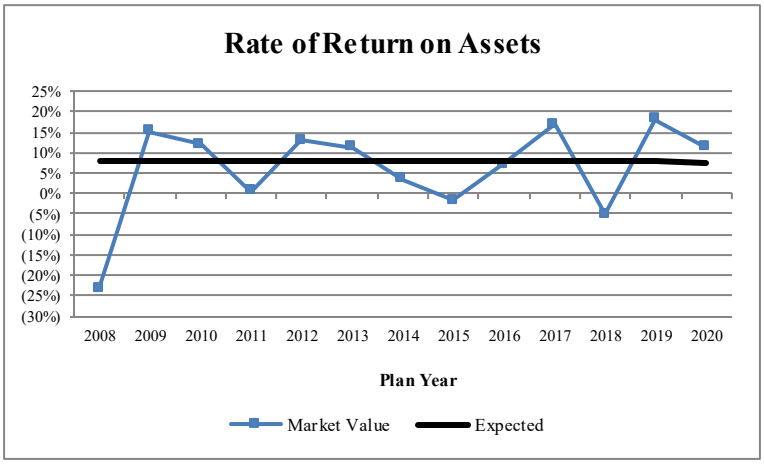
There are a number of risks inherent in the funding of a defined benefit plan. These include:

- 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 (not required to be addressed under ASOP 51).

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 accrued 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 eight of the past ten years, despite increases in the contribution rate for both members and employers. The System currently contributes a fixed contribution rate, however, funding moves to an actuarial contribution rate beginning July 1, 2021 which should increase the probability of a higher funded ratio over time.



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 18). 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, 2021 valuation, the asset volatility ratio was 3.04. 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 be at least one standard deviation (12%) from the expected return. To put that in context, a return 12% different than the expected return of 7.25% translates to about $83 million and a change of 2.73% in the contribution rate (without reflecting asset smoothing). The distribution of returns would indicate that such an event would be expected to happen once every three years (half higher than 19.25% and half lower than -4.75%). 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 7.25%	Below 7.25%
1. Rate of Return	19.25%	-4.75%
2. Ratio of Assets to Payroll	3.04	3.04
3. Asset Gain/Loss as a Percent of Payroll [(1) - 7.25%] * (2)	36%	36%
4. Ultimate Impact on Contribution Rate	-2.73%	2.73%

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, as experienced with the COVID-19 pandemic. This type of event could also be significant, but would be 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 19). 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 18

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 contributions.

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	3.79%
1/1/2009	624,647,065	205,326,108	3.04	2.73%
1/1/2010	693,934,794	194,474,437	3.57	3.21%
1/1/2011	730,278,733	162,417,257	4.50	4.04%
1/1/2012	681,930,607	155,893,016	4.37	3.93%
1/1/2013	702,966,521	157,303,005	4.47	4.02%
1/1/2014	726,553,301	157,014,537	4.63	4.16%
1/1/2015	698,523,480	170,845,124	4.09	3.68%
1/1/2016	636,109,506	179,013,516	3.55	3.19%
1/1/2017	631,442,613	194,132,739	3.25	2.92%
1/1/2018	685,801,998	196,277,971	3.49	3.14%
1/1/2019	602,762,479	203,310,599	2.96	2.66%
1/1/2020	662,085,840	217,255,306	3.05	2.74%
1/1/2021	694,237,740	228,084,635	3.04	2.73%

* The impact of asset smoothing is not reflected in the impact on the Actuarial Contribution Rate (ACR). Current year assumptions are used for all years shown.

The assets as of January 1, 2021 are 304% of payroll so underperforming the investment return assumption by 12% (i.e., earn -4.75% for one year) is equivalent to 36.5% of payroll. While the actual impact in the first year is mitigated by the asset smoothing method and amortization of the UAAL, this illustrates the risk associated with volatile investment returns.

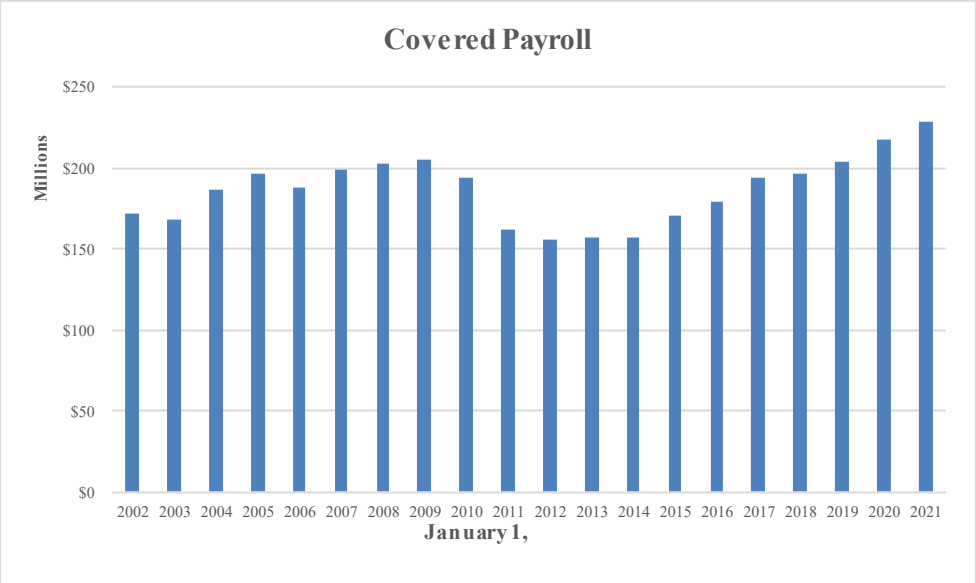
TABLE 19

HISTORICAL MEMBERSHIP

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 2.85%), 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. From 2004 to 2012, the number of active members declined significantly which creates challenges for funding the System, but since 2012 we have seen the number of active members steadily increase.

	Number of Active Members						
Actuarial Valuation Date	Charter Schools	School District	Library	Total	Covered Payroll	Number of Retired Members	Active/ Retired
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
1/1/2020	1,640	2,285	149	4,074	217,255,306	4,145	0.98
1/1/2021	1,650	2,306	152	4,108	228,084,635	4,099	1.00

This table shows the change in active membership among the participating employers over the last 15 to 20 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 2004 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 2012. 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.

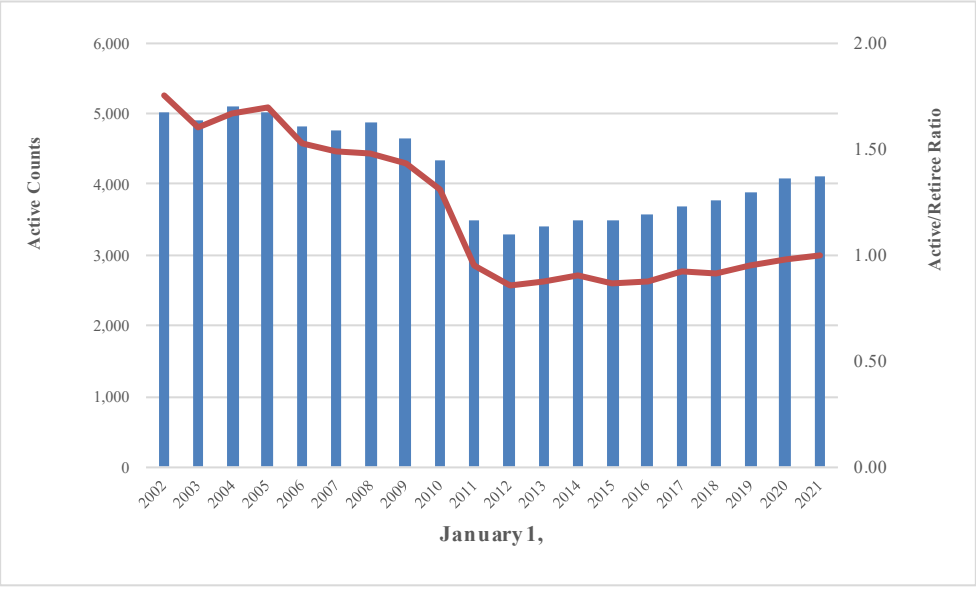


TABLE 20

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 by KCPSRS' investment consultant. 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%)
12/31/19	662,085,840	40,013,495	85,166,451	(45,152,956)	(6.82%)
12/31/20	694,237,740	45,303,195	84,790,529	(39,487,334)	(5.69%)

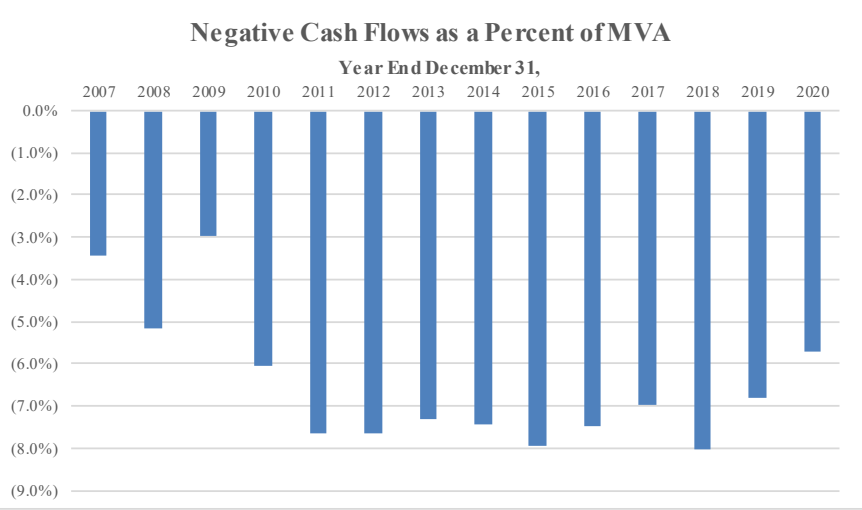


TABLE 21

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 continued retirement of the baby boomers 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
12/31/19	725,892,076	1,020,121,813	71.2%	217,255,306	4.70
12/31/20	695,451,559	997,587,405	69.7%	228,084,635	4.37

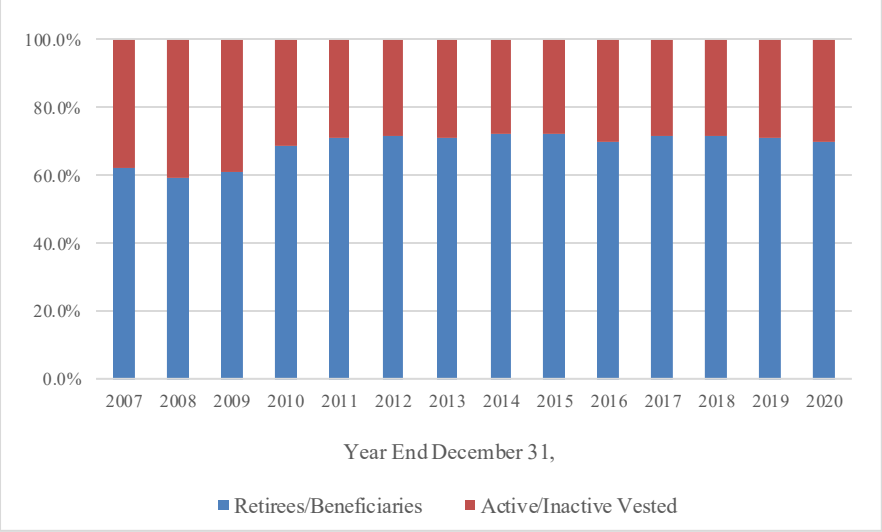


TABLE 22

COMPARISON OF VALUATION RESULTS UNDER ALTERNATE INVESTMENT RETURN ASSUMPTIONS
($ in thousands)

This exhibit compares the key January 1, 2021 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	**6.75%**	**7.00%**	**7.25%**	**7.50%**	**7.75%**
Contributions					
Total Normal Cost	10.42%	10.01%	9.63%	9.28%	8.95%
Administrative Expenses	0.71%	0.71%	0.71%	0.71%	0.71%
Amortization of UAAL	10.33%	9.74%	9.15%	8.57%	7.99%
Actuarial Required Contribution	21.46%	20.46%	19.49%	18.56%	17.65%
Member Contribution	(9.00%)	(9.00%)	(9.00%)	(9.00%)	(9.00%)
Employer Contribution	(12.46%)	(12.00%)	(12.00%)	(12.00%)	(12.00%)
Contribution Rate Shortfall/(Margin)	0.00%	(0.54%)	(1.51%)	(2.44%)	(3.35%)
Actuarial Accrued Liability	$1,045,552	$1,021,053	$997,587	$975,097	$953,534
Actuarial Value of Assets	663,211	663,211	663,211	663,211	663,211
Unfunded Actuarial Accrued Liability	$382,342	$357,843	$334,377	$311,887	$290,324
Funded Ratio	63.4%	65.0%	66.5%	68.0%	69.6%

Note: All other assumptions are unchanged for purposes of this sensitivity analysis. Numbers may not add due to rounding.

MEMBER CENSUS INFORMATION

A. ACTIVE MEMBERS	January 1, 2021	January 1, 2020	% Change
1. Number of Active Members			
(a) Plan B	1,356	1,461	(7.2%)
(b) Plan C	2,752	2,613	5.3%
(c) Total	4,108	4,074	0.8%
2. Active Member Averages			
(a) Age	42.8	42.7	0.2%
(b) Service	7.4	7.1	4.2%
(c) Expected Annual Pay	$ 55,522	$ 53,327	4.1%
B. TERMINATED VESTED MEMBERS			
1. Number of Terminated Vested Members	521	529	(1.5%)
2. Terminated Vested Members Averages			
(a) Age	47.3	47.8	(1.0%)
(b) Estimated Monthly Benefit	$ 640	$ 650	(1.5%)
C. TERMINATED NON-VESTED MEMBERS			
1. Number of Terminated Non-Vested Members	2,590	2,631	(1.6%)
2. Terminated Non-Vested Members Averages			
(a) Age	43.3	43.7	(0.9%)
(b) Account Balance	$ 4,227	$ 3,947	7.1%
D. RETIREES, DISABLEDS, AND BENEFICIARIES			
1. Number of Members			
(a) Retired	3,798	3,840	(1.1%)
(b) Disabled	70	77	(9.1%)
(c) Beneficiaries	231	228	1.3%
(e) Total	4,099	4,145	(1.1%)
2. Average Age			
(a) Retired	73.2	72.9	0.4%
(b) Disabled	69.3	68.5	1.2%
(c) Beneficiaries	74.8	74.9	(0.1%)
(e) Total	73.2	72.9	0.4%
3. Average Monthly Benefit			
(a) Retired	$ 1,673	$ 1,671	0.1%
(b) Disabled	1,011	1,026	(1.5%)
(c) Beneficiaries	1,150	1,149	0.1%
(e) Total	$ 1,632	$ 1,631	0.1%

MEMBER DATA RECONCILIATION

January 1, 2020 to January 1, 2021

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, 2020	4,074	529	2,631	3,840	228	77	11,379
New Entrants	573	0	53	0	18	0	644
Rehires/Transfers	50	(17)	(33)	0	0	0	0
Retirements	(74)	(31)	0	105	0	0	0
Disablements	0	0	0	0	0	0	0
Deaths	(4)	(2)	0	(147)	(14)	(7)	(174)
Vested Terminations	(63)	63	0	0	0	0	0
Non-vested Terminations	(266)	0	266	0	0	0	0
Refunds Paid	(177)	(21)	(327)	0	(1)	0	(526)
Payments Ended	0	0	0	0	0	0	0
Data Adjustments	(5)	0	0	0	0	0	(5)
Total as of January 1, 2021	4,108	521	2,590	3,798	231	70	11,318

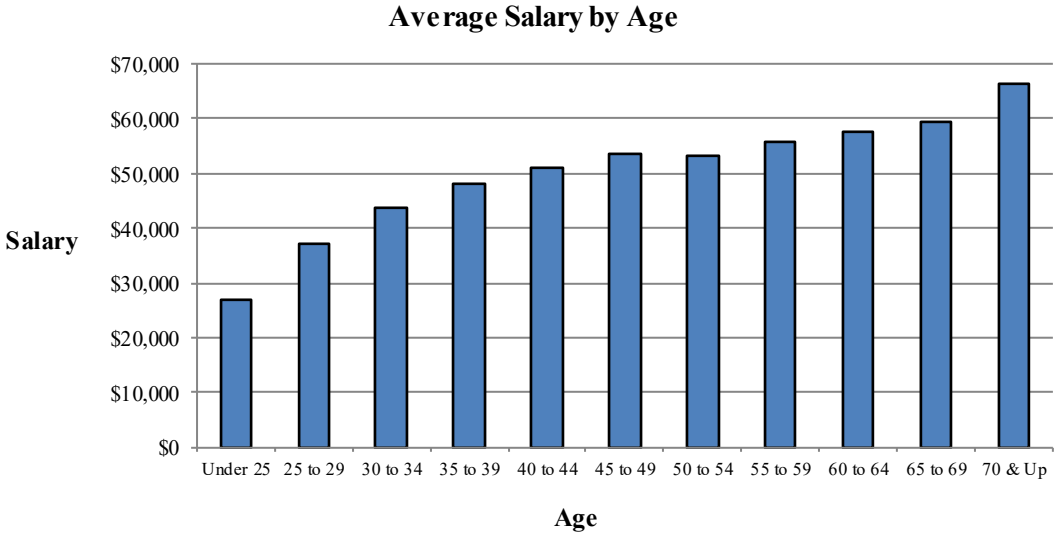
* Includes beneficiaries who were owed a single lump sum payment and were not paid prior to the valuation date.

SUMMARY OF ACTIVE MEMBERS
as of January 1, 2021

Total – All Plans

	Number			2020 Reported Compensation*		
Age	Male	Female	Total	Male	Female	Total
Under 25	53	167	220	$ 1,346,438	$ 4,543,174	$ 5,889,612
25 to 29	114	480	594	4,082,869	18,018,690	22,101,559
30 to 34	158	463	621	7,016,672	20,164,208	27,180,880
35 to 39	146	355	501	7,385,887	16,663,162	24,049,049
40 to 44	120	314	434	6,649,476	15,532,162	22,181,638
45 to 49	120	303	423	7,217,811	15,487,174	22,704,985
50 to 54	116	293	409	6,074,849	15,705,922	21,780,771
55 to 59	114	301	415	6,782,371	16,407,279	23,189,650
60 to 64	80	229	309	4,505,724	13,305,784	17,811,508
65 to 69	48	103	151	3,037,891	5,949,155	8,987,046
70 & Up	8	23	31	521,668	1,538,198	2,059,866
Total	1,077	3,031	4,108	$54,621,656	$143,314,908	$197,936,564

* Partial year pay amounts have not been annualized.

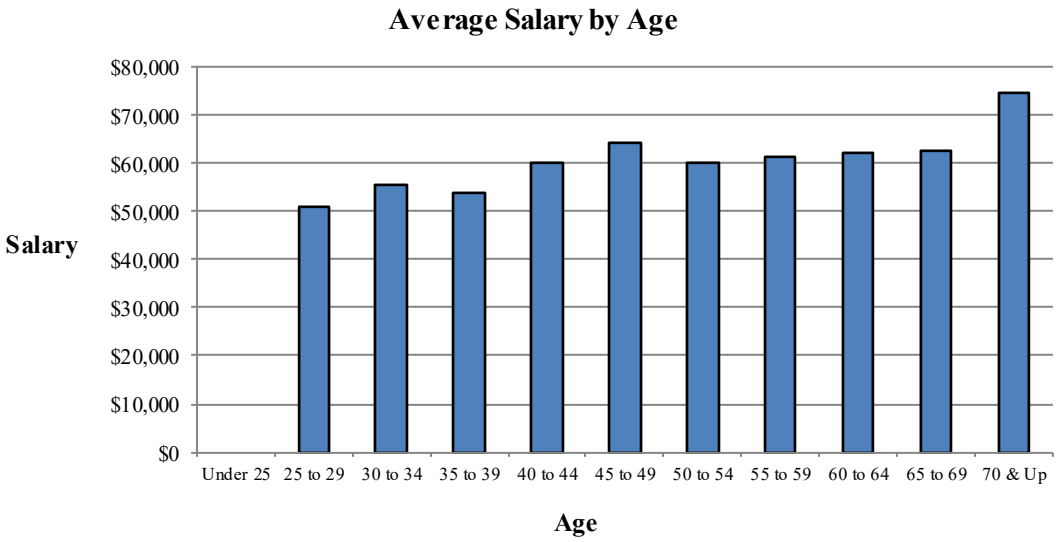


SUMMARY OF ACTIVE MEMBERS
as of January 1, 2021

Total – Plan B

	Number			2020 Reported Compensation*		
Age	Male	Female	Total	Male	Female	Total
Under 25	0	0	0	$ 0	$ 0	$ 0
25 to 29	2	13	15	95,149	667,951	763,100
30 to 34	34	99	133	1,917,392	5,439,567	7,356,959
35 to 39	37	96	133	2,130,941	5,014,322	7,145,263
40 to 44	37	130	167	2,539,249	7,525,854	10,065,103
45 to 49	41	124	165	2,862,932	7,745,420	10,608,352
50 to 54	52	129	181	3,150,816	7,745,203	10,896,019
55 to 59	74	177	251	4,773,237	10,667,911	15,441,148
60 to 64	45	145	190	2,935,498	8,884,789	11,820,287
65 to 69	27	74	101	1,814,966	4,515,037	6,330,003
70 & Up	5	15	20	384,533	1,107,849	1,492,382
Total	354	1,002	1,356	$22,604,713	$59,313,903	$81,918,616

* Partial year pay amounts have not been annualized.



SUMMARY OF ACTIVE MEMBERS
as of January 1, 2021

Total – Plan C

	Number			2020 Reported Compensation*		
Age	Male	Female	Total	Male	Female	Total
Under 25	53	167	220	$ 1,346,438	$ 4,543,174	$ 5,889,612
25 to 29	112	467	579	3,987,720	17,350,739	21,338,459
30 to 34	124	364	488	5,099,280	14,724,641	19,823,921
35 to 39	109	259	368	5,254,946	11,648,840	16,903,786
40 to 44	83	184	267	4,110,227	8,006,308	12,116,535
45 to 49	79	179	258	4,354,879	7,741,754	12,096,633
50 to 54	64	164	228	2,924,033	7,960,719	10,884,752
55 to 59	40	124	164	2,009,134	5,739,368	7,748,502
60 to 64	35	84	119	1,570,226	4,420,995	5,991,221
65 to 69	21	29	50	1,222,925	1,434,118	2,657,043
70 & Up	3	8	11	137,135	430,349	567,484
Total	723	2,029	2,752	$32,016,943	$84,001,005	$116,017,948

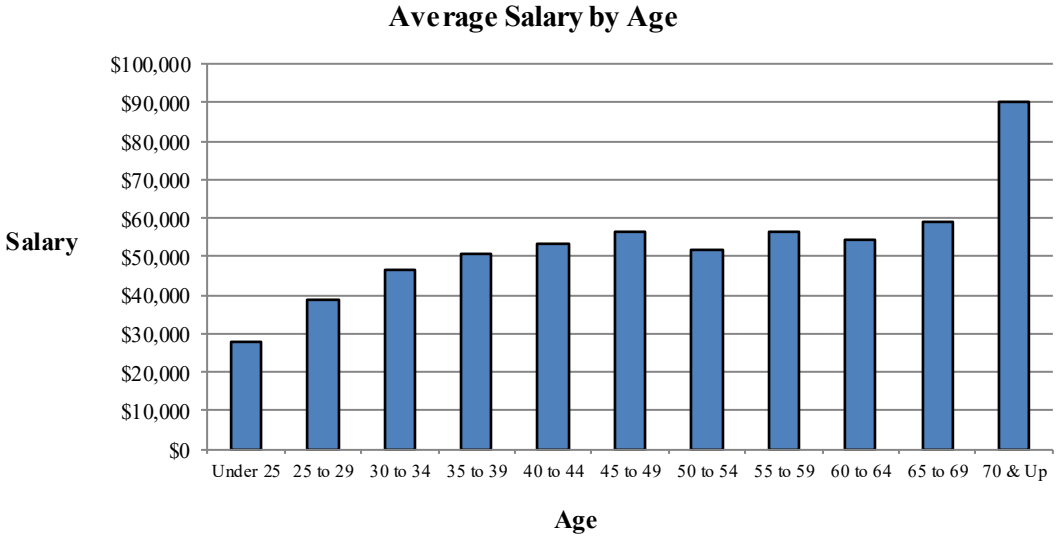
* Partial year pay amounts have not been annualized.

SUMMARY OF ACTIVE MEMBERS
as of January 1, 2021

Charter Schools – All Plans

	Number			2020 Reported Compensation*		
Age	Male	Female	Total	Male	Female	Total
Under 25	25	94	119	$ 624,074	$ 2,680,358	$ 3,304,432
25 to 29	49	278	327	1,952,181	10,771,234	12,723,415
30 to 34	72	275	347	3,279,110	12,908,293	16,187,403
35 to 39	67	168	235	3,491,425	8,462,659	11,954,084
40 to 44	42	114	156	2,338,918	5,940,232	8,279,150
45 to 49	53	104	157	3,335,880	5,519,380	8,855,260
50 to 54	32	85	117	1,716,671	4,322,148	6,038,819
55 to 59	38	59	97	2,375,125	3,084,623	5,459,748
60 to 64	14	37	51	710,771	2,067,348	2,778,119
65 to 69	13	25	38	878,856	1,357,762	2,236,618
70 & Up	1	5	6	69,188	471,991	541,179
Total	406	1,244	1,650	$20,772,199	$57,586,028	$78,358,227

* Partial year pay amounts have not been annualized.



SUMMARY OF ACTIVE MEMBERS
as of January 1, 2021

Charter Schools – Plan B

	Number			2020 Reported Compensation*		
Age	Male	Female	Total	Male	Female	Total
Under 25	0	0	0	$ 0	$ 0	$ 0
25 to 29	1	7	8	46,217	326,698	372,915
30 to 34	17	73	90	980,057	4,141,980	5,122,037
35 to 39	17	49	66	1,016,514	2,941,678	3,958,192
40 to 44	10	50	60	714,231	3,055,134	3,769,365
45 to 49	22	35	57	1,484,750	2,271,607	3,756,357
50 to 54	10	31	41	635,184	1,859,939	2,495,123
55 to 59	21	20	41	1,421,816	1,147,078	2,568,894
60 to 64	9	12	21	586,075	758,276	1,344,351
65 to 69	4	16	20	223,834	972,185	1,196,019
70 & Up	0	2	2	0	296,894	296,894
Total	111	295	406	$7,108,678	$17,771,469	$24,880,147

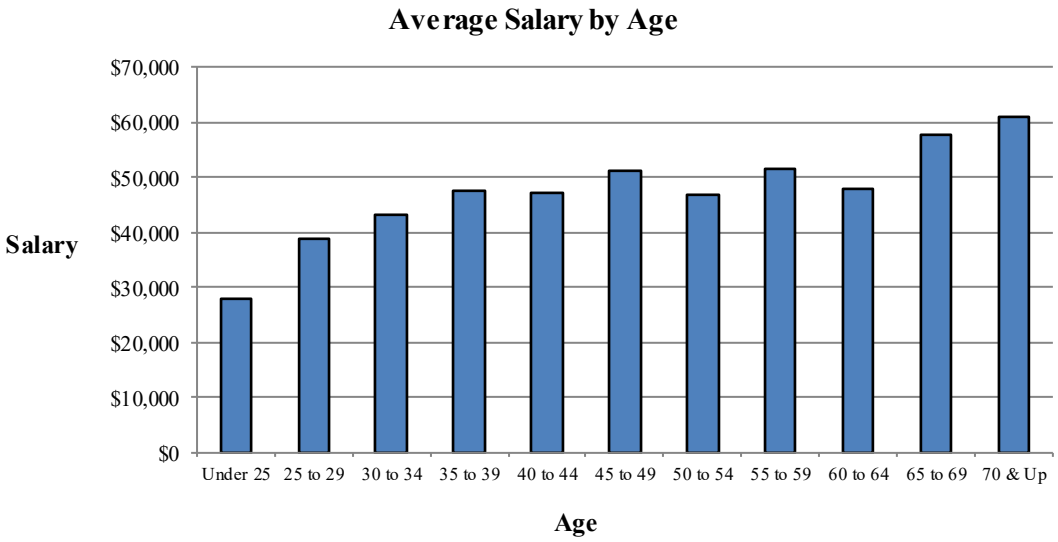
* Partial year pay amounts have not been annualized.

SUMMARY OF ACTIVE MEMBERS
as of January 1, 2021

Charter Schools – Plan C

	Number			2020 Reported Compensation*		
Age	Male	Female	Total	Male	Female	Total
Under 25	25	94	119	$ 624,074	$ 2,680,358	$ 3,304,432
25 to 29	48	271	319	1,905,964	10,444,536	12,350,500
30 to 34	55	202	257	2,299,053	8,766,313	11,065,366
35 to 39	50	119	169	2,474,911	5,520,981	7,995,892
40 to 44	32	64	96	1,624,687	2,885,098	4,509,785
45 to 49	31	69	100	1,851,130	3,247,773	5,098,903
50 to 54	22	54	76	1,081,487	2,462,209	3,543,696
55 to 59	17	39	56	953,309	1,937,545	2,890,854
60 to 64	5	25	30	124,696	1,309,072	1,433,768
65 to 69	9	9	18	655,022	385,577	1,040,599
70 & Up	1	3	4	69,188	175,097	244,285
Total	295	949	1,244	$13,663,521	$39,814,559	$53,478,080

* Partial year pay amounts have not been annualized.

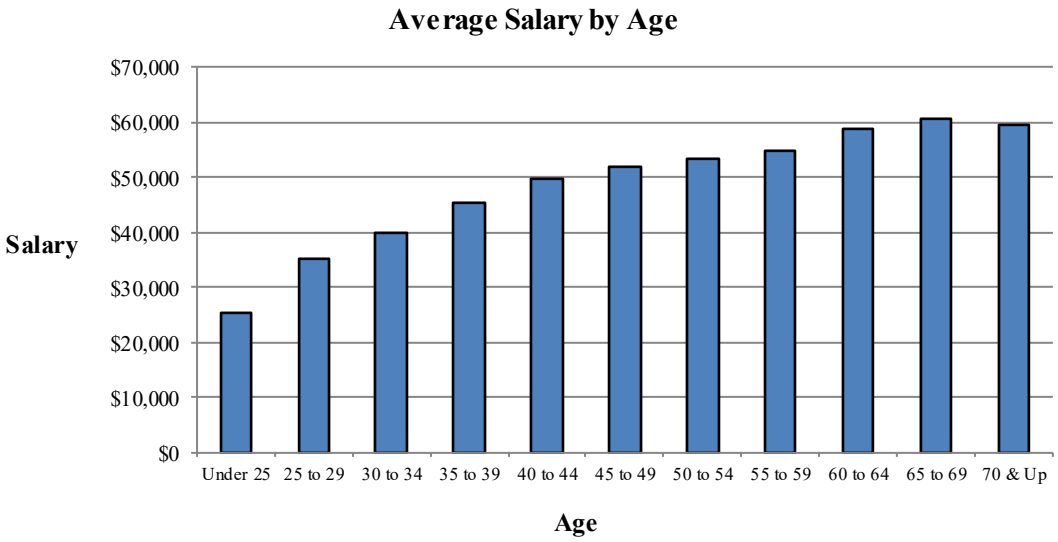


SUMMARY OF ACTIVE MEMBERS
as of January 1, 2021

School District & Retirement System – All Plans

	Number			2020 Reported Compensation*		
Age	Male	Female	Total	Male	Female	Total
Under 25	28	71	99	$ 722,364	$ 1,789,820	$ 2,512,184
25 to 29	65	190	255	2,130,688	6,794,576	8,925,264
30 to 34	80	175	255	3,494,375	6,690,596	10,184,971
35 to 39	74	173	247	3,667,526	7,502,400	11,169,926
40 to 44	69	187	256	3,865,318	8,862,715	12,728,033
45 to 49	61	187	248	3,526,201	9,336,679	12,862,880
50 to 54	77	197	274	3,947,586	10,682,584	14,630,170
55 to 59	72	227	299	4,098,204	12,293,426	16,391,630
60 to 64	58	183	241	3,379,133	10,741,591	14,120,724
65 to 69	32	76	108	2,041,389	4,484,020	6,525,409
70 & Up	7	17	24	452,480	978,475	1,430,955
Total	623	1,683	2,306	$31,325,264	$80,156,882	$111,482,146

* Partial year pay amounts have not been annualized.

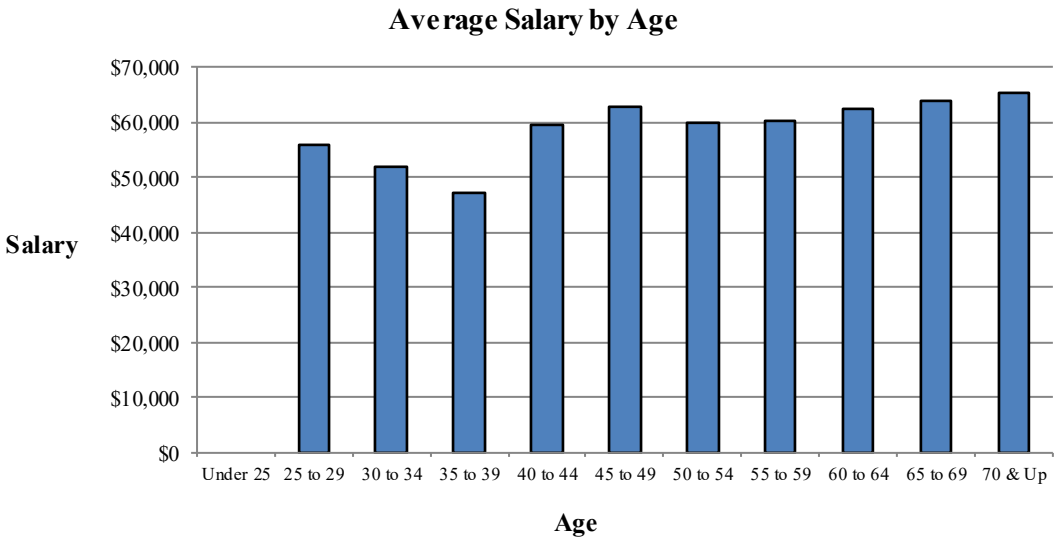


SUMMARY OF ACTIVE MEMBERS
as of January 1, 2021

School District & Retirement System – Plan B

	Number			2020 Reported Compensation*		
Age	Male	Female	Total	Male	Female	Total
Under 25	0	0	0	$ 0	$ 0	$ 0
25 to 29	1	6	7	48,932	341,253	390,185
30 to 34	17	26	43	937,335	1,297,587	2,234,922
35 to 39	19	44	63	1,059,409	1,916,643	2,976,052
40 to 44	23	74	97	1,618,640	4,132,495	5,751,135
45 to 49	16	85	101	1,152,824	5,193,018	6,345,842
50 to 54	38	93	131	2,294,142	5,558,870	7,853,012
55 to 59	49	145	194	3,042,379	8,656,955	11,699,334
60 to 64	28	126	154	1,933,603	7,697,327	9,630,930
65 to 69	21	57	78	1,507,267	3,485,447	4,992,714
70 & Up	5	12	17	384,533	723,223	1,107,756
Total	217	668	885	$13,979,064	$39,002,818	$52,981,882

* Partial year pay amounts have not been annualized.



SUMMARY OF ACTIVE MEMBERS
as of January 1, 2021

School District & Retirement System – Plan C

	Number			2020 Reported Compensation*		
Age	Male	Female	Total	Male	Female	Total
Under 25	28	71	99	$ 722,364	$ 1,789,820	$ 2,512,184
25 to 29	64	184	248	2,081,756	6,453,323	8,535,079
30 to 34	63	149	212	2,557,040	5,393,009	7,950,049
35 to 39	55	129	184	2,608,117	5,585,757	8,193,874
40 to 44	46	113	159	2,246,678	4,730,220	6,976,898
45 to 49	45	102	147	2,373,377	4,143,661	6,517,038
50 to 54	39	104	143	1,653,444	5,123,714	6,777,158
55 to 59	23	82	105	1,055,825	3,636,471	4,692,296
60 to 64	30	57	87	1,445,530	3,044,264	4,489,794
65 to 69	11	19	30	534,122	998,573	1,532,695
70 & Up	2	5	7	67,947	255,252	323,199
Total	406	1,015	1,421	$17,346,200	$41,154,064	$58,500,264

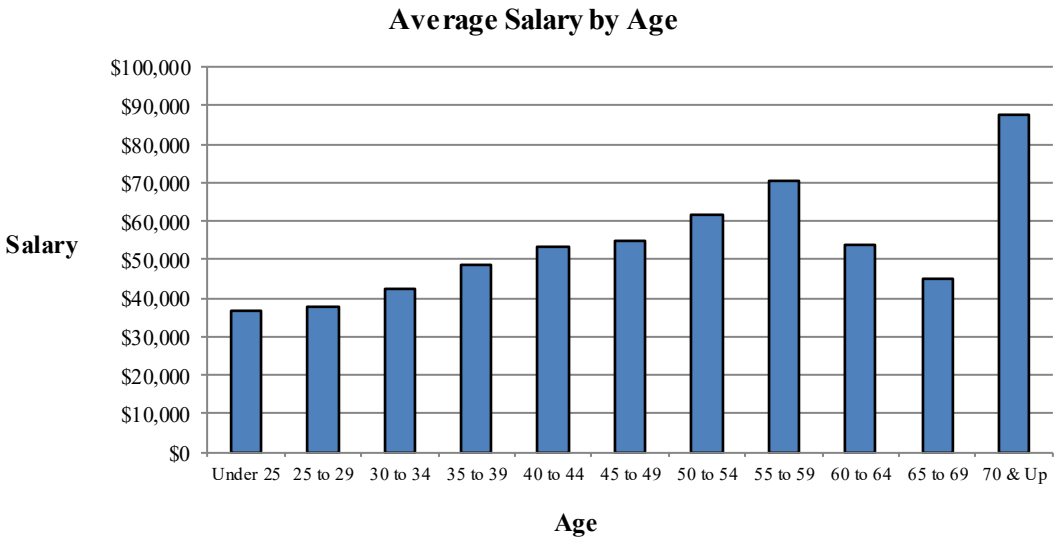
* Partial year pay amounts have not been annualized.

SUMMARY OF ACTIVE MEMBERS
as of January 1, 2021

Library – All Plans

	Number			2020 Reported Compensation*		
Age	Male	Female	Total	Male	Female	Total
Under 25	0	2	2	$ 0	$ 72,996	$ 72,996
25 to 29	0	12	12	0	452,880	452,880
30 to 34	6	13	19	243,187	565,319	808,506
35 to 39	5	14	19	226,936	698,103	925,039
40 to 44	9	13	22	445,240	729,215	1,174,455
45 to 49	6	12	18	355,730	631,115	986,845
50 to 54	7	11	18	410,592	701,190	1,111,782
55 to 59	4	15	19	309,042	1,029,230	1,338,272
60 to 64	8	9	17	415,820	496,845	912,665
65 to 69	3	2	5	117,646	107,373	225,019
70 & Up	0	1	1	0	87,732	87,732
Total	48	104	152	$2,524,193	$5,571,998	$8,096,191

* Partial year pay amounts have not been annualized.

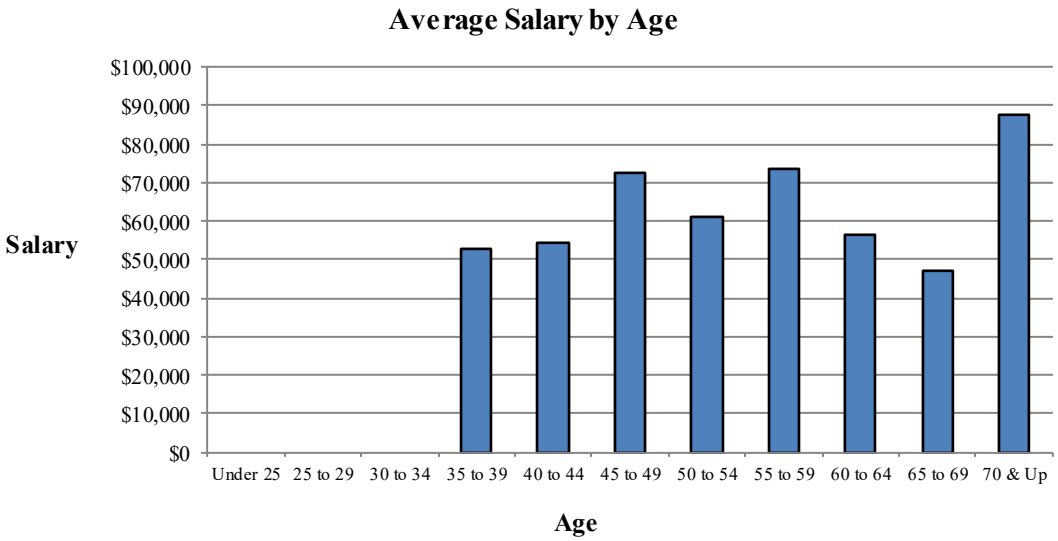


SUMMARY OF ACTIVE MEMBERS
as of January 1, 2021

Library – Plan B

	Number			2020 Reported Compensation*		
Age	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	0	0	0	0	0	0
35 to 39	1	3	4	55,018	156,001	211,019
40 to 44	4	6	10	206,378	338,225	544,603
45 to 49	3	4	7	225,358	280,795	506,153
50 to 54	4	5	9	221,490	326,394	547,884
55 to 59	4	12	16	309,042	863,878	1,172,920
60 to 64	8	7	15	415,820	429,186	845,006
65 to 69	2	1	3	83,865	57,405	141,270
70 & Up	0	1	1	0	87,732	87,732
Total	26	39	65	$1,516,971	$2,539,616	$4,056,587

* Partial year pay amounts have not been annualized.



SUMMARY OF ACTIVE MEMBERS
as of January 1, 2021

Library – Plan C

	Number			2020 Reported Compensation*		
Age	Male	Female	Total	Male	Female	Total
Under 25	0	2	2	$ 0	$ 72,996	$ 72,996
25 to 29	0	12	12	0	452,880	452,880
30 to 34	6	13	19	243,187	565,319	808,506
35 to 39	4	11	15	171,918	542,102	714,020
40 to 44	5	7	12	238,862	390,990	629,852
45 to 49	3	8	11	130,372	350,320	480,692
50 to 54	3	6	9	189,102	374,796	563,898
55 to 59	0	3	3	0	165,352	165,352
60 to 64	0	2	2	0	67,659	67,659
65 to 69	1	1	2	33,781	49,968	83,749
70 & Up	0	0	0	0	0	0
Total	22	65	87	$ 1,007,222	$3,032,382	$4,039,604

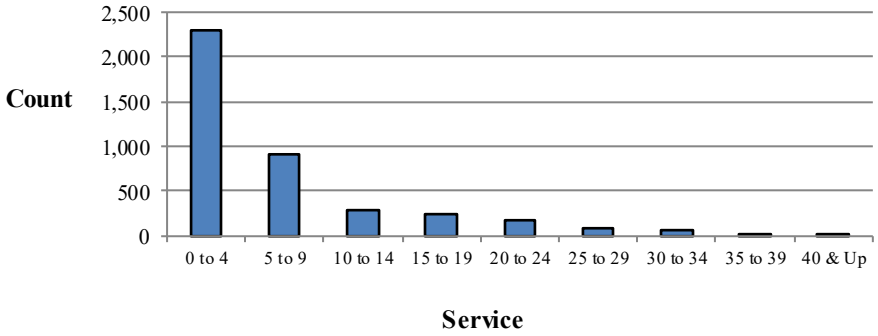
* Partial year pay amounts have not been annualized.

DISTRIBUTION OF ACTIVE MEMBERS
as of January 1, 2021

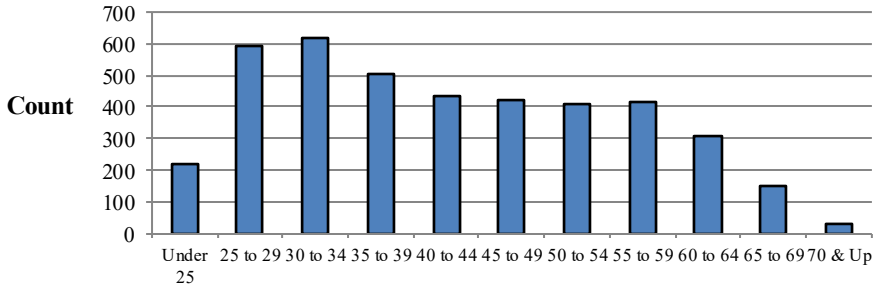
Total – All Plans

	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	220	0	0	0	0	0	0	0	0	220
25 to 29	526	68	0	0	0	0	0	0	0	594
30 to 34	368	229	24	0	0	0	0	0	0	621
35 to 39	305	140	42	13	1	0	0	0	0	501
40 to 44	221	107	48	48	10	0	0	0	0	434
45 to 49	207	86	41	40	42	7	0	0	0	423
50 to 54	170	108	35	26	37	22	10	1	0	409
55 to 59	134	76	40	57	45	28	29	5	1	415
60 to 64	96	60	29	35	25	25	24	12	3	309
65 to 69	41	35	23	21	9	8	7	2	5	151
70 & Up	11	4	4	2	2	2	2	1	3	31
Total	2,299	913	286	242	171	92	72	21	12	4,108

Service Distribution



Age Distribution

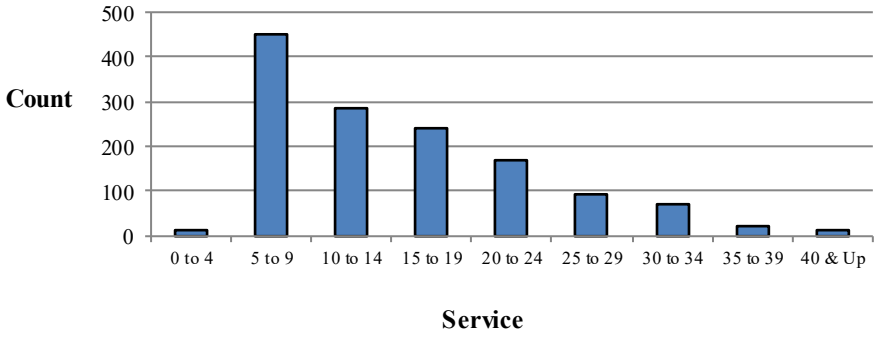


DISTRIBUTION OF ACTIVE MEMBERS
as of January 1, 2021

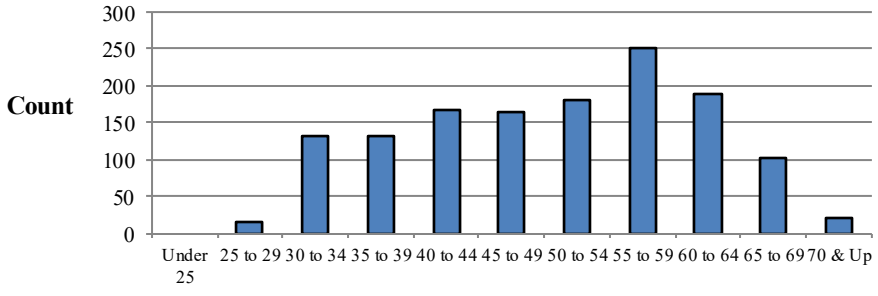
Total – Plan B

	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	15	0	0	0	0	0	0	0	15
30 to 34	0	109	24	0	0	0	0	0	0	133
35 to 39	0	77	42	13	1	0	0	0	0	133
40 to 44	0	61	48	48	10	0	0	0	0	167
45 to 49	0	35	41	40	42	7	0	0	0	165
50 to 54	0	50	35	26	37	22	10	1	0	181
55 to 59	1	45	40	57	45	28	29	5	1	251
60 to 64	5	32	29	35	25	25	24	12	3	190
65 to 69	3	23	23	21	9	8	7	2	5	101
70 & Up	2	2	4	2	2	2	2	1	3	20
Total	11	449	286	242	171	92	72	21	12	1,356

Service Distribution



Age Distribution

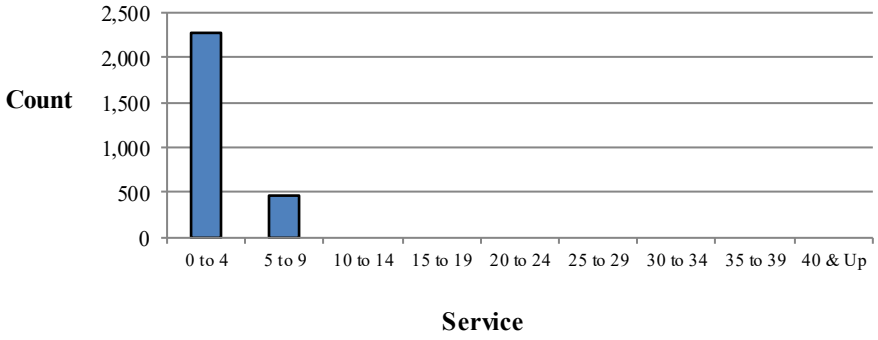


DISTRIBUTION OF ACTIVE MEMBERS
as of January 1, 2021

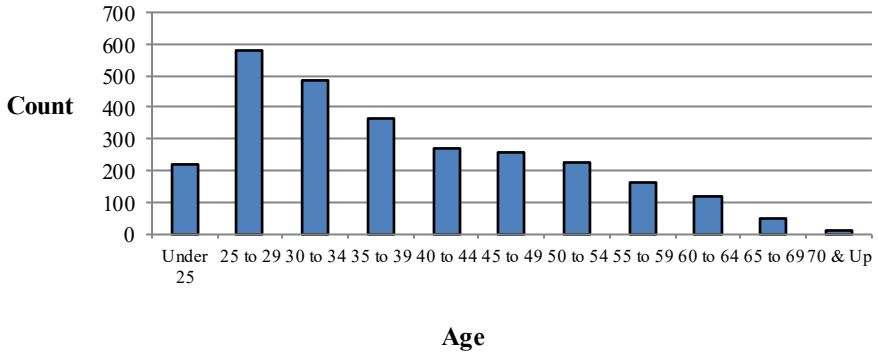
Total – Plan C

	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	220	0	0	0	0	0	0	0	0	220
25 to 29	526	53	0	0	0	0	0	0	0	579
30 to 34	368	120	0	0	0	0	0	0	0	488
35 to 39	305	63	0	0	0	0	0	0	0	368
40 to 44	221	46	0	0	0	0	0	0	0	267
45 to 49	207	51	0	0	0	0	0	0	0	258
50 to 54	170	58	0	0	0	0	0	0	0	228
55 to 59	133	31	0	0	0	0	0	0	0	164
60 to 64	91	28	0	0	0	0	0	0	0	119
65 to 69	38	12	0	0	0	0	0	0	0	50
70 & Up	9	2	0	0	0	0	0	0	0	11
Total	2,288	464	0	0	0	0	0	0	0	2,752

Service Distribution



Age Distribution

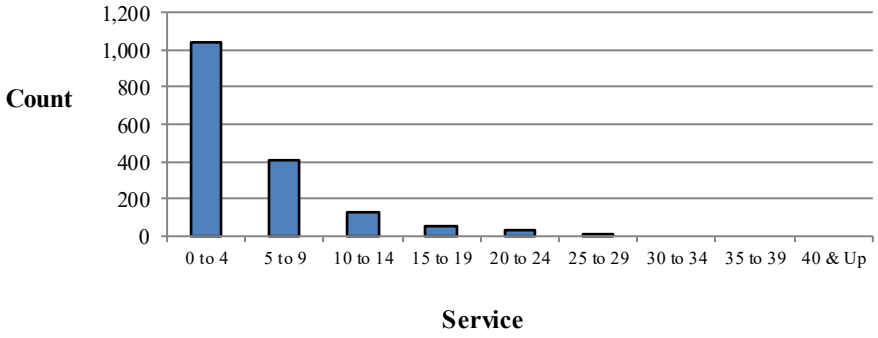


DISTRIBUTION OF ACTIVE MEMBERS
as of January 1, 2021

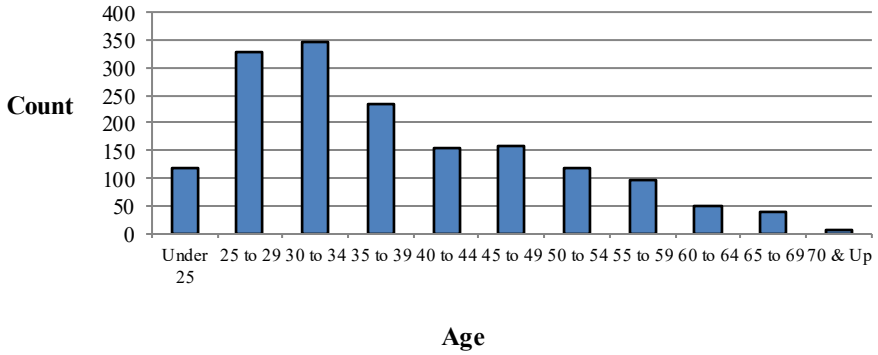
Charter Schools – All Plans

	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	119	0	0	0	0	0	0	0	0	119
25 to 29	285	42	0	0	0	0	0	0	0	327
30 to 34	187	144	16	0	0	0	0	0	0	347
35 to 39	140	62	26	6	1	0	0	0	0	235
40 to 44	78	48	18	11	1	0	0	0	0	156
45 to 49	75	39	20	11	12	0	0	0	0	157
50 to 54	67	28	11	4	7	0	0	0	0	117
55 to 59	49	19	14	10	5	0	0	0	0	97
60 to 64	24	14	7	5	0	1	0	0	0	51
65 to 69	15	8	8	2	4	1	0	0	0	38
70 & Up	3	1	1	0	1	0	0	0	0	6
Total	1,042	405	121	49	31	2	0	0	0	1,650

Service Distribution



Age Distribution

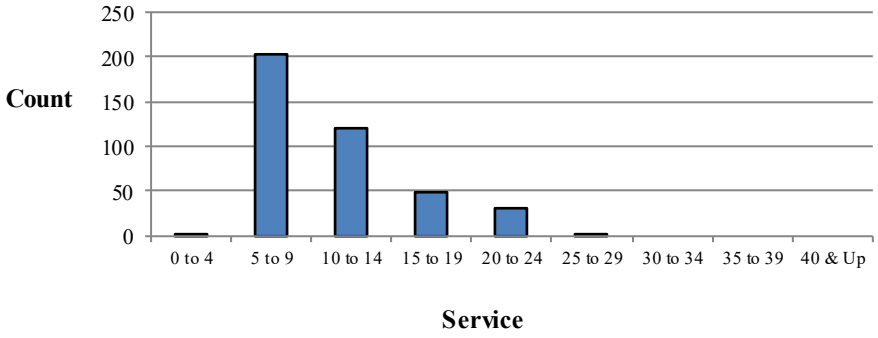


DISTRIBUTION OF ACTIVE MEMBERS
as of January 1, 2021

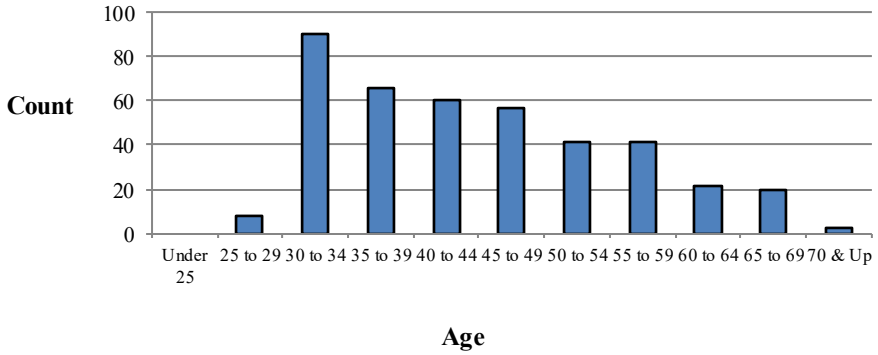
Charter Schools – Plan B

	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	8	0	0	0	0	0	0	0	8
30 to 34	0	74	16	0	0	0	0	0	0	90
35 to 39	0	33	26	6	1	0	0	0	0	66
40 to 44	0	30	18	11	1	0	0	0	0	60
45 to 49	0	14	20	11	12	0	0	0	0	57
50 to 54	0	19	11	4	7	0	0	0	0	41
55 to 59	1	11	14	10	5	0	0	0	0	41
60 to 64	0	8	7	5	0	1	0	0	0	21
65 to 69	0	5	8	2	4	1	0	0	0	20
70 & Up	0	0	1	0	1	0	0	0	0	2
Total	1	202	121	49	31	2	0	0	0	406

Service Distribution



Age Distribution

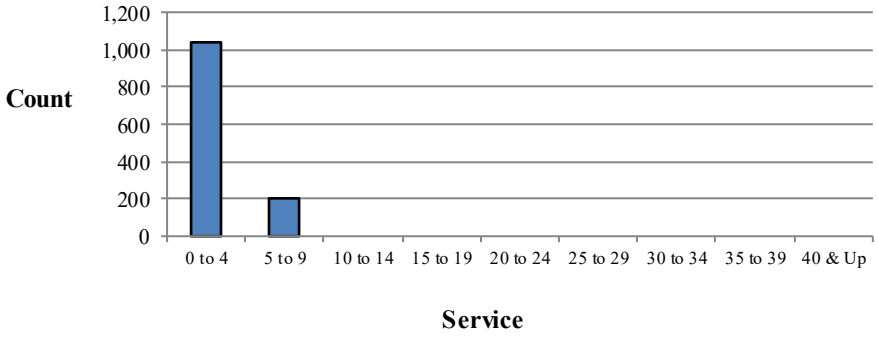


DISTRIBUTION OF ACTIVE MEMBERS
as of January 1, 2021

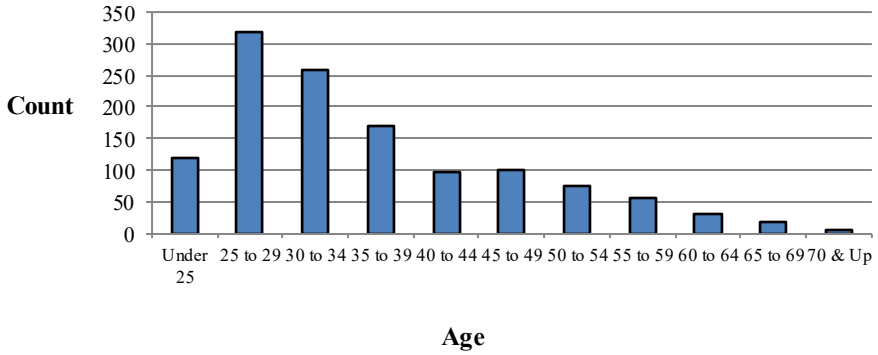
Charter Schools – Plan C

	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	119	0	0	0	0	0	0	0	0	119
25 to 29	285	34	0	0	0	0	0	0	0	319
30 to 34	187	70	0	0	0	0	0	0	0	257
35 to 39	140	29	0	0	0	0	0	0	0	169
40 to 44	78	18	0	0	0	0	0	0	0	96
45 to 49	75	25	0	0	0	0	0	0	0	100
50 to 54	67	9	0	0	0	0	0	0	0	76
55 to 59	48	8	0	0	0	0	0	0	0	56
60 to 64	24	6	0	0	0	0	0	0	0	30
65 to 69	15	3	0	0	0	0	0	0	0	18
70 & Up	3	1	0	0	0	0	0	0	0	4
Total	1,041	203	0	0	0	0	0	0	0	1,244

Service Distribution



Age Distribution

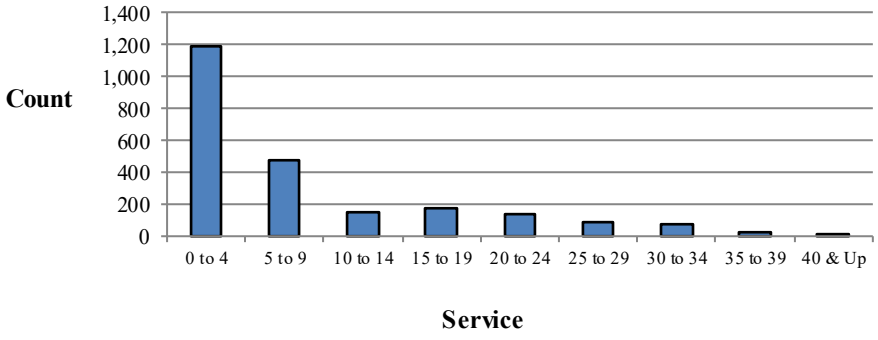


DISTRIBUTION OF ACTIVE MEMBERS
as of January 1, 2021

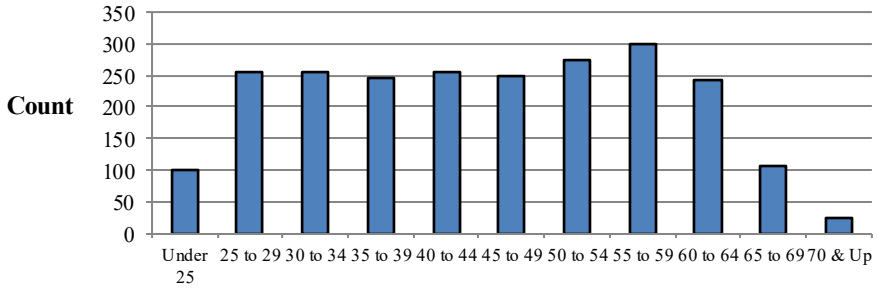
School District & Retirement System – All Plans

	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	99	0	0	0	0	0	0	0	0	99
25 to 29	229	26	0	0	0	0	0	0	0	255
30 to 34	166	81	8	0	0	0	0	0	0	255
35 to 39	154	71	16	6	0	0	0	0	0	247
40 to 44	132	55	26	35	8	0	0	0	0	256
45 to 49	124	41	18	29	29	7	0	0	0	248
50 to 54	96	76	21	20	28	22	10	1	0	274
55 to 59	84	53	21	41	40	27	28	5	0	299
60 to 64	70	46	18	26	22	23	23	10	3	241
65 to 69	25	24	14	19	5	7	7	2	5	108
70 & Up	8	3	3	2	1	2	2	1	2	24
Total	1,187	476	145	178	133	88	70	19	10	2,306

Service Distribution



Age Distribution

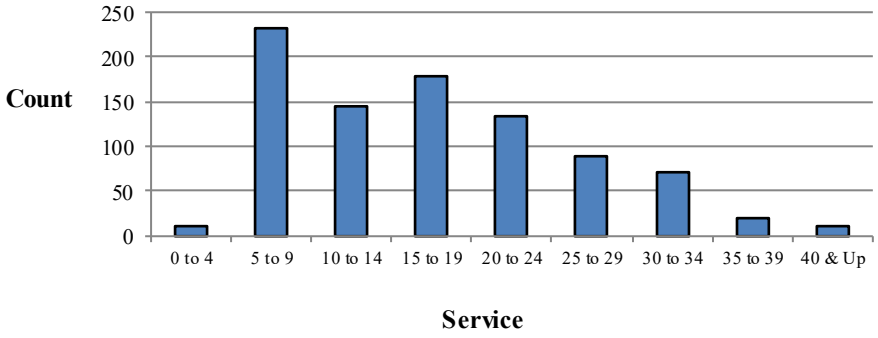


DISTRIBUTION OF ACTIVE MEMBERS
as of January 1, 2021

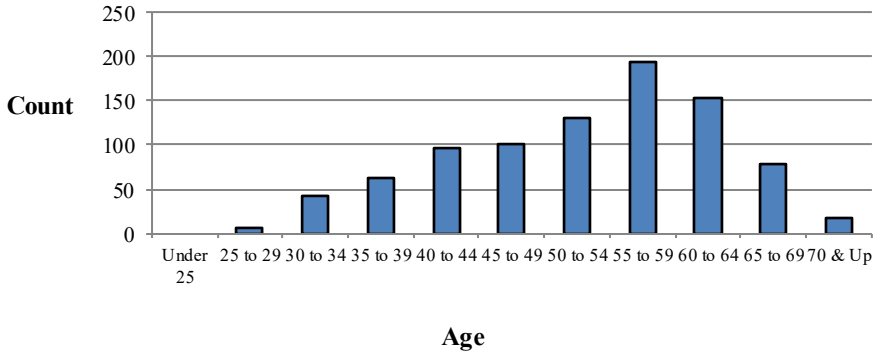
School District & Retirement System – Plan B

	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	7	0	0	0	0	0	0	0	7
30 to 34	0	35	8	0	0	0	0	0	0	43
35 to 39	0	41	16	6	0	0	0	0	0	63
40 to 44	0	28	26	35	8	0	0	0	0	97
45 to 49	0	18	18	29	29	7	0	0	0	101
50 to 54	0	29	21	20	28	22	10	1	0	131
55 to 59	0	32	21	41	40	27	28	5	0	194
60 to 64	5	24	18	26	22	23	23	10	3	154
65 to 69	3	16	14	19	5	7	7	2	5	78
70 & Up	2	2	3	2	1	2	2	1	2	17
Total	10	232	145	178	133	88	70	19	10	885

Service Distribution



Age Distribution

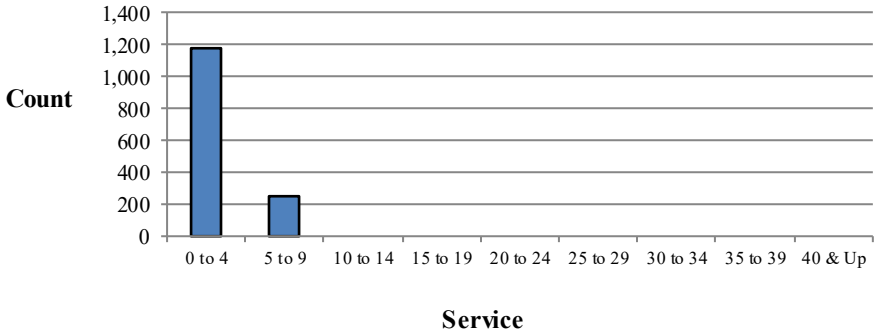


DISTRIBUTION OF ACTIVE MEMBERS
as of January 1, 2021

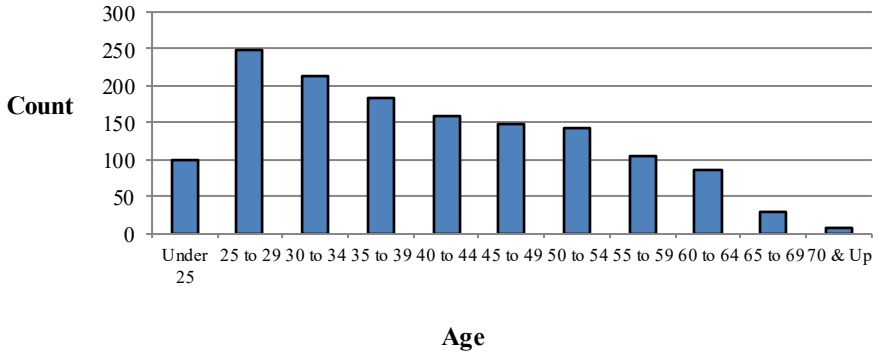
School District & Retirement System – Plan C

	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	99	0	0	0	0	0	0	0	0	99
25 to 29	229	19	0	0	0	0	0	0	0	248
30 to 34	166	46	0	0	0	0	0	0	0	212
35 to 39	154	30	0	0	0	0	0	0	0	184
40 to 44	132	27	0	0	0	0	0	0	0	159
45 to 49	124	23	0	0	0	0	0	0	0	147
50 to 54	96	47	0	0	0	0	0	0	0	143
55 to 59	84	21	0	0	0	0	0	0	0	105
60 to 64	65	22	0	0	0	0	0	0	0	87
65 to 69	22	8	0	0	0	0	0	0	0	30
70 & Up	6	1	0	0	0	0	0	0	0	7
Total	1,177	244	0	0	0	0	0	0	0	1,421

Service Distribution



Age Distribution

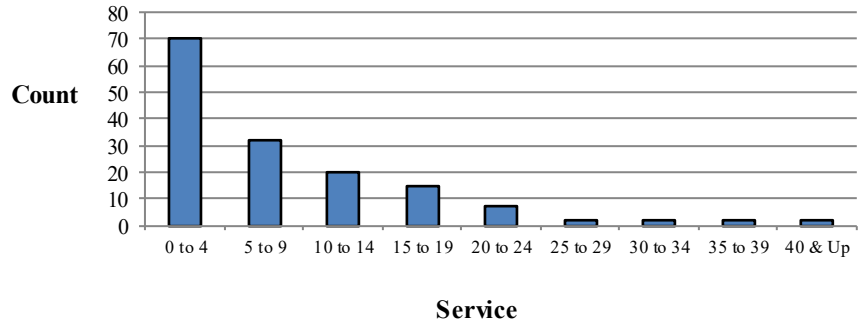


DISTRIBUTION OF ACTIVE MEMBERS
as of January 1, 2021

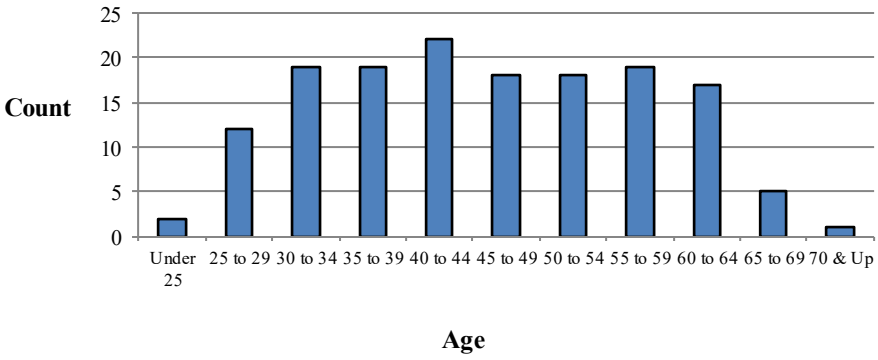
Library – All Plans

	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	2	0	0	0	0	0	0	0	0	2
25 to 29	12	0	0	0	0	0	0	0	0	12
30 to 34	15	4	0	0	0	0	0	0	0	19
35 to 39	11	7	0	1	0	0	0	0	0	19
40 to 44	11	4	4	2	1	0	0	0	0	22
45 to 49	8	6	3	0	1	0	0	0	0	18
50 to 54	7	4	3	2	2	0	0	0	0	18
55 to 59	1	4	5	6	0	1	1	0	1	19
60 to 64	2	0	4	4	3	1	1	2	0	17
65 to 69	1	3	1	0	0	0	0	0	0	5
70 & Up	0	0	0	0	0	0	0	0	1	1
Total	70	32	20	15	7	2	2	2	2	152

Service Distribution



Age Distribution

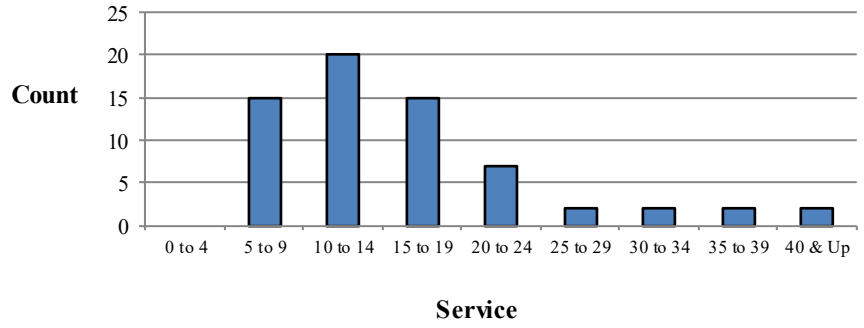


DISTRIBUTION OF ACTIVE MEMBERS
as of January 1, 2021

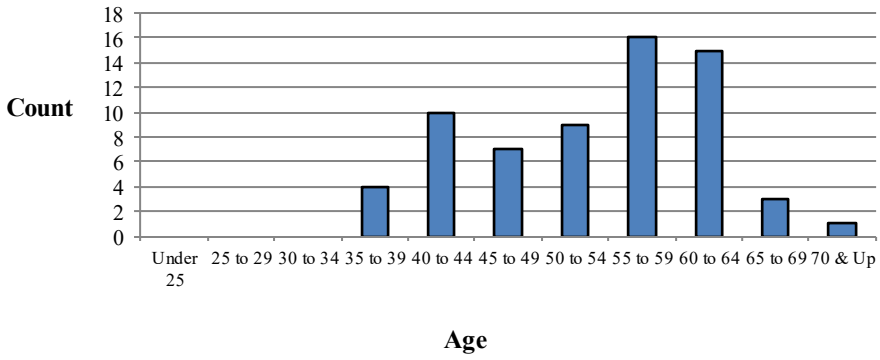
Library – Plan B

	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	0	0	0	0	0	0	0	0	0
35 to 39	0	3	0	1	0	0	0	0	0	4
40 to 44	0	3	4	2	1	0	0	0	0	10
45 to 49	0	3	3	0	1	0	0	0	0	7
50 to 54	0	2	3	2	2	0	0	0	0	9
55 to 59	0	2	5	6	0	1	1	0	1	16
60 to 64	0	0	4	4	3	1	1	2	0	15
65 to 69	0	2	1	0	0	0	0	0	0	3
70 & Up	0	0	0	0	0	0	0	0	1	1
Total	0	15	20	15	7	2	2	2	2	65

Service Distribution



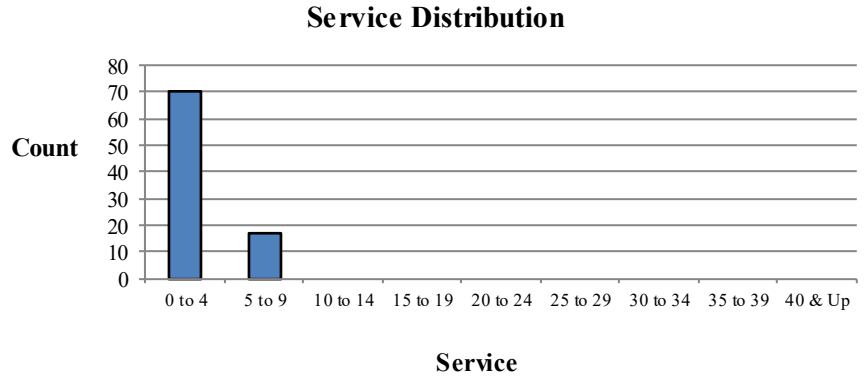
Age Distribution

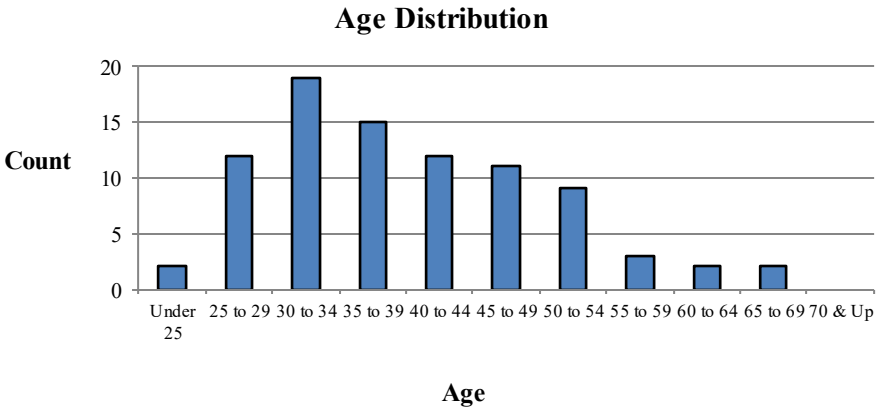


DISTRIBUTION OF ACTIVE MEMBERS
as of January 1, 2021

Library – Plan C

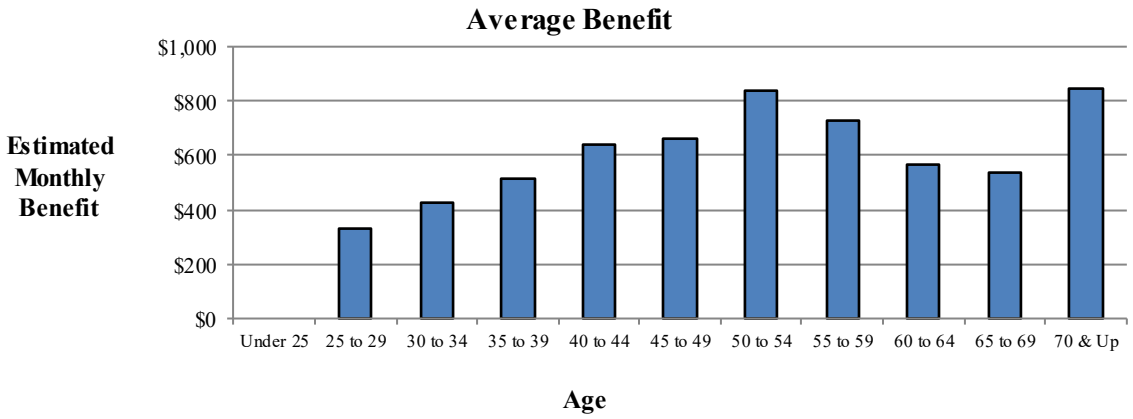
	Years of Service									
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & Up	Total
Under 25	2	0	0	0	0	0	0	0	0	2
25 to 29	12	0	0	0	0	0	0	0	0	12
30 to 34	15	4	0	0	0	0	0	0	0	19
35 to 39	11	4	0	0	0	0	0	0	0	15
40 to 44	11	1	0	0	0	0	0	0	0	12
45 to 49	8	3	0	0	0	0	0	0	0	11
50 to 54	7	2	0	0	0	0	0	0	0	9
55 to 59	1	2	0	0	0	0	0	0	0	3
60 to 64	2	0	0	0	0	0	0	0	0	2
65 to 69	1	1	0	0	0	0	0	0	0	2
70 & Up	0	0	0	0	0	0	0	0	0	0
Total	70	17	0	0	0	0	0	0	0	87

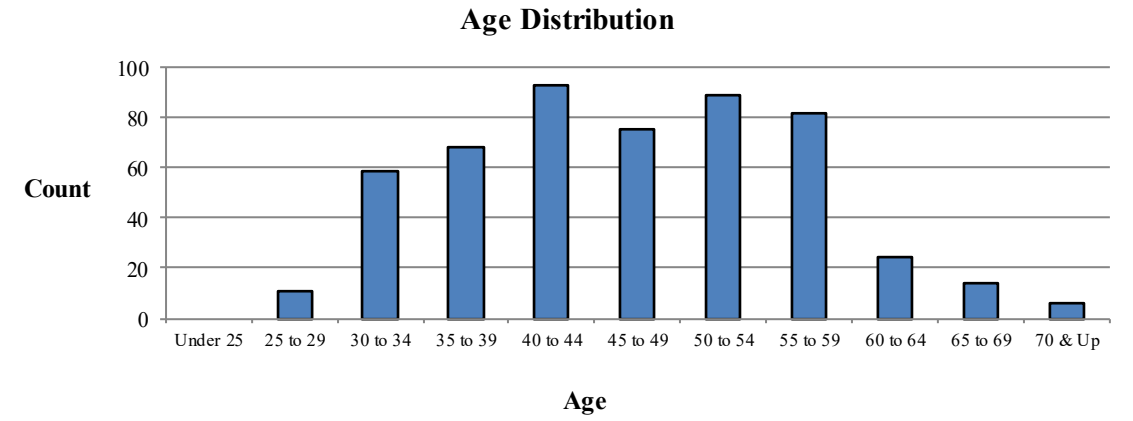




SUMMARY OF TERMINATED VESTED MEMBERS
as of January 1, 2021

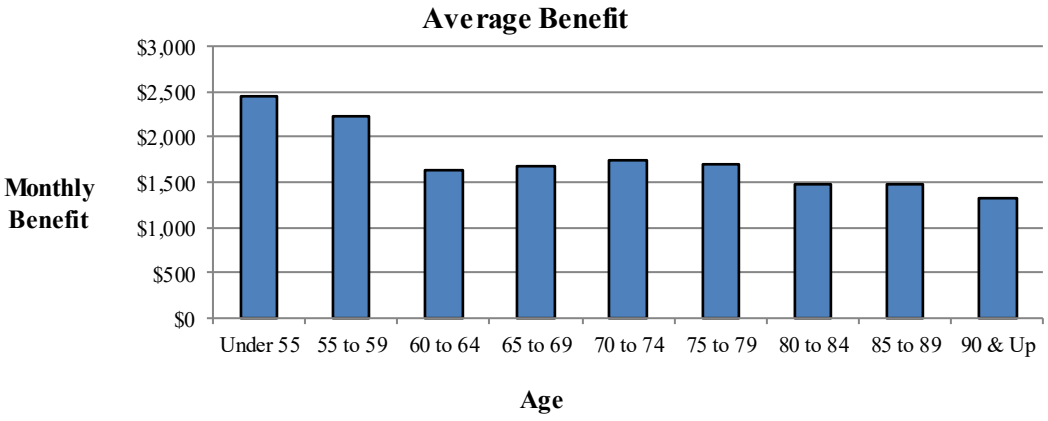
	Number			Estimated Monthly Benefit		
Age	Male	Female	Total	Male	Female	Total
Under 25	0	0	0	$ 0	$ 0	$ 0
25 to 29	2	9	11	830	2,856	3,686
30 to 34	9	50	59	3,081	21,991	25,072
35 to 39	14	54	68	8,045	26,828	34,873
40 to 44	27	66	93	18,097	41,522	59,619
45 to 49	19	56	75	14,810	34,898	49,708
50 to 54	21	68	89	14,228	60,516	74,744
55 to 59	32	50	82	27,491	32,276	59,767
60 to 64	5	19	24	3,595	10,084	13,679
65 to 69	3	11	14	1,232	6,242	7,474
70 & Up	3	3	6	3,378	1,700	5,078
Total	135	386	521	$94,787	$238,913	$333,700

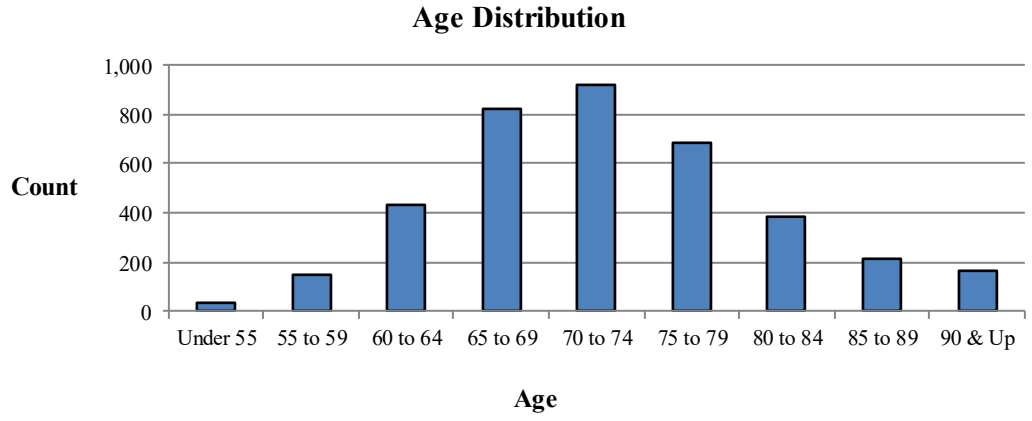




SUMMARY OF ALL RETIRED MEMBERS
as of January 1, 2021

	Number			Monthly Benefit		
Age	Male	Female	Total	Male	Female	Total
Under 55	14	18	32	$ 34,665	$ 43,856	$ 78,521
55 to 59	43	102	145	88,006	233,795	321,801
60 to 64	123	311	434	202,135	501,994	704,129
65 to 69	207	616	823	312,959	1,075,768	1,388,727
70 to 74	242	680	922	379,205	1,224,847	1,604,052
75 to 79	159	521	680	237,182	923,812	1,160,994
80 to 84	97	283	380	162,104	396,093	558,197
85 to 89	53	163	216	95,315	222,063	317,378
90 & Up	36	130	166	53,440	166,220	219,660
Total	974	2,824	3,798	$ 1,565,011	$ 4,788,448	$ 6,353,459



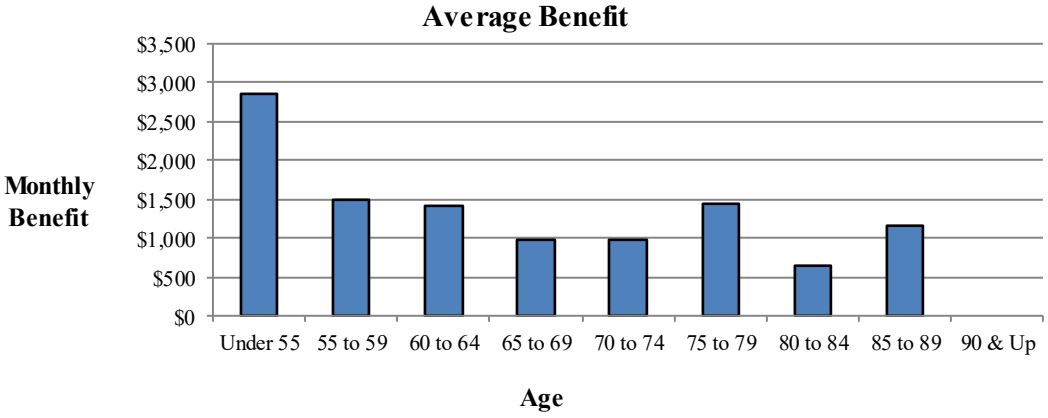


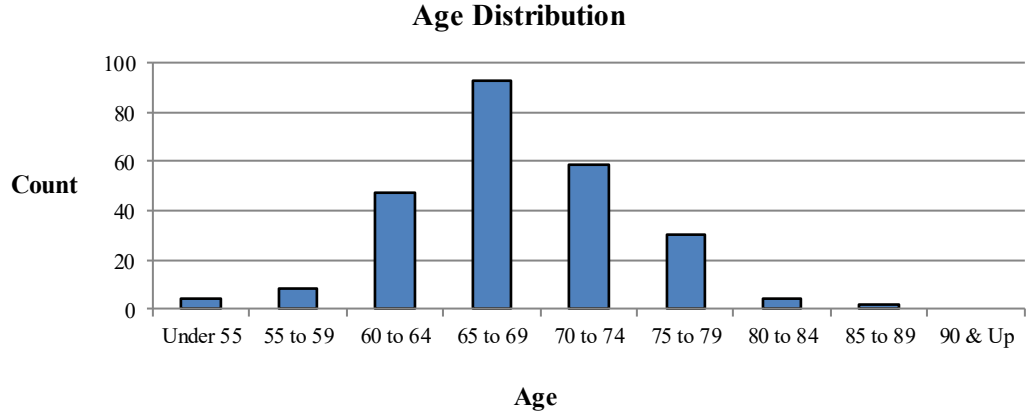
SUMMARY OF RETIRED MEMBERS

as of January 1, 2021

Charter Schools
(Last employer prior to retirement)

Age	Number			Monthly Benefit		
	Male	Female	Total	Male	Female	Total
Under 55	1	3	4	$ 3,648	$ 7,806	$ 11,454
55 to 59	1	7	8	616	11,256	11,872
60 to 64	14	33	47	26,545	39,979	66,524
65 to 69	27	66	93	23,636	66,616	90,252
70 to 74	15	44	59	13,469	44,794	58,263
75 to 79	10	20	30	9,929	33,015	42,944
80 to 84	2	2	4	1,080	1,557	2,637
85 to 89	1	1	2	436	1,883	2,319
90 & Up	0	0	0	0	0	0
Total	71	176	247	$ 79,359	$ 206,906	$ 286,265



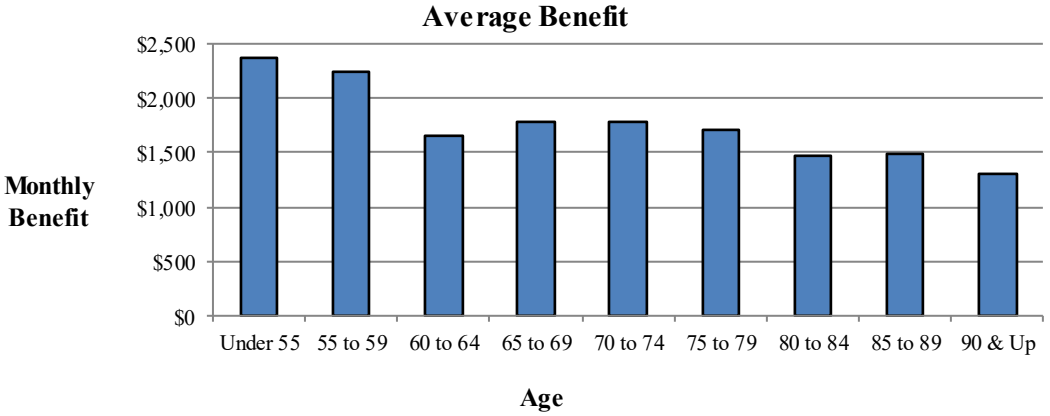


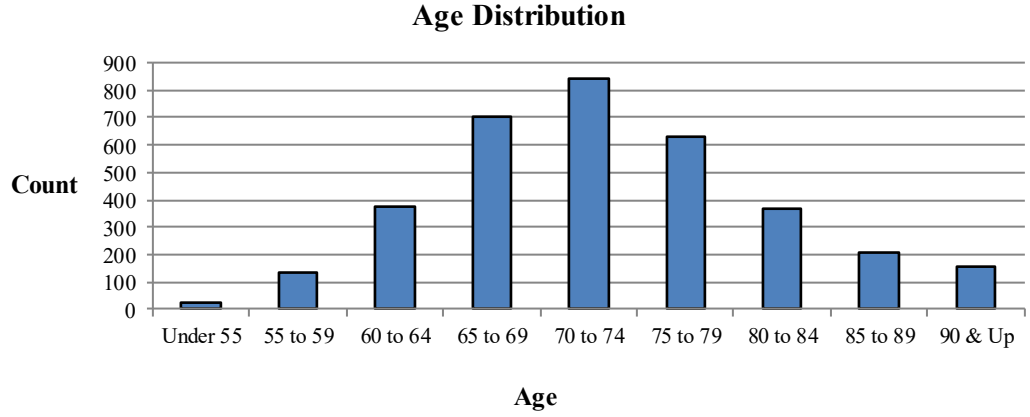
SUMMARY OF RETIRED MEMBERS

as of January 1, 2021

School District & Retirement System
(Last employer prior to retirement)

Age	Number			Monthly Benefit		
	Male	Female	Total	Male	Female	Total
Under 55	12	15	27	$ 27,946	$ 36,050	$ 63,996
55 to 59	41	94	135	85,406	218,063	303,469
60 to 64	104	274	378	168,476	454,194	622,670
65 to 69	171	533	704	273,230	981,771	1,255,001
70 to 74	222	622	844	358,313	1,151,089	1,509,402
75 to 79	147	484	631	221,410	859,517	1,080,927
80 to 84	95	273	368	161,024	381,955	542,979
85 to 89	51	159	210	93,892	216,929	310,821
90 & Up	34	124	158	51,857	154,723	206,580
Total	877	2,578	3,455	$ 1,441,554	$ 4,454,291	$ 5,895,845

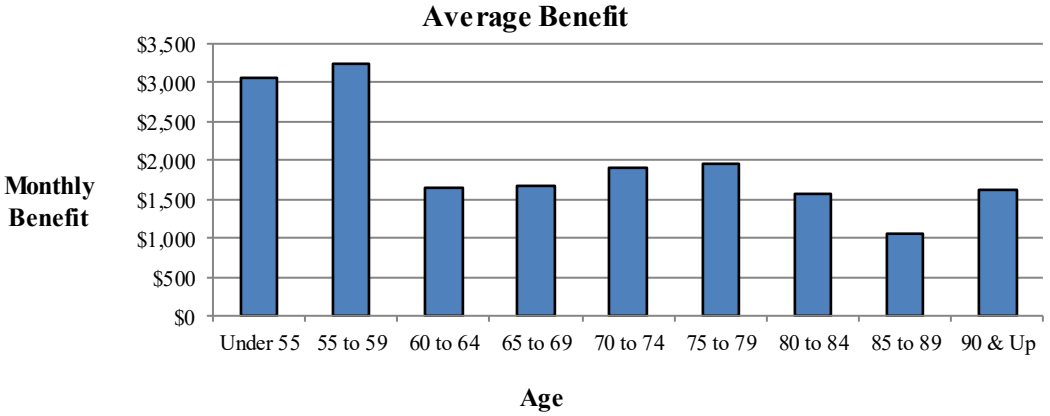


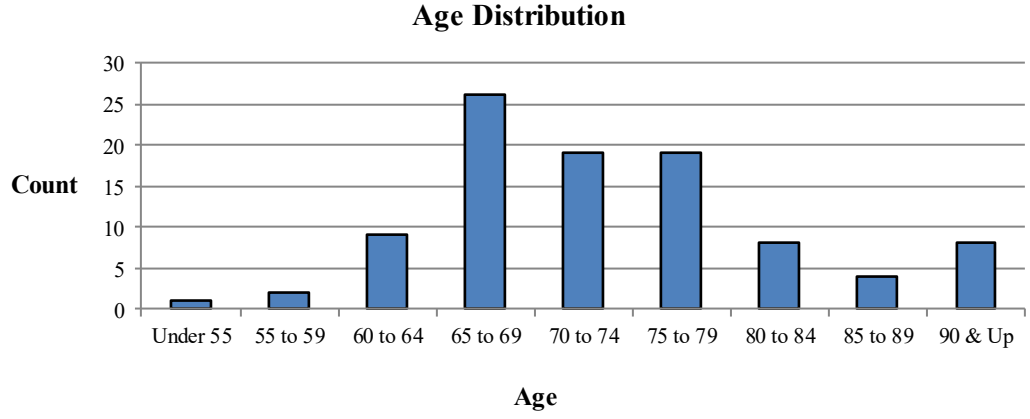


SUMMARY OF RETIRED MEMBERS
as of January 1, 2021

Library
(Last employer prior to retirement)

Age	Number			Monthly Benefit		
	Male	Female	Total	Male	Female	Total
Under 55	1	0	1	$ 3,071	$ 0	$ 3,071
55 to 59	1	1	2	1,984	4,476	6,460
60 to 64	5	4	9	7,114	7,821	14,935
65 to 69	9	17	26	16,093	27,381	43,474
70 to 74	5	14	19	7,423	28,964	36,387
75 to 79	2	17	19	5,843	31,280	37,123
80 to 84	0	8	8	0	12,581	12,581
85 to 89	1	3	4	987	3,251	4,238
90 & Up	2	6	8	1,583	11,497	13,080
Total	26	70	96	$ 44,098	$ 127,251	$ 171,349



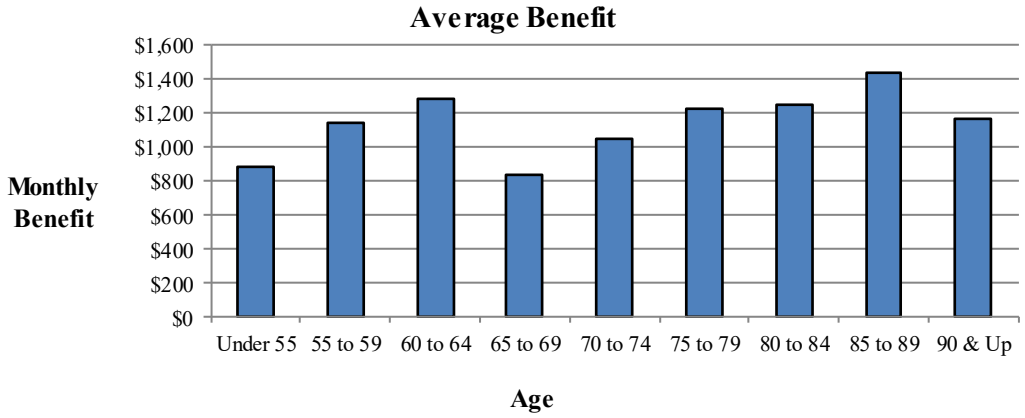


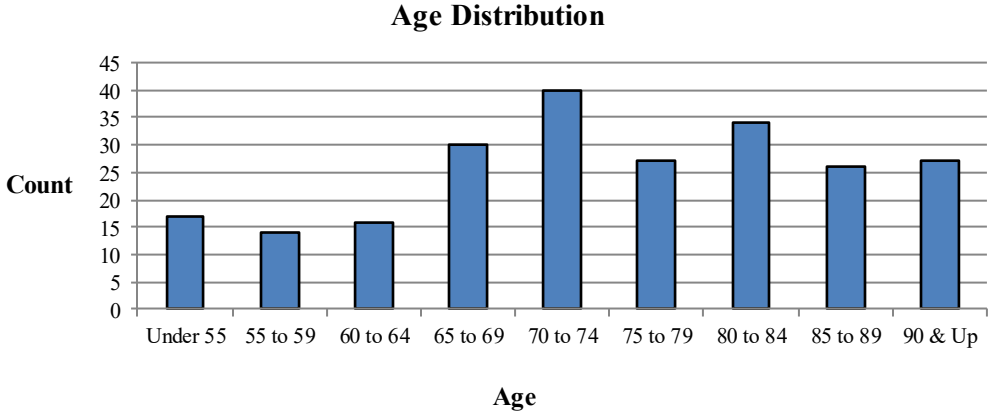
SUMMARY OF BENEFICIARIES*

as of January 1, 2021

Age	Number			Monthly Benefit		
	Male	Female	Total	Male	Female	Total
Under 55	7	10	17	$ 7,244	$ 7,679	$ 14,923
55 to 59	7	7	14	6,066	9,943	16,009
60 to 64	5	11	16	5,363	15,134	20,497
65 to 69	5	25	30	5,171	19,759	24,930
70 to 74	14	26	40	13,645	28,182	41,827
75 to 79	9	18	27	9,120	23,876	32,996
80 to 84	7	27	34	7,939	34,599	42,538
85 to 89	6	20	26	9,553	27,726	37,279
90 & Up	5	22	27	3,827	27,478	31,305
Total	65	166	231	$ 67,928	$ 194,376	$ 262,304

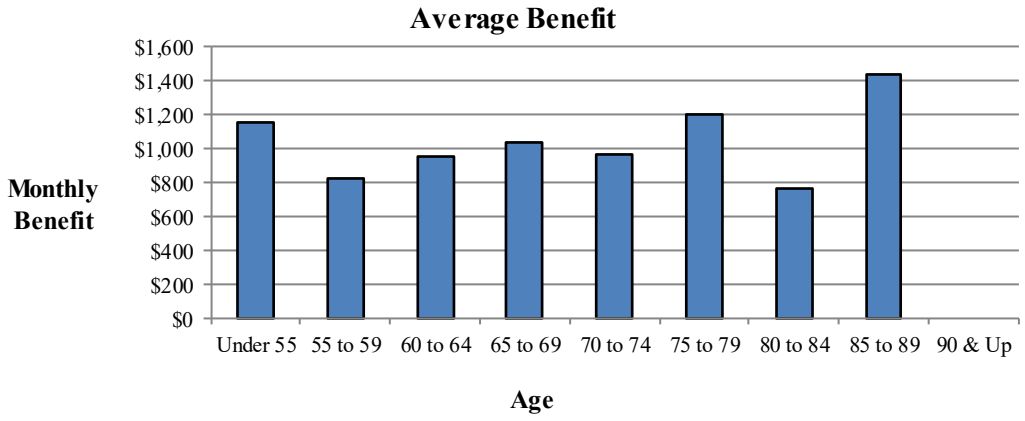
* Includes 3 beneficiaries who were owed a single lump sum payment and were not paid prior to the valuation date.

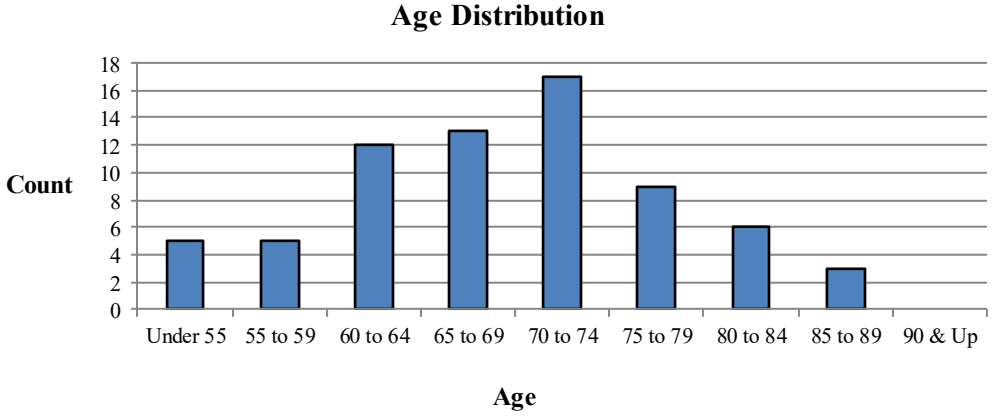




SUMMARY OF DISABLED MEMBERS
as of January 1, 2021

Age	Number			Monthly Benefit		
	Male	Female	Total	Male	Female	Total
Under 55	0	5	5	$ 0	$ 5,761	$ 5,761
55 to 59	3	2	5	2,849	1,294	4,143
60 to 64	3	9	12	1,812	9,565	11,377
65 to 69	3	10	13	2,800	10,674	13,474
70 to 74	7	10	17	6,563	9,807	16,370
75 to 79	0	9	9	0	10,753	10,753
80 to 84	0	6	6	0	4,602	4,602
85 to 89	0	3	3	0	4,291	4,291
90 & Up	0	0	0	0	0	0
Total	16	54	70	$ 14,024	$ 56,747	$ 70,771





HISTORICAL MEMBERSHIP PROFILE

as of January 1

	2021	2020	2019	2018	2017	2016	2015	2014	2013
Active Members	4,108	4,074	3,898	3,760	3,701	3,574	3,493	3,501	3,396
Average Age	42.8	42.7	42.7	42.8	43.5	44.0	44.4	44.5	44.9
Average Years of Service	7.4	7.1	7.2	7.5	8.1	8.1	8.3	8.5	9.0
Inactive Vested	521	529	531	522	490	461	476	560	526
Average Age	47.3	47.8	48.6	49.8	50.5	50.5	50.2	51.6	51.1
Average Estimated Monthly Benefit	$640	$650	$647	$678	$671	$689			
Retirees, Disabled and Survivors	4,099	4,145	4,113	4,112	4,032	4,049	4,011	3,885	3,859
Average Age	73.2	72.9	72.5	72.3	72.2	72.0	71.7	71.7	71.5
Average Monthly Benefit	$1,632	$1,631	$1,625	$1,607	$1,589	$1,580	$1,574	$1,569	$1,562

HISTORICAL ACTIVE MEMBER DATA

Valuation January 1	Active Members	Annual Payroll	Annual Average Pay	% Increase in Average Pay
2012	3,284	$155,893,016	$47,470	2.00%
2013	3,396	157,303,005	46,320	(2.42%)
2014	3,501	157,014,537	44,848	(3.18%)
2015	3,493	170,845,124	48,911	9.06%
2016	3,574	179,013,516	50,088	2.41%
2017	3,701	194,132,739	52,454	4.72%
2018	3,760	196,277,971	52,202	(0.48%)
2019	3,898	203,310,599	52,158	(0.08%)
2020	4,074	217,255,306	53,327	2.24%
2021	4,108	228,084,635	55,522	4.12%

AVERAGE MONTHLY BENEFIT AMOUNTS FOR NEW RETIREES

	Years of Credited Service							All
Members Retiring During	<5	5-10	10-15	15-20	20-25	25-30	30+	Members
Fiscal Year Ending 01/01/2014								
Average monthly benefit	$1,669	$566	$827	$1,428	$2,091	$2,218	$2,662	$1,399
Number of retirees	5	32	28	19	22	22	6	134
Fiscal Year Ending 01/01/2015								
Average monthly benefit	$343	$563	$879	$1,656	$2,120	$2,591	$2,985	$1,516
Number of retirees	3	37	44	25	36	25	10	180
Fiscal Year Ending 01/01/2016								
Average monthly benefit	$436	$625	$977	$1,403	$2,174	$2,678	$3,414	$1,579
Number of retirees	9	23	39	17	21	27	9	145
Fiscal Year Ending 01/01/2017								
Average monthly benefit	$478	$493	$1,019	$1,415	$2,036	$2,568	$2,740	$1,570
Number of retirees	4	26	24	17	22	24	12	129
Fiscal Year Ending 01/01/2018								
Average monthly benefit	$549	$611	$935	$1,490	$2,435	$2,786	$3,087	$1,792
Number of retirees	11	32	31	30	33	35	24	196
Fiscal Year Ending 01/01/2019								
Average monthly benefit	$730	$701	$961	$1,818	$2,245	$2,643	$2,928	$1,684
Number of retirees	2	35	22	27	16	18	18	138
Fiscal Year Ending 01/01/2020								
Average monthly benefit	$465	$680	$928	$1,640	$2,253	$3,469	$2,787	$1,569
Number of retirees	6	38	24	22	15	18	8	131
Fiscal Year Ending 01/01/2021								
Average monthly benefit	$396	$515	$1,082	$1,466	$1,742	$2,944	$2,939	$1,508
Number of retirees	1	19	20	30	17	8	10	105

RETIREES AND BENEFICIARIES ADDED TO AND REMOVED FROM ROLLS

Year Ended December 31	Added to Rolls		Removed from Rolls		Rolls End of Year		% Increase in Annual Benefits	Average Annual Benefits
	Number	Annual Benefits	Number	Annual Benefits	Number	Annual Benefits		
2012	138	$1,939,048	108	$1,485,934	3,859	$72,356,163		$18,750
2013	148	2,480,646	95	1,690,031	3,885	73,146,778	1.09%	18,828
2014	257	4,763,445	131	2,173,699	4,011	75,736,524	3.54%	18,882
2015	159	2,949,800	122	1,900,088	4,049	76,786,236	1.39%	18,964
2016	151	2,791,834	167	2,697,334	4,032	76,880,736	0.12%	19,068
2017	215	4,456,931	135	2,040,515	4,112	79,297,152	3.14%	19,284
2018	153	2,992,593	152	2,161,017	4,113	80,128,728	1.05%	19,482
2019	155	2,832,629	123	1,866,173	4,145	81,095,184	1.21%	19,565
2020	120	2,115,087	166	2,971,863	4,099	80,238,408	-1.06%	19,575

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, as determined in the valuation prepared for the prior calendar year, 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

None.

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.

For contribution rates beginning July 1, 2021 and later, there is a 18-month lag between the valuation date in which the employer contribution rates are determined and the effective date of those contribution rates. Therefore, the unfunded actuarial accrued liability is projected from the valuation date to July 1 of the year in which the contribution rate will apply based on the scheduled statutory contribution rates and expected payroll in the intervening years to better approximate the UAAL at that point in time.

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 salary increases to members

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

(iv) Rates of termination of active members

(v) The age patterns of actual retirements

Investment Return Assumption: (net of investment expenses): 7.25% per year, compounded annually (2.25% long-term price inflation and a 5.00% real rate of return).

Price Inflation: 2.25%

General Wage Growth (Wage Inflation): 2.85%

Payroll Growth Assumption: 2.85% per year.

Interest Crediting Rate on Member Accounts: 2.50% per year.

Salary Increase Rates: Rates vary by years of service.

	Rates by Service			
Years	Inflation	Productivity	Merit	Total
<1	2.25%	0.60%	6.65%	9.50%
1	2.25	0.60	4.65	7.50
2	2.25	0.60	3.65	6.50
3	2.25	0.60	2.65	5.50
4	2.25	0.60	2.40	5.25
5	2.25	0.60	2.15	5.00
6	2.25	0.60	1.90	4.75
7	2.25	0.60	1.80	4.65
8 – 19	2.25	0.60	1.65	4.50
20 – 25	2.25	0.60	1.15	4.00
26+	2.25	0.60	1.00	3.85

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: Pub-2010 General Members (Below Median) Retiree Mortality Table with a one-year age setback for males and a one-year age set-forward for females, projected 7 years from valuation date using most recent MP-Scale.

Beneficiaries: Pub-2010 General Members (Below Median) Contingent Survivor Mortality Table with a one-year age setback for males and a one-year age set-forward for females, projected 7 years from valuation date using most recent MP-Scale.

Disabled Retirees: Pub-2010 General Members (Below Median) Disabled Retiree Mortality Table with a one-year age setback for males and a one-year age set-forward for females.

Active Members: Pub-2010 General Members (Below Median) Employee Mortality Table with a one-year age setback for males and a one-year age set-forward for females, projected 15 years from valuation date using most recent MP-Scale.

Rates of Retirement: These rates are used to measure the probability of eligible members retiring under the regular retirement provisions. 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 – 52	12%	12%
53 – 54	15	12
55	20	12
56 – 61	15	12
62	15	20
63	30	20
64	20	20
65	20	28
66 – 74	30	28
75	100	100

Retirement Rates When Eligible for Reduced Benefits	
Age	Rate
55 – 59	5%

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 probability 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	26.0%
1	25.0
5	14.0
10	8.5
15	4.5
20	2.5
25+	1.0

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: None.

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.

Administrative Expense: The actuarial contribution rate includes an explicit component for administrative expenses, based on the actual administrative expenses for the prior year.

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 were several changes to the System's actuarial methods and assumptions as the result of a comprehensive experience study completed in 2020. The most significant changes are outline below:

- The investment return assumption was lowered from 7.50% to 7.25%.
- The inflation assumption was lowered from 2.75% to 2.25%.
- The assumed interest rate credited on employee account balances was lowered from 3.25% to 2.50%.
- The general wage increase assumption was lowered from 3.50% to 2.85%.
- The payroll growth assumption was lowered from 3.00% to 2.85%.
- The mortality assumption was changed to the Pub-2010 General Members (Below Median) Mortality Tables with a 1-year age setback for males and a 1-year age set-forward for females, projected using the most recent MP mortality improvement scale. Disabled retiree mortality rates do not reflect future mortality improvement.
- Retirement rates were modified to partially reflect observed experience.
- Termination rates were modified to partially reflect observed experience.
- The disability assumption was eliminated.
- Salary scale increases were changed from a flat 5.00% for all years to service-based rates.
- The actuarial contribution rate includes an explicit component for administrative expenses, based on the actual administrative expenses for the prior year.

There was also one change to the actuarial methods implemented in this valuation. There is an 18-month lag between the valuation date in which the actuarial contribution rates are determined and the effective date of those contribution rates. A change was made in determining the amortization payment on the unfunded actuarial accrued liability (UAAL) by projecting the UAAL to July 1 of the following year.

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.