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

Actuarial Valuation Report
as of January 1, 2020

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May 19, 2020

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, 2020. The major findings of the valuation are contained in this report, including the actuarial required contribution rate for the 2020 plan year. The 2018, the Missouri General Assembly passed legislation that changed the contribution policy for funding the System. The employer contribution rate increased to 10.50%, effective January 1, 2019, and increased again January 1, 2020 to 12.00%. Effective July 1, 2021, the employer contribution rate will be set based on the actuarial contribution rate. There were no changes to the actuarial assumptions or actuarial methods since the prior valuation with one exception. The long-term rate of return assumption was lowered from 7.75% to 7.50%.

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by the System's staff. This information includes, but is not limited to, plan provisions, member data, and financial information. We found this information to be reasonably consistent and comparable with information for the last valuation. The valuation results depend on the integrity of the data provided. If any of this information is inaccurate or incomplete, our valuation results may be different and our calculations may need to be revised.

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

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period); and changes in plan provisions or applicable law. Due to the limited scope of our assignment, we did not perform an analysis of the potential range of future measurements.

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

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

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

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

Sincerely,

Patrice Beckham

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, 2020 actuarial valuation of the Public School Retirement System of the School District of Kansas City, Missouri (System). The primary purposes of performing a valuation are to:

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

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 again to 12.00% of pay, effective January 1, 2020. Beginning July 1, 2021, the employer contribution rate will be the greater of (1) the actuarial required contribution rate, as determined in the valuation prepared for the prior calendar year, less the member contribution rate, or (2) 12.00% of pay, until the System is fully funded. More detail on the contribution provisions can be found in Appendix B of this report. The January 1, 2020 actuarial valuation will be used to set the employer contribution rate for July 1, 2021 through June 30, 2022. A summary of the calculation of the employer contribution rate effective July 1, 2021 is shown below.

Employer Contribution Rate Beginning July 1, 2021	
1. Actuarial Contribution Rate as of January 1, 2020	20.80%
2. Member Contribution Rate	(9.00%)
3. Employer Actuarial Contribution Rate as of January 1, 2020	11.80%
4. Funded Ratio as of January 1, 2020	63.26%
5. Minimum Employer Contribution Rate [If (4) < 100%, then 12.00%]	12.00%
6. Employer Contribution Rate Effective July 1, 2021 to June 30, 2022 [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 with time and provide a more sustainable path toward reaching full funding.

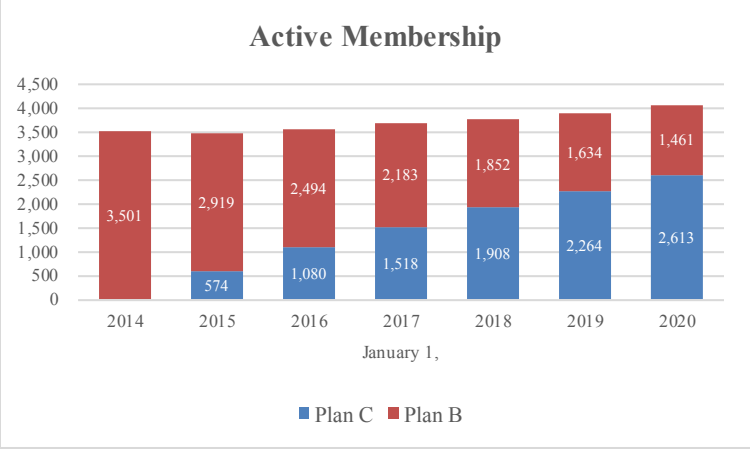
There were no changes to the plan provisions or actuarial methods since the prior valuation, but there was one change to the actuarial assumptions. At their May 4, 2020 meeting, the Board of Trustees voted to adopt the actuary's recommendation to lower the long-term rate of return assumption from 7.75% to 7.50%. This change increased the unfunded actuarial accrued liability by $23.4 million and increased the actuarial contribution rate by 0.88%.

The actuarial valuation results provide a "snapshot" view of the System's financial condition on January 1, 2020, which reflects net unfavorable experience for the past plan year as demonstrated by an unfunded actuarial accrued liability that was greater than expected, after reflecting the impact of the change in assumptions. The net experience on liabilities resulted in a loss of $0.9 million. There was also unfavorable experience on the actuarial value of assets despite a return of 18% on the market value of assets for 2019. When the 2019 investment experience was combined with the other deferred investment experience from prior years, the return on the actuarial value of assets was 5.7%. This resulted in an actuarial loss of $12.7 million. The combined impact of all experience was an actuarial loss of $13.6 million. The System's unfunded actuarial accrued liability increased from $334.0 million in the January 1, 2019 valuation to $374.7 million in the January 1, 2020 valuation. A detailed analysis of the change in the unfunded actuarial accrued liability is shown on page 5.

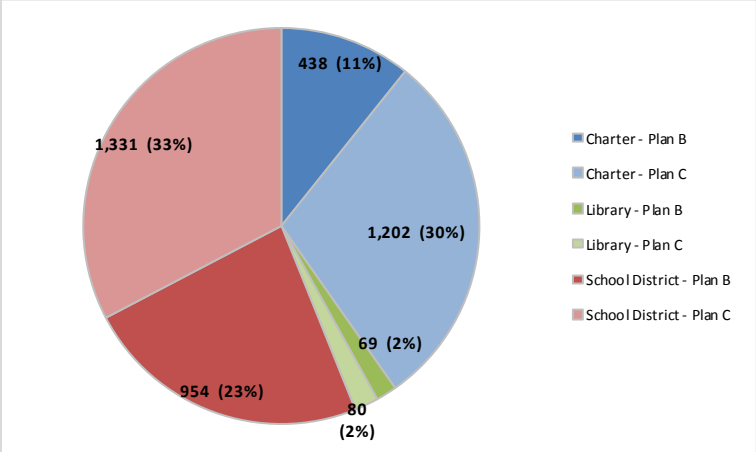
In the following pages, changes in the membership, assets, liabilities, and contributions of the System over the last year are discussed in more detail.

MEMBERSHIP

The size of the active membership increased about 4.5%, from 3,898 in the 2019 valuation to 4,074 in the current valuation. There are different benefit provisions applicable to the current active membership. The number of actives covered by Plan C, which was effective for members hired on and after January 1, 2014, increased from 2,264 last year (about 58%) to 2,613 in the 2020 valuation (about 64%). 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	2,285	$46,491	45.8	8.5
Charter Schools	1,640	44,252	38.2	5.0
Library	149	47,466	45.8	8.5
Total	4,074	$45,625	42.7	7.1

Total covered payroll (on which contributions are expected to be paid) increased by 6.9% from the prior valuation (the assumption is 3.0%), largely due to the increase in the number of active members. 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 4.7% from the 2019 valuation. The largest decrease in count was in the terminated non-vested group, which decreased by 153 (5.5%). The number of members receiving benefits increased slightly, from 4,113 in the 2019 valuation to 4,145 in the 2020 valuation.

ASSETS

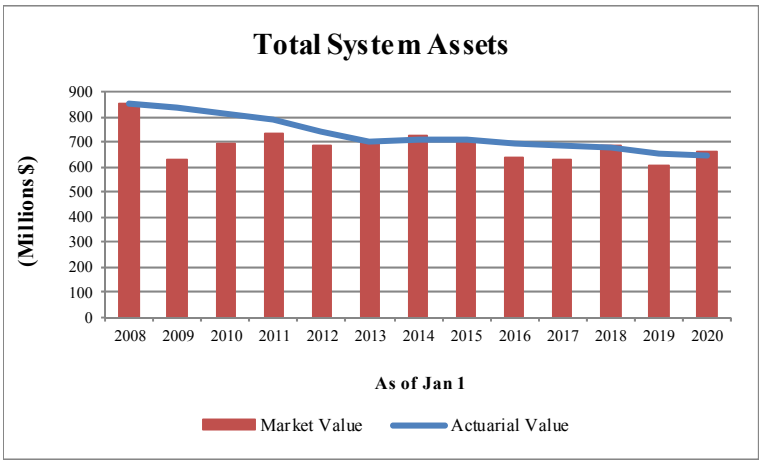
As of January 1, 2020, the System had total assets of $662.1 million when measured on a market value basis, an increase of $59.3 million from the January 1, 2019 value of $602.8 million. The market value of assets is not used directly in the calculation of the System's funded status and the actuarial contribution rate. An asset valuation method, which smoothes the effect of market fluctuations, is used to determine the value of assets used in the valuation, called the "actuarial value of assets". Gains and losses, determined as the difference between the actual and expected value of assets, are recognized equally over a five-year period. See Table 3 for a detailed development of the actuarial value of assets. The rate of return on the market value of assets was 18.0%, but due to the asset smoothing method the return on the actuarial value of assets was 5.7%. Because the investment return on the actuarial value of assets was

lower than the actuarial assumed rate of return (7.75% for 2019), an actuarial loss on assets occurred. Due to the favorable investment experience during 2019 along with the recognition of a portion of deferred losses in the actuarial value of assets, the net deferred asset loss of $51.5 million in the January 1, 2019 valuation changed to a net deferred asset gain of $16.7 million in the January 1, 2020 valuation.

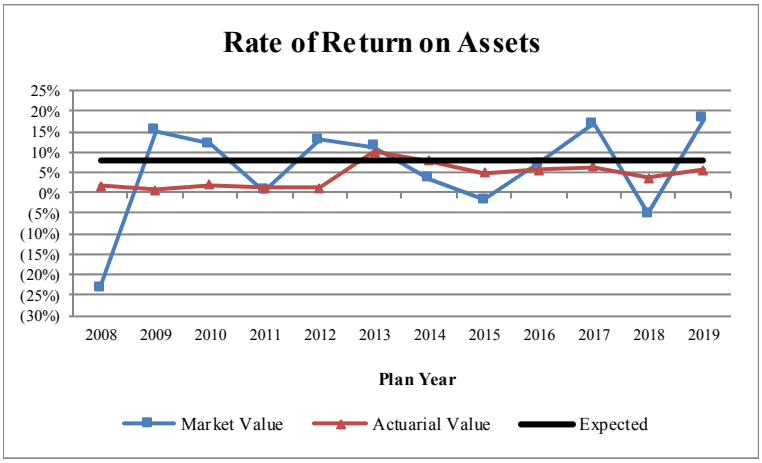
The components of the change in the market and actuarial value of assets for the System (in millions) are set forth below:

	Market Value ($M)	Actuarial Value ($M)
Assets, January 1, 2019	$602.8	$654.3
- Employers and Member Contributions	40.0	40.0
- Benefit Payments and Refunds	(85.2)	(85.2)
- Investment, Depreciation and Administrative Expenses	(8.1)	(8.1)
- Investment Income	112.6	44.4
Assets, January 1, 2020	$662.1	$645.4
Estimated Rate of Return	18.0%	5.7%

The unrecognized net asset gain represents about 2.5% of the market value of assets. Unless offset by future investment losses or other unfavorable experience, the recognition of the $16.7 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 63% to 65% and the actuarial contribution rate for the System would decrease from 20.80% to 20.22% 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, 2020 are:

Actuarial Accrued Liability	$1,020,121,813
Actuarial Value of Assets	645,373,172
Unfunded Actuarial Accrued Liability	$ 374,748,641

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. Consequently, contributions in excess of the normal cost will be needed in order for the System to reach fully funded status, assuming all assumptions are met in the future. Because the actuarial accrued liability includes projections of future salary increases and years of service, this measure does not provide a reliable indication of the level of funding relative to actual benefits earned to date. In addition, note that if the market value of assets were used instead of the actuarial value of assets, the amount of UAAL would be different. This information is shown on page 10 of this report.

Between January 1, 2019 and January 1, 2020, the change in the unfunded actuarial accrued liability for the System was as follows (in millions):

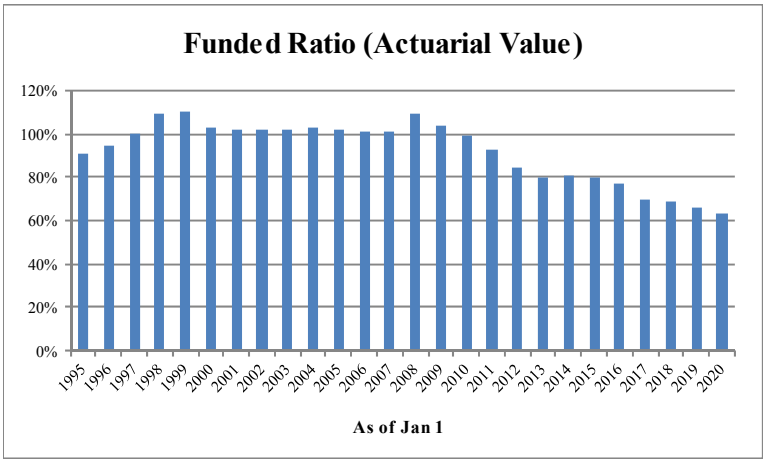
	($ Millions)
Unfunded Actuarial Accrued Liability, January 1, 2019	$ 334.0
- Expected increase from amortization method	3.4
- Actual versus actuarial contributions	0.7
- Investment experience	12.7
- Liability experience	0.9
- Assumption change	23.4
- Other experience	(0.4)
Unfunded Actuarial Accrued Liability, January 1, 2020	$ 374.7

The experience loss for the 2019 plan year of $13.6 million reflects the net impact of an actuarial loss of $0.9 million on System liabilities, and an actuarial loss of $12.7 million on System assets (actuarial value). The net liability experience reflects actuarial gains from salary and termination experience which were more than offset by actuarial losses from mortality and retirement experience.

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:

	1/1/2016	1/1/2017*	1/1/2018	1/1/2019	1/1/2020*
Actuarial Accrued Liability ($M)	$895.2	$981.5	$980.4	$988.2	$1,020.1
Actuarial Value of Assets ($M)	$694.6	$684.4	$678.3	$654.3	$645.4
Funded Ratio (Actuarial Value)	77.6%	69.7%	69.2%	66.2%	63.3%
Market Value of Assets ($M)	$636.1	$631.4	$685.8	$602.8	$662.1
Funded Ratio (Market Value)	71.1%	64.3%	70.0%	61.0%	64.9%

*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 and from 7.75% to 7.50% in 2020.



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

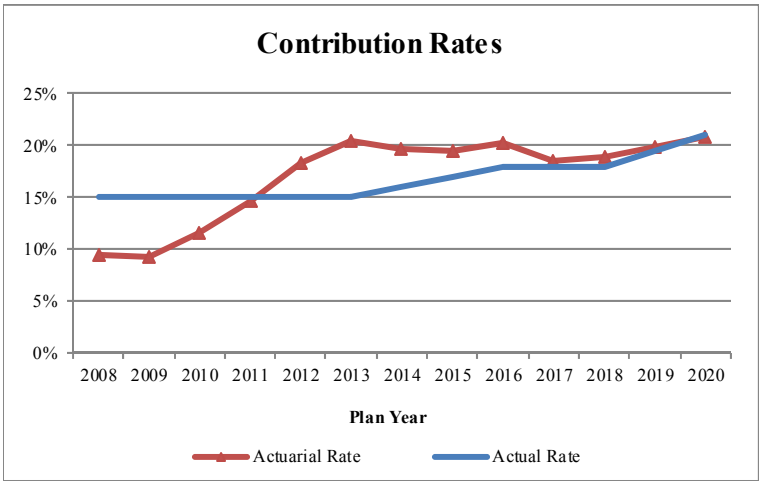
As mentioned earlier in this report, due to the asset smoothing method there is currently a $16.7 million difference between the market value and the actuarial value of assets. To the extent there is not unfavorable investment experience to offset the net deferred investment gain of $16.7 million, it will be recognized in future years and the System's funded status will increase. The System's funded status will continue to be heavily dependent on future investment experience.

CONTRIBUTION RATES

Generally, contributions to the System consist of:

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

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



The actuarial contribution rate increased dramatically from 2009 to 2013 due to the recognition of the large asset loss from 2008 in the asset smoothing method. The contribution shortfall has been reduced due to increases in the member and employer contribution rates. Based on legislation passed in 2018, the employer contribution rate increased to 12% on January 1, 2020. Beginning July 1, 2021, the employer contribution rate will be based on the valuation results..

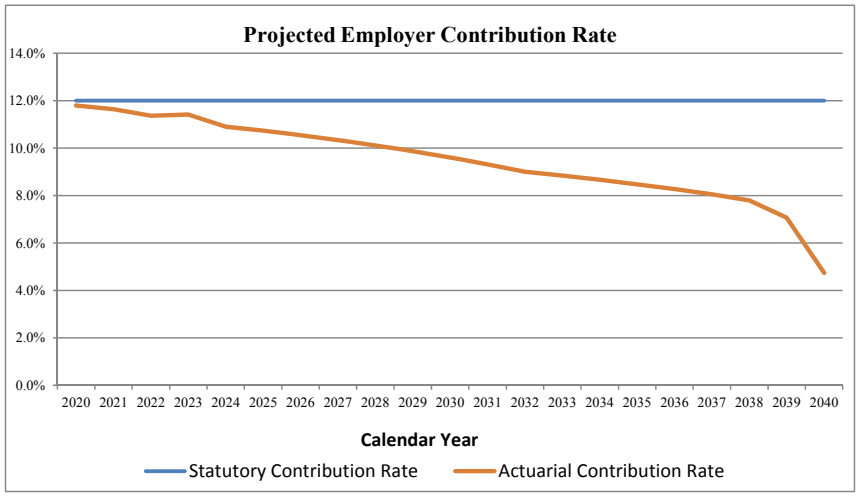
As of January 1, 2020, the actuarial accrued liability exceeds the actuarial value of assets so an unfunded actuarial accrued liability (UAAL) exists. The January 1, 2017 UAAL is amortized over a closed 30-year period and subsequent pieces of UAAL, determined each year in the valuation process, are amortized over a separate, closed 20-year period. The amortization payments on each of the UAAL bases are determined as a level percentage of payroll. The resulting UAAL contribution rate is 11.34% of pay. The System's actuarial contribution rate is the sum of the normal cost and the UAAL amortization contribution or 20.80% of pay (9.46% normal cost plus 11.34% UAAL contribution).

The various factors contributing to the change in the actuarial contribution rate from the January 1, 2019 valuation to the January 1, 2020 valuation are shown in the following table:

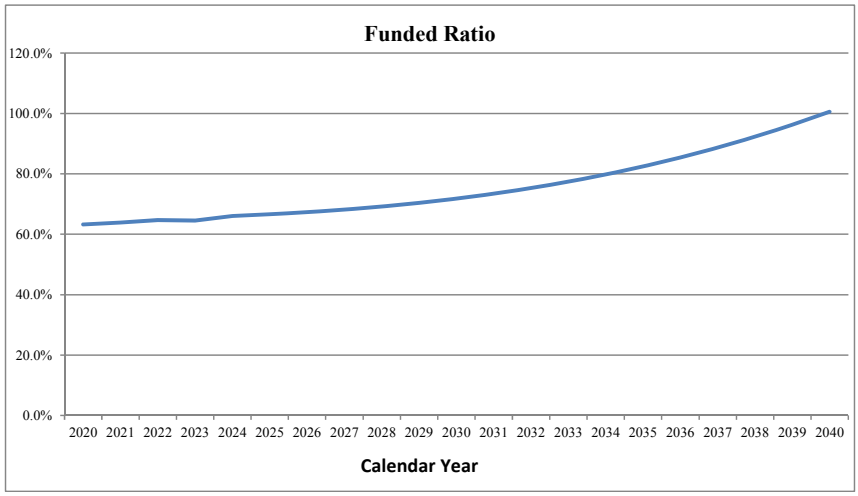
Total Actuarial Contribution Rate	
As of January 1, 2019	19.82%
- Change in normal cost rate	(0.03%)
- Actual versus actuarial contributions	0.02%
- Payroll growth greater than expected	(0.42%)
- Investment experience	0.44%
- Liability experience	0.03%
- Updated mortality assumption	0.07%
- Assumption change	0.88%
- Other experience	(0.01%)
As of January 1, 2020	20.80%

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 then to 12.00% of pay, effective January 1, 2020. Beginning July 1, 2021, the employer contribution rate will be the greater of (1) the actuarial required contribution rate less the member contribution rate, or (2) 12.00% of pay, until the System is fully funded. Once the System is fully funded, the employer contribution rate may increase or decrease in subsequent years, depending on the valuation results, and the employee contribution rate may decrease from 9.00% depending on valuation results. However, such changes are subject to statutory limitations. These changes to the determination of the employer contribution rate were a significant step in strengthening the long-term funding of the System and providing a sustainable path towards full funding.

The current contribution rate is 21.00% of pay (9.00% for employee and 12.00% employer). In the current valuation, 9.46% is needed to fund the normal cost for current active members and the remainder, 11.54% of payroll, is available to finance the UAAL. The following graphs reflects the projected employer contribution rate and funded ratio, assuming all assumptions are met in the future, including a 7.50% 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 remain below 80% for the next 15 years and then rather quickly move to 100%. This is typical of funding the UAAL with payments that are a level percent of payroll (dollar amounts increase 3.00% per year). Such a payment schedule results in much higher dollar amounts in the later years of the amortization period and lower amounts in the shorter term. As a result, the UAAL payment is often less than the interest on the UAAL in the earlier part of the amortization period and the funded ratio does not increase significantly.

COMMENTS

The System's actuarial required contribution rate increased from 19.82% in the January 1, 2019 valuation to 20.80% in the January 1, 2020 valuation. The two major drivers of these results were the actual return on assets for calendar year 2019 of 18% and lowering the investment return assumption from 7.75% to 7.50%. At their May 4, 2020 meeting, the Board of Trustees voted to adopt the actuary's recommendation to lower the long-term rate of return assumption from 7.75% to 7.50%. This change increased the unfunded actuarial accrued liability by $23.4 million and increased the actuarial contribution rate by 0.88%. Due to the favorable investment experience during 2019 and the recognition of a portion of deferred investment losses in the actuarial value of assets, the net deferred investment loss of $51.5 million in the January 1, 2019 valuation changed to a net deferred investment gain of $16.7 million in the January 1, 2020 valuation. To the extent there is not unfavorable investment experience to offset the net deferred investment gain of $16.7 million, it will be recognized in future years and the System's funded status will increase.

The System does not use the actual market value of assets in developing the actuarial contribution rate, but utilizes an asset valuation method to smooth out the peaks and valleys in investment returns from year to year. Due to the current year's recognition of prior investment experience, the System experienced an actuarial loss on assets of $12.7 million. In addition to the unfavorable experience on the actuarial value of assets, there was a net loss on liabilities of $0.9 million. The combined impact of the asset and the liability experience was an actuarial loss of $13.6 million.

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 7.50% 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.

The net deferred investment gain (market value greater than actuarial value of assets) is $16.7 million, about 2.5% 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, 2020 actuarial valuation using both the actuarial and market value of assets.

	Using Actuarial Value of Assets	Using Market Value of Assets
Actuarial Accrued Liability	$1,020,121,813	$1,020,121,813
Asset Value	645,373,172	662,085,840
Unfunded Actuarial Accrued Liability	$374,748,641	$358,035,973
Funded Ratio	63.3%	64.9%
Normal Cost Rate	9.46%	9.46%
UAAL Contribution Rate	11.34%	10.76%
Total Contribution Rate	20.80%	20.22%
Employee Contribution Rate	(9.00%)	(9.00%)
Employer Contribution Rate	(12.00%)	(12.00%)
Contribution Shortfall/(Margin)	(0.20%)	(0.78%)

A typical retirement plan faces many different risks. The term "risk" is most commonly associated with an outcome with undesirable results. However, in the actuarial world risk can be translated as uncertainty. The actuarial valuation process uses many actuarial assumptions to project how future contributions and investment returns will meet the cash flow needs for future benefit payments. Of course, we know that actual experience will not unfold exactly as anticipated by the assumptions and that uncertainty, whether favorable or unfavorable, creates risk. Actuarial Standard of Practice Number 51 defines risk as the potential of actual future measurements to deviate from expected results due to actual experience that is different than the actuarial assumptions. Risk evaluation is an important part of managing a defined benefit plan. Please see Section VII of this report for an in-depth discussion of the specific risks facing the Public School Retirement System of the School District of Kansas City, Missouri.

Summary of Principal Valuation Results

	1/1/2020 Valuation	1/1/2019 Valuation	% Change
1. PARTICIPANT DATA			
Number of:			
Active Members			
- Plan B	1,461	1,634	(10.59%)
- Plan C	2,613	2,264	15.42%
Total	4,074	3,898	4.52%
Retirees, Disableds, and Beneficiaries	4,145	4,113	0.78%
Terminated Members			
- Vested Members	529	531	(0.38%)
- Non-Vested Members	2,631	2,784	(5.50%)
Total	3,160	3,315	(4.68%)
Total Members	11,379	11,326	0.47%
Projected Annual Salaries of Active Members	$ 217,255,306	$ 203,310,599	6.86%
Annual Retirement Payments for Retirees, Disableds, and Beneficiaries	$ 81,095,184	$ 80,128,728	1.21%
2. ASSETS AND LIABILITIES			
a. Market Value of Assets	$ 662,085,840	$ 602,762,479	9.84%
b. Actuarial Value of Assets	645,373,172	654,259,324	(1.36%)
c. Total Actuarial Accrued Liability	1,020,121,813	988,234,763	3.23%
d. Unfunded Actuarial Accrued Liability [c - b]	$ 374,748,641	$ 333,975,439	12.21%
e. Funded Ratio (Actuarial Value of Assets) [b / c]	63.26%	66.20%	(4.44%)
f. Funded Ratio (Market Value of Assets) [a / c]	64.90%	60.99%	6.41%
g. Projected Benefit Obligation	$ 993,605,233	$ 964,326,783	3.04%
3. CONTRIBUTION RATES AS A PERCENT OF PAYROLL			
Normal Cost	9.46%	9.15%	3.39%
Amortization of Unfunded Actuarial Accrued Liability	11.34%	10.67%	6.28%
Actuarial Required Contribution Rate	20.80%	19.82%	4.94%
Member Contribution Rate	(9.00%)	(9.00%)	0.00%
Employer Contribution Rate	(12.00%)	(10.50%)	14.29%
Contribution Rate Shortfall/(Margin)	(0.20%)	0.32%	(162.50%)
Contribution Shortfall/(Margin)	$ (434,511)	$ 650,594	(166.79%)

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, 2020. 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, 2020.

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

A summary of the findings resulting from this valuation is presented in the previous section. Section 3 describes the assets and investment experience of the System. Sections 4 and 5 describe how the obligations of the System are to be met under the actuarial cost method in use. Section 6 includes additional information regarding the System's funding history. Section 7 includes a number of risks for the System to consider.

This report includes several appendices:

- Appendix A Schedules of valuation data classified by various categories of members.
- Appendix B A summary of the current benefit structure, as determined by the provisions of governing law on the valuation date.
- Appendix C A summary of the actuarial methods and assumptions used to estimate liabilities and determine contribution rates.
- Appendix D A glossary of actuarial terms.

In many respects, an actuarial valuation can be thought of as an inventory process. The inventory is taken as of the actuarial valuation date, which for this valuation is January 1, 2020. 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, 2020, the market value of assets for the System was $662.1 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, 2019 and January 1, 2020.

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, 2020.

TABLE 1

Net Assets at Fair (Market) Value as of January 1, 2020

INVESTMENTS, AT MARKET VALUE		
Cash and short term investments	$	6,511,704
Commingled domestic fixed income		64,044,449
High yield fixed income		17,115,419
Global fixed income		33,025,912
Domestic equity		156,074,664
International equity		157,924,044
Pooled real estate funds		62,888,278
Alternative equity fund		132,440,656
Private equity		28,250,520
Commodities		0
Total Investments, at Market Value	$	658,275,646
RECEIVABLES		
Plan member contributions	$	657,626
Employer contributions		1,298,949
Securities sold		811,895
Accrued interest and dividends		499,746
Total Receivables	$	3,268,216
OTHER ASSETS		
Cash	$	1,324,695
Fixed assets		16,687
Other assets		65,706
Total Other Assets	$	1,407,088
TOTAL ASSETS	$	662,950,950
LIABILITIES		
Due to broker for securities purchased	$	208,162
Accounts payable		546,467
Accrued payroll expenses		110,481
Total Liabilities	$	865,110
NET ASSETS AVAILABLE FOR BENEFITS	$	662,085,840

Note: Based on unaudited asset information.

TABLE 2

Statement of Changes in Net Assets as of January 1, 2020

ADDITIONS TO NET ASSETS		
Contributions		
Plan members	$	18,524,657
Employers		21,488,838
Total Contributions	$	40,013,495
Investment Income		
Net appreciation (depreciation) in fair value of investments	$	104,158,263
Interest/Dividends		8,370,409
Other income		0
Investment income before expenses	$	112,528,672
Less: investment expenses		(6,494,954)
Net investment income	$	106,033,718
TOTAL ADDITIONS TO NET ASSETS	$	146,047,213
DEDUCTIONS FROM NET ASSETS		
Benefits paid directly to participants	$	80,228,574
Refunds of contributions		4,937,877
Depreciation expense		11,020
Administrative expenses		1,546,381
TOTAL DEDUCTION FROM ASSETS	$	86,723,852
NET INCREASE (DECREASE)	$	59,323,361
NET ASSETS AVAILABLE FOR BENEFITS		
Beginning of year	$	602,762,479
End of year	$	662,085,840

Note: Based on unaudited asset information.

TABLE 3

Development of Actuarial Value of Assets as of January 1, 2020

1. Deferral of Investment Return for 2019		
a. Market Value, January 1, 2019	$	602,762,479
b. Contributions for 2019		40,013,495
c. Benefit Payments for 2019		85,166,451
d. Actual Investment Return, Net of All Expenses	$	104,476,317
e. Expected Return Rate		7.75%
f. Expected Return - Weighted for Timing* (a. x e.) + [(b. - c.) x (((1 + e.)$^{.5}$) - 1)]	$	44,997,062
g. Investment Gain/(Loss) for the Year (d. - f.)	$	59,479,255
h. Deferred Investment Return (g. x 80%)	$	47,583,404
2. Actuarial Value, January 1, 2020		
a. Market Value, January 1, 2020	$	662,085,840
b. Total Deferred Investment Gain/(Loss)		16,712,668
c. Actuarial Value, January 1, 2020 (a. - b.)	$	645,373,172
d. Ratio of Actuarial Value of Assets to Market Value of Assets		97.5%
e. Approximate Actuarial Value Rate of Return for 2019, Net of All Expenses		5.7%

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

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

Plan Year Ended	Asset Gain/(Loss)	Gain/(Loss) Recognized in Prior Years	Gain/(Loss) Recognized This Year	Gain/(Loss) Deferred to Future Years
12/31/2015	$(65,826,115)	$(52,660,892)	$(13,165,223)	$ 0
12/31/2016	(6,337,217)	(3,802,329)	(1,267,443)	(1,267,445)
12/31/2017	55,114,812	22,045,924	11,022,962	22,045,926
12/31/2018	(86,082,027)	(17,216,405)	(17,216,405)	(51,649,217)
12/31/2019	59,479,255	0	11,895,851	47,583,404
Total	$(43,651,292)	$(51,633,702)	$(8,730,258)	$ 16,712,668

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, 2020. 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, 2020.

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, 2019.

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, 2020

1. Active Members		
a. Retirement Benefits	$	316,168,468
b. Disability Benefits		4,970,285
c. Death Benefits		7,390,007
d. Withdrawal Benefits		51,910,970
e. Subtotal	$	380,439,730
2. Benefit Recipients		
a. Retiree Benefits	$	694,041,763
b. Survivor Benefits		24,236,182
c. Disability Benefits		7,614,131
d. Subtotal	$	725,892,076
3. Inactive Members		
a. Vested Retirement Benefits	$	23,544,086
b. Non-vested Account Balance		10,383,613
c. Subtotal	$	33,927,699
4. Total (1e. + 2d. + 3c.)	$	1,140,259,505

TABLE 5

Actuarial Accrued Liability
as of January 1, 2020

1. Present Value of Future Benefits (PVFB)	$	1,140,259,505
2. Present Value of Future Normal Costs (PVFNC)		
a. Retirement benefits	$	61,760,260
b. Disability benefits		1,783,427
c. Death benefits		2,987,278
d. Withdrawal benefits		53,606,727
e. Total	$	120,137,692
3. Actuarial Accrued Liability (AAL) (1. - 2e.)	$	1,020,121,813
4. Actuarial Value of Assets (AVA)	$	645,373,172
5. Unfunded Actuarial Accrued Liability (UAAL) (3. - 4.)	$	374,748,641
6. Funded Ratio (AVA / AAL) (4. / 3.)		63.3%

TABLE 6

Actuarial Gain/(Loss) for 2019

Liabilities			
1.	Actuarial accrued liability as of January 1, 2019	$	988,234,763
2.	Normal cost for 2019		16,338,551
3.	Interest at 7.75% on (1) and (2) to December 31, 2019		77,854,432
4.	Benefit payments during 2019		(85,166,451)
5.	Interest on benefit payments		(3,238,622)
6.	Updated mortality assumption		1,802,231
7.	Assumption change		23,365,556
8.	Expected actuarial accrued liability as of December 31, 2019	$	1,019,190,460
9.	Actuarial accrued liability as of December 31, 2019		1,020,121,813
10.	Actuarial gain / (loss) on actuarial accrued liability (8. – 9.)	$	(931,353)
Assets			
11.	Actuarial value of assets as of January 1, 2019	$	654,259,324
12.	Contributions during 2019		40,013,495
13.	Benefit payments during 2019		(85,166,451)
14.	Interest at 7.75% on (11), (12) and (13) to December 31, 2019		48,988,067
15.	Expected actuarial value of assets as of December 31, 2019	$	658,094,435
16.	Actuarial value of assets as of December 31, 2019		645,373,172
17.	Actuarial gain / (loss) on actuarial assets (16. – 15.)	$	(12,721,263)
18.	Total actuarial gain / (loss) (10. + 17.)	$	(13,652,616)

TABLE 7

Gain/(Loss) Analysis by Source

The System experienced a net actuarial loss on liabilities of about $0.9 million during the plan year ended December 31, 2019. The major components of this overall loss are shown below:

Liability Sources		Gain/(Loss)
Retirement	$	(1,281,000)
Termination		2,210,000
Disability		(212,000)
Mortality		(560,000)
Salary		2,700,000
New Entrants/Rehires		(4,401,000)
Miscellaneous		613,000
Total Liability Gain/(Loss)	$	(931,000)
Asset Gain/(Loss)	$	(12,721,000)
Net Actuarial Gain/(Loss)	$	(13,653,000)

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 C of this report.

Net demographic actuarial experience for the year was a loss of $0.9 million, about 0.1% of actuarial accrued liability. The largest source of unfavorable experience was a $4.4 million loss due to new active and rehired members.

Another significant component of the experience for the year ending December 31, 2019 was the investment experience. Due to the net deferred investment loss in last year's valuation of $51.5 million, there was a loss on the actuarial value of assets of $12.7 million despite favorable experience on the market value of assets. As of January 1, 2020, there is a net deferred investment gain of $16.7 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)	$	645,373,172
Present value of future normal costs		120,137,692
Present value of future contributions to fund unfunded actuarial accrued liability		374,748,641
Total Assets	$	1,140,259,505
Liabilities		
Present value of future retirement benefits for:		
Active employees	$	380,439,730
Members currently receiving a benefit		725,892,076
Terminated vested members		23,544,086
Inactive employees due refunds		10,383,613
Total Liabilities	$	1,140,259,505

TABLE 9

Pension Benefit Obligation Funded Status

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

Projected Benefit Obligation		January 1, 2020	January 1, 2019
1.	Retired members and beneficiaries currently receiving benefits and terminated members not yet receiving benefits	$ 759,819,775	$ 744,459,772
2.	Current active participants		
a.	Accumulated member contributions, including interest	112,913,289	106,618,062
b.	Employer-financed vested benefits	120,872,169	113,248,949
Total Projected Benefit Obligation (PBO)		$ 993,605,233	$ 964,326,783
Projected Benefit Obligation funded status			
1.	Actuarial Value of Assets (AVA)	$ 645,373,172	$ 654,259,324
a.	Unfunded Projected Benefit Obligation	348,232,061	310,067,459
b.	Funding Ratio (AVA / PBO)	65%	68%
2.	Market Value of Assets (MVA)	$ 662,085,840	$ 602,762,479
a.	Unfunded Projected Benefit Obligation	331,519,393	361,564,304
b.	Funding Ratio (MVA / PBO)	67%	63%

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

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

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

DESCRIPTION OF CONTRIBUTION RATE COMPONENTS

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

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

As of January 1, 2020, the valuation assets were less than the actuarial accrued liability so an unfunded actuarial accrued liability exists. The System's funding policy is to amortize the UAAL, as a level percent of pay amount, using a "layered" approach with the legacy UAAL amortized over a closed 30-year period commencing January 1, 2017 and new bases over a closed 20-year period.

CONTRIBUTION RATE SUMMARY

Table 10 develops the normal cost rate for the System. In Table 11, the amortization payment related to the unfunded actuarial accrued liability, as of January 1, 2020, is developed. In Table 12, the contribution rate for the System is calculated.

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

TABLE 10

Normal Cost Rate

1. Normal Cost		
a. Retirement Benefits	$	9,601,188
b. Disability Benefits		256,327
c. Death Benefits		501,156
d. Termination Benefits		7,689,524
e. Total	$	18,048,195
2. Expected Payroll for Current Actives	$	190,737,223
3. Normal Cost Rate for 2020		9.46%

TABLE 11

Amortization of the Unfunded Actuarial Accrued Liability

Amortization Bases	Original Amount	1/1/2020 Remaining Payments	Date of Last Payment	Outstanding Balance as of Jan. 1, 2020	Annual Contribution*
2017 UAAL Base	$ 297,102,390	27	1/1/2046	$ 308,253,271	$ 19,536,545
2018 Experience Base	1,054,285	18	1/1/2037	1,046,388	84,595
2019 Experience Base	28,100,770	19	1/1/2038	28,031,914	2,187,245
2020 Assumption Change	23,365,556	20	1/1/2039	23,365,556	1,764,226
2020 Experience Base	14,051,512	20	1/1/2039	14,051,512	1,060,965
Total				**$ 374,748,641**	**$ 24,633,576**

* Contribution amount reflects mid-year timing.

1. Total UAAL Amortization Payments	$ 24,633,576
2. Projected Payroll for plan year ending December 31, 2020	$ 217,255,306
3. UAAL Amortization Payment Rate	11.34%

TABLE 12

Development of
2020 Actuarial Required Contribution (ARC)

1. Normal Cost Rate (See Table 10)	9.46%
2. UAAL Contribution Rate (See Table 11)	11.34%
3. Actuarial Recommended Contribution Rate (1) + (2)	20.80%
4. Statutory Contribution Rate:	
(a) Member	9.00%
(b) Employer	12.00%
(c) Total	21.00%
5. Contribution Shortfall/(Margin) (3) - (4c)	(0.20%)

HISTORICAL FUNDING AND OTHER INFORMATION

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

TABLE 13

Schedule of Funding Progress

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

Actuarial Valuation Date	Actuarial Value of Assets (AVA) (a)	Actuarial Accrued Liabilities (AAL) (b)	Unfunded AAL (UAAL) (b - a)	Funded Ratio (a / b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll [(b - a) / c]
1/1/1996	$ 389,103,803	$ 409,428,594	$ 20,324,791	95.0%	$ 171,262,008	11.9%
1/1/1997	428,419,710	429,517,108	1,097,398	99.7%	161,802,480	0.7%
1/1/1998	482,599,919	442,614,693	(39,985,225)	102.3%	168,328,728	(23.8%)
1/1/1999	624,225,667	564,056,509	(60,169,158)	110.7%	153,733,920	(39.1%)
1/1/2000	660,830,255	640,614,688	(20,215,567)	103.2%	151,091,616	(13.4%)
1/1/2001	696,071,310	682,531,577	(13,539,734)	102.0%	165,795,367	(8.2%)
1/1/2002	718,703,692	701,725,938	(16,977,755)	102.4%	171,523,233	(9.9%)
1/1/2003	717,681,067	701,114,370	(16,566,697)	102.4%	168,391,474	(9.8%)
1/1/2004	738,612,110	716,126,707	(22,485,404)	103.1%	186,528,530	(12.1%)
1/1/2005	763,684,602	747,711,194	(15,973,408)	102.1%	195,866,663	(8.2%)
1/1/2006	788,788,666	780,663,389	(8,125,277)	101.0%	187,445,140	(4.3%)
1/1/2007	824,302,795	818,027,315	(6,275,480)	100.8%	199,221,110	(3.2%)
1/1/2008	854,123,580	781,284,025	(72,839,554)	109.3%	202,311,837	(36.0%)
1/1/2009	832,609,879	804,623,080	(27,986,799)	103.5%	205,326,108	(13.6%)
1/1/2010	814,536,473	819,534,391	4,997,918	99.4%	194,474,437	2.6%
1/1/2011	786,297,998	844,232,490	57,934,492	93.1%	162,417,257	35.7%
1/1/2012	742,279,611	874,286,498	132,006,887	84.9%	155,893,016	84.7%
1/1/2013	697,028,072	868,663,383	171,635,311	80.2%	157,303,005	109.1%
1/1/2014	710,828,744	875,451,114	164,622,370	81.2%	157,014,537	104.8%
1/1/2015	712,390,611	891,543,036	179,152,425	79.9%	170,845,124	104.9%
1/1/2016	694,641,248	895,230,295	200,589,047	77.6%	179,013,516	112.1%
1/1/2017	684,412,437	981,514,827	297,102,390	69.7%	194,132,739	153.0%
1/1/2018	678,288,805	980,436,626	302,147,821	69.2%	196,277,971	153.9%
1/1/2019	654,259,324	988,234,763	333,975,439	66.2%	203,310,599	164.3%
1/1/2020	645,373,172	1,020,121,813	374,748,641	63.3%	217,255,306	172.5%

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

TABLE 14

Historical Contribution Rates

Actuarial Valuation Date	Actuarial Contribution Rate	Actual Contribution Rate	Contribution Shortfall/(Margin)
1/1/2005	14.02%	15.00%	(0.98%)
1/1/2006	13.78%	15.00%	(1.22%)
1/1/2007	13.28%	15.00%	(1.72%)
1/1/2008	9.39%	15.00%	(5.61%)
1/1/2009	9.35%	15.00%	(5.65%)
1/1/2010	11.50%	15.00%	(3.50%)
1/1/2011	14.64%	15.00%	(0.36%)
1/1/2012	18.30%	15.00%	3.30%
1/1/2013	20.52%	15.00%	5.52%
1/1/2014	19.68%	16.00%	3.68%
1/1/2015	19.56%	17.00%	2.56%
1/1/2016	20.18%	18.00%	2.18%
1/1/2017	18.61%	18.00%	0.61%
1/1/2018	18.82%	18.00%	0.82%
1/1/2019	19.82%	19.50%	0.32%
1/1/2020	20.80%	21.00%	(0.20%)

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

Summary of Actuarial Methods and Assumptions

Valuation Date	January 1, 2020
Actuarial Cost Method	Entry Age Normal
Amortization Method	Level-Percent of Pay, layered
Remaining Amortization Period	January 1, 2017 UAAL – 27 years Subsequent layers of amortization – See Table 11
Asset Valuation Method	5-Year Smoothed Market Value
Actuarial Assumptions:	
Investment Rate of Return*	7.50%
Projected Salary Increases*	5.00%
No future COLAs	

*Includes Inflation at 2.75%

TABLE 15

Solvency Test

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

Valuation Date January 1,	Active Participants' Accumulated Contributions (1)	Retirees, Beneficiaries and Inactive Participants (2)	Active Participants (Employer Financed) (3)	Valuation Assets	Percent Covered By Valuation Assets (1)	(2)	(3)
1991	$ 86,392,672	$ 77,212,948	$ 62,859,420	$ 241,369,537	100%	100%	124%
1992	91,688,784	101,408,720	69,055,820	278,065,508	100%	100%	123%
1993	98,482,791	102,336,338	61,479,865	307,050,085	100%	100%	173%
1994	99,547,061	123,475,760	121,674,513	336,466,320	100%	100%	93%
1995	110,658,079	144,027,489	124,562,502	353,451,344	100%	100%	79%
1996	108,123,636	177,617,507	117,169,151	389,103,803	100%	100%	88%
1997	104,554,877	231,762,583	91,329,968	428,419,710	100%	100%	101%
1998	115,847,655	228,328,855	108,592,620	482,599,919	100%	100%	127%
1999	117,478,379	274,442,924	172,607,724	624,225,667	100%	100%	135%
2000	113,334,820	343,382,932	184,049,309	660,830,255	100%	100%	111%
2001	115,781,706	389,055,603	184,779,937	696,071,310	100%	100%	103%
2002	119,968,776	406,094,033	187,309,245	718,703,692	100%	100%	103%
2003	112,468,027	435,548,298	165,766,206	717,681,067	100%	100%	102%
2004	125,754,562	430,145,689	179,264,397	738,612,110	100%	100%	102%
2005	127,221,118	431,366,177	201,836,083	763,684,602	100%	100%	102%
2006	133,811,729	477,844,206	177,531,611	788,788,666	100%	100%	100%
2007	136,978,872	498,841,373	187,966,845	824,302,795	100%	100%	100%
2008	140,844,707	492,273,102	156,840,245	854,123,580	100%	100%	141%
2009	140,096,771	503,450,518	161,075,791	832,609,879	100%	100%	117%
2010	139,860,248	524,692,426	154,981,717	814,536,473	100%	100%	97%
2011	110,538,745	611,806,997	121,886,748	786,297,998	100%	100%	52%
2012	99,513,420	654,828,752	119,944,326	742,279,611	100%	98%	0%
2013	100,767,726	653,949,421	113,946,236	697,028,072	100%	91%	0%
2014	98,272,633	660,003,861	117,174,620	710,828,744	100%	93%	0%
2015	98,966,336	674,794,654	117,782,046	712,390,611	100%	91%	0%
2016	101,173,695	677,295,366	116,761,234	694,641,248	100%	88%	0%
2017	105,887,868	717,052,296	158,574,663	684,412,437	100%	81%	0%
2018	103,069,314	739,004,732	138,362,580	678,288,805	100%	78%	0%
2019	106,618,062	744,459,772	137,156,929	654,259,324	100%	74%	0%
2020	112,913,289	759,819,775	147,388,749	645,373,172	100%	70%	0%

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

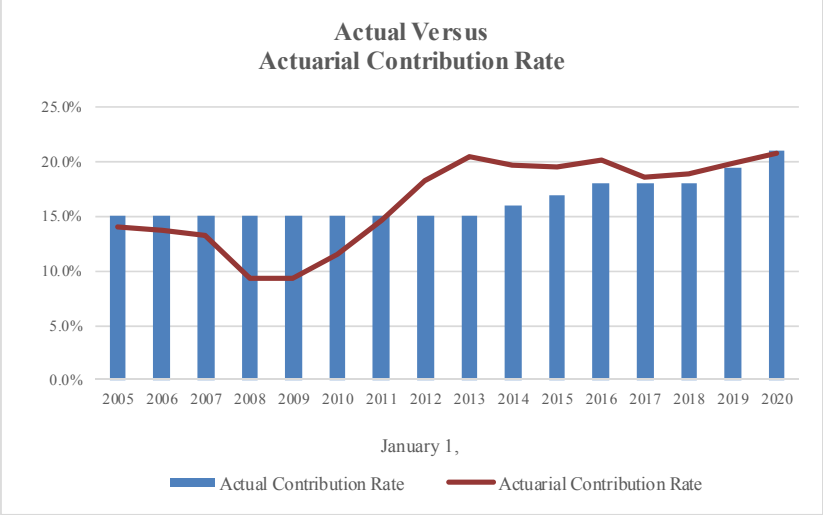
Actuarial Standards of Practice are issued by the Actuarial Standards Board and are binding on credentialed actuaries practicing in the United States. These standards generally identify what the actuary should consider, document and disclose when performing an actuarial assignment. In September, 2017,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

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 nine years, despite increases in the contribution rate for both members and employers. The System currently contributes a fixed contribution rate, however, funding will move to an actuarial contribution rate beginning July 1, 2021. This change will improve the funding risk for the System.



The most significant risk factor is investment return because of the volatility of the returns and the size of plan assets compared to payroll (see Table 16). A perusal of historical rates over 10-20 years reveals that the actual return each year is rarely close to the average return for the same period. This is an expected result given the underlying capital market assumptions and the asset allocation. However, the valuation is a measurement based on a single investment return, usually around the median of the distribution of returns. The magnitude of variations in investment returns and the short timeframe in which they occur makes the management of this risk very challenging.

The size of the plan assets relative to covered payroll, sometimes referred to as the asset volatility ratio, is an important indicator of the contribution risk/volatility for the System. The higher this ratio, the more sensitive a plan's contribution rate is to investment return volatility. In other words, it will be harder to recover from investment losses with increased contributions because of the magnitude of the increase. In the January 1, 2020 valuation, the asset volatility ratio was 3.05. 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 7.50% translates to about $79 million and an change of 2.76% 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 19.50% and half lower than -4.50%). 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 7.50%	Below 7.50%
1. Rate of Return	19.50%	-4.50%
2. Ratio of Assets to Payroll	3.05	3.05
3. Asset Gain/Loss as a Percent of Payroll [(1) - 7.50%] * (2)	37%	37%
4. Initial Impact on Contribution Rate	-2.76%	2.76%

A key demographic risk for all retirement systems, including KCPSRS, is improvements in mortality (longevity) greater than anticipated. While the mortality assumption used in the valuation reflects some improvement in mortality experience and this assumption is evaluated and refined in each experience study, the risk arises because there is a possibility of some sudden shift, perhaps from a significant medical breakthrough that could quickly increase liabilities. Likewise, there is some possibility of a significant public health crisis that could result in a significant number of additional deaths in a short time period, would also be significant, although more easily absorbed. While either of these events could happen, it represents a small probability and thus represents much less risk than the volatility associated with investment returns.

Finally, the unfunded actuarial accrued liability is amortized as a level percentage of payroll. The underlying assumption used in developing the payment schedule assumes an increasing payroll over time which is dependent on a stable employment level, i.e., active member count remains the same. We would note that the active population declined significantly for about a decade from a high of 5,090 in 2004 to 3,493 in 2015. The active population has started to increase over the past few years (see Table 17). When payroll does not grow as expected, the UAAL contribution rate will be higher than expected even if the dollar amount of the payment is the same as scheduled.

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

TABLE 16

HISTORICAL ASSET VOLATILITY RATIO

As a retirement system matures, the size of the market value of assets increases relative to the covered payroll of active members, on which the System is funded. The size of the plan assets relative to covered payroll, sometimes referred to as the asset volatility ratio, is an important indicator of the contribution risk for the System. The higher this ratio, the more sensitive a plan's contribution rate is to investment return volatility. In other words, it will be harder to recover from investment losses with increased contribution. In the January 1, 2020 valuation, the asset volatility ratio was 3.05. Therefore, underperforming the investment return assumption by 1.00% (i.e., earn 6.50% for one year) is equivalent to $6.6 million or 3.05% of payroll. This ratio tends to grow over time as plans become better funded, so this is an important metric to monitor over time.

Valuation Date	Market Value of Assets	Covered Payroll	Asset Volatility Ratio	Increase in ACR with a Return 12% Lower than Assumed*
1/1/2008	$853,722,741	$202,311,837	4.22	0.76%
1/1/2009	624,647,065	205,326,108	3.04	0.55%
1/1/2010	693,934,794	194,474,437	3.57	0.65%
1/1/2011	730,278,733	162,417,257	4.50	0.82%
1/1/2012	681,930,607	155,893,016	4.37	0.79%
1/1/2013	702,966,521	157,303,005	4.47	0.81%
1/1/2014	726,553,301	157,014,537	4.63	0.84%
1/1/2015	698,523,480	170,845,124	4.09	0.74%
1/1/2016	636,109,506	179,013,516	3.55	0.64%
1/1/2017	631,442,613	194,132,739	3.25	0.59%
1/1/2018	685,801,998	196,277,971	3.49	0.63%
1/1/2019	602,762,479	203,310,599	2.96	0.54%
1/1/2020	662,085,840	217,255,306	3.05	0.55%

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

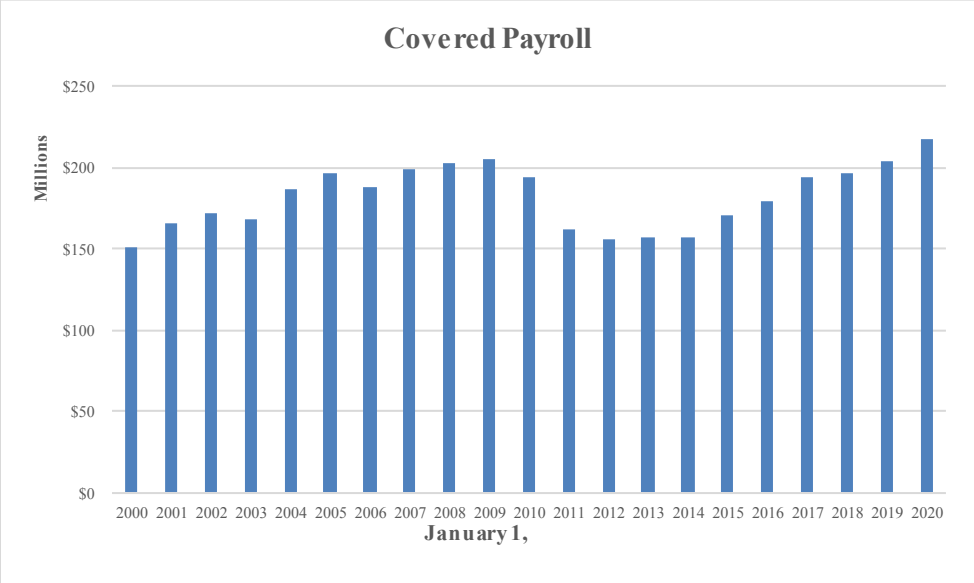
TABLE 17

COVERED PAYROLL VOLATILITY

Member and employer contributions to the System are made based on covered payroll. In addition, the payment on the unfunded actuarial accrued liability is calculated anticipating covered payroll increases each year in the future. To the extent actual payroll does not meet the assumed rate of increase (currently 3.00%), 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.

Actuarial	Number of Active Members				Covered	Number of	Active/
Valuation Date	Charter Schools	School District	Library	Total	Payroll	Retired Members	Retired
1/1/2000				4,666	$151,091,616	2,806	1.66
1/1/2001				5,012	165,795,367	2,865	1.75
1/1/2002				5,014	171,523,233	2,861	1.75
1/1/2003				4,891	168,391,474	3,058	1.60
1/1/2004				5,090	186,528,530	3,042	1.67
1/1/2005	539	4,336	130	5,005	195,866,663	2,951	1.70
1/1/2006	462	4,228	118	4,808	187,445,140	3,140	1.53
1/1/2007	588	4,030	139	4,757	199,221,110	3,198	1.49
1/1/2008	784	3,937	141	4,862	202,311,837	3,283	1.48
1/1/2009	820	3,680	148	4,648	205,326,108	3,247	1.43
1/1/2010	973	3,222	141	4,336	194,474,437	3,317	1.31
1/1/2011	1,061	2,296	133	3,490	162,417,257	3,670	0.95
1/1/2012	1,133	2,022	129	3,284	155,893,016	3,829	0.86
1/1/2013	1,108	2,152	136	3,396	157,303,005	3,859	0.88
1/1/2014	1,147	2,215	139	3,501	157,014,537	3,885	0.90
1/1/2015	1,245	2,112	136	3,493	170,845,124	4,011	0.87
1/1/2016	1,336	2,095	143	3,574	179,013,516	4,049	0.88
1/1/2017	1,481	2,076	144	3,701	194,132,739	4,032	0.92
1/1/2018	1,555	2,065	140	3,760	196,277,971	4,112	0.91
1/1/2019	1,586	2,172	140	3,898	203,310,599	4,113	0.95
1/1/2020	1,640	2,285	149	4,074	217,255,306	4,145	0.98

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



From 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.

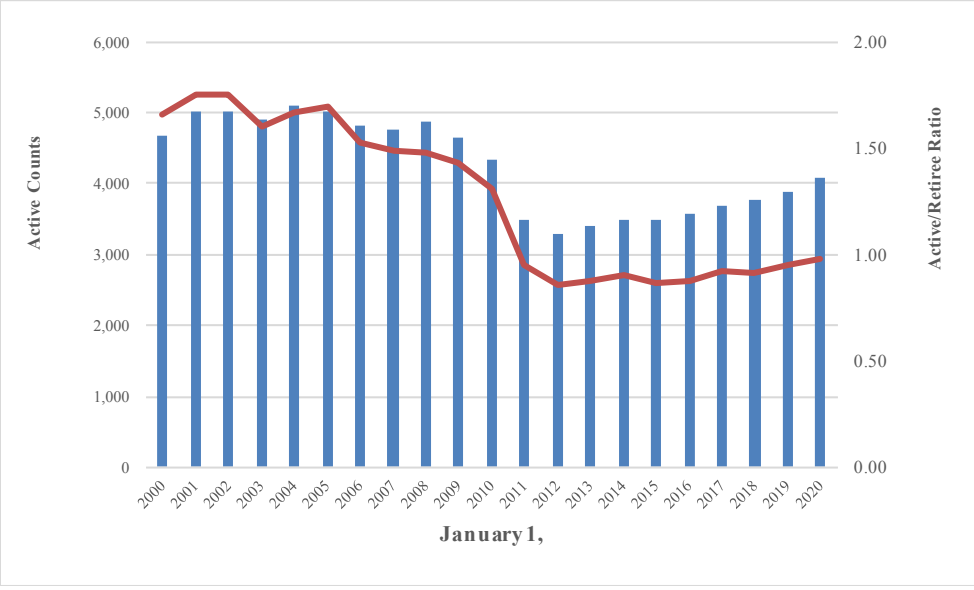


TABLE 18

HISTORICAL CASH FLOWS

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

Fiscal Year End	Market Value of Assets (MVA)	Contributions	Benefit Payments	Net Cash Flow	Net Cash Flow as a Percent of MVA
12/31/07	$853,722,741	$30,420,687	$59,789,249	($29,368,562)	(3.44%)
12/31/08	624,647,065	31,501,230	63,870,255	(32,369,025)	(5.18%)
12/31/09	693,934,794	42,652,068	63,243,063	(20,590,995)	(2.97%)
12/31/10	730,278,733	27,094,752	71,323,384	(44,228,632)	(6.06%)
12/31/11	681,930,607	24,054,927	76,133,226	(52,078,299)	(7.64%)
12/31/12	702,966,521	22,948,176	76,813,694	(53,865,518)	(7.66%)
12/31/13	726,553,301	24,404,265	77,412,174	(53,007,909)	(7.30%)
12/31/14	698,523,480	26,646,322	78,535,383	(51,889,061)	(7.43%)
12/31/15	636,109,506	29,145,161	79,634,189	(50,489,028)	(7.94%)
12/31/16	631,442,613	32,808,515	80,168,978	(47,360,463)	(7.50%)
12/31/17	685,801,998	33,890,913	81,762,722	(47,871,809)	(6.98%)
12/31/18	602,762,479	35,146,999	83,418,526	(48,271,527)	(8.01%)
12/31/19	662,085,840	40,013,495	85,166,451	(45,152,956)	(6.82%)

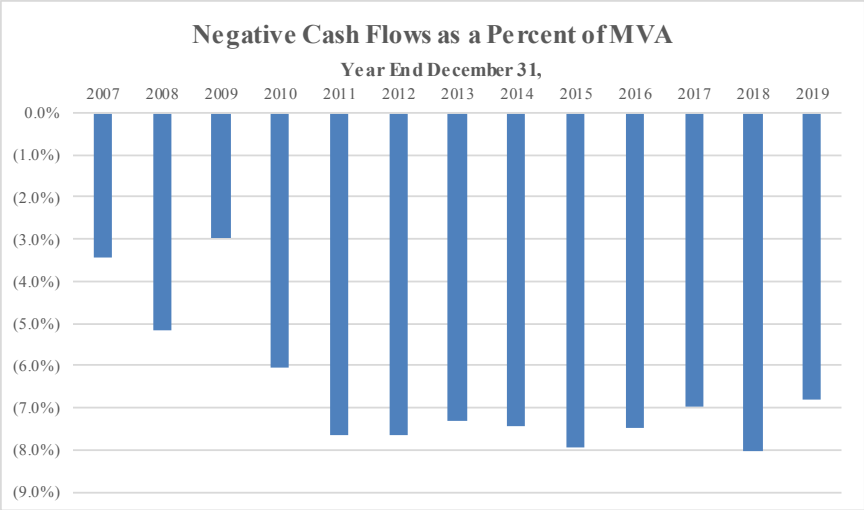


TABLE 19

LIABILITY MATURITY MEASUREMENTS

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

Fiscal Year End	Retiree Liability (a)	Total Actuarial Accrued Liability (b)	Retiree Percentage (a) / (b)	Covered Payroll (c)	Ratio (b) / (c)
12/31/07	$484,041,632	$781,284,025	62.0%	$202,311,837	3.86
12/31/08	477,828,410	804,623,080	59.4%	205,326,108	3.92
12/31/09	498,921,369	819,534,391	60.9%	194,474,437	4.21
12/31/10	580,324,640	844,232,490	68.7%	162,417,257	5.20
12/31/11	622,135,967	874,286,498	71.2%	155,893,016	5.61
12/31/12	620,358,237	868,663,383	71.4%	157,303,005	5.52
12/31/13	621,249,525	875,451,114	71.0%	157,014,537	5.58
12/31/14	645,100,053	891,543,036	72.4%	170,845,124	5.22
12/31/15	648,136,960	895,230,295	72.4%	179,013,516	5.00
12/31/16	684,767,536	981,514,827	69.8%	194,132,739	5.06
12/31/17	704,534,913	980,436,626	71.9%	196,277,971	5.00
12/31/18	710,111,431	988,234,763	71.9%	203,310,599	4.86
12/31/19	725,892,076	1,020,121,813	71.2%	217,255,306	4.70

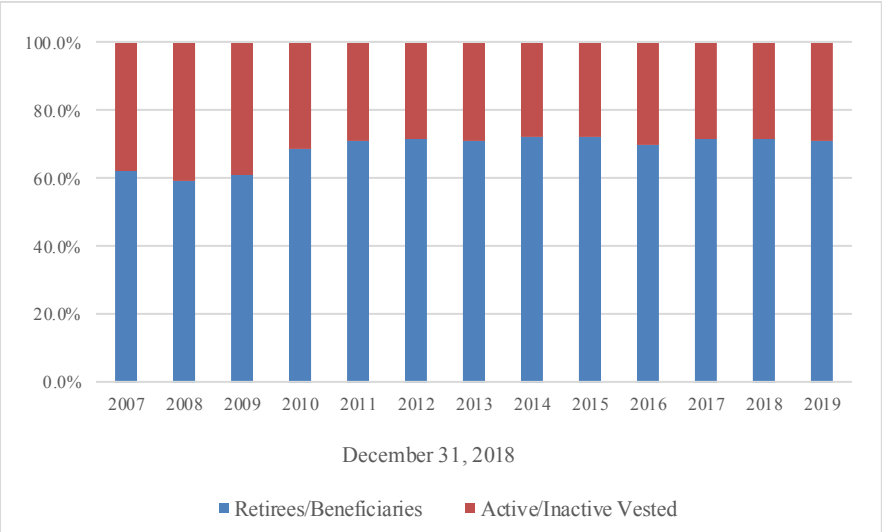


TABLE 20

COMPARISON OF VALUATION RESULTS UNDER ALTERNATE INVESTMENT RETURN ASSUMPTIONS

This exhibit compares the key January 1, 2020 valuation results under five (5) different investment return assumptions to illustrate the impact of different assumptions on the funding of the System. Note that only the investment return assumption is changed, as identified in the heading below. All other assumptions are unchanged for purposes of this analysis.

Investment Return Assumption	**7.00%**	**7.25%**	**7.50%**	**7.75%**	**8.00%**
Contributions					
Total Normal Cost	10.20%	9.82%	9.46%	9.13%	8.82%
Amortization of UAAL	12.46%	11.90%	11.34%	10.79%	10.24%
Actuarial Required Contribution	22.66%	21.72%	20.80%	19.92%	19.06%
Member Contribution	(9.00%)	(9.00%)	(9.00%)	(9.00%)	(9.00%)
Employer Contribution	(12.00%)	(12.00%)	(12.00%)	(12.00%)	(12.00%)
Contribution Rate Shortfall/(Margin)	1.66%	0.72%	(0.20%)	(1.08%)	(1.94%)
Actuarial Accrued Liability ($ in thousands)	$1,069,936	$1,044,497	$1,020,122	$996,755	$974,342
Actuarial Value of Assets ($ in thousands)	645,373	645,373	645,373	645,373	645,373
Unfunded Actuarial Accrued Liability ($ in thousands)	$424,563	$399,124	$374,749	$351,382	$328,969
Funded Ratio	60.3%	61.8%	63.3%	64.7%	66.2%

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, 2020	January 1, 2019	% Change
1. Number of Active Members			
(a) Plan B	1,461	1,634	(10.6%)
(b) Plan C	2,613	2,264	15.4%
(c) Total	4,074	3,898	4.5%
2. Active Member Averages			
(a) Age	42.7	42.7	0.0%
(b) Service	7.1	7.2	(1.4%)
(c) Expected Annual Pay	$ 53,327	$ 52,158	2.2%
B. TERMINATED VESTED MEMBERS			
1. Number of Terminated Vested Members	529	531	(0.4%)
2. Terminated Vested Members Averages			
(a) Age	47.8	48.6	(1.6%)
(b) Estimated Monthly Benefit	$ 650	$ 647	0.5%
C. TERMINATED NON-VESTED MEMBERS			
1. Number of Terminated Non-Vested Members	2,631	2,784	(5.5%)
2. Terminated Non-Vested Members Averages			
(a) Age	43.7	44.5	(1.8%)
(b) Account Balance	$ 3,947	$ 3,767	4.8%
D. RETIREES, DISABLEDS, AND BENEFICIARIES			
1. Number of Members			
(a) Retired	3,840	3,817	0.6%
(b) Disabled	77	79	(2.5%)
(c) Beneficiaries	228	217	5.1%
(e) Total	4,145	4,113	0.8%
2. Average Age			
(a) Retired	72.9	72.6	0.4%
(b) Disabled	68.5	68.6	(0.1%)
(c) Beneficiaries	74.9	74.1	1.1%
(e) Total	72.9	72.5	0.6%
3. Average Monthly Benefit			
(a) Retired	$ 1,671	$ 1,665	0.4%
(b) Disabled	1,026	996	3.0%
(c) Beneficiaries	1,149	1,128	1.9%
(e) Total	$ 1,631	$ 1,625	0.4%

MEMBER DATA RECONCILIATION

January 1, 2019 to January 1, 2020

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, 2019	3,898	531	2,784	3,817	217	79	11,326
New Entrants	754	0	71	0	22	0	847
Rehires/Transfers	70	(21)	(49)	0	0	0	0
Retirements	(92)	(39)	0	131	0	0	0
Disablements	(1)	0	0	0	0	1	0
Deaths	(3)	(2)	0	(109)	(8)	(3)	(125)
Vested Terminations	(84)	84	0	0	0	0	0
Non-vested Terminations	(243)	0	243	0	0	0	0
Refunds Paid	(221)	(23)	(418)	0	(3)	0	(665)
Payments Ended	0	0	0	0	0	(1)	(1)
Data Adjustments	(4)	(1)	0	1	0	1	(3)
Total as of January 1, 2020	4,074	529	2,631	3,840	228	77	11,379

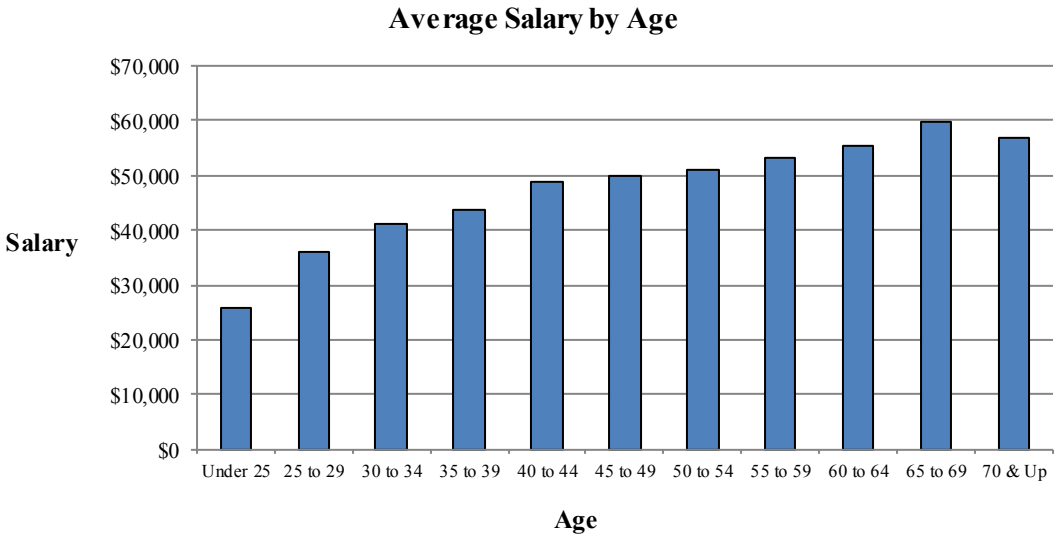
* Includes beneficiaries who were owed a single lump sum payment and were not paid prior to the valuation date.

SUMMARY OF ACTIVE MEMBERS
as of January 1, 2020

Total – All Plans

	Number			2019 Reported Compensation*		
Age	Male	Female	Total	Male	Female	Total
Under 25	43	180	223	$ 1,019,258	$ 4,771,592	$ 5,790,850
25 to 29	140	485	625	4,617,269	17,953,620	22,570,889
30 to 34	156	432	588	6,305,217	17,861,634	24,166,851
35 to 39	145	358	503	6,811,387	15,246,997	22,058,384
40 to 44	114	309	423	5,630,855	15,008,502	20,639,357
45 to 49	117	289	406	6,355,710	13,931,889	20,287,599
50 to 54	121	281	402	6,301,390	14,140,959	20,442,349
55 to 59	107	298	405	5,810,094	15,721,246	21,531,340
60 to 64	87	236	323	4,568,999	13,365,765	17,934,764
65 to 69	42	105	147	2,794,545	6,006,295	8,800,840
70 & Up	10	19	29	565,108	1,088,635	1,653,743
Total	1,082	2,992	4,074	$50,779,832	$135,097,134	$185,876,966

* Partial year pay amounts have not been annualized.

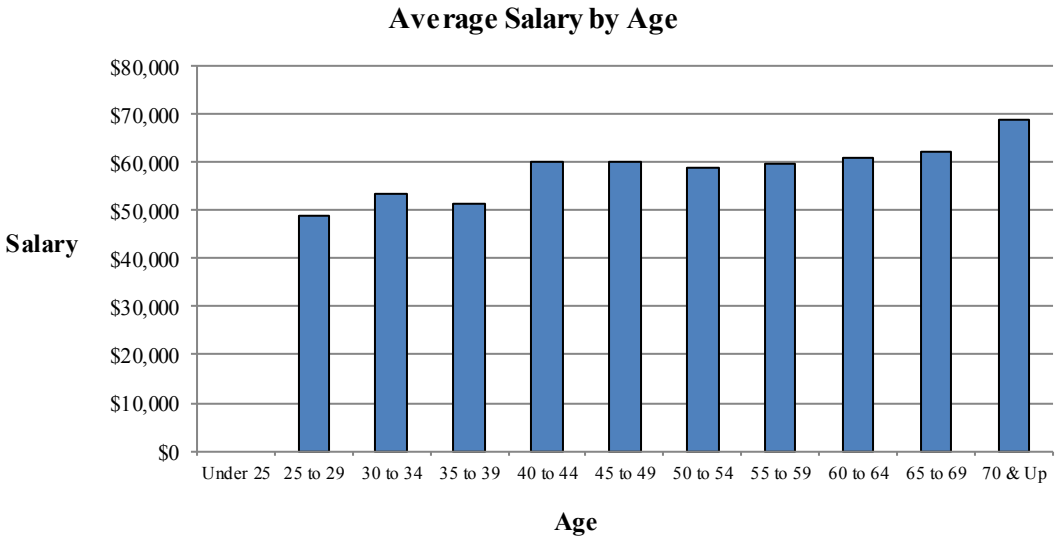


SUMMARY OF ACTIVE MEMBERS
as of January 1, 2020

Total – Plan B

	Number			2019 Reported Compensation*		
Age	Male	Female	Total	Male	Female	Total
Under 25	0	0	0	$ 0	$ 0	$ 0
25 to 29	6	30	36	302,816	1,450,550	1,753,366
30 to 34	33	109	142	1,807,721	5,798,204	7,605,925
35 to 39	40	113	153	2,265,751	5,611,614	7,877,365
40 to 44	39	133	172	2,484,714	7,834,755	10,319,469
45 to 49	42	128	170	2,873,681	7,344,697	10,218,378
50 to 54	62	139	201	3,836,805	8,028,547	11,865,352
55 to 59	72	184	256	4,305,430	11,015,033	15,320,463
60 to 64	54	153	207	3,460,551	9,119,496	12,580,047
65 to 69	23	82	105	1,580,771	4,942,318	6,523,089
70 & Up	7	12	19	467,503	839,100	1,306,603
Total	378	1,083	1,461	$23,385,743	$61,984,314	$85,370,057

* Partial year pay amounts have not been annualized.

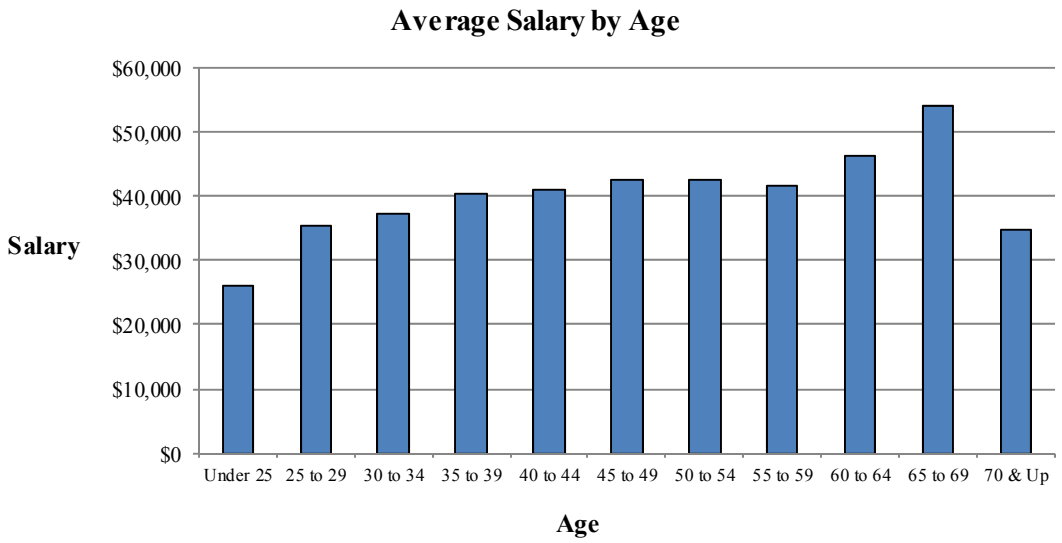


SUMMARY OF ACTIVE MEMBERS
as of January 1, 2020

Total – Plan C

	Number			2019 Reported Compensation*		
Age	Male	Female	Total	Male	Female	Total
Under 25	43	180	223	$ 1,019,258	$ 4,771,592	$ 5,790,850
25 to 29	134	455	589	4,314,453	16,503,070	20,817,523
30 to 34	123	323	446	4,497,496	12,063,430	16,560,926
35 to 39	105	245	350	4,545,636	9,635,383	14,181,019
40 to 44	75	176	251	3,146,141	7,173,747	10,319,888
45 to 49	75	161	236	3,482,029	6,587,192	10,069,221
50 to 54	59	142	201	2,464,585	6,112,412	8,576,997
55 to 59	35	114	149	1,504,664	4,706,213	6,210,877
60 to 64	33	83	116	1,108,448	4,246,269	5,354,717
65 to 69	19	23	42	1,213,774	1,063,977	2,277,751
70 & Up	3	7	10	97,605	249,535	347,140
Total	704	1,909	2,613	$27,394,089	$73,112,820	$100,506,909

* Partial year pay amounts have not been annualized.

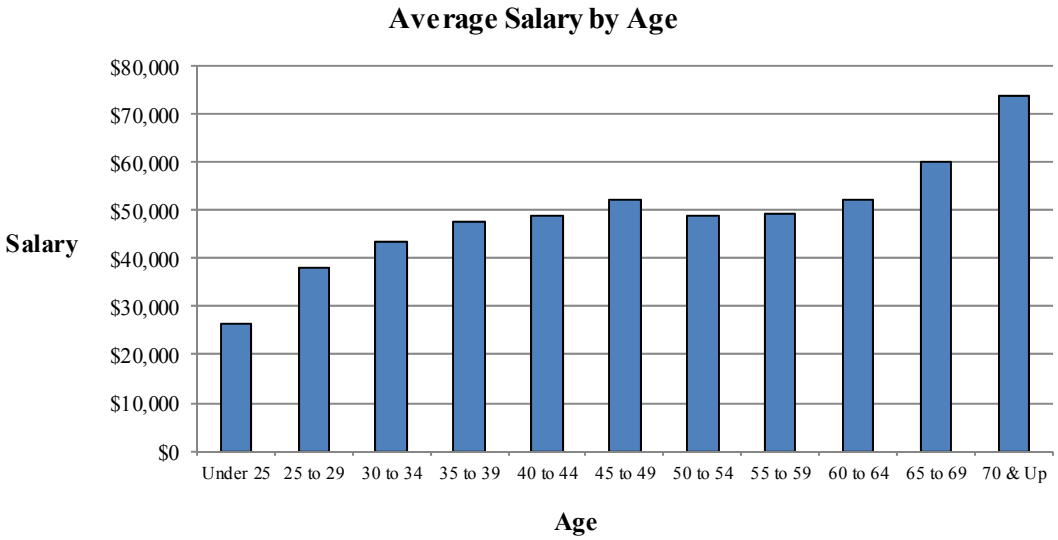


SUMMARY OF ACTIVE MEMBERS
as of January 1, 2020

Charter Schools – All Plans

	Number			2019 Reported Compensation*		
Age	Male	Female	Total	Male	Female	Total
Under 25	23	110	133	$ 591,673	$ 2,901,157	$ 3,492,830
25 to 29	60	288	348	2,236,891	11,067,426	13,304,317
30 to 34	78	261	339	3,221,035	11,490,265	14,711,300
35 to 39	57	168	225	2,954,985	7,730,657	10,685,642
40 to 44	44	117	161	2,019,575	5,842,064	7,861,639
45 to 49	46	94	140	2,728,333	4,589,249	7,317,582
50 to 54	35	77	112	1,914,801	3,550,742	5,465,543
55 to 59	26	55	81	1,427,047	2,569,796	3,996,843
60 to 64	16	40	56	928,679	2,004,656	2,933,335
65 to 69	14	24	38	904,178	1,383,664	2,287,842
70 & Up	3	4	7	164,811	351,278	516,089
Total	402	1,238	1,640	$19,092,008	$53,480,954	$72,572,962

* Partial year pay amounts have not been annualized.

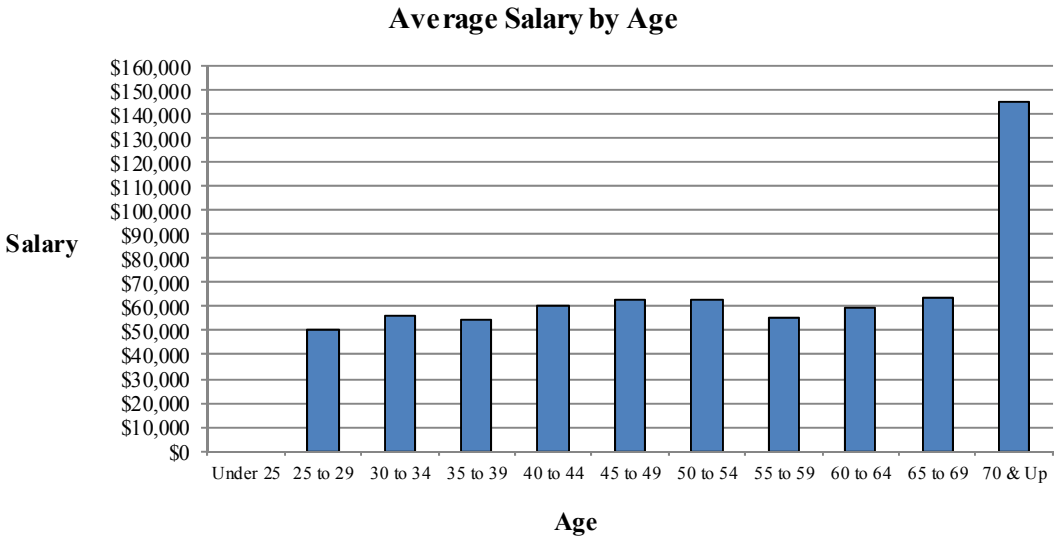


SUMMARY OF ACTIVE MEMBERS
as of January 1, 2020

Charter Schools – Plan B

	Number			2019 Reported Compensation*		
Age	Male	Female	Total	Male	Female	Total
Under 25	0	0	0	$ 0	$ 0	$ 0
25 to 29	4	18	22	207,825	895,456	1,103,281
30 to 34	17	76	93	947,121	4,260,313	5,207,434
35 to 39	18	60	78	1,084,765	3,169,265	4,254,030
40 to 44	12	52	64	738,183	3,138,438	3,876,621
45 to 49	19	34	53	1,270,538	2,047,528	3,318,066
50 to 54	14	30	44	1,018,330	1,728,937	2,747,267
55 to 59	16	19	35	918,328	1,020,828	1,939,156
60 to 64	13	17	30	833,587	948,438	1,782,025
65 to 69	3	14	17	139,370	936,743	1,076,113
70 & Up	1	1	2	91,557	198,269	289,826
Total	117	321	438	$7,249,604	$18,344,215	$25,593,819

* Partial year pay amounts have not been annualized.

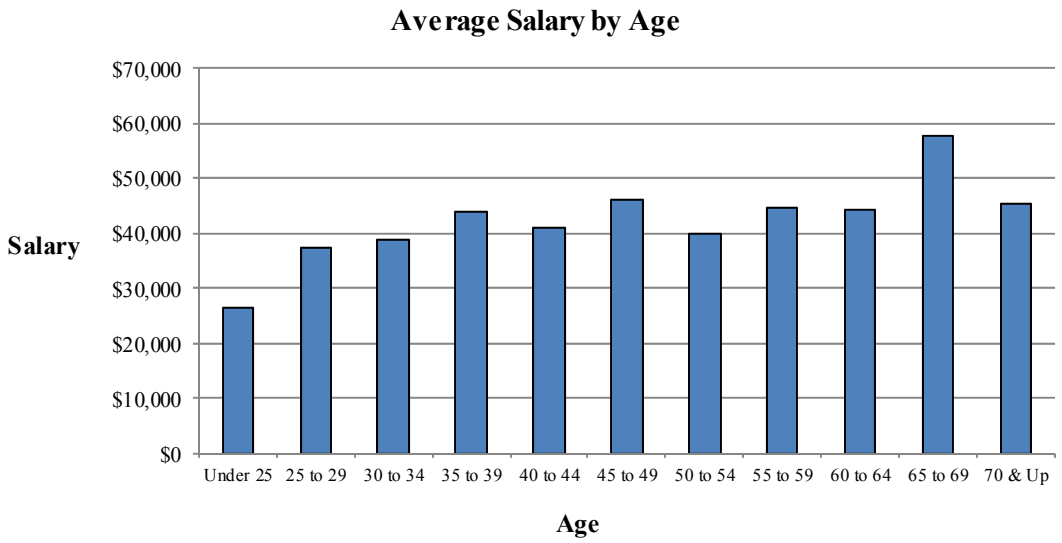


SUMMARY OF ACTIVE MEMBERS
as of January 1, 2020

Charter Schools – Plan C

	Number			2019 Reported Compensation*		
Age	Male	Female	Total	Male	Female	Total
Under 25	23	110	133	$ 591,673	$ 2,901,157	$ 3,492,830
25 to 29	56	270	326	2,029,066	10,171,970	12,201,036
30 to 34	61	185	246	2,273,914	7,229,952	9,503,866
35 to 39	39	108	147	1,870,220	4,561,392	6,431,612
40 to 44	32	65	97	1,281,392	2,703,626	3,985,018
45 to 49	27	60	87	1,457,795	2,541,721	3,999,516
50 to 54	21	47	68	896,471	1,821,805	2,718,276
55 to 59	10	36	46	508,719	1,548,968	2,057,687
60 to 64	3	23	26	95,092	1,056,218	1,151,310
65 to 69	11	10	21	764,808	446,921	1,211,729
70 & Up	2	3	5	73,254	153,009	226,263
Total	285	917	1,202	$11,842,404	$35,136,739	$46,979,143

* Partial year pay amounts have not been annualized.

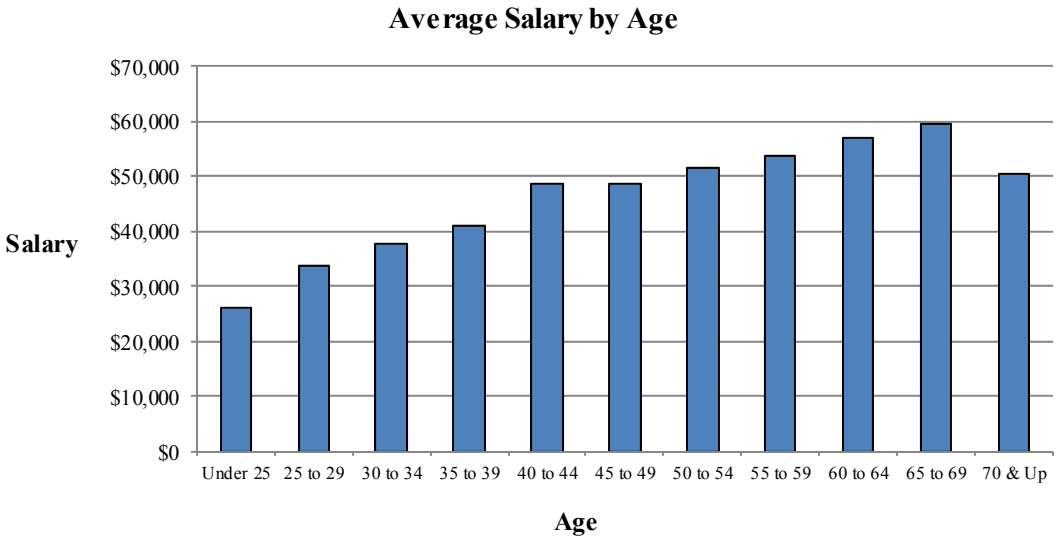


SUMMARY OF ACTIVE MEMBERS
as of January 1, 2020

School District & Retirement System – All Plans

	Number			2019 Reported Compensation*		
Age	Male	Female	Total	Male	Female	Total
Under 25	19	68	87	$ 421,108	$ 1,829,050	$ 2,250,158
25 to 29	79	186	265	2,361,776	6,531,301	8,893,077
30 to 34	73	157	230	2,898,445	5,804,109	8,702,554
35 to 39	81	177	258	3,642,828	6,928,603	10,571,431
40 to 44	62	179	241	3,239,187	8,499,246	11,738,433
45 to 49	65	185	250	3,284,821	8,893,089	12,177,910
50 to 54	79	196	275	4,006,011	10,129,429	14,135,440
55 to 59	77	227	304	4,148,548	12,183,268	16,331,816
60 to 64	64	187	251	3,336,811	10,914,373	14,251,184
65 to 69	24	79	103	1,559,329	4,564,487	6,123,816
70 & Up	7	14	21	400,297	655,383	1,055,680
Total	630	1,655	2,285	$29,299,161	$76,932,338	$106,231,499

* Partial year pay amounts have not been annualized.

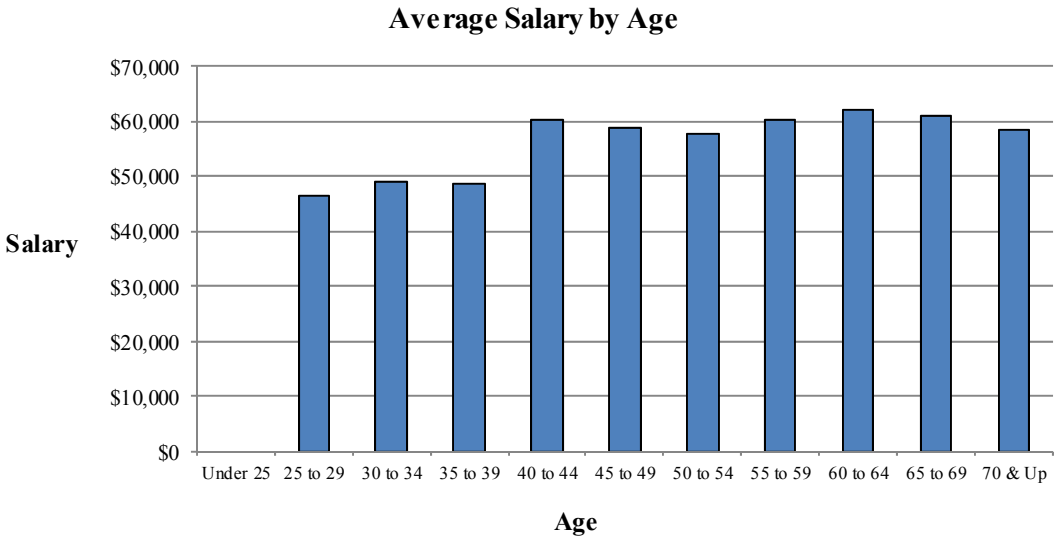


SUMMARY OF ACTIVE MEMBERS
as of January 1, 2020

School District & Retirement System – Plan B

	Number			2019 Reported Compensation*		
Age	Male	Female	Total	Male	Female	Total
Under 25	0	0	0	$ 0	$ 0	$ 0
25 to 29	2	12	14	94,991	555,094	650,085
30 to 34	16	32	48	860,600	1,488,449	2,349,049
35 to 39	21	50	71	1,129,502	2,307,683	3,437,185
40 to 44	23	75	98	1,554,311	4,340,004	5,894,315
45 to 49	19	90	109	1,328,487	5,066,357	6,394,844
50 to 54	43	105	148	2,511,887	6,045,909	8,557,796
55 to 59	52	152	204	3,152,603	9,140,417	12,293,020
60 to 64	35	128	163	2,350,817	7,758,222	10,109,039
65 to 69	16	67	83	1,110,363	3,952,058	5,062,421
70 & Up	6	10	16	375,946	558,857	934,803
Total	233	721	954	$14,469,507	$41,213,050	$55,682,557

* Partial year pay amounts have not been annualized.

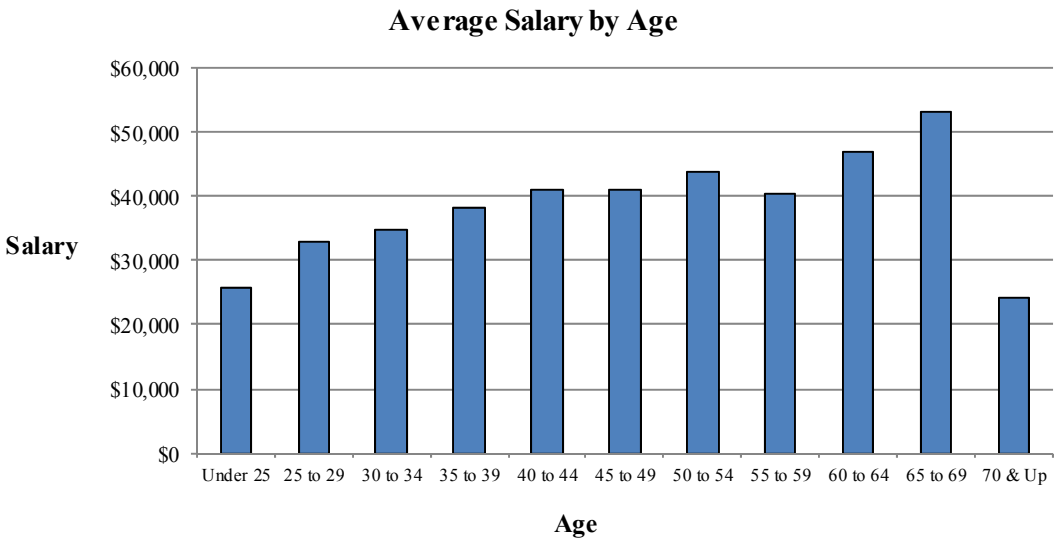


SUMMARY OF ACTIVE MEMBERS
as of January 1, 2020

School District & Retirement System – Plan C

	Number			2019 Reported Compensation*		
Age	Male	Female	Total	Male	Female	Total
Under 25	19	68	87	$ 421,108	$ 1,829,050	$ 2,250,158
25 to 29	77	174	251	2,266,785	5,976,207	8,242,992
30 to 34	57	125	182	2,037,845	4,315,660	6,353,505
35 to 39	60	127	187	2,513,326	4,620,920	7,134,246
40 to 44	39	104	143	1,684,876	4,159,242	5,844,118
45 to 49	46	95	141	1,956,334	3,826,732	5,783,066
50 to 54	36	91	127	1,494,124	4,083,520	5,577,644
55 to 59	25	75	100	995,945	3,042,851	4,038,796
60 to 64	29	59	88	985,994	3,156,151	4,142,145
65 to 69	8	12	20	448,966	612,429	1,061,395
70 & Up	1	4	5	24,351	96,526	120,877
Total	397	934	1,331	$14,829,654	$35,719,288	$50,548,942

* Partial year pay amounts have not been annualized.

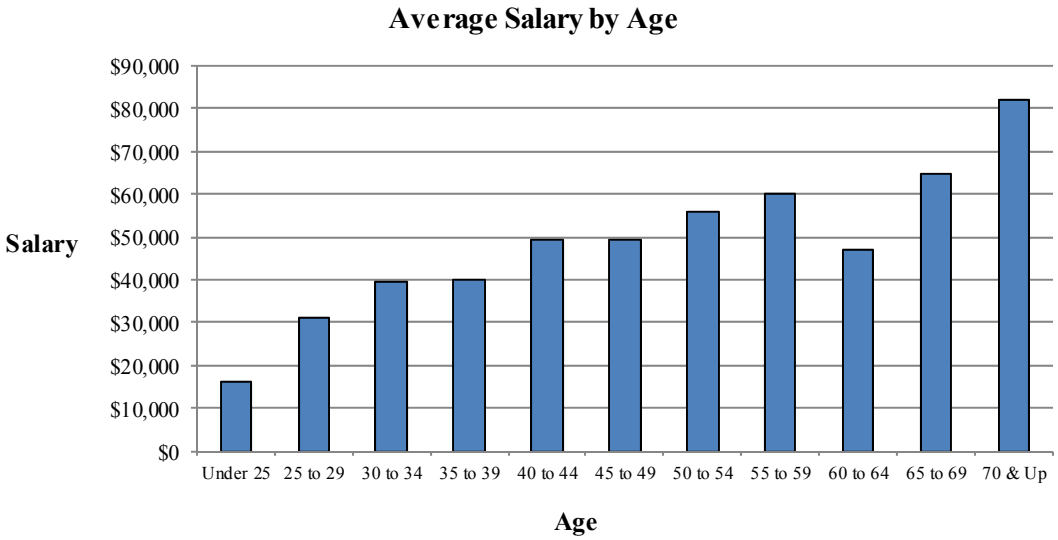


SUMMARY OF ACTIVE MEMBERS
as of January 1, 2020

Library – All Plans

	Number			2019 Reported Compensation*		
Age	Male	Female	Total	Male	Female	Total
Under 25	1	2	3	$ 6,477	$ 41,385	$ 47,862
25 to 29	1	11	12	18,602	354,893	373,495
30 to 34	5	14	19	185,737	567,260	752,997
35 to 39	7	13	20	213,574	587,737	801,311
40 to 44	8	13	21	372,093	667,192	1,039,285
45 to 49	6	10	16	342,556	449,551	792,107
50 to 54	7	8	15	380,578	460,788	841,366
55 to 59	4	16	20	234,499	968,182	1,202,681
60 to 64	7	9	16	303,509	446,736	750,245
65 to 69	4	2	6	331,038	58,144	389,182
70 & Up	0	1	1	0	81,974	81,974
Total	50	99	149	$2,388,663	$4,683,842	$7,072,505

* Partial year pay amounts have not been annualized.

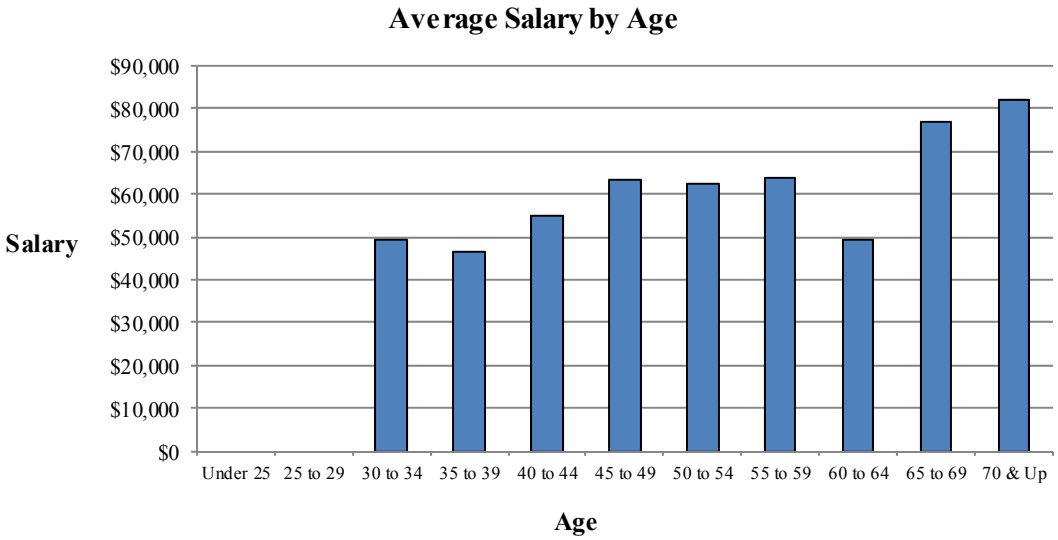


SUMMARY OF ACTIVE MEMBERS
as of January 1, 2020

Library – Plan B

	Number			2019 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	1	1	0	49,442	49,442
35 to 39	1	3	4	51,484	134,666	186,150
40 to 44	4	6	10	192,220	356,313	548,533
45 to 49	4	4	8	274,656	230,812	505,468
50 to 54	5	4	9	306,588	253,701	560,289
55 to 59	4	13	17	234,499	853,788	1,088,287
60 to 64	6	8	14	276,147	412,836	688,983
65 to 69	4	1	5	331,038	53,517	384,555
70 & Up	0	1	1	0	81,974	81,974
Total	28	41	69	$1,666,632	$2,427,049	$4,093,681

* Partial year pay amounts have not been annualized.



SUMMARY OF ACTIVE MEMBERS
as of January 1, 2020

Library – Plan C

	Number			2019 Reported Compensation*		
Age	Male	Female	Total	Male	Female	Total
Under 25	1	2	3	$ 6,477	$ 41,385	$ 47,862
25 to 29	1	11	12	18,602	354,893	373,495
30 to 34	5	13	18	185,737	517,818	703,555
35 to 39	6	10	16	162,090	453,071	615,161
40 to 44	4	7	11	179,873	310,879	490,752
45 to 49	2	6	8	67,900	218,739	286,639
50 to 54	2	4	6	73,990	207,087	281,077
55 to 59	0	3	3	0	114,394	114,394
60 to 64	1	1	2	27,362	33,900	61,262
65 to 69	0	1	1	0	4,627	4,627
70 & Up	0	0	0	0	0	0
Total	22	58	80	$ 722,031	$2,256,793	$2,978,824

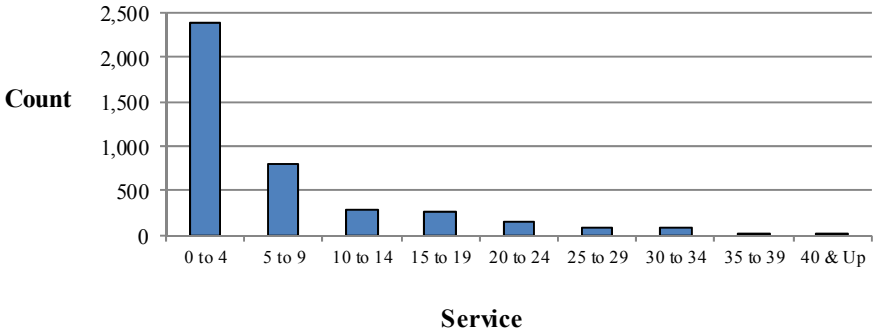
* Partial year pay amounts have not been annualized.

DISTRIBUTION OF ACTIVE MEMBERS
as of January 1, 2020

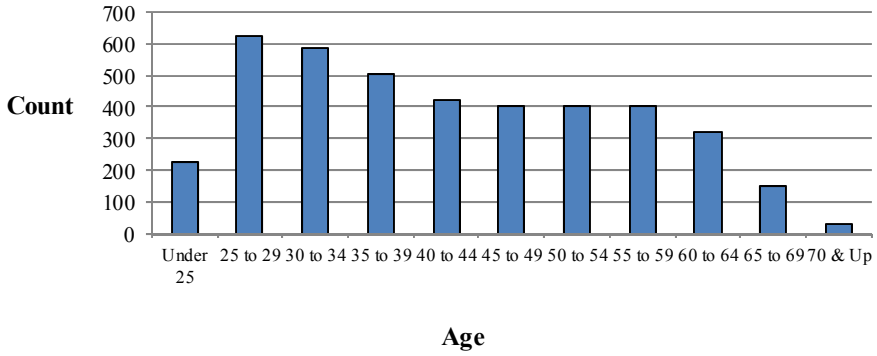
Total – All Plans

	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	223	0	0	0	0	0	0	0	0	223
25 to 29	561	64	0	0	0	0	0	0	0	625
30 to 34	377	194	17	0	0	0	0	0	0	588
35 to 39	312	125	51	15	0	0	0	0	0	503
40 to 44	226	97	44	47	9	0	0	0	0	423
45 to 49	213	77	37	40	35	4	0	0	0	406
50 to 54	171	87	33	35	37	28	11	0	0	402
55 to 59	142	69	40	57	35	29	28	5	0	405
60 to 64	107	57	35	42	26	19	27	8	2	323
65 to 69	38	28	20	26	11	8	10	1	5	147
70 & Up	10	5	2	3	3	2	1	0	3	29
Total	2,380	803	279	265	156	90	77	14	10	4,074

Service Distribution



Age Distribution

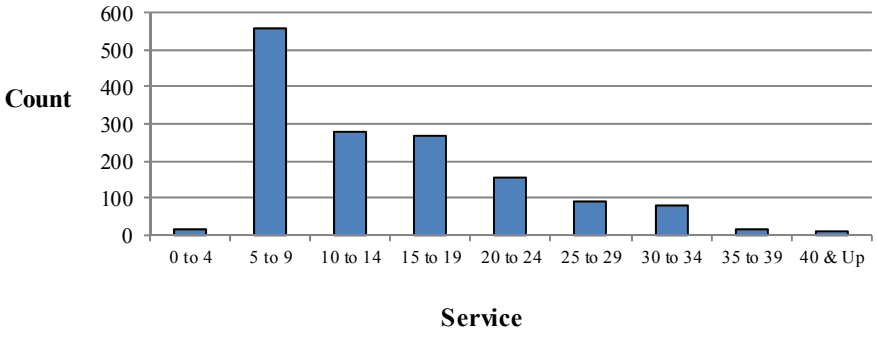


DISTRIBUTION OF ACTIVE MEMBERS
as of January 1, 2020

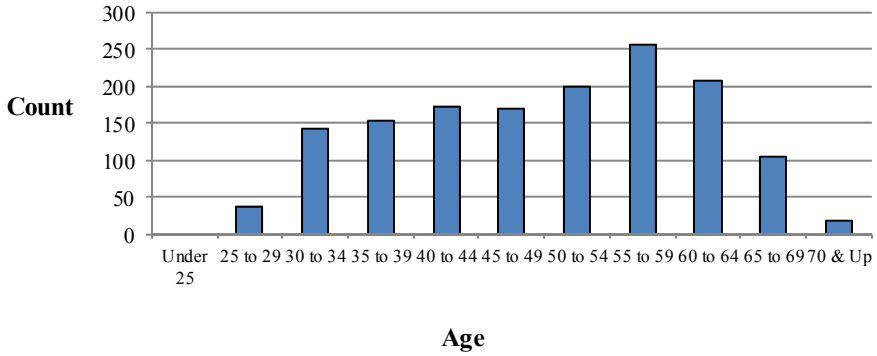
Total – Plan B

	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	36	0	0	0	0	0	0	0	36
30 to 34	1	124	17	0	0	0	0	0	0	142
35 to 39	0	87	51	15	0	0	0	0	0	153
40 to 44	0	72	44	47	9	0	0	0	0	172
45 to 49	1	53	37	40	35	4	0	0	0	170
50 to 54	0	57	33	35	37	28	11	0	0	201
55 to 59	4	58	40	57	35	29	28	5	0	256
60 to 64	2	46	35	42	26	19	27	8	2	207
65 to 69	4	21	19	26	11	8	10	1	5	105
70 & Up	1	4	2	3	3	2	1	0	3	19
Total	13	558	278	265	156	90	77	14	10	1,461

Service Distribution



Age Distribution

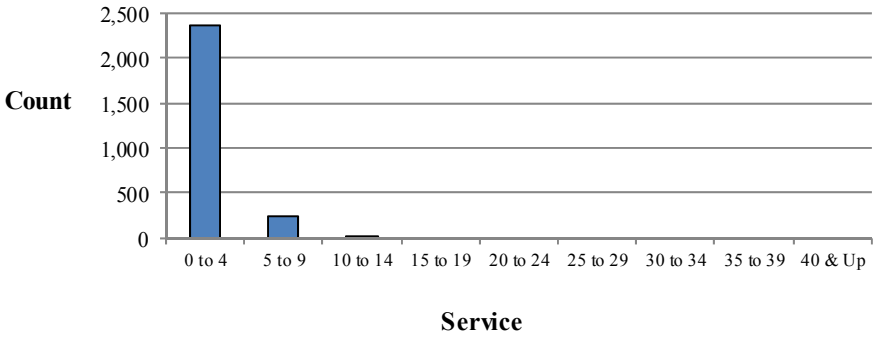


DISTRIBUTION OF ACTIVE MEMBERS
as of January 1, 2020

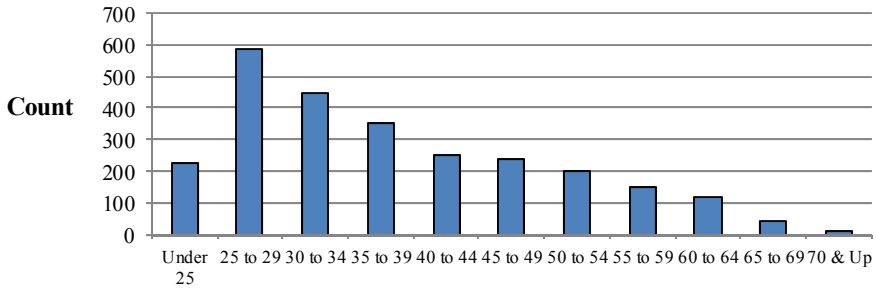
Total – Plan C

	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	223	0	0	0	0	0	0	0	0	223
25 to 29	561	28	0	0	0	0	0	0	0	589
30 to 34	376	70	0	0	0	0	0	0	0	446
35 to 39	312	38	0	0	0	0	0	0	0	350
40 to 44	226	25	0	0	0	0	0	0	0	251
45 to 49	212	24	0	0	0	0	0	0	0	236
50 to 54	171	30	0	0	0	0	0	0	0	201
55 to 59	138	11	0	0	0	0	0	0	0	149
60 to 64	105	11	0	0	0	0	0	0	0	116
65 to 69	34	7	1	0	0	0	0	0	0	42
70 & Up	9	1	0	0	0	0	0	0	0	10
Total	2,367	245	1	0	0	0	0	0	0	2,613

Service Distribution



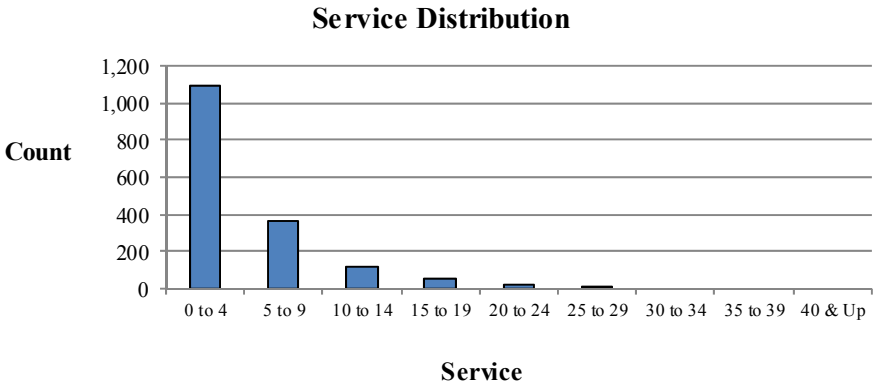
Age Distribution

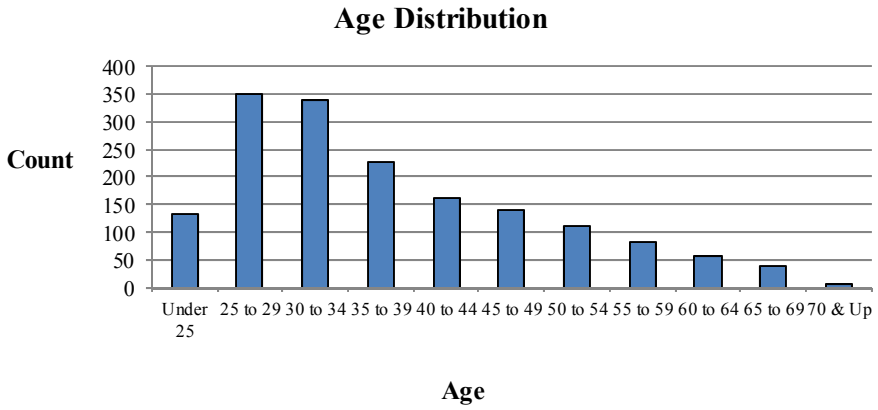


DISTRIBUTION OF ACTIVE MEMBERS
as of January 1, 2020

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	133	0	0	0	0	0	0	0	0	133
25 to 29	307	41	0	0	0	0	0	0	0	348
30 to 34	205	122	12	0	0	0	0	0	0	339
35 to 39	131	57	32	5	0	0	0	0	0	225
40 to 44	84	45	16	13	3	0	0	0	0	161
45 to 49	77	32	13	11	7	0	0	0	0	140
50 to 54	63	24	13	8	4	0	0	0	0	112
55 to 59	44	19	10	5	2	1	0	0	0	81
60 to 64	25	14	10	6	1	0	0	0	0	56
65 to 69	17	6	7	3	4	1	0	0	0	38
70 & Up	4	2	0	1	0	0	0	0	0	7
Total	1,090	362	113	52	21	2	0	0	0	1,640



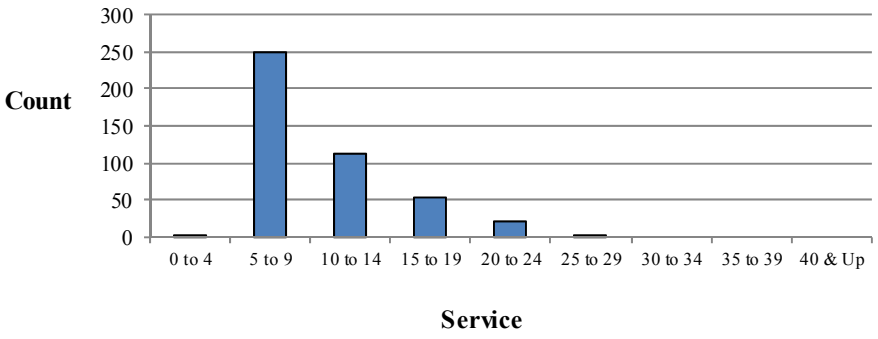


DISTRIBUTION OF ACTIVE MEMBERS
as of January 1, 2020

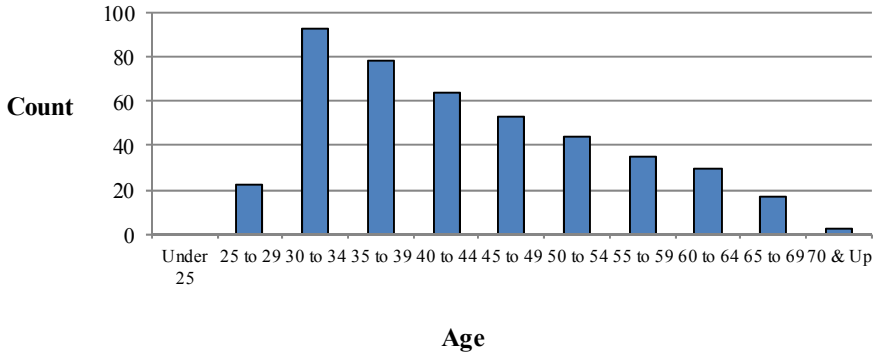
Charter Schools – Plan B

	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	22	0	0	0	0	0	0	0	22
30 to 34	1	80	12	0	0	0	0	0	0	93
35 to 39	0	41	32	5	0	0	0	0	0	78
40 to 44	0	32	16	13	3	0	0	0	0	64
45 to 49	1	21	13	11	7	0	0	0	0	53
50 to 54	0	19	13	8	4	0	0	0	0	44
55 to 59	1	16	10	5	2	1	0	0	0	35
60 to 64	0	13	10	6	1	0	0	0	0	30
65 to 69	0	3	6	3	4	1	0	0	0	17
70 & Up	0	1	0	1	0	0	0	0	0	2
Total	3	248	112	52	21	2	0	0	0	438

Service Distribution



Age Distribution

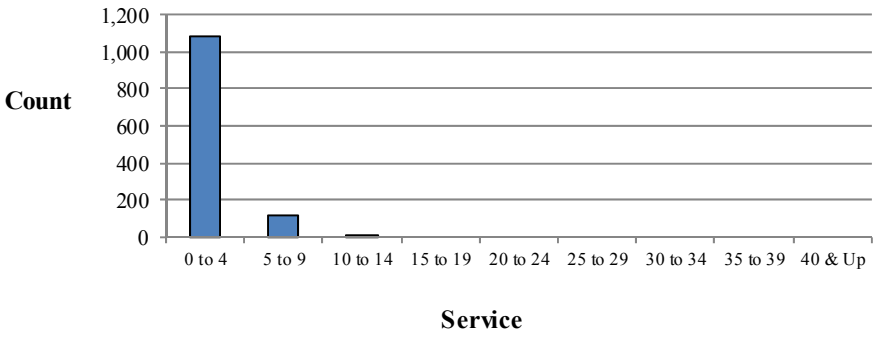


DISTRIBUTION OF ACTIVE MEMBERS
as of January 1, 2020

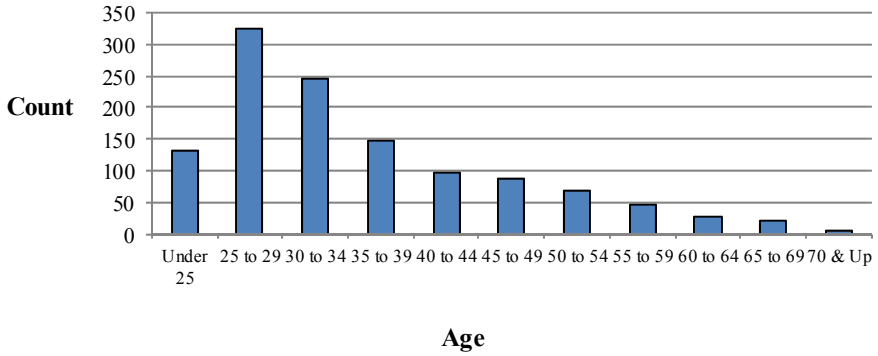
Charter Schools – Plan C

	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	133	0	0	0	0	0	0	0	0	133
25 to 29	307	19	0	0	0	0	0	0	0	326
30 to 34	204	42	0	0	0	0	0	0	0	246
35 to 39	131	16	0	0	0	0	0	0	0	147
40 to 44	84	13	0	0	0	0	0	0	0	97
45 to 49	76	11	0	0	0	0	0	0	0	87
50 to 54	63	5	0	0	0	0	0	0	0	68
55 to 59	43	3	0	0	0	0	0	0	0	46
60 to 64	25	1	0	0	0	0	0	0	0	26
65 to 69	17	3	1	0	0	0	0	0	0	21
70 & Up	4	1	0	0	0	0	0	0	0	5
Total	1,087	114	1	0	0	0	0	0	0	1,202

Service Distribution



Age Distribution

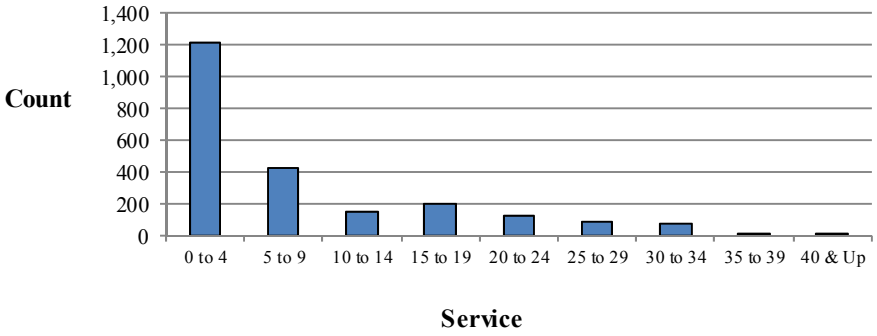


DISTRIBUTION OF ACTIVE MEMBERS
as of January 1, 2020

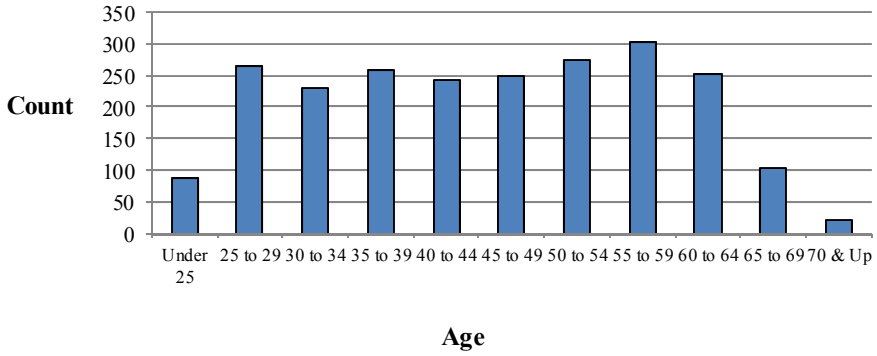
School District & Retirement System – All Plans

	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	87	0	0	0	0	0	0	0	0	87
25 to 29	242	23	0	0	0	0	0	0	0	265
30 to 34	157	68	5	0	0	0	0	0	0	230
35 to 39	166	64	19	9	0	0	0	0	0	258
40 to 44	131	49	23	32	6	0	0	0	0	241
45 to 49	129	41	20	29	27	4	0	0	0	250
50 to 54	103	60	19	25	31	26	11	0	0	275
55 to 59	95	47	24	47	32	28	28	3	0	304
60 to 64	81	42	20	33	22	17	27	7	2	251
65 to 69	20	20	11	22	7	7	10	1	5	103
70 & Up	6	3	2	2	3	2	1	0	2	21
Total	1,217	417	143	199	128	84	77	11	9	2,285

Service Distribution



Age Distribution

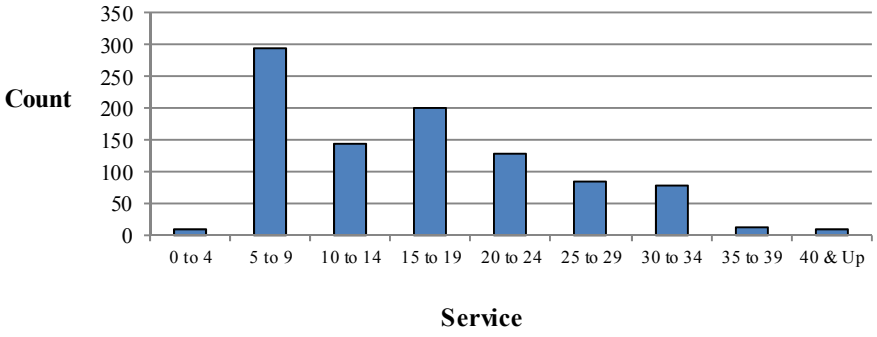


DISTRIBUTION OF ACTIVE MEMBERS
as of January 1, 2020

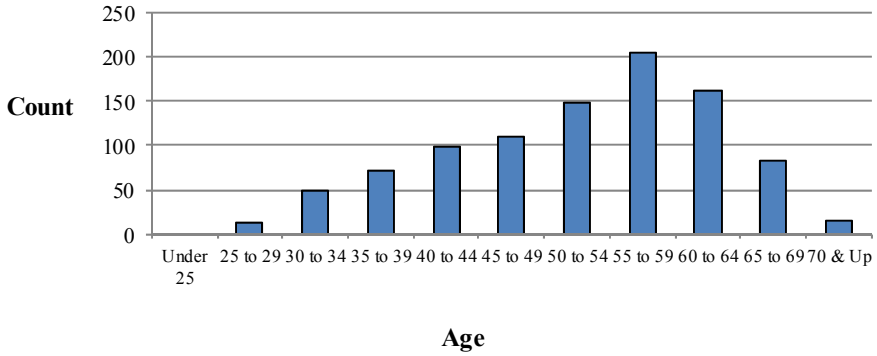
School District & Retirement System – Plan B

	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	14	0	0	0	0	0	0	0	14
30 to 34	0	43	5	0	0	0	0	0	0	48
35 to 39	0	43	19	9	0	0	0	0	0	71
40 to 44	0	37	23	32	6	0	0	0	0	98
45 to 49	0	29	20	29	27	4	0	0	0	109
50 to 54	0	36	19	25	31	26	11	0	0	148
55 to 59	3	39	24	47	32	28	28	3	0	204
60 to 64	2	33	20	33	22	17	27	7	2	163
65 to 69	4	16	11	22	7	7	10	1	5	83
70 & Up	1	3	2	2	3	2	1	0	2	16
Total	10	293	143	199	128	84	77	11	9	954

Service Distribution



Age Distribution

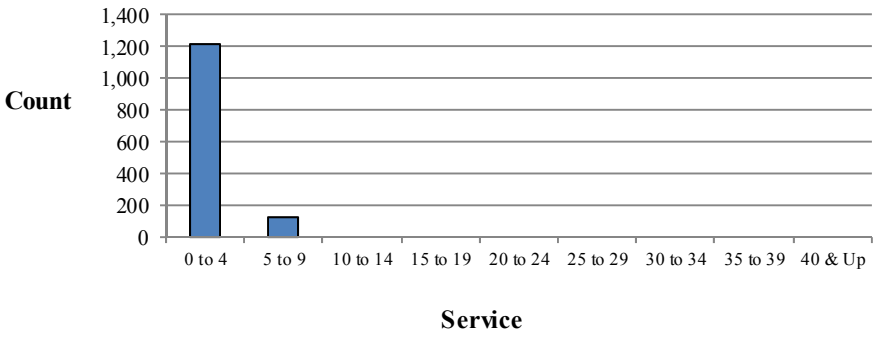


DISTRIBUTION OF ACTIVE MEMBERS
as of January 1, 2020

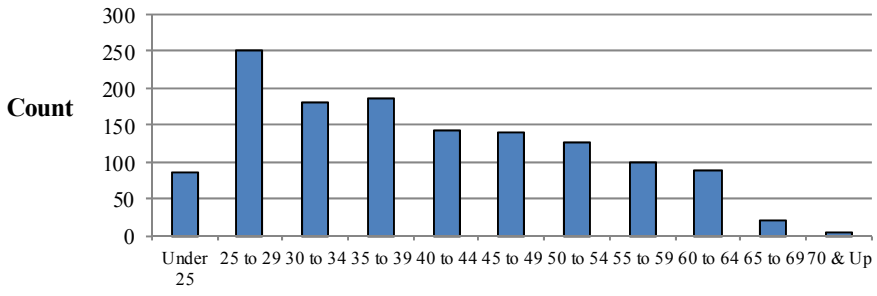
School District & Retirement System – Plan C

	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	87	0	0	0	0	0	0	0	0	87
25 to 29	242	9	0	0	0	0	0	0	0	251
30 to 34	157	25	0	0	0	0	0	0	0	182
35 to 39	166	21	0	0	0	0	0	0	0	187
40 to 44	131	12	0	0	0	0	0	0	0	143
45 to 49	129	12	0	0	0	0	0	0	0	141
50 to 54	103	24	0	0	0	0	0	0	0	127
55 to 59	92	8	0	0	0	0	0	0	0	100
60 to 64	79	9	0	0	0	0	0	0	0	88
65 to 69	16	4	0	0	0	0	0	0	0	20
70 & Up	5	0	0	0	0	0	0	0	0	5
Total	1,207	124	0	0	0	0	0	0	0	1,331

Service Distribution



Age Distribution

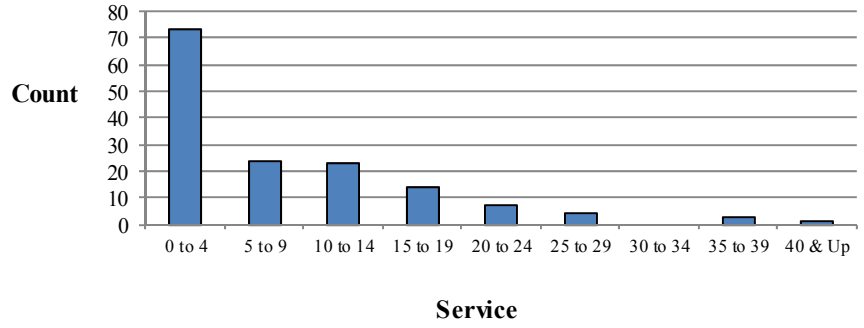


DISTRIBUTION OF ACTIVE MEMBERS
as of January 1, 2020

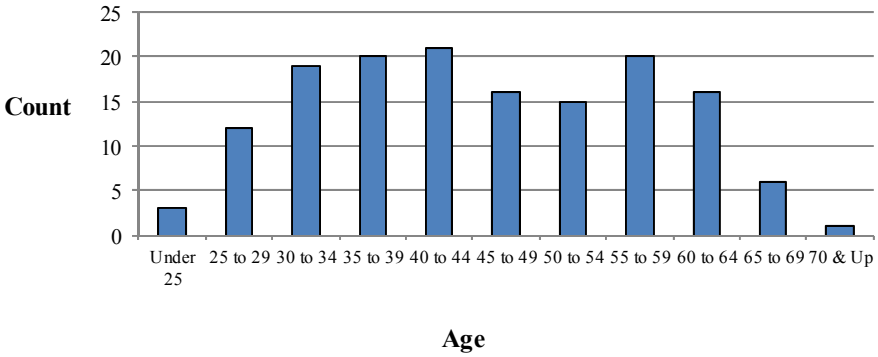
Library – All Plans

	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	3	0	0	0	0	0	0	0	0	3
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	15	4	0	1	0	0	0	0	0	20
40 to 44	11	3	5	2	0	0	0	0	0	21
45 to 49	7	4	4	0	1	0	0	0	0	16
50 to 54	5	3	1	2	2	2	0	0	0	15
55 to 59	3	3	6	5	1	0	0	2	0	20
60 to 64	1	1	5	3	3	2	0	1	0	16
65 to 69	1	2	2	1	0	0	0	0	0	6
70 & Up	0	0	0	0	0	0	0	0	1	1
Total	73	24	23	14	7	4	0	3	1	149

Service Distribution



Age Distribution



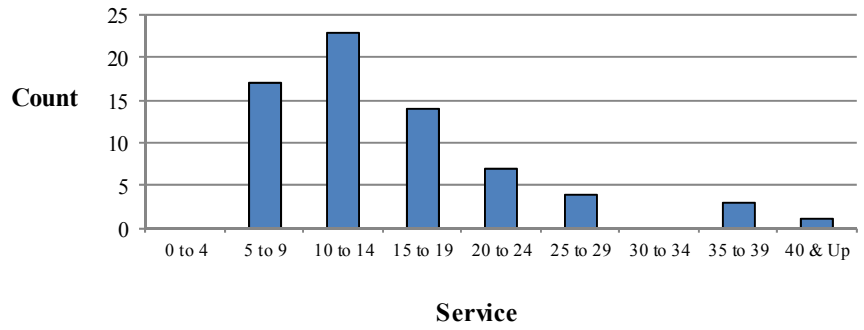
DISTRIBUTION OF ACTIVE MEMBERS

as of January 1, 2020

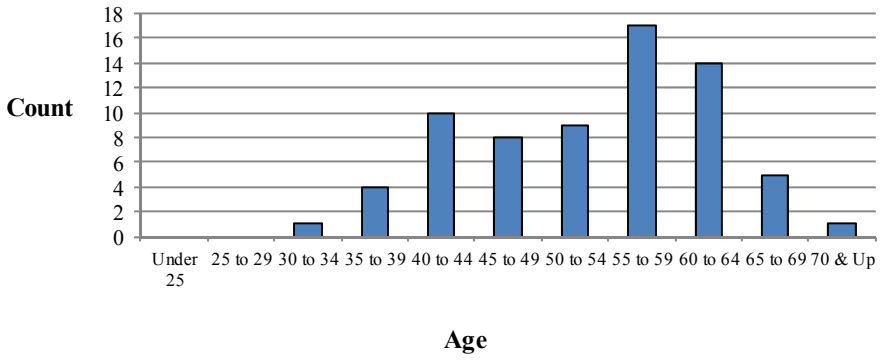
Library – Plan B

	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	1	0	0	0	0	0	0	0	1
35 to 39	0	3	0	1	0	0	0	0	0	4
40 to 44	0	3	5	2	0	0	0	0	0	10
45 to 49	0	3	4	0	1	0	0	0	0	8
50 to 54	0	2	1	2	2	2	0	0	0	9
55 to 59	0	3	6	5	1	0	0	2	0	17
60 to 64	0	0	5	3	3	2	0	1	0	14
65 to 69	0	2	2	1	0	0	0	0	0	5
70 & Up	0	0	0	0	0	0	0	0	1	1
Total	0	17	23	14	7	4	0	3	1	69

Service Distribution



Age Distribution

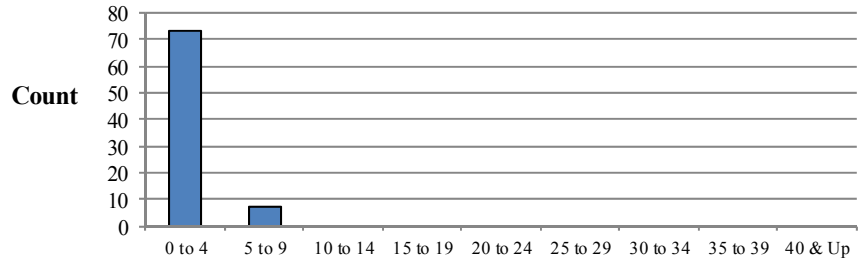


DISTRIBUTION OF ACTIVE MEMBERS
as of January 1, 2020

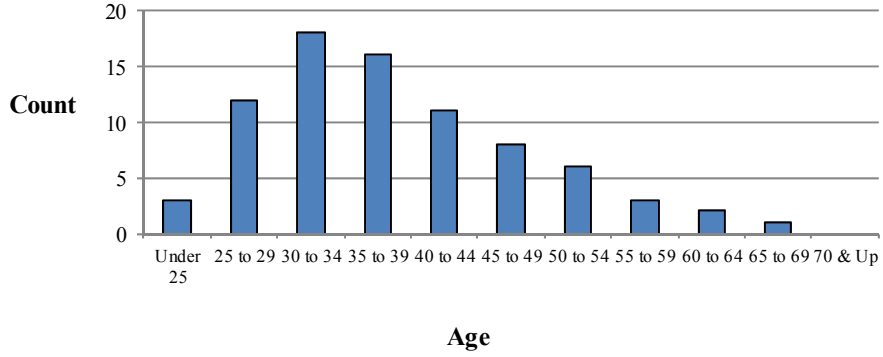
Library – Plan C

	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	3	0	0	0	0	0	0	0	0	3
25 to 29	12	0	0	0	0	0	0	0	0	12
30 to 34	15	3	0	0	0	0	0	0	0	18
35 to 39	15	1	0	0	0	0	0	0	0	16
40 to 44	11	0	0	0	0	0	0	0	0	11
45 to 49	7	1	0	0	0	0	0	0	0	8
50 to 54	5	1	0	0	0	0	0	0	0	6
55 to 59	3	0	0	0	0	0	0	0	0	3
60 to 64	1	1	0	0	0	0	0	0	0	2
65 to 69	1	0	0	0	0	0	0	0	0	1
70 & Up	0	0	0	0	0	0	0	0	0	0
Total	73	7	0	0	0	0	0	0	0	80

Service Distribution



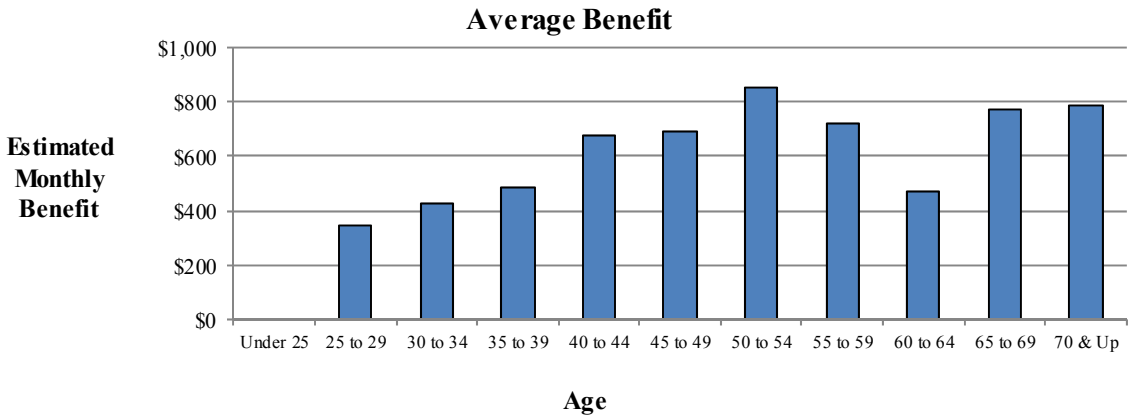
Age Distribution

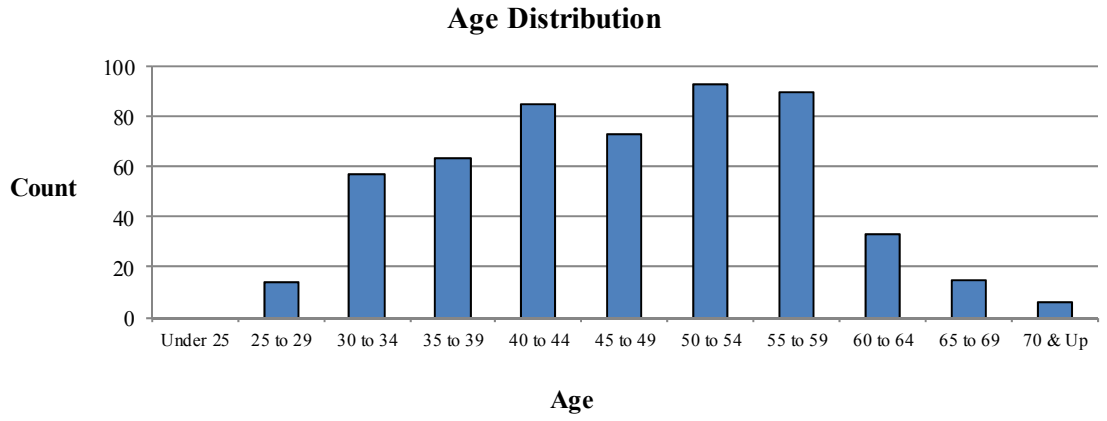


SUMMARY OF TERMINATED VESTED MEMBERS

as of January 1, 2020

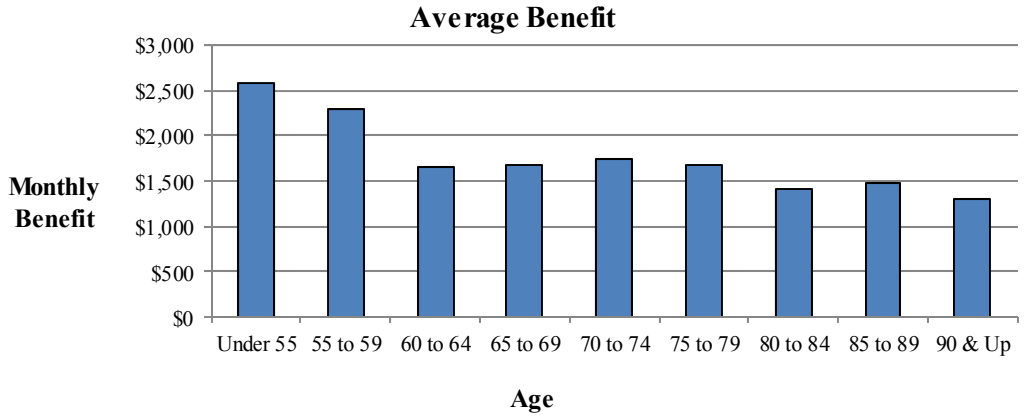
Age	Number			Estimated Monthly Benefit		
	Male	Female	Total	Male	Female	Total
Under 25	0	0	0	$ 0	$ 0	$ 0
25 to 29	6	8	14	2,175	2,698	4,873
30 to 34	14	43	57	6,693	17,569	24,262
35 to 39	15	48	63	7,230	23,273	30,503
40 to 44	25	60	85	20,612	37,172	57,784
45 to 49	20	53	73	13,375	37,045	50,420
50 to 54	26	67	93	19,253	59,839	79,092
55 to 59	33	57	90	27,179	37,983	65,162
60 to 64	8	25	33	3,340	12,174	15,514
65 to 69	3	12	15	1,255	10,334	11,589
70 & Up	3	3	6	3,378	1,346	4,724
Total	153	376	529	$104,490	$239,433	$343,923

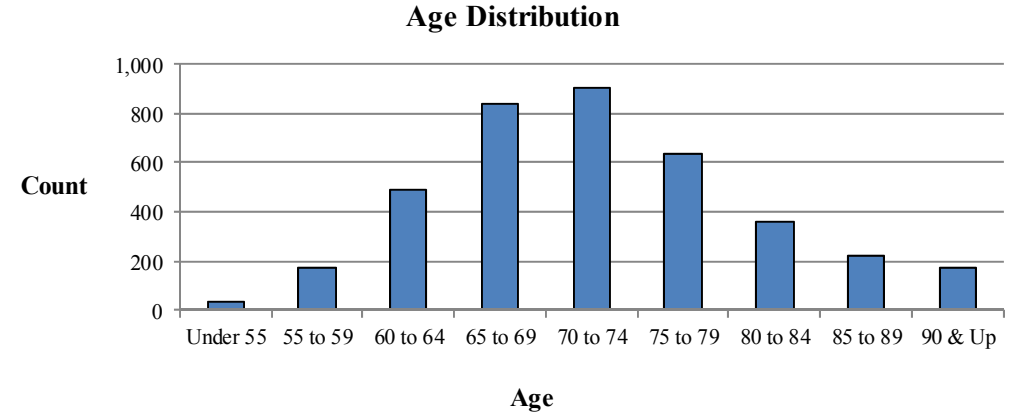




SUMMARY OF ALL RETIRED MEMBERS
as of January 1, 2020

Age	Number			Monthly Benefit		
	Male	Female	Total	Male	Female	Total
Under 55	16	18	34	$ 39,681	$ 48,038	$ 87,719
55 to 59	48	125	173	103,574	294,241	397,815
60 to 64	137	350	487	225,667	576,761	802,428
65 to 69	211	626	837	308,338	1,091,785	1,400,123
70 to 74	235	671	906	375,990	1,211,784	1,587,774
75 to 79	147	492	639	225,192	841,625	1,066,817
80 to 84	90	273	363	145,947	368,720	514,667
85 to 89	60	165	225	103,507	228,733	332,240
90 & Up	36	140	176	57,242	171,355	228,597
Total	980	2,860	3,840	$ 1,585,138	$ 4,833,042	$ 6,418,180



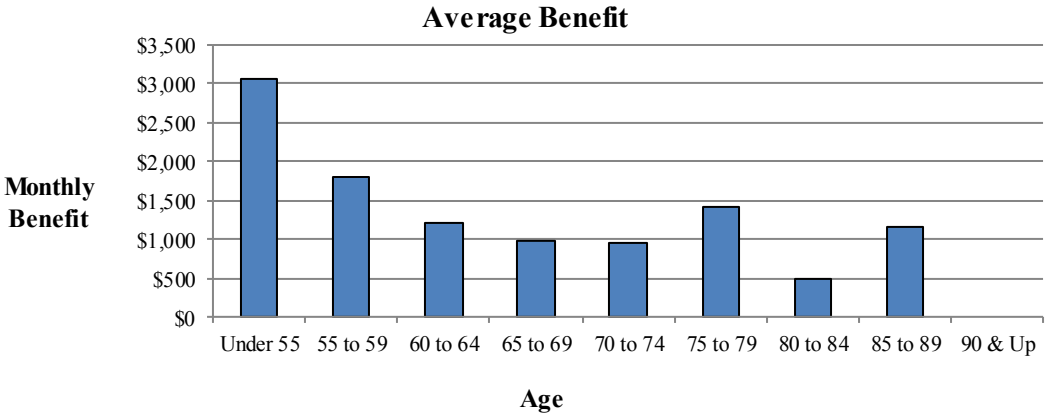


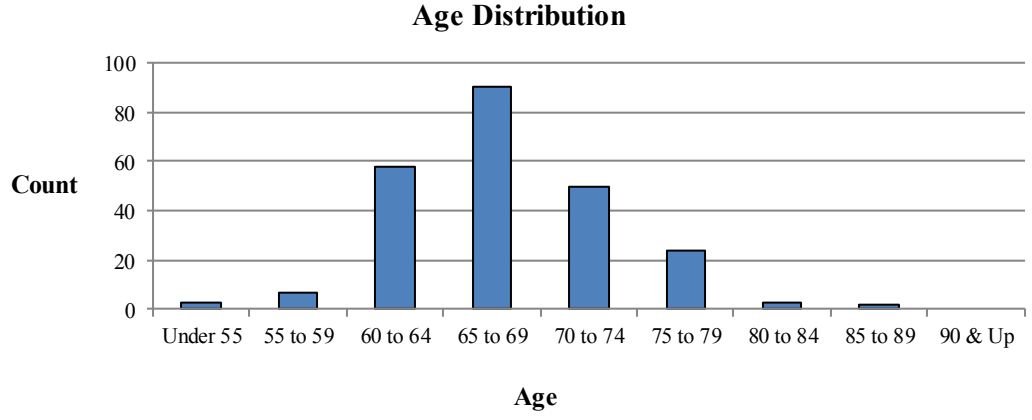
SUMMARY OF RETIRED MEMBERS

as of January 1, 2020

Charter Schools
(Last employer prior to retirement)

Age	Number			Monthly Benefit		
	Male	Female	Total	Male	Female	Total
Under 55	1	2	3	$ 3,648	$ 5,525	$ 9,173
55 to 59	0	7	7	0	12,692	12,692
60 to 64	18	40	58	29,745	40,529	70,274
65 to 69	21	69	90	18,190	71,173	89,363
70 to 74	14	36	50	12,663	34,612	47,275
75 to 79	8	16	24	6,276	27,615	33,891
80 to 84	1	2	3	213	1,244	1,457
85 to 89	1	1	2	436	1,883	2,319
90 & Up	0	0	0	0	0	0
Total	64	173	237	$ 71,171	$ 195,273	$ 266,444



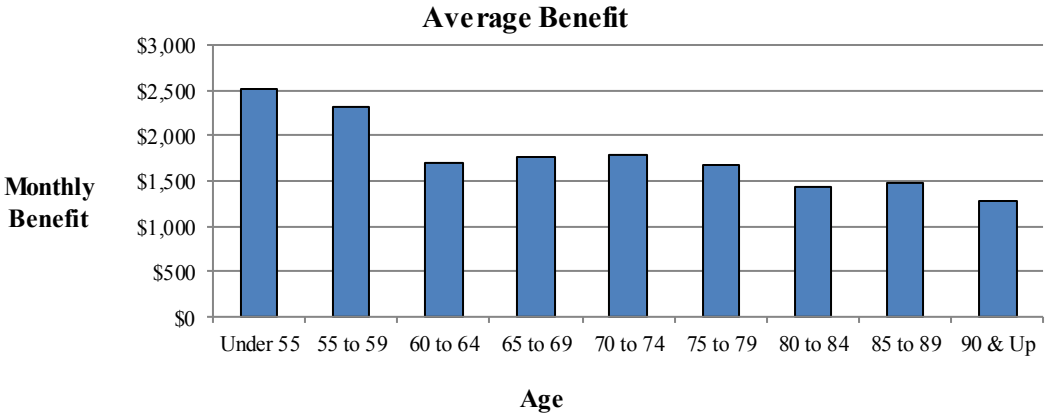


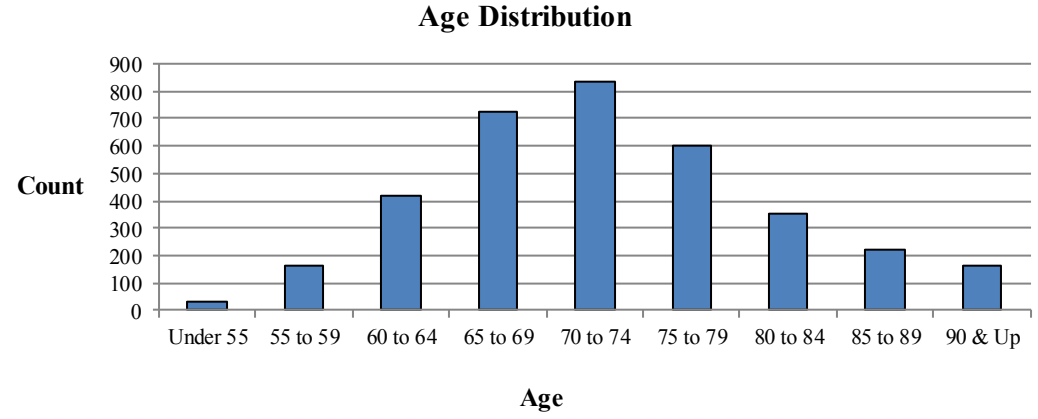
SUMMARY OF RETIRED MEMBERS

as of January 1, 2020

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

Age	Number			Monthly Benefit		
	Male	Female	Total	Male	Female	Total
Under 55	14	16	30	$ 32,962	$ 42,513	$ 75,475
55 to 59	46	116	162	99,373	275,012	374,385
60 to 64	114	308	422	188,557	532,196	720,753
65 to 69	183	539	722	280,336	987,903	1,268,239
70 to 74	216	616	832	353,928	1,139,745	1,493,673
75 to 79	138	466	604	217,183	795,926	1,013,109
80 to 84	89	262	351	145,734	355,585	501,319
85 to 89	58	163	221	102,084	224,623	326,707
90 & Up	34	131	165	55,659	154,383	210,042
Total	892	2,617	3,509	$ 1,475,816	$ 4,507,886	$ 5,983,702



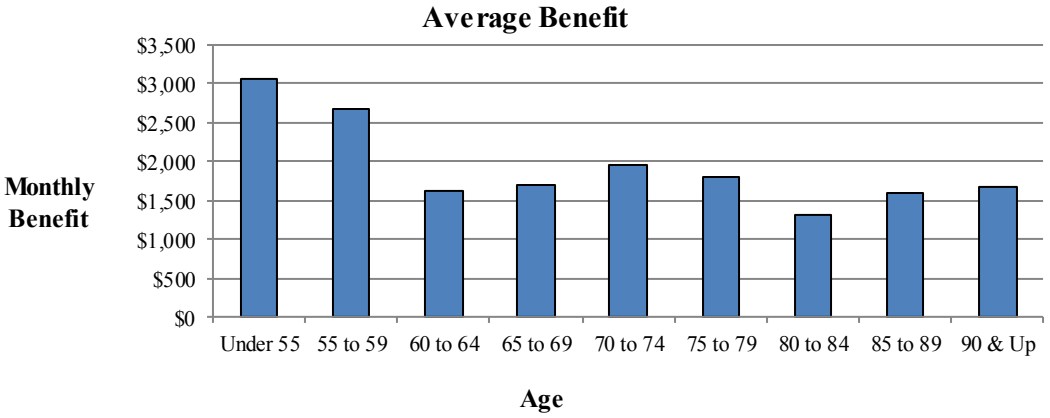


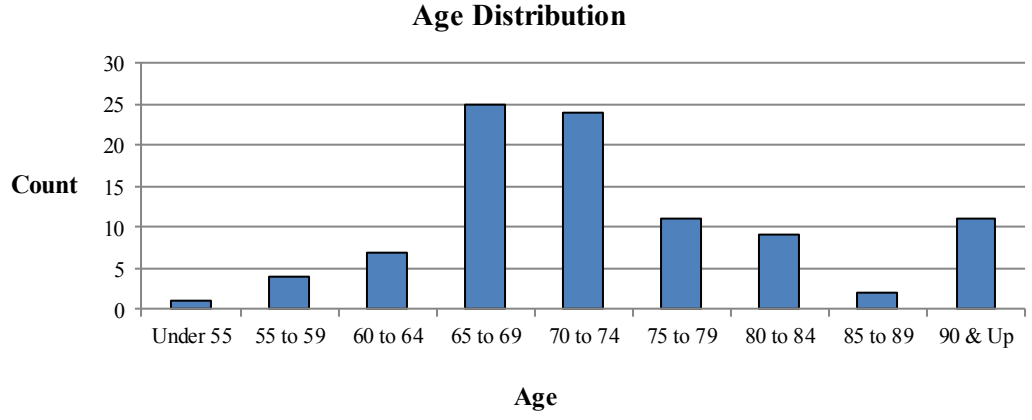
SUMMARY OF RETIRED MEMBERS

as of January 1, 2020

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	2	2	4	4,201	6,537	10,738
60 to 64	5	2	7	7,365	4,036	11,401
65 to 69	7	18	25	9,812	32,709	42,521
70 to 74	5	19	24	9,399	37,427	46,826
75 to 79	1	10	11	1,733	18,084	19,817
80 to 84	0	9	9	0	11,891	11,891
85 to 89	1	1	2	987	2,227	3,214
90 & Up	2	9	11	1,583	16,972	18,555
Total	24	70	94	$ 38,151	$ 129,883	$ 168,034



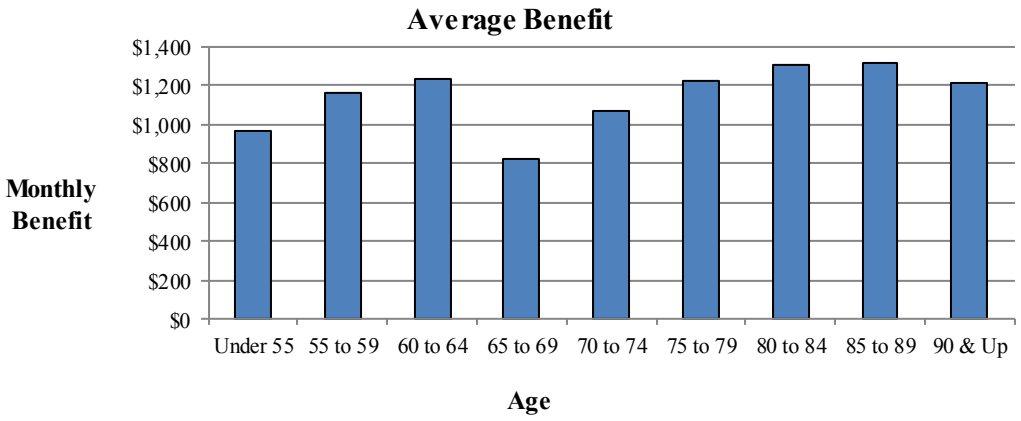


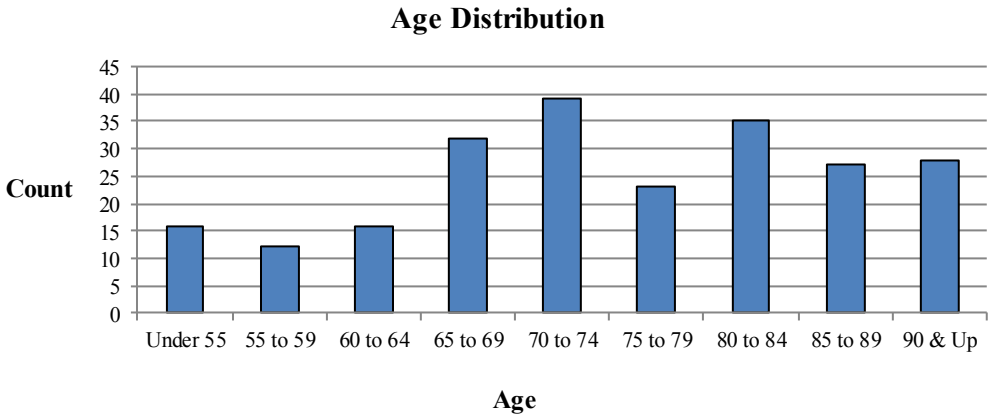
SUMMARY OF BENEFICIARIES*

as of January 1, 2020

Age	Number			Monthly Benefit		
	Male	Female	Total	Male	Female	Total
Under 55	8	8	16	$ 9,044	$ 6,439	$ 15,483
55 to 59	7	5	12	4,874	9,119	13,993
60 to 64	4	12	16	5,363	14,351	19,714
65 to 69	6	26	32	5,707	20,707	26,414
70 to 74	14	25	39	13,452	28,291	41,743
75 to 79	8	15	23	8,761	19,412	28,173
80 to 84	7	28	35	7,645	38,144	45,789
85 to 89	7	20	27	10,317	25,103	35,420
90 & Up	4	24	28	4,033	29,955	33,988
Total	65	163	228	$ 69,196	$ 191,521	$ 260,717

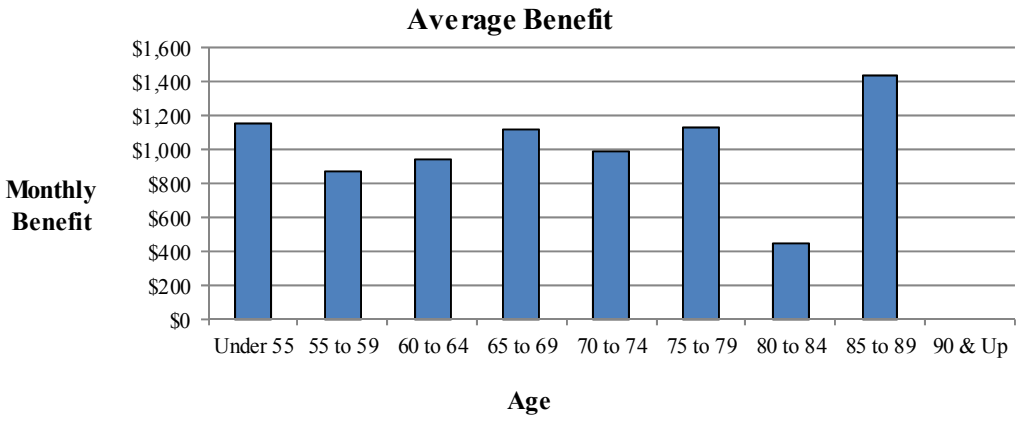
* Includes 1 beneficiary who was owed a single lump sum payment and was not paid prior to the valuation date.

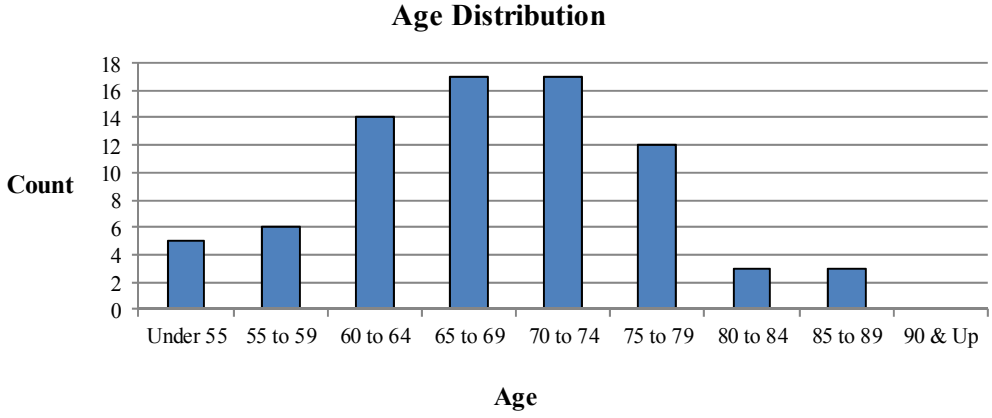




SUMMARY OF DISABLED MEMBERS
as of January 1, 2020

Age	Number			Monthly Benefit		
	Male	Female	Total	Male	Female	Total
Under 55	0	5	5	$ 0	$ 5,761	$ 5,761
55 to 59	3	3	6	2,849	2,403	5,252
60 to 64	5	9	14	3,781	9,341	13,122
65 to 69	2	15	17	2,969	15,972	18,941
70 to 74	8	9	17	8,808	7,937	16,745
75 to 79	1	11	12	1,023	12,548	13,571
80 to 84	0	3	3	0	1,352	1,352
85 to 89	0	3	3	0	4,291	4,291
90 & Up	0	0	0	0	0	0
Total	19	58	77	$ 19,430	$ 59,605	$ 79,035





Summary of Plan Provisions

Effective Date

January 1, 1944, most recently amended in 2018.

Plan Type

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

Eligibility for coverage

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

Service

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

Annual compensation

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

Average final compensation

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

Normal retirement

Eligibility

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

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

Benefit

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

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

Minimum benefit

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

Early retirement

Eligibility

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

Benefit

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

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

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

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

Disability retirement

Eligibility

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

Benefit

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

Vested termination benefits

Eligibility

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

Benefit

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

Non-vested benefits

Benefit

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

Death Benefit

Prior to retirement

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

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

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

Postretirement

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

Normal form of benefit payments

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

Optional forms of benefit payments

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

Option 1

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

Option 2

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

Option 3

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

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

Cost-of-living allowances

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

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

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

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

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

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

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

Administration of the retirement system

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

Employee contributions

Contributions for Employees are as follows;

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

Employer contributions

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

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

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

Changes from the Prior Valuation

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.

CALCULATION OF THE ACTUARIAL VALUE OF ASSETS

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

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

ACTUARIAL ASSUMPTIONS

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

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

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

(ii) Patterns of pay increases to members

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

(iv) Rates of withdrawal of active members

(v) Rates of disability among active members

(vi) The age patterns of actual retirements

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

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

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

Long-term Rate of Return: (net of administrative expenses): 7.50% per year, compounded annually (2.75% long-term price inflation and a 4.75% real rate of return).

Price Inflation: 2.75%

General Wage Growth (Wage Inflation): 3.50%

Payroll Growth Assumption: 3.00% per year.

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

Salary Increase Rates: 5.00% per year.

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

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

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

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

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

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

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

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

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

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

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

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

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

Active Member Group Size: Assumed to remain constant.

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

MISCELLANEOUS AND TECHNICAL ASSUMPTIONS

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

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

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

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

CHANGES FROM THE PRIOR VALUATION

The assumed long-term rate of return was lowered from 7.75% to 7.50%.

Actuarial Accrued Liability	The difference between the actuarial present value of system benefits and the actuarial present value of future normal costs. Also referred to as "accrued liability" or "actuarial accrued liability".
Actuarial Assumptions	Estimates of future experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and salary increases. Decrement assumptions (rates of mortality, disability, turnover and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (salary increases and investment income) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation.
Accrued Service	Service credited under the system which was rendered before the date of the actuarial valuation.
Actuarial Equivalent	A single amount or series of amounts of equal actuarial value to another singe amount or series of amounts, computed on the basis of appropriate assumptions.
Actuarial Cost Method	A mathematical budgeting procedure for allocating the dollar amount of the actuarial present value of retirement system benefit between future normal cost and actuarial accrued liability; sometimes referred to as the "actuarial funding method".
Experience Gain (Loss)	The difference between actual experience and actuarial assumptions anticipated experience during the period between two actuarial valuation dates.
Actuarial Present Value	The amount of funds currently required to provide a payment or series of payments in the future. It is determined by discounting future payments at predetermined rates of interest and by probabilities of payment.
Amortization	Paying off an interest-discounted amount with periodic payments of interest and principal, as opposed to paying off with a lump sum payment.
Normal Cost	The actuarial present value of retirement system benefits allocated to the current year by the actuarial cost method.
Unfunded Actuarial Accrued Liability	The difference between actuarial accrued liability and the valuation assets. Most retirement systems have unfunded actuarial accrued liability. They arise each time new benefits are added and each time an actuarial loss is realized. The existence of unfunded actuarial accrued liability is not in itself bad, any more than a mortgage on a house is bad. Unfunded actuarial accrued liability does not represent a debt that is payable today. What is important is the ability to amortize the unfunded actuarial accrued liability and the trend in its amount.