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NEBRASKA PUBLIC EMPLOYEES RETIREMENT SYSTEM

SCHOOL RETIREMENT SYSTEM

ACTUARIAL VALUATION REPORT as of July 1, 2022

Seventieth Actuarial Report for
System Plan Year Beginning July 1, 2022
and
State Fiscal Year Ending June 30, 2024

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November 11, 2022

Public Employees Retirement Board
Nebraska Public Employees Retirement System
Post Office Box 94816
Lincoln, NE 68509

Dear Members of the Board:

At your request, we have performed an actuarial valuation of the School Retirement System as of July 1, 2022 for the purpose of determining the actuarial required contribution rate for the plan year ending June 30, 2023. It is our understanding that any required additional State contribution for this plan year will be made on July 1, 2023 (State fiscal year end 2024). The major findings of the valuation are contained in this report, which reflects the benefit and funding provisions in place on July 1, 2022. There have been no changes to the actuarial methods or benefit provisions from the prior valuation, but the set of economic assumptions has changed since the last valuation.

At their December 21, 2020 meeting, the Board adopted a plan to phase-in a change in the set of economic assumptions over a four-year period, with the ultimate set of economic assumptions going into effect with the July 1, 2024 valuation. The scheduled economic assumption changes include price inflation, cost-of-living adjustments for Tier 1 members, general wage inflation, covered payroll growth and the investment return assumption. Over the course of this four-year period, two years of which have been completed, the investment return assumption will decrease from 7.50% to 7.00%. The phase-in of the new set of economic assumptions, as well as its impact on the current valuation results, is discussed in further detail in the Executive Summary of this report.

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

We further certify that all costs, liabilities, rates of interest and other factors for the School Retirement 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 the 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 Public Employees Retirement Board has the final decision regarding the appropriateness of the assumptions and adopted the set of assumptions indicated in Appendix C.

In order to prepare the results in this report, we have utilized actuarial models that were developed to measure liabilities and develop actuarial costs. These models include tools that we have produced and tested, along with commercially available valuation software that we have reviewed to confirm the appropriateness and accuracy of the output. In utilizing these models, we develop and use input parameters and assumptions about future contingent events along with recognized actuarial approaches to develop the needed results. Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. Due to the limited scope of our assignment, we did not perform an analysis of the potential range of future measurements.

The actuarial computations presented in this report are for purposes of determining the funding amounts for the System as specified in the Nebraska state statutes. 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. Cavanaugh Macdonald's advice is not intended to be a substitute for qualified legal or accounting counsel.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein. We are available to answer any questions on the material contained in the report or to provide explanations or further details as may be appropriate.

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

Brent A. Banister

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

This report presents the results of the July 1, 2022 actuarial valuation of the School Retirement System. The primary purposes of performing this actuarial valuation are to:

- Determine whether the employer, member and State contribution rates defined in the Nebraska state statutes are sufficient to fund the total Formula Annuity for the Nebraska School System, and if not, the additional State contribution required. In addition, the calculation of the State contribution to fund the Omaha Service Annuity for the plan year ending June 30, 2023 is also determined;
- Disclose asset and liability measurements as well as the current funded status of the System as of the valuation date;
- Compare the actual and expected experience of the System during the plan year ended June 30, 2022;
- Assess and disclose the key risks associated with funding the System; and
- Analyze and report on trends in System contributions, assets and liabilities over the past several years.

The actuarial valuation results provide a "snapshot" view of the System's financial condition on July 1, 2022. The System's unfunded actuarial accrued liability (UAAL) decreased from $370 million last year to $237 million this year, the funded ratio increased from 97% to 98% and the actuarial required contribution rate decreased from 15.65% of payroll last year to 15.37% of payroll this year.

The Nebraska statutes require the State to make an additional contribution if the regular, payroll-related contributions by members, employers, and the State are insufficient to meet the actuarial required contribution for the plan year. **Based on the results of the July 1, 2022 actuarial valuation, no additional State contribution is necessary for this plan year.**

Changes to Actuarial Assumptions

At their December 21, 2020 meeting, the Board adopted a plan to phase-in a change in the set of economic assumptions over a four-year period (2021 through 2024 valuation). The scheduled economic assumption changes include price inflation, COLA for Tier 1 members, general wage inflation, covered payroll growth and the investment return assumption. The remaining phase-in of the economic assumptions will be implemented as follows:

	Current (2022 Valuation)	2023 Valuation	2024 Valuation
Price Inflation	2.55%	2.45%	2.35%
Real Return	4.65%	4.65%	4.65%
Investment Return	7.20%	7.10%	7.00%
COLA (Tier 1)	2.10%	2.05%	2.00%
General Wage Inflation	3.05%	2.95%	2.85%
Covered Payroll Growth	3.05%	2.95%	2.85%

The net impact of the scheduled change in the set of economic assumptions in this valuation was an increase of $82.6 million in the actuarial accrued liability, as well as an increase of 0.33% in the actuarial required contribution rate. The continued phase-in of the economic assumptions is expected to increase the unfunded actuarial accrued liability (UAAL), normal cost rate and actuarial required contribution rate over the next two years, absent the impact of future favorable experience. If the ultimate set of economic assumptions

was fully recognized in the current valuation, it would increase the UAAL by $166 million, decrease the funded ratio to 97% and increase the actuarial required contribution rate by 0.69%.

Actual Experience Impacting the July 1, 2022 Valuation

The valuation results reflect net favorable experience for the past plan year as demonstrated by an UAAL that was lower than expected. The UAAL on July 1, 2022 is $237 million compared to an expected UAAL of $308 million. The favorable experience was due to several factors, discussed below:

- The rate of return on the market value of assets for the year ending June 30, 2022 was -8.3%, as reported by the Nebraska Investment Council, compared to the assumed return of 7.3% for FY 2022. However, the asset smoothing method used in the valuation only recognizes 20% of the difference between the dollar amount of the assumed and actual return in the current valuation. The partial recognition of FY 2022 experience, coupled with the scheduled recognition of the deferred investment experience from the prior four years, resulted in a rate of return on the actuarial (smoothed) value of assets of 7.8%. Because this return is higher than the assumed rate of return (7.3% for FY 2022), there was an actuarial experience gain of $67 million on the actuarial value of assets.

- There was a net actuarial experience gain of $5 million on System liabilities. This is the net impact of various factors including gains from salary increases that were lower than expected partially offset by actuarial losses from larger COLAs than expected and unfavorable retirement experience.

- The statutory contribution rate for the year ending June 30, 2022 was higher than the actuarial required contribution rate by 6.01%. As a result, actual contributions for FY 2022 exceeded the actuarial required contribution by around $139 million which served to reduce the UAAL.

Legislation passed in the 2013 session made changes to the benefit structure for members hired on or after July 1, 2013 (Tier Two), including changing final average salary to the highest 60 months rather than the highest 36 months of service and changing the maximum cost of living adjustment from 2.5% to 1.0%. Additional legislation was passed in the 2017 session, which granted the PERB the authority to set the actuarial assumptions used to determine the benefit amounts payable under optional forms of payment for members hired on or after July 1, 2017 (Tier Three). It also changed the minimum age required to qualify for unreduced retirement under the Rule of 85 from age 55 to age 60 for members hired on or after July 1, 2018 (Tier Four). There were 22,292 members in Tiers Two, Three and Four as of July 1, 2022, or about 51% of the active membership, compared to 47% in the prior valuation. The covered payroll for these members is about 39% of the total covered payroll. Because these newer members have fewer years of service and lower average pay, they tend to have lower liabilities. While members who were hired on or after July 1, 2013 represent a comparatively small part of the total liability, the new provisions are beginning to impact the valuation by resulting in lower costs.

A summary of the key results from the July 1, 2022 actuarial valuation, excluding the Omaha Service Annuity, is shown in the following table. As the table indicates, **the statutory contribution rates are sufficient to meet the actuarial required contribution rate and no additional State appropriation is required for the current year.** Further detail on the valuation results can be found in the following sections of this Board Summary.

	July 1, 2022 Valuation Results	July 1, 2021 Valuation Results
Unfunded Actuarial Accrued Liability ($M)	$237	$370
Funded Ratio (Actuarial Assets)	98.42%	97.41%
Actuarial Required Contribution	15.37%	15.65%
Member Contribution Rate	(9.78%)	(9.78%)
Employer Contribution Rate	(9.88%)	(9.88%)
State Contribution Rate	(2.00%)	(2.00%)
Total Contribution Rate	(21.66%)	(21.66%)
Shortfall/(Margin)	(6.29%)	(6.01%)
Additional Required State Contribution	$0	$0

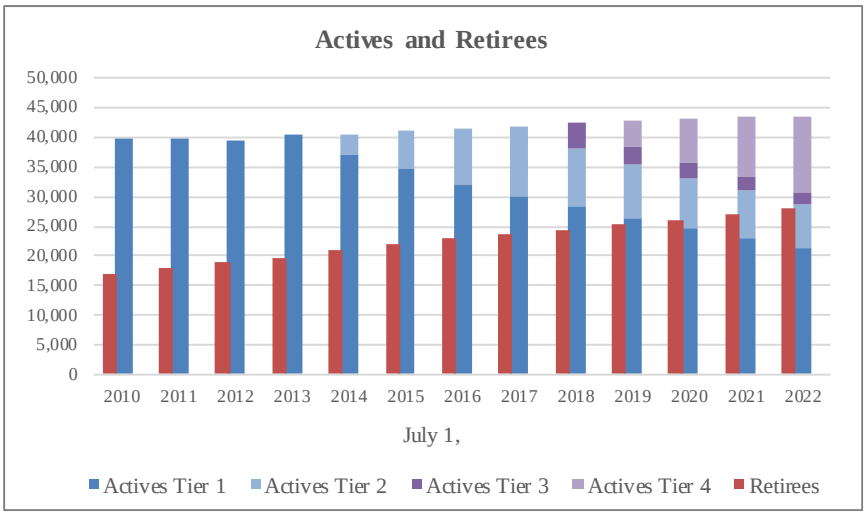
EXPERIENCE FOR THE LAST PLAN YEAR

Numerous factors contributed to the change in the System's assets, liabilities, and actuarial required contribution rate between July 1, 2021 and July 1, 2022. The components are examined in the following discussion.

MEMBERSHIP

There are 43,586 active members in the July 1, 2022 valuation compared to 43,423 in the 2021 valuation, a 0.4% increase. In general, when the number of active members increases it has a positive influence on the System's funding as it results in higher contributions. In addition, the UAAL contribution rate may also be favorably impacted if the increase in active members results in a larger covered payroll than expected. The UAAL in this valuation is amortized assuming future covered payroll will increase each year (current assumption is 3.05% per year). If total payroll growth is higher than expected, the dollar amount of the UAAL payment is divided by higher payroll, resulting in a lower UAAL amortization rate. Conversely, a decrease in the number of active members or covered payroll increases that are less than the assumed rate will tend to result in a higher UAAL amortization rate.

The following graph shows the number of active and retired/beneficiaries in each valuation since 2010. While the number of active members has fluctuated at times over this period, the number of members receiving a benefit has steadily increased and the number is currently 28,094. This trend is not unusual or unexpected in a mature retirement system and is the key reason for advance funding of a retirement plan.



The graph above shows the portion of the total active members covered by each of the benefit structures. In the 2022 valuation, the active membership is split by tier:

21,294 in Tier One (joined before July 1, 2013),
7,335 in Tier Two (joined between July 1, 2013 and June 30, 2017),
2,188 in Tier Three (joined between July 1, 2017 and June 30, 2018), and
12,769 in Tier Four (joined on or after July 1, 2018).

Of the total active membership, about 51% are affected by changes in the benefit structure passed in the 2013 and later legislative sessions. While the number of active members in the new tiers is significant, the actuarial accrued liability for active members is still heavily related to Tier 1 because that group is older with both higher service and salary amounts.

ASSETS

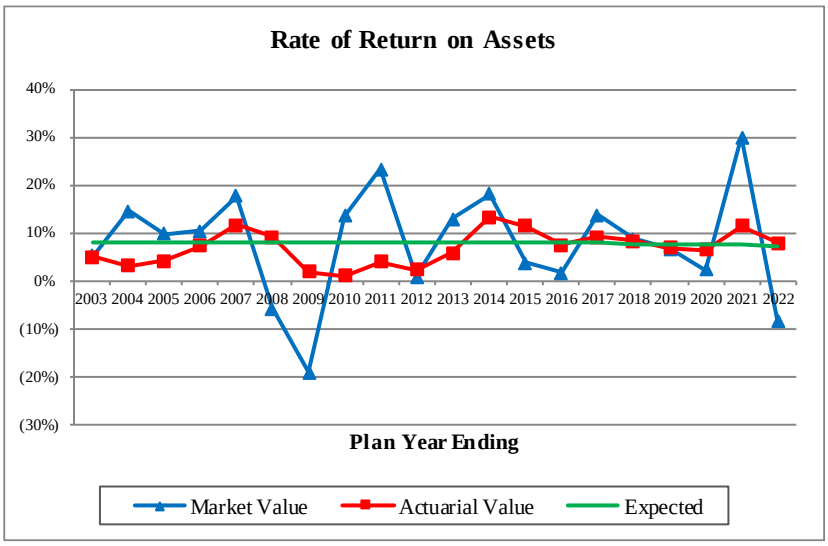
As of June 30, 2022, the System had net assets of $14.143 billion, when measured on a market value basis, a decrease of $1.550 billion from the prior year value. The investment return on the market value of assets for FY 2022 was -8.3%, which is lower than the assumed return for FY 2022 of 7.3%.

The market value of assets is not used directly in the calculation of the unfunded actuarial accrued liability and the actuarial required 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. In this year's valuation, the actuarial value of assets is $14.721 billion, an increase of $0.812 billion from the prior year. The components of change in the asset values are shown in the following table.

	Market Value ($M)		Actuarial Value ($M)	
Net Assets, June 30, 2021	$	15,692.56	$	13,909.83
- Employer and Member Contributions	+	478.49	+	478.49
- Benefit Payments and Admin Expenses	-	740.01	-	740.01
- Net Investment Income	+	(1,288.28)	+	1,073.14
Net Assets, June 30, 2022	$	14,142.76	$	14,721.45
Rate of Return, Net of Expenses*		-8.3%		7.8%

* Rate of return on the market value of assets was provided by the Nebraska Investment Council.

Due to the smoothing of actual investment experience over the last five years, the rate of return on the actuarial value of assets was 7.8%, which was higher than the investment return assumption of 7.30% in effect for FY 2022. As a result, there was an experience gain on assets of $67 million. As a result of the combined impact of the unfavorable investment experience for FY 2022 and the scheduled recognition of deferred investment experience from the prior four years, the net deferred investment gain of $1.783 billion in last year's valuation is now a net deferred investment loss of $0.579 billion in the current valuation (actuarial value exceeds market value of assets). Please see Section 3 of this report for more detailed information on the market and actuarial value of assets.



The rate of return of the actuarial value of assets has been less volatile than the market value return, illustrating the benefit of 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 normal costs, i.e., the portion allocated to past years. The difference between this liability and the actuarial value of assets as of the valuation date is called the unfunded actuarial accrued liability (UAAL). The dollar amount of unfunded actuarial accrued liability is reduced if the contributions to the System exceed the normal cost for the year plus interest on the prior year's UAAL.

The unfunded actuarial accrued liability as of July 1, 2022, using both the actuarial and market value of assets, is shown in the following table:

	Actuarial Value of Assets	Market Value of Assets
Actuarial Accrued Liability	$14,958,362,275	$14,958,362,275
Value of Assets	14,721,451,378	14,142,759,710
Unfunded Actuarial Accrued Liability	$236,910,897	$815,602,565
Funded Ratio	98.42%	94.55%

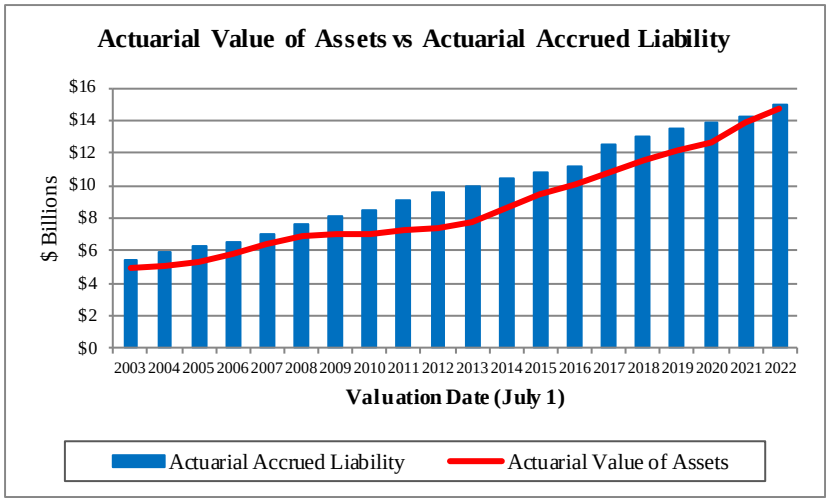
The net deferred investment loss means that, absent investment returns higher than expected (7.2% for FY 2023, 7.1% for FY 2024 and 7.0% for FY 2025) or favorable liability experience, the funded ratio is expected to decrease over the next four years as the deferred investment experience is recognized. We also expect there to be downward pressure on the funded ratio because of the phase-in of the economic assumptions. See Section 4 of the report for the detailed development of the unfunded actuarial accrued liability.

The components of the net decrease of $133 million in the UAAL from July 1, 2021 to July 1, 2022 are shown in the following table.

	($ Millions)
Unfunded Actuarial Accrued Liability, July 1, 2021	$369.7
- Expected change from amortization method	(33.0)
- Contributions (above)/below the Actuarial Required Contribution	(139.2)
- Investment experience	(66.5)
- Liability experience	(4.8)
- Assumption changes	82.6
- Other experience	28.1
Unfunded Actuarial Accrued Liability, July 1, 2022	$236.9

As shown above, various factors impacted the amount of the UAAL. Actuarial experience gains/(losses), which result from actual experience that is more (less) favorable than anticipated based on the actuarial assumptions, are reflected in the UAAL and are measured as the difference between the expected UAAL and the actual UAAL, taking into account any changes due to actuarial assumptions and methods, or benefit provisions. Overall, the System experienced a net actuarial experience gain of $71 million. The actuarial gain may be explained by considering the separate experience of assets and liabilities. As noted earlier, there was an actuarial experience gain of $67 million on the actuarial value of assets. Favorable net experience on System liabilities, largely from salary increases that were lower than expected, resulted in an actuarial experience gain of $5 million. A breakdown of the components of experience gains and losses can be found in Table 8 of this report.

As the following graph of historical actuarial assets and actuarial accrued liabilities illustrates, the System's liabilities grew at a faster pace than the System's assets for the five-year period beginning after the FY 2009 market downturn. As a result, the funded ratio declined over that period. Recently, the System's assets have been growing at a faster rate than the System's liabilities and the funded ratio has been improving. Changes to actuarial assumptions in the July 1, 2017 valuation significantly increased the System's liabilities and lowered the funded ratio, while investment experience during FY 2021 significantly increased the System's assets and improved the funded ratio.

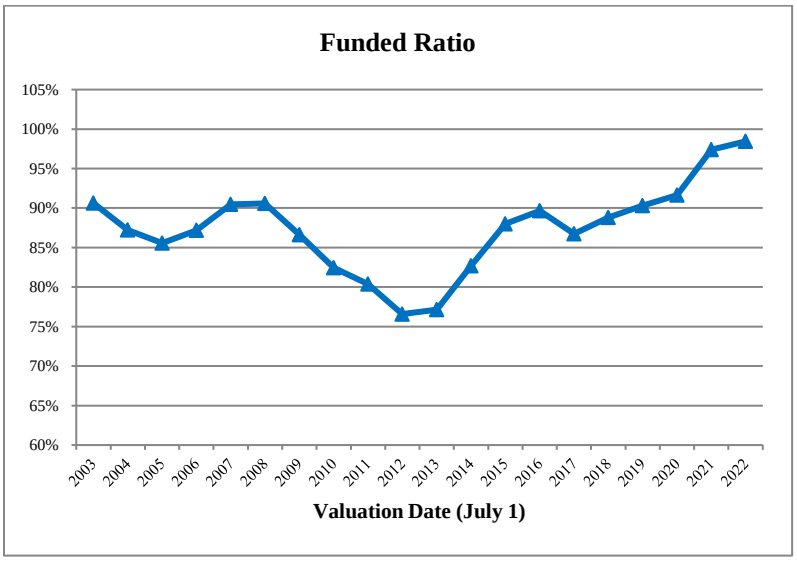


An evaluation of the UAAL on a pure dollar basis may not provide a complete analysis since only the difference between the assets and liabilities (which are both very large numbers) is reflected. Another way to evaluate the UAAL and the progress made in its funding is to track the funded ratio, the ratio of the actuarial value of assets to the actuarial accrued liability. The funded status information, using the actuarial value of assets, is shown below (in millions).

	7/1/2018	7/1/2019	7/1/2020	7/1/2021	7/1/2022
Funded Ratio	88.8%	90.3%	91.7%	97.4%	98.4%
UAAL	$1,455.6	$1,305.2	$1,156.6	$369.7	$236.9

Note that the funded ratio does not indicate whether or not the System assets are sufficient to settle benefits earned to date. The funded ratio, by itself, also may not be indicative of future funding requirements. In addition, if the funded ratios were shown using the market value of assets, the results would differ.

The funded ratio over a longer period is shown in the following graph.



ACTUARIAL REQUIRED CONTRIBUTION RATE

The System is funded by statutory contribution rates for members (9.78% of pay), employers (101% of the member rate) and the State (2.00% of pay). In addition, the statutes require the State to make an additional contribution if the regular, payroll-related contributions by employees, employers and the State are insufficient to meet the actuarial required contribution for the plan year. The additional State contributions for the plan year are made on the July 1 following the plan year end. **Based on the results of the July 1, 2022 actuarial valuation, no additional State contribution is necessary for the current plan year.**

Under the Entry Age Normal cost method, the actuarial required contribution rate consists of three components:

- A "normal cost" for the portion of projected liabilities allocated by the actuarial cost method to service of members during the year following the valuation date.
- An "administrative expense" load for the expenses expected to be paid from the trust for the year.
- 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.

The UAAL contribution rate is determined by calculating the amortization payments as a level-percent of payroll, assuming the number of active members remains constant, and salary increases occur as assumed. This methodology results in dollar amounts of payments that are lower in the initial years of the 25-year amortization period but increase each year in the future with the assumed payroll growth assumption (3.05% in this valuation). Because the UAAL contribution rate is determined as a level-percent of payroll, the dollar amount of the UAAL contribution is scheduled to increase 3.05% each year in the future even if all actuarial assumptions are met. Therefore, if the increase in covered payroll is less than 3.05% per year, the UAAL contribution rate will increase.

See Section 5 of the report for the detailed development of the contribution rates, which are summarized in the following table.

Contribution Rates	July 1, 2022	July 1, 2021
1. Normal Cost Rate	12.93%	12.93%
2. Administrative Expenses	0.16%	0.16%
3. UAAL Contribution Rate	2.28%	2.56%
4. Total Actuarial Required Contribution Rate	15.37%	15.65%
5. Member Contribution Rate	(9.78%)	(9.78%)
6. Employer Contribution Rate	(9.88%)	(9.88%)
7. State Contribution Rate	(2.00%)	(2.00%)
8. Total Contribution Rate	(21.66%)	(21.66%)
9. Shortfall/(Margin) [4 + 8]	(6.29%)	(6.01%)
10. Estimated Payroll	$ 2,291,057,398	$ 2,235,203,829
11. Additional State Required Contribution [9 * 10 with interest, but not less than $0]	$ 0	$ 0

Note: Contribution rates exclude State funding of Omaha Service Annuity.

The actuarial required contribution rate for the current plan year is 15.37%. The member contribution rate of 9.78%, School District contribution rate of 9.88% (101% of 9.78%) and State contribution rate of 2.00% of pay result in total statutory contributions of 21.66% of pay. As a result, there is a contribution margin of 6.29%, which will move the System toward fully funded status more rapidly than targeted by the amortization schedule, if all actuarial assumptions are met in future years. The actuarial required contribution, determined this year based on the snapshot of the System taken on the valuation date of July 1, 2022, will change each year as the deferred investment experience is recognized and other experience (both investment and demographic) impacts the System. Overall, there was a decrease of 0.28% in the actuarial required contribution rate from the July 1, 2021 valuation to the July 1, 2022 valuation. The primary components of the change in the actuarial required contribution rate are shown in the following table.

Total Actuarial Required Contribution Rate, July 1, 2021	15.65%
- Change in normal cost rate (before assumption changes)	(0.09%)
- Contributions (above)/below the Actuarial Required Contribution	(0.39%)
- Investment experience	(0.19%)
- Liability experience	(0.01%)
- Actual vs. expected payroll	0.01%
- Assumption changes	0.33%
- Other experience	0.06%
Total Actuarial Required Contribution Rate, July 1, 2022	15.37%

While there is a contribution margin for the current plan year, this should not be viewed as an unnecessary or excess contribution. In order for the financing of the System on a fixed contribution rate basis to succeed, contributions above the actuarial required contribution rate must be made to offset years where the fixed contribution rate will be below the actuarial required contribution rate.

A history of the actuarial required contribution rate and any resulting additional required State contributions, whether or not actually contributed, is shown in the following table.

History of Required Contribution Rates and Additional State Funding

Fiscal Year	Required Contribution Rate	Additional State Contributions*
2023/2024	15.37%	$ 0
2022/2023	15.65%	0
2021/2022	18.05%	0
2020/2021	18.42%	0
2019/2020	18.73%	0
2018/2019	19.31%	0
2017/2018	16.59%	0
2016/2017	17.03%	0
2015/2016	18.39%	0
2014/2015	19.94%	0
2013/2014	23.27%	48,092,426
2012/2013	20.45%	23,465,817
2011/2012	19.21%	18,871,705
2010/2011	17.24%	0
2009/2010	15.46%	0
2008/2009	15.64%	0
2007/2008	16.58%	0
2006/2007	17.95%	12,847,537
2005/2006	16.97%	15,415,949
2004/2005	15.26%	0

* Excludes funding of Omaha Service Annuity.
Note: Information before Fiscal Year 2014/2015 was produced by prior actuary.

RISK ASSESSMENT AND DISCLOSURE

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 6 of this report for an in-depth discussion of the specific risks facing the Nebraska School Retirement System.

SUMMARY OF PRINCIPAL RESULTS

	7/1/2022 Valuation	7/1/2021 Valuation	% Change
1. PARTICIPANT DATA			
Number of:			
Active Members			
- Tier 1	21,294	23,110	(7.9%)
- Tier 2	7,335	7,937	(7.6%)
- Tier 3	2,188	2,412	(9.3%)
- Tier 4	12,769	9,964	28.2%
- Total	43,586	43,423	0.4%
Retired Members and Beneficiaries	27,791	26,589	4.5%
Disabled Members	303	305	(0.7%)
Inactive Members	27,194	25,910	5.0%
Total Members	98,874	96,227	2.8%
Projected Annual Salaries of Active Members	$ 2,291,057,398	$ 2,235,203,829	2.5%
Annual Retirement Payments for Retired Members, Disabled Members and Beneficiaries	$ 740,979,380	$ 687,764,531	7.7%
2. ASSETS AND LIABILITIES			
a. Market Value of Assets	$ 14,142,759,710	$ 15,692,556,258	(9.9%)
b. Actuarial Value of Assets	14,721,451,378	13,909,828,154	5.8%
c. Total Actuarial Accrued Liability	14,958,362,275	14,279,493,188	4.8%
d. Unfunded Actuarial Accrued Liability [c - b]	$ 236,910,897	$ 369,665,034	(35.9%)
e. Funded Ratio (Actuarial Value of Assets) [b / c]	98.42%	97.41%	1.0%
f. Funded Ratio (Market Value of Assets) [a / c]	94.55%	109.90%	(14.0%)
3. CONTRIBUTION RATES AS A PERCENT OF PAYROLL (excluding Omaha Service Annuity)			
Normal Cost	12.93%	12.93%	0.0%
Administrative Expenses	0.16%	0.16%	0.0%
Amortization of Unfunded Actuarial Accrued Liability	2.28%	2.56%	(10.9%)
Actuarial Required Contribution Rate	15.37%	15.65%	(1.8%)
Member Contribution Rate	(9.78%)	(9.78%)	0.0%
Employer Required Contribution Rate*	(9.88%)	(9.88%)	0.0%
State Contribution Rate	(2.00%)	(2.00%)	0.0%
Shortfall/(Margin)	(6.29%)	(6.01%)	4.7%
Additional Required State Contribution Amount	$ 0	$ 0	0.0%

* 101% of employee contribution rate

This report presents the actuarial valuation results of the School Retirement System as of July 1, 2022. This valuation was prepared at the request of the Public Employees Retirement Board of the Nebraska Public Employees Retirement System.

Please pay particular attention to our actuarial certification 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 which result 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 risk considerations related to the Nebraska Schools Retirement System. Section 7 includes some historical funding and other information.

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 July 1, 2022.
- 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 July 1, 2022. On that date, the assets available for the payment of benefits are appraised. The assets are compared with the liabilities of the System, which are generally in excess of assets. The actuarial process then leads to a method of determining the contributions needed by members and the employer in the future to balance the System's 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 from time to time. Table 1 is a comparison, at market values, of System assets as of July 1, 2022 and July 1, 2021, in total and by investment category. Table 2 summarizes the change in the market value of assets from July 1, 2021 to July 1, 2022.

Actuarial Value of Assets

Due to the extreme volatility in the market value of assets, which represents the "cash-out" value of System assets on a single day, may not be the best measure of the System's ongoing ability to meet its obligations. To arrive at a suitable value of assets 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. Under the asset smoothing methodology, the difference between the actual and assumed investment return on the market value of assets is recognized evenly over a five-year period.

Table 3 shows the development of the actuarial value of assets (AVA) as of the valuation date.

TABLE 1

SCHOOL RETIREMENT SYSTEM

MARKET VALUE OF ASSETS
by Investment Category

	June 30, 2022	June 30, 2021
1. Cash and Equivalents	$ 241,379	$ 9,497,018
2. Investments	14,311,546,011	15,913,519,989
3. Capital Assets	4,595	5,412
4. Receivables and Prepaids	860,577,596	629,731,555
5. Accounts Payable	(1,029,609,871)	(860,197,716)
6. Net Assets Available for Pension Benefits	$ 14,142,759,710	$ 15,692,556,258

TABLE 2

SCHOOL RETIREMENT SYSTEM

CHANGE IN MARKET VALUE OF ASSETS

	Nebraska School System	Omaha Service Annuity	Total
1. Market Value of Assets, July 1, 2021	$ 15,678,792,515	$ 13,763,743	$ 15,692,556,258
2. Contributions			
(a) Member (includes purchased service)	$ 216,125,582	$ 0	$ 216,125,582
(b) Employer	216,059,310	0	216,059,310
(c) State appropriations	44,704,077	1,603,111	46,307,188
(d) Total	$ 476,888,969	$ 1,603,111	$ 478,492,080
3. Expenditures			
(a) Benefit payments	$ 717,554,059	$ 1,294,582	$ 718,848,641
(b) Refunds	17,831,665	0	17,831,665
(c) Administrative expenses	3,329,242	0	3,329,242
(d) Total	$ 738,714,966	$ 1,294,582	$ 740,009,548
4. Investment Return, Net of Expenses			
(a) Investment income	$ 196,761,458	$ 186,351	$ 196,947,809
(b) Securities lending income	2,287,261	1,898	2,289,159
(c) Securities lending expense	(823,358)	(683)	(824,041)
(d) Net appreciation/(depreciation) in fair value of investments	(1,485,451,976)	(1,255,956)	(1,486,707,932)
(e) Other	15,925	0	15,925
(f) Net investment return	$ (1,287,210,690)	$ (1,068,390)	$ (1,288,279,080)
5. Market Value of Assets, June 30, 2022 [1 + 2(d) - 3(d) + 4(f)]	$ 14,129,755,828	$ 13,003,882	$ 14,142,759,710
6. Rate of Return, Net of Expenses*			(8.3%)

* Annual money-weighted rate of return, net of investment expense, as reported by the Nebraska Investment Council.

TABLE 3

SCHOOL RETIREMENT SYSTEM

DEVELOPMENT OF ACTUARIAL VALUE OF ASSETS

	Year End			
	6/30/2019	6/30/2020	6/30/2021	6/30/2022
1. Actuarial Value of Assets, Beginning of Year	$ 11,545,658,962	$ 12,130,496,836	$ 12,692,545,458	$ 13,909,828,154
2. Unrecognized Return Beginning of Year	$ 90,639,941	$ 84,450,187	$ (406,808,808)	$ 1,782,728,104
3. Contributions During Year				
(a) Member	$ 197,095,568	$ 203,866,708	$ 210,035,574	$ 216,125,582
(b) Employer	196,850,333	203,022,597	208,990,879	216,059,310
(c) State appropriations	41,791,906	43,076,482	44,254,036	46,307,188
(d) Total	$ 435,737,807	$ 449,965,787	$ 463,280,489	$ 478,492,080
4. Benefit Payments and Admin Expenses During Year	$ 626,500,723	$ 660,565,238	$ 692,620,210	$ 740,009,548
5. Assumed Rate of Return	7.50%	7.50%	7.50%	7.30%
6. Expected Investment Income on (1), (2), (3) and (4)	$ 867,652,575	$ 910,427,030	$ 915,146,195	$ 1,136,765,994
7. Actual Return on Market Value, Net of Investment Expenses*	$ 769,411,036	$ 281,389,078	$ 3,636,159,329	$ (1,288,279,080)
8. Return to be Spread, End of Year [7 - 6]	$ (98,241,539)	$ (629,037,952)	$ 2,721,013,134	$ (2,425,045,074)

*Prior to 6/30/2022, the return on the market value of assets was net of all expenses.

TABLE 3
(continued)

SCHOOL RETIREMENT SYSTEM

DEVELOPMENT OF ACTUARIAL VALUE OF ASSETS

9. Return to be Spread

Plan Year Ending	Return to be Spread	Unrecognized Percent	Unrecognized Return
2022	($2,425,045,074)	80%	($1,940,036,059)
2021	2,721,013,134	60%	1,632,607,880
2020	(629,037,952)	40%	(251,615,181)
2019	(98,241,539)	20%	(19,648,308)
			($578,691,668)

10. Total Market Value of Assets as of July 1, 2022	$14,142,759,710
11. Total Actuarial Value of Assets as of July 1, 2022 [10 - 9]	$14,721,451,378
12. Asset Ratios	
(a) Actuarial Value to Market Value [11 / 10]	104.09%
(b) Market Value to Actuarial Value [10 / 11]	96.07%

Plan Year Ended	Gain/(Loss) Deferred to Future Years	Gain/(Loss) to be Recognized in Plan Year Ending 2023	2024	2025	2026
6/30/2019	($19,648,308)	(19,648,308)			
6/30/2020	(251,615,181)	(125,807,590)	(125,807,591)		
6/30/2021	1,632,607,880	544,202,627	544,202,627	544,202,626	
6/30/2022	(1,940,036,059)	(485,009,015)	(485,009,015)	(485,009,015)	(485,009,014)
Total	($578,691,668)	($86,262,286)	($66,613,979)	$59,193,611	($485,009,014)

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 School Retirement System as of the valuation date, July 1, 2022. In this section, the discussion will focus on the commitments (future benefit payments) 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 July 1, 2022.

Actuarial Accrued Liability

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

(1) that which is attributable to the past and

(2) that which is attributable to the future.

Actuarial terminology calls the part attributable to the past the "past service liability" or the "actuarial 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 for the System. The Entry Age Normal actuarial cost method is used to develop the actuarial accrued liability.

TABLE 4

SCHOOL RETIREMENT SYSTEM

PRESENT VALUE OF FUTURE BENEFITS (PVFB)
AS OF JULY 1, 2022

	Nebraska School System	Omaha Service Annuity	Total
1. Active Employees			
(a) Retirement	$ 7,902,453,980	$ 19,901,568	$ 7,922,355,548
(b) Withdrawal	585,057,593	1,738,937	586,796,530
(c) Death	98,387,864	144,941	98,532,805
(d) Disability	58,928,003	216,235	59,144,238
(e) Total	$ 8,644,827,440	$ 22,001,681	$ 8,666,829,121
2. Inactive Vested Members	358,067,970	2,204,856	360,272,826
3. Inactive Nonvested Members	60,079,887	0	60,079,887
4. Disabled Members	49,327,146	0	49,327,146
5. Retirees	8,198,754,959	0	8,198,754,959
6. Beneficiaries	346,402,784	0	346,402,784
7. Total Present Value of Future Benefits [1(e) + 2 + 3 + 4 + 5 + 6]	$ 17,657,460,186	$ 24,206,537	$ 17,681,666,723

TABLE 5

SCHOOL RETIREMENT SYSTEM

ACTUARIAL ACCRUED LIABILITY
AS OF JULY 1, 2022

	Nebraska School System	Omaha Service Annuity	Total
1. Present Value of Future Benefits for Active Members	$ 8,644,827,440	$ 22,001,681	$ 8,666,829,121
2. Present Value of Future Normal Costs for Active Members			
(a) Retirement benefit	$ 2,003,880,851	$ 4,571,393	$ 2,008,452,244
(b) Termination benefit	656,162,746	1,370,281	657,533,027
(c) Pre-Retirement death benefit	35,761,410	43,620	35,805,030
(d) Disability benefit	21,433,812	80,335	21,514,147
(e) Total	$ 2,717,238,819	$ 6,065,629	$ 2,723,304,448
3. Actuarial Accrued Liability for Active Members [1 - 2(e)]	$ 5,927,588,621	$ 15,936,052	$ 5,943,524,673
4. Actuarial Accrued Liability for Inactive Members	9,012,632,746	2,204,856	9,014,837,602
5. Total Actuarial Accrued Liability [3 + 4]	14,940,221,367	18,140,908	14,958,362,275
6. Actuarial Value of Assets*	14,707,915,405	13,535,973	14,721,451,378
7. Unfunded Actuarial Accrued Liability [5- 6]	$ 232,305,962	$ 4,604,935	$ 236,910,897
8. Funded Ratio [6 / 5]			98.42%

*The actuarial value of assets is split between the Nebraska Schools System and the Omaha Service Annuity based on the respective proportions of the market value of assets.

TABLE 6

SCHOOL RETIREMENT SYSTEM

ACTUARIAL BALANCE SHEET
AS OF JULY 1, 2022

ASSETS		
Actuarial Value of Assets		$ 14,721,451,378
Unfunded Actuarial Accrued Liability		236,910,897
Present Value of Future Normal Costs		2,723,304,448
Total Assets		$ 17,681,666,723
LIABILITIES		
Present Value of Future Benefits		
Active members		
Retirement	$ 7,902,453,980	
Withdrawal	585,057,593	
Death	98,387,864	
Disability	58,928,003	
Total		$ 8,644,827,440
Inactive members		
Currently receiving benefits	8,594,484,889	
Not currently receiving benefits	418,147,857	
Total		$ 9,012,632,746
Omaha Service Annuity		
Active	22,001,681	
Inactive vested	2,204,856	
Total		$ 24,206,537
Total Liabilities		$ 17,681,666,723

TABLE 7

SCHOOL RETIREMENT SYSTEM

ACTUARIAL GAIN/(LOSS)

Liabilities		
1. Actuarial Accrued Liability as of July 1, 2021	$	14,279,493,188
2. Normal Cost for Plan Year Ending June 30, 2022, Including New Hires		297,811,644
3. Benefit Payments During Plan Year Ending June 30, 2022		(736,680,306)
4. Interest at 7.30%		1,039,964,996
5. Assumption Changes		82,620,879
6. Expected Actuarial Accrued Liability as of July 1, 2022	$	14,963,210,401
7. Actuarial Accrued Liability as of July 1, 2022	$	14,958,362,275
Assets		
8. Actuarial Value of Assets as of July 1, 2021	$	13,909,828,154
9. Contributions During Plan Year Ending June 30, 2022		478,492,080
10. Benefit Payments and Expenses During Plan Year Ending June 30, 2022		(740,009,548)
11. Interest at 7.30%		1,006,626,842
12. Expected Actuarial Value of Assets as of July 1, 2022	$	14,654,937,528
13. Actuarial Value of Assets as of July 1, 2022	$	14,721,451,378
Gain / (Loss)		
14. Actuarial Gain / (Loss) on Liabilities [6 - 7]	$	4,848,126
15. Actuarial Gain / (Loss) on Assets [13 - 12]	$	66,513,850
16. Total Actuarial Gain / (Loss) for Plan Year Ending June 30, 2022 [14 + 15]	$	71,361,976

TABLE 8

SCHOOL RETIREMENT SYSTEM

GAIN/(LOSS) ANALYSIS BY SOURCE

Liability Sources		Gain/(Loss)
Retirement	$	(24,317,000)
Termination		(16,264,000)
Disability		(650,000)
Mortality		14,889,000
Salary		45,232,000
COLA		(27,014,000)
Miscellaneous		12,972,000
Total Liability Gain/(Loss)	$	4,848,000
Asset Gain/(Loss)	$	66,514,000
Net Actuarial Gain/(Loss)	$	71,362,000

TABLE 9

SCHOOL RETIREMENT SYSTEM

PROJECTED BENEFIT PAYMENTS
AS OF JULY 1, 2022

Plan Year Ending June 30	Current Active Members	Current In-Pay Members	Total
2023	$ 55,592,000	$ 740,459,000	$ 796,051,000
2024	83,887,000	746,933,000	830,820,000
2025	114,565,000	752,974,000	867,539,000
2026	147,334,000	757,755,000	905,089,000
2027	182,043,000	761,121,000	943,164,000
2028	219,027,000	763,245,000	982,272,000
2029	257,644,000	763,828,000	1,021,472,000
2030	298,394,000	762,975,000	1,061,369,000
2031	341,377,000	760,604,000	1,101,981,000
2032	386,546,000	756,523,000	1,143,069,000
2033	434,085,000	750,443,000	1,184,528,000
2034	484,061,000	742,451,000	1,226,512,000
2035	536,315,000	732,483,000	1,268,798,000
2036	590,657,000	720,110,000	1,310,767,000
2037	647,658,000	705,162,000	1,352,820,000
2038	707,433,000	688,778,000	1,396,211,000
2039	769,794,000	670,507,000	1,440,301,000
2040	833,858,000	650,186,000	1,484,044,000
2041	899,505,000	627,748,000	1,527,253,000
2042	967,063,000	603,242,000	1,570,305,000
2043	1,036,412,000	576,686,000	1,613,098,000
2044	1,106,895,000	548,916,000	1,655,811,000
2045	1,178,479,000	519,913,000	1,698,392,000
2046	1,249,862,000	489,835,000	1,739,697,000
2047	1,320,232,000	458,906,000	1,779,138,000
2048	1,387,939,000	427,635,000	1,815,574,000
2049	1,452,237,000	396,184,000	1,848,421,000
2050	1,511,823,000	365,024,000	1,876,847,000
2051	1,565,715,000	334,341,000	1,900,056,000
2052	1,612,491,000	304,509,000	1,917,000,000

Note: Cash flows are the expected future non-discounted payments to current members. These numbers exclude refund payouts to any current vested or nonvested inactives and assume future retirees elect the normal form of payment. Also excludes Omaha appropriations.

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 in all but a completely closed fund, where no further contributions are anticipated. In an active system, there will almost always be a difference between the actuarial value of assets and total liabilities. This deficiency has to be made up by future contributions and investment returns. An actuarial valuation sets out a schedule of future contributions that will deal with this deficiency in an orderly fashion.

The method used to determine the incidence of the contributions in various years is called the actuarial cost method. Under an actuarial cost method, the contributions required to meet the difference between current assets and current liabilities are allocated each year between two elements: (1) the normal cost 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 by the actuarial assumptions. 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 that 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/(surplus) 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 and losses.

In general, contributions are computed in accordance with a level percent-of-payroll funding objective. The contribution rate based on the July 1, 2022 actuarial valuation will be used to determine the actuarial required employer contribution rate to the School Retirement System for the plan year ending June 30, 2023. Any additional State contributions are expected to be deposited on July 1, 2023 (State fiscal year 2024). In this context, the term "contribution rate" means the percentage, which is applied to a particular active member payroll to determine the actual employer contribution amount (i.e., in dollars) for the group.

Contribution Rate Summary

In Table 10 the amortization payment related to the unfunded actuarial accrued liability, as of July 1, 2022, is developed. Table 11 develops the actuarial required contribution rate for the System and the amount of required State contributions.

The contribution rates shown in this report are based on the actuarial assumptions and cost methods described in Appendix C.

TABLE 10

SCHOOL RETIREMENT SYSTEM

SCHEDULE OF AMORTIZATION BASES

Amortization Bases	Original Amount	July 1, 2022 Remaining Payments	Date of Last Payment	Outstanding Balance as of July 1, 2022	Annual Contribution*
2006 UAAL Base	$ 845,226,412	14	7/1/2036	$ 763,446,684	$ 72,063,554
2007 UAAL Base	(163,793,512)	15	7/1/2037	(154,055,674)	(13,816,920)
2008 UAAL Base	54,258,200	16	7/1/2038	52,926,196	4,529,809
2009 UAAL Base	370,759,908	17	7/1/2039	373,769,423	30,643,127
2010 UAAL Base	427,955,512	18	7/1/2040	444,517,390	35,025,825
2011 UAAL Base	287,237,896	19	7/1/2041	306,580,763	23,286,397
2012 UAAL Base	497,977,442	20	7/1/2042	544,872,803	40,000,014
2013 Experience Base	57,652,106	21	7/1/2043	64,530,841	4,589,574
2014 Experience Base	(514,341,070)	22	7/1/2044	(570,516,576)	(39,395,326)
2015 Experience Base	(534,298,489)	23	7/1/2045	(586,161,861)	(39,373,976)
2016 Experience Base	(140,025,390)	24	7/1/2046	(151,664,836)	(9,927,948)
2017 Assumption Change Base	853,085,886	25	7/1/2047	910,773,276	58,192,685
2017 Experience Base	(361,516,559)	25	7/1/2047	(385,963,039)	(24,660,611)
2018 Experience Base	(201,647,779)	26	7/1/2048	(212,898,583)	(13,297,074)
2019 Experience Base	(144,680,227)	27	7/1/2049	(150,854,068)	(9,222,632)
2020 Experience Base	(136,044,073)	28	7/1/2050	(139,910,172)	(8,383,097)
2021 Assumption Change Base	(155,121,129)	24	7/1/2046	(156,177,376)	(10,223,338)
2021 Experience Base	(612,344,486)	24	7/1/2046	(616,514,049)	(40,356,877)
2022 Assumption Change Base	82,620,879	25	7/1/2047	82,620,879	5,278,955
2022 Experience Base	(182,411,124)	25	7/1/2047	(182,411,124)	(11,654,924)
Total				**$ 236,910,897**	**$ 53,297,217**

* Contribution amount reflects mid-year timing.

1. Total UAAL Amortization Payments	$ 53,297,217
2. Projected Payroll for FY 2023	$ 2,291,057,398
3. UAAL Amortization Payment Rate	2.33%

Note: The payments on each UAAL base are determined as a level-percent of payroll using a 3.05% payroll growth assumption.

TABLE 11

SCHOOL RETIREMENT SYSTEM

ACTUARIAL REQUIRED CONTRIBUTION FOR PLAN YEAR ENDING JUNE 30, 2023 and DEVELOPMENT OF ADDITIONAL STATE CONTRIBUTION

1. Normal Cost Rate - Nebraska School System*				12.93%
2. Administrative Expenses				0.16%
3. UAAL Amortization Rate - Nebraska School System*				2.28%
4. Total Actuarial Required Contribution Rate - Nebraska School System [1 + 2 + 3]				15.37%
5. Statutory Contribution Rates - Nebraska School System				
(a) Member				9.78%
(b) Employer (101% of Member)				9.88%
(c) State				2.00%
(d) Total				21.66%
6. Shortfall/(Margin) - Nebraska School System [4 - 5(d)]				(6.29%)
7. Expected pay for all actives for FY 2023			$	2,291,057,398
8. Additional Required State Contribution payable July 1, 2023 [6 * 7 * $1.072^{1/2}$, but not less than 0]			$	0
9. State Contribution due July 1, 2023				
(a) State Statutory Amount due July 1, 2023 [2% x Expected pay]			$	45,821,148
(b) Omaha Service Annuity due July 1, 2023				
(i) Normal Cost amount	$	891,994		
(ii) Amortization amount		1,072,606		
(iii) Total amount				1,964,600
(d) Additional Contribution				0
(e) Total			$	47,785,748

*Excludes funding of Omaha Service Annuity

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 July 1, 2019 actuarial valuation for the Nebraska School Retirement System (System).

A typical retirement plan faces many different risks, but the greatest risk is the inability to make benefit payments when due. If plan assets are depleted, benefits may not be paid which could create legal and litigation risk or the plan could become "pay as you go". The term "risk" is most commonly associated with an outcome with undesirable results. However, in the actuarial world, risk can be translated as uncertainty. ASOP 51 defines risk as the potential of actual future measurements to deviate from expected results due to actual experience that is different than the actuarial assumptions. The 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.

The various risk factors for a given plan can have a significant impact – positive or negative – on the actuarial projection of liability and contribution rates.

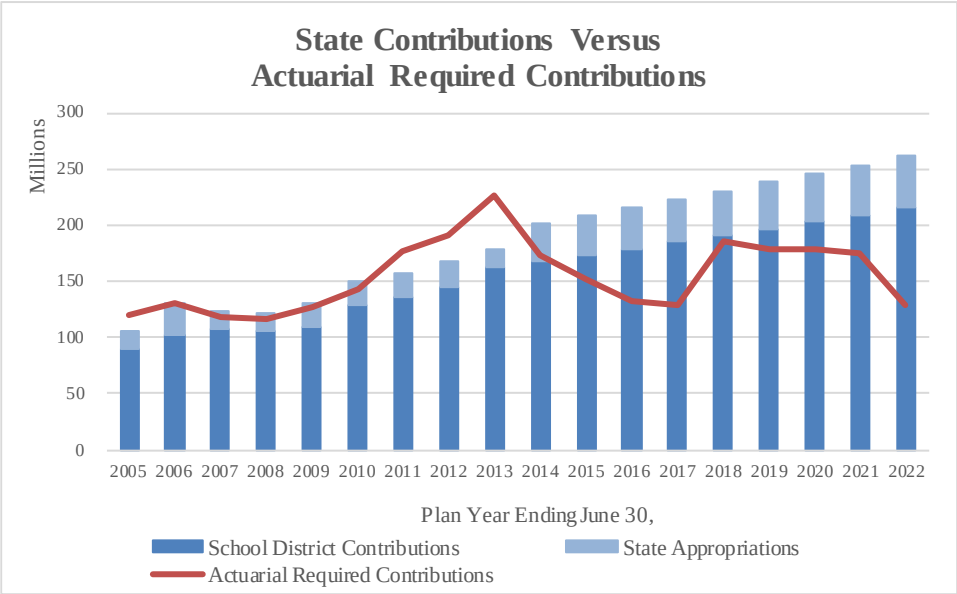
There are a number of risks inherent in the funding of a defined benefit plan. These include:

- economic risks, such as investment return and price inflation;
- demographic risks such as mortality, payroll growth, aging population including impact of baby boomers, and retirement ages;
- contribution risk, i.e., the potential for contribution rates to be too high for the plan sponsor/employer to pay; and
- external risks such as the regulatory and political environment.

Although the external risks do exist, ASOP 51 does not require the actuary to opine on those risks, and so no discussion is included here.

Actual vs Actuarial required contributions

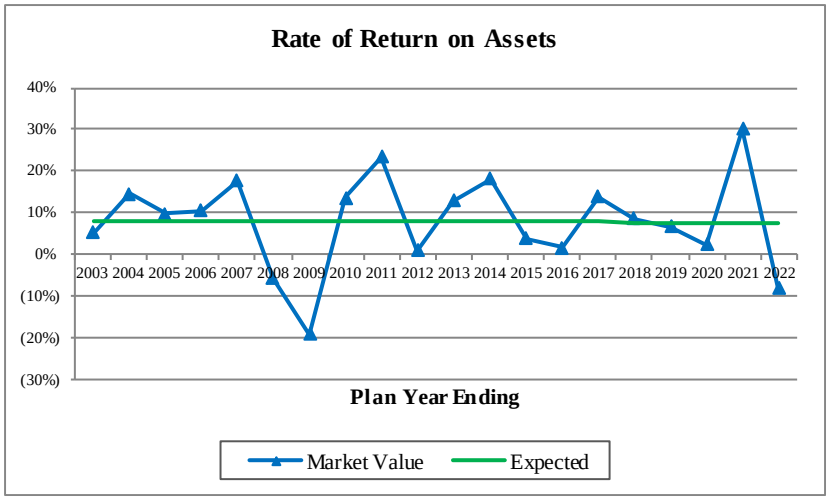
Employees contribute a fixed contribution rate of 9.78% of pay, which is set by statute, and the School Districts contribute at a rate equal to 101% of the employees' rate. In addition, the State contributes 2.00% of pay (1.00% of pay prior to July 1, 2014). The State is also required by Nebraska statutes to make additional contributions if the regular, payroll-related contributions are insufficient to meet the actuarial required contribution for the plan year. The additional State contribution for each plan year is made on the July 1 following the plan year-end. There is a direct correlation between healthy, well-funded retirement plans and consistent contributions equal to the full actuarial required contribution rate each year. As the following graph shows, contributions equal to or more than the full actuarial required contribution have been made in 14 of the last 18 years.



One of the positive factors regarding the funding of the School Retirement System is that contributions at least equal to the actuarial required contribution have been made in most years. As a result, the funded ratio of the System is strong and improving.

Investment Return Risk

The most significant risk factor for most public retirement systems, including the Nebraska School Retirement System, is investment return because of the volatility of returns and the size of plan assets compared to payroll (see Table 12). A perusal of historical returns over the last 20 years reveals that the actual returns each year are rarely close to the assumed return. This is to be expected, given the System's asset allocation, but it creates significant contribution risk (volatility). As Table 12 illustrates, a return that is lower than the 7.2% assumption by 10.0% (-2.8%) equates to 62% of payroll. Even with asset smoothing and amortization of the actuarial experience loss over 25 years, the impact on the actuarial required contribution rate is dramatic (3.94% once the experience is fully recognized).



Contribution Risks

The actuarial required contribution rate, which is based on the snapshot of the System taken on the valuation date, will change each year as the deferred investment experience is recognized and future experience (both investment and demographic) impacts the System. Therefore, the actuarial required contribution rate is expected to change each year. To the extent the difference between the actual and expected experience is significant, the change in the actuarial required contribution rate is also expected to change significantly. This volatility in the actuarial required contribution rate can result in extreme volatility in the additional State contribution amount.

Return on Actuarial Value of Assets	2% Loss (5.2% Return)	5% Loss (2.2% Return)	10% Loss (-2.8% Return)
Actuarial Required Contribution Rate	16.16%	17.34%	19.31%
Member Contribution Rate	(9.78%)	(9.78%)	(9.78%)
School District Contribution Rate	(9.88%)	(9.88%)	(9.88%)
State Contribution Rate	(2.00%)	(2.00%)	(2.00%)
Additional Required State Contribution Rate	(5.50%)	(4.32%)	(2.35%)
Expected pay for FY 2023	$2,291,057,398	$2,291,057,398	$2,291,057,398
Additional Required State Contribution Amount	$0	$0	$0

The July 1, 2022 valuation results indicate that the current statutory contribution rates are 6.29% above the actuarial required contribution rate, indicating a healthy contribution rate margin. However, there additional changes to the economic assumptions which will increase the actuarial contribution rate. In addition, this margin assumes all actuarial assumptions will be met in the future, including the assumed investment return of 7.20%. To the extent the difference between the actual and expected investment experience is significant, the change in the actuarial required contribution rate is also expected to change significantly. The table below illustrates the unfavorable investment experience over various time periods that can be absorbed without creating additional contributions by the State once the loss is fully recognized. All other assumptions are assumed to be met for purposes of this modeling.

Years	Return
1	-5.75%
2	0.25%
3	2.50%
4	3.50%
5	4.25%
10	5.50%

Demographic Risks

A key demographic risk for all retirement systems, including the Nebraska School Retirement System, is improvements in mortality (longevity) greater than anticipated. While the actuarial assumptions reflect small, continuous improvements in mortality experience over time and these assumptions are refined every experience study, the risk arises because there is a possibility of some sudden shift, perhaps from a significant medical breakthrough that could quickly increase liabilities. Likewise, there is some possibility

of a significant public health crisis that could result in a significant number of additional deaths in a short time period, as experienced with Covid-19. This kind of event is 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 so the UAAL payment schedule reflects an increasing dollar amount of payments over time, in anticipation of increasing payroll. This creates demographic risk of the active membership decreasing or actual salary increases, and therefore payroll, not increasing as assumed. Because there are many different employers who participate in the School Retirement System, the risk of a significant decline in the active membership is likely small. However, some widespread outsourcing of jobs that are now covered by the System could have an adverse impact on the System's funding. In addition, lower salary increases than assumed will results in lower covered payroll. When that occurs, the UAAL contribution rate is higher than expected even if the dollar amount of the payment is the same as scheduled.

The following exhibits summarize some historical information that helps indicate how certain key risk metrics have changed over time. Many are due to the maturing of the retirement system.

TABLE 12

SCHOOL RETIREMENT SYSTEM

HISTORICAL ASSET VOLATILITY RATIOS

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

Actuarial Valuation Date	Market Value of Assets	Covered Payroll	Asset Volatility Ratio	Increase in ACR with a Return 10% Lower than Assumed*
July 1, 2003	$4,282,430,841	$1,138,776,241	3.76	2.40%
July 1, 2004	4,918,013,255	1,170,601,127	4.20	2.68%
July 1, 2005	5,393,380,574	1,214,227,197	4.44	2.84%
July 1, 2006	5,974,750,945	1,247,684,378	4.79	3.06%
July 1, 2007	7,024,856,413	1,325,616,322	5.30	3.39%
July 1, 2008	6,578,300,402	1,389,124,819	4.74	3.03%
July 1, 2009	5,265,649,707	1,481,568,432	3.55	2.27%
July 1, 2010	5,940,401,645	1,543,930,532	3.85	2.46%
July 1, 2011	7,263,954,832	1,590,225,983	4.57	2.92%
July 1, 2012	7,246,311,781	1,593,184,929	4.55	2.91%
July 1, 2013	8,092,953,030	1,735,175,956	4.66	2.98%
July 1, 2014	9,450,981,723	1,774,679,549	5.33	3.41%
July 1, 2015	9,685,816,053	1,845,979,997	5.25	3.35%
July 1, 2016	9,698,584,810	1,901,967,362	5.10	3.26%
July 1, 2017	10,876,861,507	1,966,968,901	5.53	3.53%
July 1, 2018	11,636,298,903	2,027,180,460	5.74	3.67%
July 1, 2019	12,214,947,023	2,093,017,529	5.84	3.73%
July 1, 2020	12,285,736,650	2,151,720,793	5.71	3.65%
July 1, 2021	15,692,556,258	2,235,203,829	7.02	4.49%
July 1, 2022	14,142,759,710	2,291,057,398	6.17	3.94%

Note: Years prior to July 1, 2013 were provided by the prior actuary.

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

The assets at July 1, 2022 are about six times payroll, so underperforming the investment return assumption by 10.00% (i.e., earn -2.80% for one year) creates an actuarial loss of about $1.41 billion, or 62% of payroll. While the actual impact in the first year is mitigated by the asset smoothing method and amortization of the UAAL, this illustrates the significant contribution risk associated with volatile investment returns.

TABLE 13

SCHOOL RETIREMENT SYSTEM

HISTORICAL CASH FLOWS

The net cash flow of a system (contributions minus benefit payments and expenses), as a percentage of the beginning of year asset value, indicates the sensitivity of the system to short-term investment returns. Mature plans can have large amounts of benefit payments compared to contributions, particularly if they are well funded. In fact, this is one reason for prefunding retirement benefits – so a portion of investment return can help to pay plan benefits. When there is negative cash flow, investment losses in the short-term are compounded by the net withdrawal from plan assets leaving a smaller asset base to try to recover from the investment losses. Large negative cash flow can also create liquidity needs for the system.

Year End	Market Value of Assets (MVA)	Contributions	Benefit Payments	Net Cash Flow	Net Cash Flow as a Percent of MVA
6/30/2003	$4,282,430,841	$184,361,384	$154,339,488	$30,021,896	0.70%
6/30/2004	4,918,013,255	190,389,662	173,370,820	17,018,842	0.35%
6/30/2005	5,393,380,574	197,738,577	191,830,379	5,908,198	0.11%
6/30/2006	5,974,750,945	234,369,665	215,191,900	19,177,765	0.32%
6/30/2007	7,024,856,413	232,011,299	242,625,499	(10,614,200)	(0.15%)
6/30/2008	6,578,300,402	229,163,204	273,432,511	(44,269,307)	(0.67%)
6/30/2009	5,265,649,707	241,497,984	300,771,337	(59,273,353)	(1.13%)
6/30/2010	5,940,401,645	280,280,640	320,509,700	(40,229,060)	(0.68%)
6/30/2011	7,263,954,832	295,505,322	351,083,806	(55,578,484)	(0.77%)
6/30/2012	7,246,311,781	316,058,643	391,133,707	(75,075,064)	(1.04%)
6/30/2013	8,092,953,030	343,844,729	427,885,060	(84,040,331)	(1.04%)
6/30/2014	9,450,981,723	372,524,092	466,161,224	(93,637,132)	(0.99%)
6/30/2015	9,685,816,053	384,302,638	502,190,816	(117,888,178)	(1.22%)
6/30/2016	9,698,584,810	395,138,678	528,499,067	(133,360,389)	(1.38%)
6/30/2017	10,876,861,507	410,111,907	554,369,720	(144,257,813)	(1.33%)
6/30/2018	11,636,298,903	422,723,237	587,984,401	(165,261,164)	(1.42%)
6/30/2019	12,214,947,023	435,737,807	626,500,723	(190,762,916)	(1.56%)
6/30/2020	12,285,736,650	449,965,787	660,565,238	(210,599,451)	(1.71%)
6/30/2021	15,692,556,258	463,280,489	692,620,210	(229,339,721)	(1.46%)
6/30/2022	14,142,759,710	478,492,080	736,680,306	(258,188,226)	(1.83%)

Note: Years prior to 6/30/2013 were provided by the prior actuary.

TABLE 14

SCHOOL RETIREMENT SYSTEM

LIABILITY MATURITY MEASUREMENTS

Most public sector retirement systems have been in operation for many years. As a result, they have aging plan populations, and in some cases declining active populations, resulting in an increasing ratio of retirees to active members (see Table 15) and a growing percentage of retiree liability (see table below). With more of the total liability residing with retirees, investment volatility has a greater impact on the funding of the system because it is more difficult to restore the system financially after losses occur when there is comparatively less payroll over which to spread costs.

Actuarial Valuation Date	Retiree Liability (a)	Total Actuarial Liability (b)	Retiree Percentage (a) / (b)
July 1, 2003	1,777,141,788	5,464,572,876	32.5%
July 1, 2004	2,123,696,982	5,868,266,970	36.2%
July 1, 2005	2,199,034,866	6,234,657,830	35.3%
July 1, 2006	2,476,199,326	6,584,275,406	37.6%
July 1, 2007	2,721,307,439	7,070,308,583	38.5%
July 1, 2008	3,109,583,957	7,654,536,359	40.6%
July 1, 2009	3,265,413,786	8,092,339,318	40.4%
July 1, 2010	3,585,655,502	8,542,119,000	42.0%
July 1, 2011	3,947,029,052	9,039,744,995	43.7%
July 1, 2012	4,584,703,061	9,609,157,134	47.7%
July 1, 2013	4,878,220,586	9,984,898,998	48.9%
July 1, 2014	5,257,094,210	10,426,112,609	50.4%
July 1, 2015	5,518,660,659	10,778,303,637	51.2%
July 1, 2016	5,871,061,908	11,207,298,169	52.4%
July 1, 2017	6,471,922,158	12,466,139,649	51.9%
July 1, 2018	6,876,106,828	13,001,288,461	52.9%
July 1, 2019	7,197,476,633	13,435,710,270	53.6%
July 1, 2020	7,487,101,482	13,849,194,050	54.1%
July 1, 2021	7,969,759,950	14,279,493,188	55.8%
July 1, 2022	8,594,484,889	14,958,362,275	57.5%

Note: Years prior to July 1, 2013 were provided by the prior actuary.

TABLE 15

SCHOOL RETIREMENT SYSTEM

ACTIVE AND RETIREE MEMBERSHIP

Valuation Date July 1,	Number of Active Members	Number of Retired Members	Active/ Retired
2003	36,779	11,840	3.11
2004	36,353	12,733	2.86
2005	36,042	13,052	2.76
2006	36,414	13,727	2.65
2007	37,152	14,408	2.58
2008	37,832	15,339	2.47
2009	39,231	15,949	2.46
2010	39,764	16,912	2.35
2011	39,886	17,814	2.24
2012	39,477	19,097	2.07
2013	40,314	19,790	2.04
2014	40,462	20,889	1.94
2015	40,994	21,836	1.88
2016	41,443	22,857	1.81
2017	41,943	23,654	1.77
2018	42,349	24,486	1.73
2019	42,713	25,272	1.69
2020	43,177	26,184	1.65
2021	43,423	26,894	1.61
2022	43,586	28,094	1.55

Note: Years prior to July 1, 2013 were provided by the prior actuary.

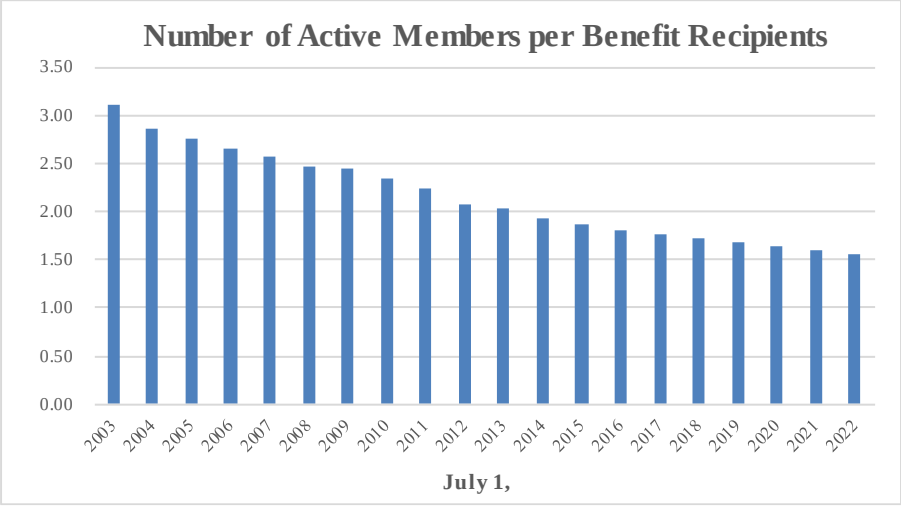


TABLE 16

SCHOOL RETIREMENT SYSTEM

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

This exhibit compares the key July 1, 2022 valuation results under five (5) different investment return assumptions to illustrate the impact of different assumptions on the funding of the System. Note that only the investment return assumption is changed, as identified in the heading below. All other assumptions are unchanged for purposes of this analysis.

Investment Return Assumption	**6.70%**	**6.95%**	**7.20%**	**7.45%**	**7.70%**
Actuarial Accrued Liability	$15,950,676	$15,442,158	$14,958,362	$14,497,842	$14,059,243
Actuarial Value of Assets	14,721,451	14,721,451	14,721,451	14,721,451	14,721,451
Unfunded Actuarial Accrued Liability*	$1,229,224	$720,706	$236,911	($223,610)	($662,208)
Funded Ratio	92.29%	95.33%	98.42%	101.54%	104.71%
Contributions**					
Normal Cost Rate	14.53%	13.70%	12.93%	12.23%	11.57%
Administrative Expenses	0.16%	0.16%	0.16%	0.16%	0.16%
UAAL Amortization Rate	4.92%	3.61%	2.28%	(0.65%)	(1.95%)
Total Actuarial Required Contribution Rate	19.61%	17.47%	15.37%	11.74%	9.78%
Member Contribution Rate	(9.78%)	(9.78%)	(9.78%)	(9.78%)	(9.78%)
Employer Required Contribution Rate	(9.88%)	(9.88%)	(9.88%)	(9.88%)	(9.88%)
State Contribution Rate	(2.00%)	(2.00%)	(2.00%)	(2.00%)	(2.00%)
Contribution Shortfall/(Margin)	(2.05%)	(4.19%)	(6.29%)	(9.92%)	(11.88%)

Note: All other assumptions are unchanged for purposes of this sensitivity analysis.
* May not add due to rounding.
** Contribution rates exclude State funding of Omaha Service Annuity.

This section of the report provides a historical perspective on the System's funding and contribution practices, along with other information that may be of interest.

TABLE 17

SCHOOL RETIREMENT SYSTEM

HISTORICAL FUNDING INFORMATION

SCHEDULE OF FUNDING PROGRESS

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded Actuarial Accrued Liability (UAAL) (b - a)	Funded Ratio (a / b)	Covered Payroll (c)	UAAL as a % of Covered Payroll [(b - a) / c]
June 30, 2003	$4,952,902,870	$5,464,572,876	$511,670,006	90.6%	$1,138,776,241	44.9%
June 30, 2004	5,118,011,165	5,868,266,970	750,255,805	87.2%	1,170,601,127	64.1%
June 30, 2005	5,335,197,409	6,234,657,830	899,460,421	85.6%	1,214,227,197	74.1%
June 30, 2006	5,739,048,994	6,584,275,406	845,226,412	87.2%	1,247,684,378	67.7%
June 30, 2007	6,396,336,863	7,070,308,583	673,971,720	90.5%	1,325,616,322	50.8%
June 30, 2008	6,932,918,638	7,654,536,359	721,617,721	90.6%	1,389,124,819	51.9%
June 30, 2009	7,007,581,825	8,092,339,318	1,084,757,493	86.6%	1,481,568,432	73.2%
June 30, 2010	7,040,908,599	8,542,119,000	1,501,210,401	82.4%	1,543,930,532	97.2%
June 30, 2011	7,267,497,259	9,039,744,995	1,772,247,736	80.4%	1,590,225,983	111.4%
June 30, 2012	7,358,964,135	9,609,157,134	2,250,192,999	76.6%	1,593,184,929	141.2%
June 30, 2013	7,703,084,507	9,984,898,998	2,281,814,491	77.1%	1,735,175,956	131.5%
June 30, 2014	8,622,023,999	10,426,112,609	1,804,088,610	82.7%	1,774,679,549	101.7%
June 30, 2015	9,485,594,650	10,778,303,637	1,292,708,987	88.0%	1,845,979,997	70.0%
June 30, 2016	10,045,925,478	11,207,298,169	1,161,372,691	89.6%	1,901,967,362	61.1%
June 30, 2017	10,810,539,558	12,466,139,649	1,655,600,091	86.7%	1,966,968,901	84.2%
June 30, 2018	11,545,658,962	13,001,288,461	1,455,629,499	88.8%	2,027,180,460	71.8%
June 30, 2019	12,130,496,836	13,435,710,270	1,305,213,434	90.3%	2,093,017,529	62.4%
June 30, 2020	12,692,545,458	13,849,194,050	1,156,648,592	91.6%	2,151,720,793	53.8%
June 30, 2021	13,909,828,154	14,279,493,188	369,665,034	97.4%	2,235,203,829	16.5%
June 30, 2022	14,721,451,378	14,958,362,275	236,910,897	98.4%	2,291,057,398	10.3%

Note: Information before 2013 was produced by the prior actuary.

TABLE 18

SCHOOL RETIREMENT SYSTEM

HISTORICAL FUNDING INFORMATION

SCHEDULE OF CONTRIBUTIONS FROM EMPLOYERS AND OTHER CONTRIBUTING ENTITIES

	Actuarial Required Contributions*			
Plan Year Ending	School Districts	State	Total	Percent Contributed
June 30, 2005	$90,178,025	$30,274,438	$120,452,463	87%
June 30, 2006	102,089,105	28,056,703	130,145,808	100%
June 30, 2007	102,849,748	15,219,871	118,069,619	104%
June 30, 2008	101,368,968	15,832,941	117,201,909	104%
June 30, 2009	105,497,775	20,620,548	126,118,323	104%
June 30, 2010	121,277,758	21,380,352	142,658,110	105%
June 30, 2011	135,328,339	40,779,653	176,107,992	89%
June 30, 2012	145,582,040	45,866,350	191,448,390	88%
June 30, 2013	161,922,831	64,966,961	226,889,792	79%
June 30, 2014	138,544,708	34,703,519	173,248,227	117%
June 30, 2015	115,776,948	35,493,591	151,270,539	138%
June 30, 2016	94,929,605	36,919,600	131,849,205	163%
June 30, 2017	90,038,793	38,039,347	128,078,140	174%
June 30, 2018	145,340,830	39,339,378	184,680,208	125%
June 30, 2019	138,503,494	40,543,609	179,047,103	133%
June 30, 2020	136,474,726	41,860,351	178,335,077	137%
June 30, 2021	132,658,366	43,034,416	175,692,782	143%
June 30, 2022	84,649,368	44,704,077	129,353,445	202%

* Excludes Omaha appropriations.

Note: Contribution information is consistent with that shown in the GASB 67 report prepared for the System.

SCHOOL RETIREMENT SYSTEM

MEMBER DATA RECONCILIATION

	Active Members	Inactive Vested	Inactive Non-vested	Retirees and Beneficiaries	Disabled Members	Total
As of July 1, 2021	43,423	6,769	19,141	26,589	305	96,227
Changes in status						
a) Retirement	(1,481)	(317)	0	1,798	0	0
b) Death	(47)	(26)	(26)	(801)	(13)	(913)
c) Non-vested termination	(1,891)	0	1,891	0	0	0
d) Vested termination	(997)	997	0	0	0	0
e) Contribution refund	(745)	(178)	(786)	0	0	(1,709)
f) Beneficiary in receipt	0	0	0	256	0	256
g) Disability retirement	(7)	(4)	0	0	11	0
h) Return to active service	742	(212)	(530)	0	0	0
i) Expired benefit	0	0	0	(51)	0	(51)
j) Data adjustment	(1)	(1)	1	0	0	(1)
Total changes in status	(4,427)	259	550	1,202	(2)	(2,418)
New entrants	4,590	0	475	0	0	5,065
Net Change	163	259	1,025	1,202	(2)	2,647
As of July 1, 2022	43,586	7,028	20,166	27,791	303	98,874

SCHOOL RETIREMENT SYSTEM

SUMMARY OF MEMBERSHIP DATA

A. ACTIVE MEMBERS	July 1, 2022	July 1, 2021	% Change
1. Number of Active Members			
(a) Tier 1	21,294	23,110	(7.9%)
(b) Tier 2	7,335	7,937	(7.6%)
(c) Tier 3	2,188	2,412	(9.3%)
(d) Tier 4	12,769	9,964	28.2%
(e) Total	43,586	43,423	0.4%
2. Annual Reported Salary			
(a) Tier 1	$ 1,314,545,072	$ 1,371,282,569	(4.1%)
(b) Tier 2	337,788,364	339,089,984	(0.4%)
(c) Tier 3	87,996,495	89,535,669	(1.7%)
(d) Tier 4	425,698,384	312,406,743	36.3%
(e) Total	$ 2,166,028,315	$ 2,112,314,965	2.5%
3. Accumulated Contributions	$ 2,059,002,080	$ 2,043,910,780	0.7%
4. Active Member Averages			
(a) Age	44.3	44.8	(1.1%)
(b) Service	10.9	11.2	(2.7%)
(c) Annual Reported Salary	$ 49,696	$ 48,645	2.2%
B. INACTIVE MEMBERS			
1. Number of Inactive Members			
(a) System vested	7,028	6,769	3.8%
(b) System nonvested (refund only)	20,166	19,141	5.4%
(d) Total	27,194	25,910	5.0%
2. Accumulated Member Contributions (excluding Omaha)	$ 275,740,613	$ 257,416,517	7.1%
3. Inactive Member Averages (excluding Omaha)			
(a) Age (vesteds only)	51.5	51.8	(0.6%)
(b) Estimated Annual Benefits (vesteds only)	$ 7,777	$ 7,514	3.5%
(c) Accumulated member contributions	$ 10,140	$ 9,935	2.1%
C. RETIREES, DISABLEDS, AND BENEFICIARIES			
1. Number of Members			
(a) Retired	25,992	24,895	4.4%
(b) Disabled	303	305	(0.7%)
(c) Beneficiaries	1,799	1,694	6.2%
(d) Total	28,094	26,894	4.5%
2. Annual Benefits			
(a) Retired	$ 697,083,951	$ 646,597,587	7.8%
(b) Disabled	4,704,139	4,547,970	3.4%
(c) Beneficiaries	39,191,290	36,618,974	7.0%
(d) Total	$ 740,979,380	$ 687,764,531	7.7%

OMAHA SCHOOL EMPLOYEES

SUMMARY OF MEMBERSHIP DATA

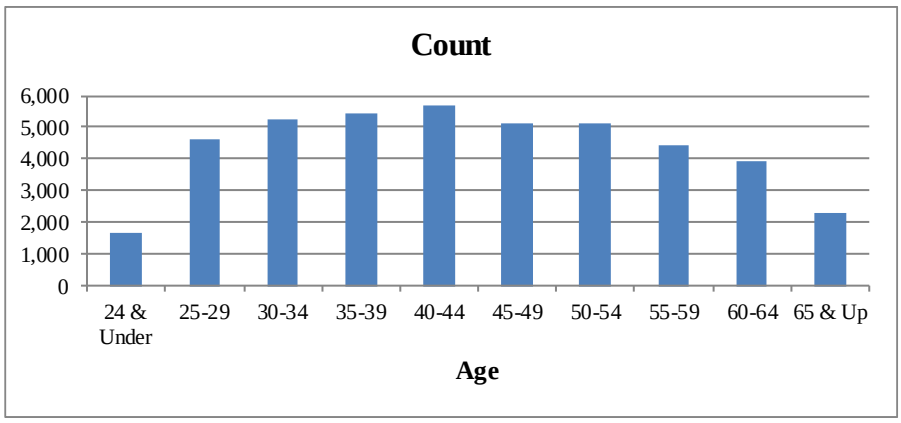
A. ACTIVE MEMBERS	January 1, 2022	January 1, 2021	% Change
1. Number of Active Members	7,085	7,182	(1.4%)
2. Average Age	47.9	44.2	8.4%
3. Average Service	10.6	10.7	(0.9%)
B. INACTIVE VESTED MEMBERS			
1. Number of Inactive Members	1,350	1,213	11.3%
2. Average Age	49.7	46.6	6.7%
3. Average Service	9.4	9.3	1.1%

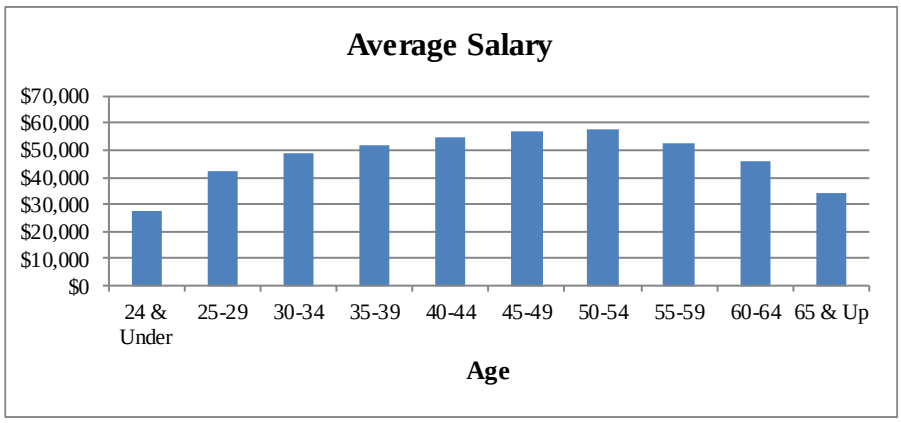
Note: Data was provided by the Omaha Schools Employee Retirement System (OSERS) for use in estimating the Service Annuity obligation. The data provided is from the most recent OSERS valuation.

ACTIVE MEMBERS
AS OF JULY 1, 2022

Total

	Count			Reported FY 2022 Earnings		
Age	Male	Female	Total	Male	Female	Total
24 & Under	327	1,349	1,676	$ 10,017,970	$ 35,671,983	$ 45,689,953
25-29	1,063	3,562	4,625	47,121,952	147,781,483	194,903,435
30-34	1,303	3,919	5,222	70,346,477	182,649,109	252,995,586
35-39	1,268	4,145	5,413	77,822,578	201,785,688	279,608,266
40-44	1,336	4,378	5,714	91,033,297	221,324,641	312,357,938
45-49	1,188	3,944	5,132	85,716,942	206,963,026	292,679,968
50-54	1,218	3,929	5,147	88,009,614	207,652,669	295,662,283
55-59	1,097	3,325	4,422	73,651,686	159,012,907	232,664,593
60-64	1,022	2,889	3,911	59,073,748	121,537,325	180,611,073
65 & Up	848	1,476	2,324	32,714,652	46,140,568	78,855,220
Total	10,670	32,916	43,586	$ 635,508,916	$ 1,530,519,399	$ 2,166,028,315

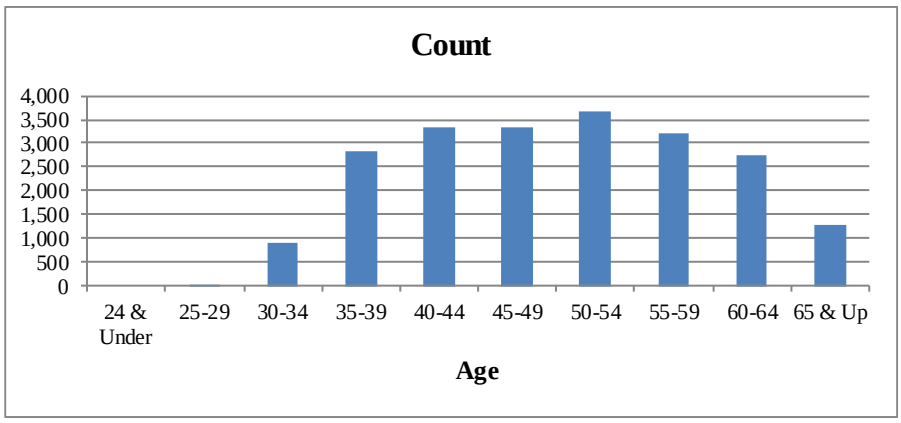


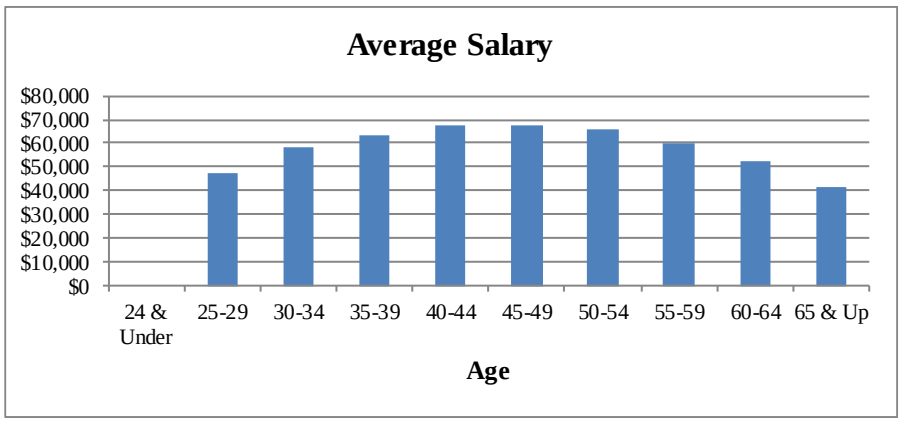


ACTIVE MEMBERS
AS OF JULY 1, 2022

Tier 1 Members

	Count			Reported FY 2022 Earnings		
Age	Male	Female	Total	Male	Female	Total
24 & Under	0	0	0	$ 0	$ 0	$ 0
25-29	0	8	8	0	380,354	380,354
30-34	219	696	915	14,258,601	39,255,277	53,513,878
35-39	706	2,104	2,810	49,139,908	128,503,214	177,643,122
40-44	890	2,432	3,322	68,182,705	155,965,233	224,147,938
45-49	838	2,513	3,351	67,244,990	160,002,439	227,247,429
50-54	893	2,778	3,671	72,987,957	170,029,997	243,017,954
55-59	774	2,431	3,205	60,272,652	132,702,798	192,975,450
60-64	640	2,099	2,739	43,441,889	99,260,137	142,702,026
65 & Up	403	870	1,273	19,568,403	33,348,518	52,916,921
Total	5,363	15,931	21,294	$ 395,097,105	$ 919,447,967	$ 1,314,545,072

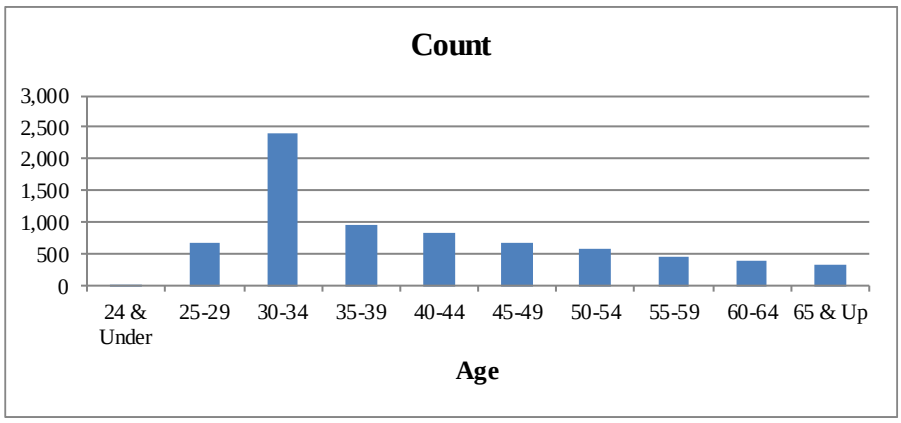


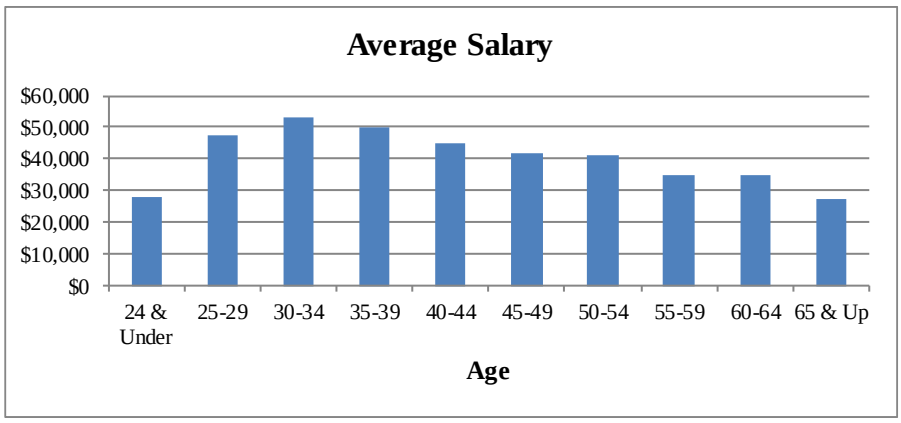


ACTIVE MEMBERS
AS OF JULY 1, 2022

Tier 2 Members

	Count			Reported FY 2022 Earnings		
Age	Male	Female	Total	Male	Female	Total
24 & Under	3	2	5	$ 82,866	$ 56,591	$ 139,457
25-29	127	548	675	6,464,104	25,501,363	31,965,467
30-34	631	1,774	2,405	36,483,439	91,863,016	128,346,455
35-39	264	704	968	15,885,332	32,734,684	48,620,016
40-44	164	661	825	9,823,260	27,320,735	37,143,995
45-49	124	549	673	7,566,159	20,763,793	28,329,952
50-54	123	459	582	6,552,011	17,246,671	23,798,682
55-59	100	363	463	4,513,780	11,665,645	16,179,425
60-64	119	278	397	5,380,339	8,501,586	13,881,925
65 & Up	154	188	342	4,812,569	4,570,421	9,382,990
Total	1,809	5,526	7,335	$ 97,563,859	$ 240,224,505	$ 337,788,364

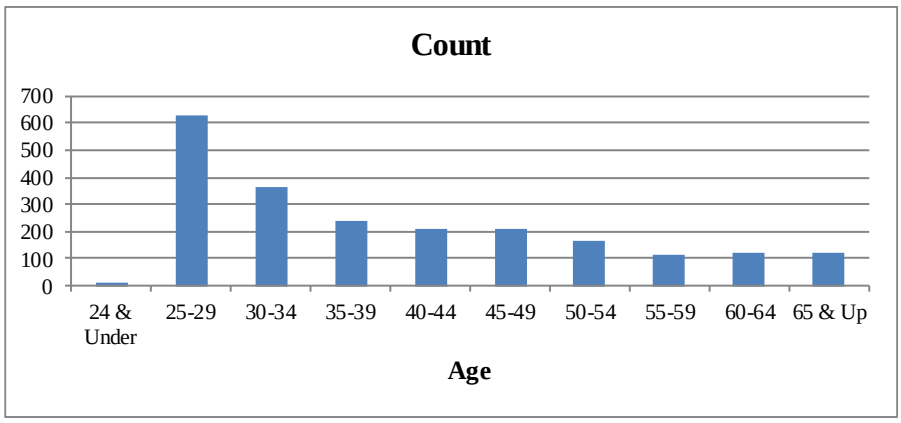


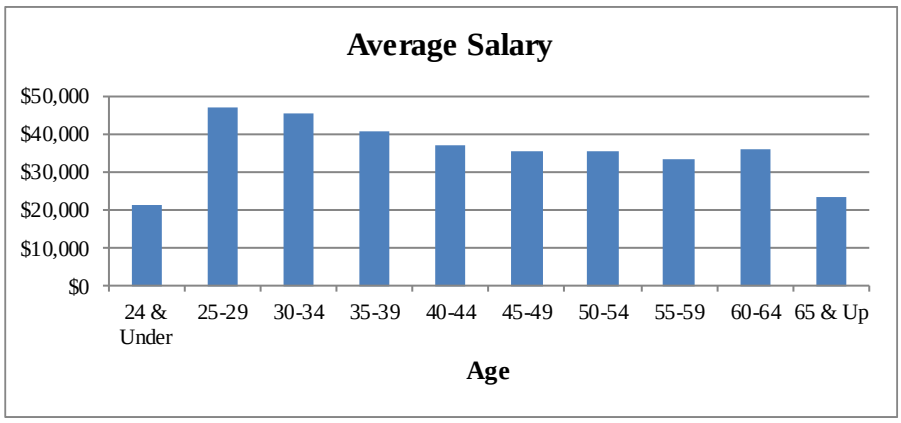


ACTIVE MEMBERS
AS OF JULY 1, 2022

Tier 3 Members

	Count			Reported FY 2022 Earnings		
Age	Male	Female	Total	Male	Female	Total
24 & Under	2	11	13	$ 95,979	$ 181,558	$ 277,537
25-29	131	495	626	6,490,515	22,765,666	29,256,181
30-34	91	274	365	4,404,930	12,186,841	16,591,771
35-39	55	187	242	2,710,527	7,121,431	9,831,958
40-44	37	171	208	1,973,219	5,765,331	7,738,550
45-49	44	166	210	2,160,819	5,255,547	7,416,366
50-54	36	130	166	1,632,216	4,219,214	5,851,430
55-59	29	83	112	1,127,129	2,624,102	3,751,231
60-64	40	83	123	1,888,609	2,526,900	4,415,509
65 & Up	48	75	123	1,391,340	1,474,622	2,865,962
Total	513	1,675	2,188	$ 23,875,283	$ 64,121,212	$ 87,996,495

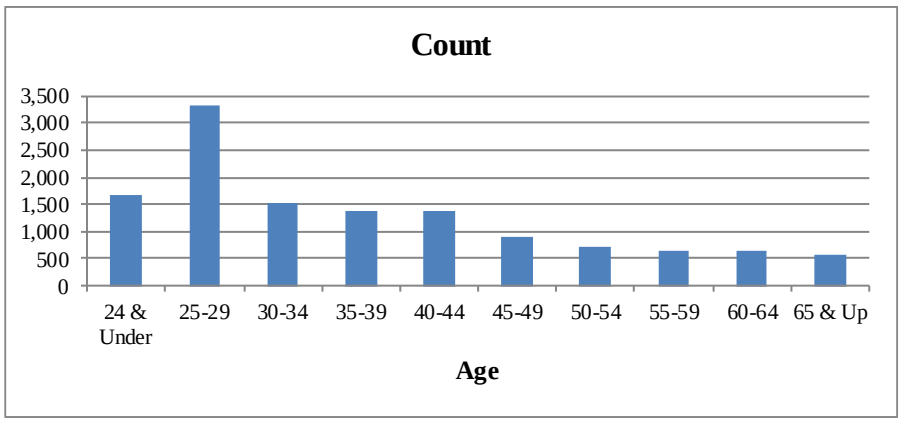


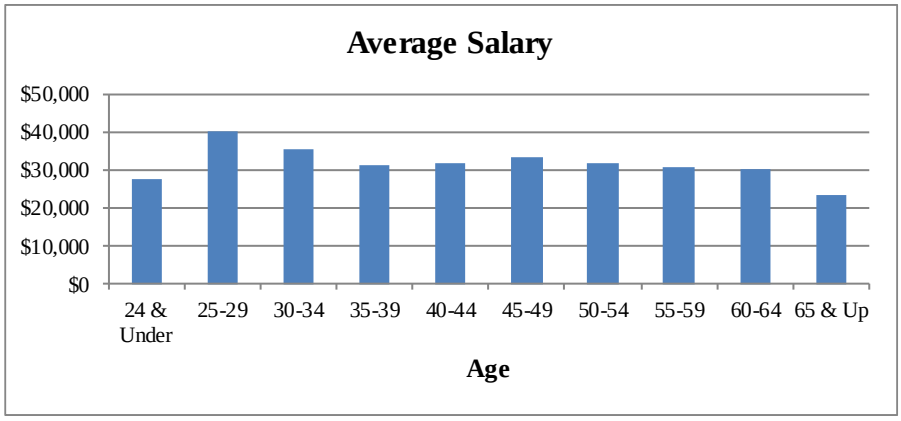


ACTIVE MEMBERS
AS OF JULY 1, 2022

Tier 4 Members

	Count			Reported FY 2022 Earnings		
Age	Male	Female	Total	Male	Female	Total
24 & Under	322	1,336	1,658	$ 9,839,125	$ 35,433,834	$ 45,272,959
25-29	805	2,511	3,316	34,167,333	99,134,100	133,301,433
30-34	362	1,175	1,537	15,199,507	39,343,975	54,543,482
35-39	243	1,150	1,393	10,086,811	33,426,359	43,513,170
40-44	245	1,114	1,359	11,054,113	32,273,342	43,327,455
45-49	182	716	898	8,744,974	20,941,247	29,686,221
50-54	166	562	728	6,837,430	16,156,787	22,994,217
55-59	194	448	642	7,738,125	12,020,362	19,758,487
60-64	223	429	652	8,362,911	11,248,702	19,611,613
65 & Up	243	343	586	6,942,340	6,747,007	13,689,347
Total	2,985	9,784	12,769	$ 118,972,669	$ 306,725,715	$ 425,698,384



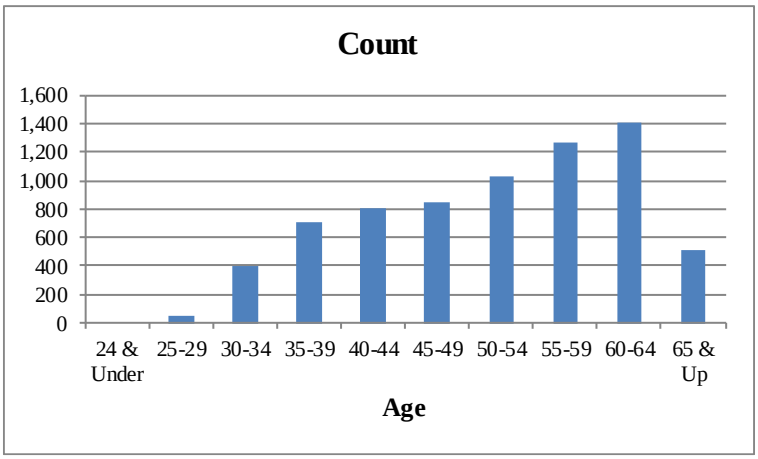


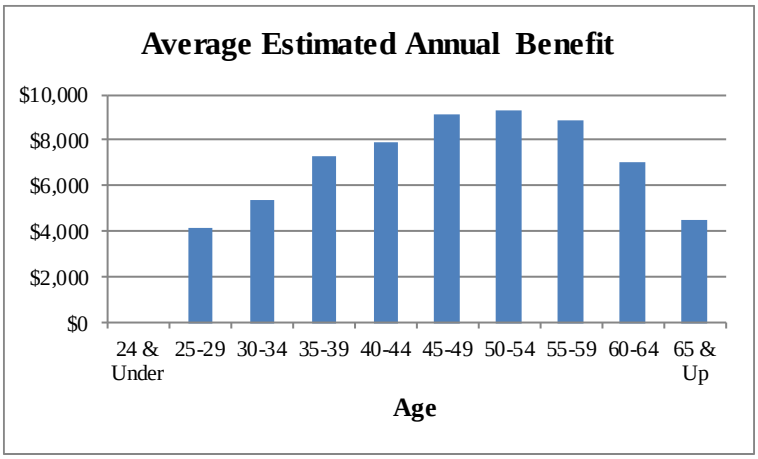
AGE AND SERVICE DISTRIBUTION
AS OF JULY 1, 2022

Age		0-4	5-9	10-14	15-19	20-24	25-29	30-34	Over 34	Total
24 & Under	Number	1,674	2	0	0	0	0	0	0	1,676
	Total Salary	$ 45,604,240	$ 85,713	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 45,689,953
	Average Sal.	$ 27,243	$ 42,857	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 27,261
25-29	Number	3,595	1,029	1	0	0	0	0	0	4,625
	Total Salary	$ 143,906,534	$ 50,962,348	$ 34,553	$ 0	$ 0	$ 0	$ 0	$ 0	$ 194,903,435
	Average Sal.	$ 40,030	$ 49,526	$ 34,553	$ 0	$ 0	$ 0	$ 0	$ 0	$ 42,141
30-34	Number	1,766	2,779	676	1	0	0	0	0	5,222
	Total Salary	$ 62,726,985	$ 149,069,462	$ 41,179,144	$ 19,995	$ 0	$ 0	$ 0	$ 0	$ 252,995,586
	Average Sal.	$ 35,519	$ 53,641	$ 60,916	$ 19,995	$ 0	$ 0	$ 0	$ 0	$ 48,448
35-39	Number	1,588	1,341	1,944	540	0	0	0	0	5,413
	Total Salary	$ 49,938,492	$ 67,319,016	$ 125,203,231	$ 37,147,527	$ 0	$ 0	$ 0	$ 0	$ 279,608,266
	Average Sal.	$ 31,447	$ 50,201	$ 64,405	$ 68,792	$ 0	$ 0	$ 0	$ 0	$ 51,655
40-44	Number	1,574	1,070	1,030	1,690	349	1	0	0	5,714
	Total Salary	$ 49,369,747	$ 50,248,977	$ 63,723,322	$ 122,068,476	$ 26,899,835	$ 47,581	$ 0	$ 0	$ 312,357,938
	Average Sal.	$ 31,366	$ 46,962	$ 61,867	$ 72,230	$ 77,077	$ 47,581	$ 0	$ 0	$ 54,665
45-49	Number	1,080	918	722	743	1,397	272	0	0	5,132
	Total Salary	$ 34,380,357	$ 39,793,271	$ 38,573,128	$ 50,432,447	$ 107,470,970	$ 22,029,795	$ 0	$ 0	$ 292,679,968
	Average Sal.	$ 31,834	$ 43,348	$ 53,425	$ 67,877	$ 76,930	$ 80,992	$ 0	$ 0	$ 57,030
50-54	Number	869	812	711	655	753	1,104	242	1	5,147
	Total Salary	$ 26,687,240	$ 33,349,275	$ 34,345,634	$ 38,932,239	$ 53,055,326	$ 89,176,932	$ 20,058,909	$ 56,728	$ 295,662,283
	Average Sal.	$ 30,710	$ 41,071	$ 48,306	$ 59,439	$ 70,459	$ 80,776	$ 82,888	$ 56,728	$ 57,444
55-59	Number	749	638	573	637	599	512	599	115	4,422
	Total Salary	$ 22,641,365	$ 22,345,588	$ 24,795,065	$ 32,380,638	$ 35,829,310	$ 37,270,048	$ 48,552,906	$ 8,849,673	$ 232,664,593
	Average Sal.	$ 30,229	$ 35,024	$ 43,272	$ 50,833	$ 59,815	$ 72,793	$ 81,057	$ 76,954	$ 52,615
60-64	Number	767	552	482	594	607	332	243	334	3,911
	Total Salary	$ 22,558,066	$ 19,794,054	$ 18,571,026	$ 26,733,300	$ 31,583,383	$ 19,579,073	$ 16,195,518	$ 25,596,653	$ 180,611,073
	Average Sal.	$ 29,411	$ 35,859	$ 38,529	$ 45,006	$ 52,032	$ 58,973	$ 66,648	$ 76,637	$ 46,180
65 & Up	Number	731	468	294	236	191	147	103	154	2,324
	Total Salary	$ 15,980,540	$ 12,650,632	$ 9,116,040	$ 9,425,981	$ 8,513,324	$ 6,785,274	$ 5,647,636	$ 10,735,793	$ 78,855,220
	Average Sal.	$ 21,861	$ 27,031	$ 31,007	$ 39,941	$ 44,572	$ 46,158	$ 54,831	$ 69,713	$ 33,931
Total	Number	14,393	9,609	6,433	5,096	3,896	2,368	1,187	604	43,586
	Total Salary	$ 473,793,566	$ 445,618,336	$ 355,541,143	$ 317,140,603	$ 263,352,148	$ 174,888,703	$ 90,454,969	$ 45,238,847	$ 2,166,028,315
	Average Sal.	$ 32,918	$ 46,375	$ 55,268	$ 62,233	$ 67,596	$ 73,855	$ 76,205	$ 74,899	$ 49,696

INACTIVE VESTED MEMBERS
AS OF JULY 1, 2022

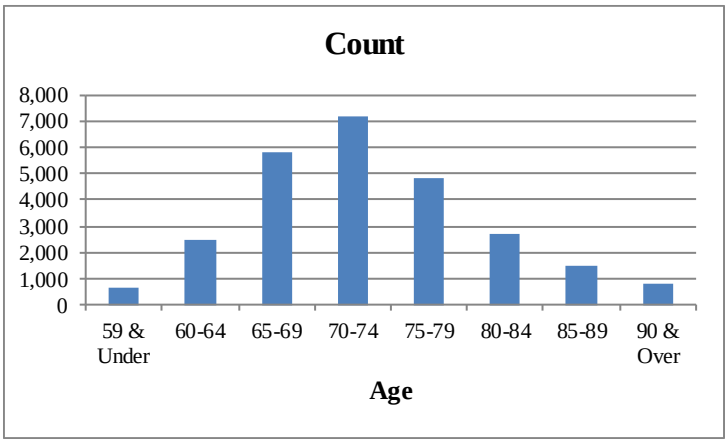
	Count			Estimated Deferred Annual Benefits		
Age	Male	Female	Total	Male	Female	Total
24 & Under	0	0	0	$ 0	$ 0	$ 0
25-29	12	42	54	62,244	164,200	226,444
30-34	85	309	394	495,997	1,618,573	2,114,570
35-39	146	565	711	1,188,061	3,973,871	5,161,932
40-44	167	639	806	1,740,919	4,656,957	6,397,876
45-49	172	676	848	2,465,336	5,312,150	7,777,486
50-54	182	847	1,029	2,360,233	7,179,286	9,539,519
55-59	197	1,073	1,270	2,747,435	8,467,434	11,214,869
60-64	202	1,204	1,406	1,845,609	8,084,205	9,929,814
65 & Up	93	417	510	513,912	1,780,840	2,294,752
Total	1,256	5,772	7,028	$ 13,419,746	$ 41,237,516	$ 54,657,262

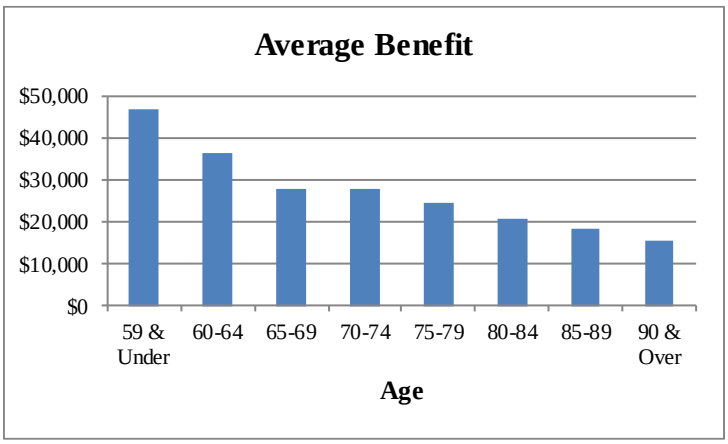




RETIRED MEMBERS
AS OF JULY 1, 2022

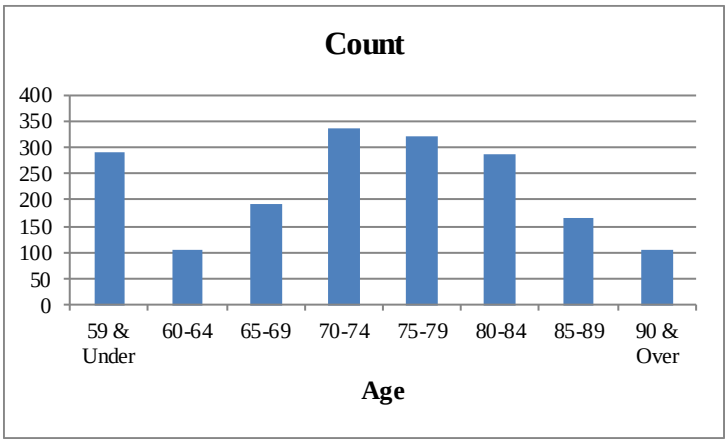
	Count			Annual Benefits		
Age	Male	Female	Total	Male	Female	Total
59 & Under	188	451	639	$ 9,931,946	$ 19,939,110	$ 29,871,056
60-64	617	1,877	2,494	26,629,657	63,907,649	90,537,306
65-69	1,404	4,433	5,837	47,204,642	114,825,015	162,029,657
70-74	1,914	5,233	7,147	65,477,120	133,838,086	199,315,206
75-79	1,594	3,201	4,795	49,227,262	68,598,712	117,825,974
80-84	881	1,841	2,722	25,191,245	31,488,876	56,680,121
85-89	416	1,094	1,510	10,639,368	16,920,411	27,559,779
90 & Over	178	670	848	4,074,674	9,190,178	13,264,852
Total	7,192	18,800	25,992	$ 238,375,914	$ 458,708,037	$ 697,083,951

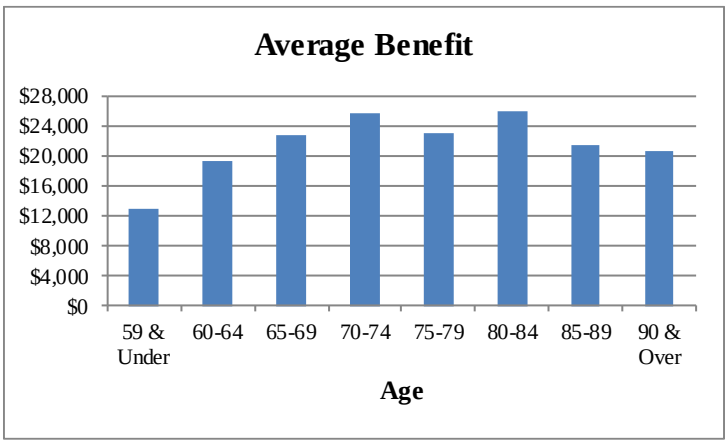




BENEFICIARIES RECEIVING BENEFITS
AS OF JULY 1, 2022

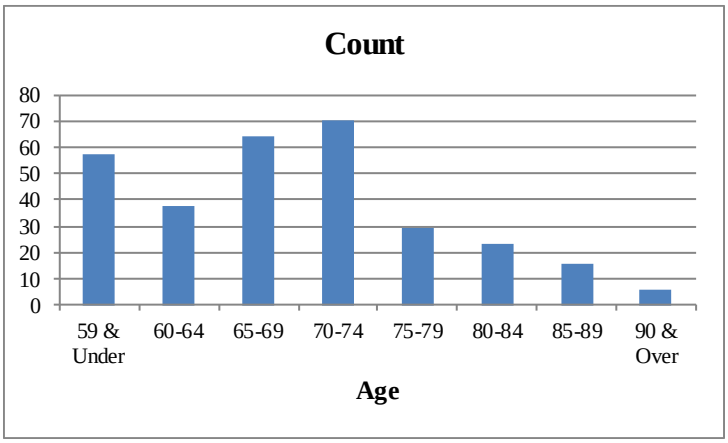
	Count			Annual Benefits		
Age	Male	Female	Total	Male	Female	Total
59 & Under	138	151	289	$ 1,491,301	$ 2,220,222	$ 3,711,523
60-64	47	59	106	794,758	1,261,554	2,056,312
65-69	71	120	191	1,452,983	2,892,784	4,345,767
70-74	137	198	335	3,087,620	5,533,183	8,620,803
75-79	111	209	320	2,108,224	5,219,079	7,327,303
80-84	85	200	285	1,599,358	5,781,002	7,380,360
85-89	39	127	166	622,075	2,921,220	3,543,295
90 & Over	17	90	107	266,594	1,939,333	2,205,927
Total	645	1,154	1,799	$ 11,422,913	$ 27,768,377	$ 39,191,290

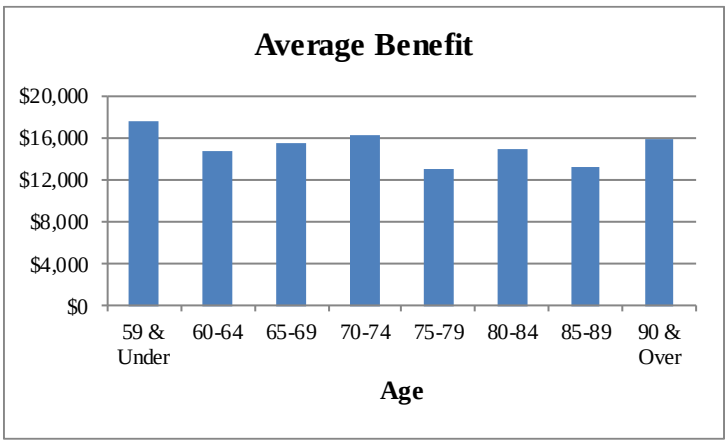




DISABLED MEMBERS
AS OF JULY 1, 2022

	Count			Annual Benefits		
Age	Male	Female	Total	Male	Female	Total
59 & Under	11	46	57	$ 217,475	$ 777,691	$ 995,166
60-64	15	23	38	220,108	340,060	560,168
65-69	19	45	64	237,222	752,045	989,267
70-74	23	47	70	348,131	784,910	1,133,041
75-79	8	21	29	126,741	251,446	378,187
80-84	9	14	23	119,794	221,171	340,965
85-89	4	12	16	71,606	140,142	211,748
90 & Over	2	4	6	19,298	76,299	95,597
Total	91	212	303	$ 1,360,375	$ 3,343,764	$ 4,704,139





Member	Any person employed by a public school 20 or more hours per week shall be a member of the system. Employees at the date of establishment could have elected not to participate, and those covered under another system do not participate. The Tier Two benefit structure covers members joining the System on or after July 1, 2013, but before July 1, 2017. The Tier Three benefit structure covers members joining the System on or after July 1, 2017, but before July 1, 2018. The Tier Four benefit structure covers members joining the System on or after July 1, 2018.
Participation Date	Date of becoming a member.
Definitions	
Final average earnings	The average of the three highest twelve-month periods of service during the period ending on the earlier of the participant's termination date or retirement date. For employees who become a member on or after July 1, 1996, earnings will be capped at the maximum earning defined in Code 401(a) (17). For Tier Two, Three and Four members, it is the average of the five highest twelve-month periods of service.
Fiscal year	Twelve-month period ending June 30.
Contributions	Members contribute 9.78% of pay. Such contributions are credited with interest based on the 1-year Treasury yield curve on July 1 of each year, as determined by State Statutes. The School Districts contribute at a rate equal to 101% of the members' rate. The State contributes 2% of pay, effective July 1, 2014 (previously 1%).
Monthly pension benefit	The greater of (1) or (2). (1) Amount: A monthly benefit equal to the sum of: (a) A savings annuity which is the actuarial equivalent of the member's accumulated contributions, and (b) A service annuity equal to $3.50 per year of service. (2) Amount: Members employed by a class I, II, III, IV, VI School District may receive a formula annuity. The formula annuity is a monthly amount equal to the product of 2.00% of final average earnings times total years of service for those members who are employed on or after July 1, 2001. To receive this benefit, retirement must occur after attaining age 65 or meeting the Rule of 85 requirements (minimum age is 55 for Tier One, Two and Three members and 60 for Tier Four members).

	An automatic annual cost-of-living adjustment (COLA) equal to the change in the CPI-W index, with a maximum increase of 2.5% in any one year is provided for current and future retirees. Also provided is a minimum floor benefit equal to 75% of the purchasing power of the original benefit. For Tier Two, Three and Four members, who are hired on or after July 1, 2013, an automatic cost-of-living adjustment (COLA) equal to the change in the CPI-W index, not to exceed 1.0% in any one year. No purchasing power COLA applies.
Normal Retirement Date (NRD)	First of month coinciding with or next following the attainment of age 65 and one-half year of service.
Service	Length of service includes all service as a school employee for which contributions have been made. This service only includes years for which the member was employed on at least a half-time basis, and includes declared emergency service in the armed forces, provided certain conditions are met. Special provisions allow credit for service prior to 1945 and for up to ten years of service in another State upon payment of the actuarial cost of the additional benefit granted.
Pensionable pay	Gross earnings subject to contributions.
Eligibility for Benefits	
Deferred vested	Termination for reasons other than death or disability retirement after completing five years of service.
Disability retirement	Retirement by reason of disability.
Early retirement	Retirement before NRD, as well as one of the following criteria: 1. Attaining age 60 and completing 5 years of service, 2. Attaining 35 years of service regardless of age, 3. For members hired before July 1, 2018, attaining age 55 and age plus service equals at least 85 (Rule of 85). 4. For members hired on or after July 1, 2018, attaining age 60 and age plus service equals at least 85 (Rule of 85).
Normal retirement	Retire on NRD.
Postponed retirement	Retire after NRD.
Pre-retirement spouse benefit	Death prior to retirement.
Monthly Benefits Payable	
Normal retirement	Monthly pension benefit determined as of NRD.

Early retirement	Monthly pension benefit determined as of early retirement date, reduced by 3% for each year that commencement of payment precedes age 65 (members must be age 60 with five years of service). Unreduced benefits are available to members who have met the applicable criteria for the Rule of 85. Benefits payable upon retirement prior to age 60 (based on the 35 year service rule) are actuarially reduced from age 65. The service annuity is a life annuity actuarially reduced before age 65. Actuarial reductions are based on the 1994 Group Annuity Mortality Table, 75% female, 25% male and 8% interest for members hired prior to July 1, 2017. For members hired on or after July 1, 2017, the Public Employees Retirement Board sets the actuarial assumptions used for actuarial reductions, with guidance from the System's actuary.
Postponed retirement	Monthly pension benefit determined as of actual retirement date.
Termination with deferred vested benefit	Monthly pension benefit determined as of termination date, reduced by 3% for each year that commencement of payment precedes age 65 (Early Commencement requires attainment of age 60).
Disability retirement	Monthly pension benefit determined as of disability retirement date.
Death with pre-retirement benefits	Survivor portion of 100% Joint and Survivor Annuity paid to spouse assuming retirement by member at death if the member is age 65 or has 20 years of service at death. If the member has met the 5-year vesting service requirement, has less than 20 years of service and is under age 65, the spouse may choose between the following two options: (1) a lump sum equal to the member's contributions with interest plus 101% of the member's contributions with interest, and (2) an annuity which equals the survivor portion of the 100% Joint and Survivor value of the member's accrued benefit, payable immediately, reduced for commencement before age 65 and the 100% joint and survivor form of payment.
Forms of payment	Pre-retirement death benefits are payable only as described above. Monthly pension benefits are paid under the form of payment elected by the retiree at retirement. Payment forms include: life annuity, 50% joint and survivor annuity, 75% joint and survivor annuity (spouse only), 100% joint and survivor annuity (spouse only), 5-year certain and life annuity, 10-year certain and life annuity, 15-year certain and life annuity, or a modified cash refund annuity. The normal form of payment for the formula annuity is a 5-year certain and life annuity. For members hired on or after July 1, 2017, the Public Employee Retirement Board sets the actuarial assumptions used to determine

the benefit amounts payable under optional forms of payment, with guidance from the System's actuary.

Funding Arrangement

Legislation enacted in 2002 created the School Retirement Fund. Balances existing on June 30, 2002 in the School Employers Deposit Account, the School Employees Savings Account, the Service Annuity Account, the Annuity Reserve Account, and the School Employees Retirement System Reserve Fund (RSRF) shall be combined and transferred into the School Retirement Fund.

There are four funds established in the State Treasury, which receive monies and pay the expenses and benefits of the retirement system, as follows:

1. School Retirement Fund – receives required deposits of the employers, the State, and employees. Upon retirement, the fund pays all savings annuities, service annuities, and formula annuities.

2. Contingent Account – receives all interest, dividends, and miscellaneous income, pays all regular interest allocated to the other accounts or funds, and meets any deficiencies occurring in the other accounts or funds.

3. Expense Fund – pays all expenses connected with the operation and administration of the system, and receives annual contributions to cover anticipated expenses.

4. Omaha Service Annuity Fund – pays service annuity benefits to Omaha members.

Benefits Reflected in Valuation

All benefits were valued, including future cost-of-living increases granted by statute.

Plan Provisions Effective after July 1, 2022

No future changes in plan provisions were recognized in determining the funded status or in determining the sufficiency of statutory contribution levels.

Changes in Plan Provisions Since the Prior Year

There have been no changes to the plan provisions since the prior year.

A. ACTUARIAL METHODS

1. **Calculation of Normal Cost and Actuarial Accrued Liability:** The method used to determine the normal cost and actuarial accrued liability was the Entry Age Actuarial Cost Method described below.

Entry Age Actuarial Cost Method

Projected pension and preretirement spouse's death benefits were determined for all active members under age 80. Cost factors designed to produce annual costs as a constant percentage of each member's expected compensation in each year from the assumed entry age to the assumed retirement age were applied to the projected benefits to determine the normal cost (the portion of the total cost of the plan allocated to the current year under the method). The normal cost is determined by summing intermediate results for active members under age 80 and determining an average normal cost rate which is then related to the total payroll of active members. The actuarial assumptions shown on the following page were used in determining the projected benefits and cost factors. The actuarial accrued liability for active members (the portion of the total cost of the plan allocated to prior years under the method) was determined as the excess of the actuarial present value of projected benefits over the actuarial present value of future normal costs.

The actuarial accrued liability for retired members and their beneficiaries currently receiving benefits, active members age 80 and over, terminated vested members and disabled members not yet receiving benefits was determined as the actuarial present value of the benefits expected to be paid. No future normal costs are payable for these members.

The actuarial accrued liability under this method at any point in time is the theoretical amount of the fund that would have been accumulated had annual contributions equal to the normal cost been made in prior years (it does not represent the liability for benefits accrued to the valuation date). The unfunded actuarial accrued liability is the excess of the actuarial accrued liability over the actuarial value of plan assets measured on the valuation date. Under this Entry Age method, experience gains or losses, i.e., decreases or increases in accrued liabilities attributable to deviations in experience from the actuarial assumptions, adjust the unfunded actuarial accrued liability.

The unfunded actuarial accrued liability is amortized using the "layered" approach. The unfunded actuarial accrued liability as of July 1, 2006 was the initial or legacy amortization base, amortized over a closed 30-year period. Changes in the unfunded actuarial accrued liability due to assumption changes or actuarial experience gains/losses are amortized over separate 25-year amortization bases, each with their own individual payment schedules, beginning June 30, 2021 and after. If the UAAL is less than or equal to zero, then all prior bases shall be considered fully funded and the UAAL shall be amortized over a 25-year period as of the actuarial valuation date. The UAAL amortization payment schedules are determined using the level percent of payroll methodology, where payments escalate annually with the assumed increase in payroll growth.

2. **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 as 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.

   The return to be spread is the difference between (1) the actual investment return on market value of assets and (2) the expected return of actuarial value of assets. Effective July 1, 2000, the expected return on actuarial value of assets includes interest on the previous year's unrecognized return.

B. VALUATION PROCEDURES

Data Procedures

Salaries for first year members are annualized by NPERS and reflected in the Calculated Salary field in the census data. This is used in the valuation process for new members. For continuing active members, the Accumulated Salary field from the data, representing the actual salary earned in the prior fiscal year, is used in the valuation process.

Active members who are missing a date of birth on their record are assumed to have been hired at age 35.

Members who are missing a gender are assumed to be female.

Other Valuation Procedures

The compensation amounts used in the projection of benefits and liabilities for active members were prior plan year compensations. Salary increases are assumed to apply to annual amounts.

Projected benefits were limited by the dollar limitation required by the Internal Revenue Code Section 415 as it applies to governmental plans and compensation limited by Section 401(a)(17).

Decrements are assumed to occur mid-year, except that immediate retirement is assumed for those who are at or above the age at which retirement rates are 100%. Standard adjustments are made for multiple decrements.

No actuarial accrued liability is included for participants who terminated without being vested prior to the valuation date, except those due a refund of contributions.

Changes in Methods and Procedures since the Prior Year

There have been no changes to the methods and procedures since the prior year.

ACTUARIAL ASSUMPTIONS

Economic Assumptions

1. Investment Return

7.20% per annum, compounded annually, net of expenses.
Note: This assumption will decrease by 0.10% per year until reaching the ultimate rate of 7.00% in the 2024 valuation.

2. Inflation

2.55% per annum, compounded annually
Note: This assumption will decrease by 0.10% per year until reaching the ultimate rate of 2.35% in the 2024 valuation.

3. Salary Increases

Rates vary by service. Sample rates are as follows:

	Rates by Service			
Years	Inflation	Productivity	Merit	Total
1	2.55%	0.50%	10.00%	13.05%
2	2.55	0.50	5.00	8.05
3	2.55	0.50	4.50	7.55
4	2.55	0.50	3.50	6.55
5	2.55	0.50	3.00	6.05
6	2.55	0.50	3.00	6.05
7	2.55	0.50	2.75	5.80
8	2.55	0.50	2.50	5.55
9	2.55	0.50	2.25	5.30
10	2.55	0.50	2.00	5.05
11	2.55	0.50	1.75	4.80
12	2.55	0.50	1.50	4.55
13	2.55	0.50	1.30	4.35
14	2.55	0.50	1.15	4.20
15	2.55	0.50	1.05	4.10
16	2.55	0.50	0.95	4.00
17	2.55	0.50	0.85	3.90
18	2.55	0.50	0.75	3.80
19	2.55	0.50	0.65	3.70
20	2.55	0.50	0.55	3.60
21	2.55	0.50	0.45	3.50
22	2.55	0.50	0.35	3.40
23	2.55	0.50	0.25	3.30
24-39	2.55	0.50	0.15	3.20
40+	2.55	0.50	0.00	3.05

Note: The inflation assumption will decrease by 0.10% per year until reaching the ultimate rate of 2.35% in the 2024 valuation.

4. Payroll Growth	3.05% per annum Note: This assumption will decrease by 0.10% per year until reaching the ultimate rate of 2.85% in the 2024 valuation.
5. Investment on Employee Contributions	2.50% per annum compounded annually.
6. Increase in Compensation And Benefit Limits	2.55% per annum on the 401(a)(17) compensation limit and 415 benefit limit Note: This assumption will decrease by 0.10% per year until reaching the ultimate rate of 2.35% in the 2024 valuation.

Demographic Assumptions

1. Mortality

a. Healthy lives - Active members	Pub-2010 General Members (Above Median) Employee Mortality Table (100% of male rates, 95% of female rates), both male and female rates set back one year, projected generationally using MP-2019 modified to 75% of the ultimate rates.
b. Healthy lives – Retired members	Pub-2010 General Members (Above Median) Retiree Mortality Table (100% of male rates, 95% of female rates), both male and female rates set back one year, projected generationally using MP-2019 modified to 75% of the ultimate rates.
c. Healthy lives – Beneficiaries	Pub-2010 General Members (Above Median) Contingent Survivor Mortality Table (100% of male rates, 95% of female rates), both male and female rates set back one year, projected generationally using MP-2019 modified to 75% of the ultimate rates.
d. Disabled lives	Pub-2010 Non-Safety Disabled Retiree Mortality Table (static table).

e. Healthy mortality rates and life expectancies are shown below at sample ages:

	Pre-retirement Mortality	
	Mortality Rate (Base Rates)	
Sample Age	Males	Females
20	0.04%	0.01%
30	0.04	0.01
40	0.07	0.03
50	0.11	0.06
60	0.27	0.16

	Post-retirement Mortality	
	Mortality Rate (Base Rates)	
Sample Age	Males	Females
50	0.11%	0.06%
60	0.53	0.35
70	1.17	0.80
80	3.60	2.60
90	11.73	9.07

	Projection Scale – Post-retirement Mortality					
	Scale (2020)		Scale (2030)		Scale (2040)	
Sample Age	Males	Females	Males	Females	Males	Females
50	0.0004	0.0030	0.0026	0.0036	0.0075	0.0075
60	0.0004	-0.0041	0.0063	0.0069	0.0075	0.0075
70	0.0017	0.0052	0.0069	0.0063	0.0075	0.0075
80	0.0067	0.0061	0.0066	0.0070	0.0075	0.0075
90	0.0048	0.0032	0.0067	0.0067	0.0069	0.0069

f. Disabled mortality rates and life expectancies are shown below at sample ages:

Sample Age	Males	Females
30	0.35%	0.26%
40	0.65	0.63
50	1.61	1.48
60	2.50	1.96
70	3.90	2.86
80	7.35	6.01

2. Retirement

Rates vary by age and eligibility for benefits.
Rates are as follows:

Retirement Rates When Eligible for Unreduced Benefits	
Age	Rate
<62	17%
62	24
63	24
64	24
65	30
66	38
67	35
68	25
69	25
70	30
71	30
72	25
73	25
74	25
75	25
76	30
77	30
78	30
79	30
80	100

Retirement Rates When Eligible for Reduced Benefits	
Age	Rate
60	5%
61	6
62	8
63	10
64	12

3. Termination

Rates vary by service.
Sample rates are as follows:

Rates by Service		
Years	Male	Female
<1	27.5%	31.7%
1	17.0	19.0
5	6.0	8.0
10	3.5	4.7
15	2.3	3.1
20	1.0	2.0
25+	1.0	1.0

4. Disability

Rates vary by age.
Sample rates are as follows:

Age	Male	Female
Under 35	0.00%	0.00%
35	0.02	0.01
40	0.02	0.01
45	0.03	0.03
50	0.05	0.04
55	0.07	0.06
60	0.10	0.08

Other Assumptions

1. Form of Payment

Service annuity – Life annuity
Formula annuity – Five year certain and life annuity.

Members who terminated vested are assumed to take a refund of contributions if it is more valuable than their deferred benefit.

For members who die with between 5 and 20 years of service before reaching age 65, their surviving spouse is assumed to take the lump sum benefit if it is more valuable than the annuity.

For inactive vested members who die with between 5 and 20 years of service before reaching age 65, their surviving spouse is assumed to take the lump sum benefit.

2. Actuarial Equivalence Basis for Members Hired After July 1, 2017
   a. Interest — 7.00%
   b. Mortality — Pub-2010 General members (Above Median) Retiree Mortality Table (100% of male rates, 95% of female rates), both male and female rates set back one year, projected to 2040 using MP-2019 modified to 75% of the ultimate rates using a 30% male, 70% female blend.

3. Marital Status
   a. Percent married — 85% married
   b. Spouse's age — Females assumed to be two years younger than males.

4. Administrative Expense — 0.16% of covered payroll

5. Commencement age for deferred vested benefit — Age 64

6. Cost of Living Adjustment	Service annuity – None Formula annuity – 2.10% per annum, compounded annually, for members hired before January 1, 2013. Note: This assumption will decrease by 0.05% per year until reaching the ultimate rate of 2.00% in the 2024 valuation. 1.00% per annum, compounded annually, for members hired on or after January 1, 2013.
7. State Contribution	State contributions for the current plan year are assumed to be contributed in a lump sum on the July 1 following the plan year end. These amounts from the prior plan year are treated as a contribution receivable on the plan's financial statements.

Changes in Assumptions since the Prior Year

At their meeting on December 21, 2020, the Public Employees Retirement Board adopted a new set of actuarial assumptions, based on the recommendations in the 2020 experience study. Changes to the set of economic assumptions are phased in over a four-year period, beginning with the July 1, 2021 valuation. Below is a summary of the key assumption changes in this valuation:

- Price inflation assumption was lowered from 2.65% to 2.55%.
- Investment return assumption was lowered from 7.30% to 7.20%.
- COLA assumption for Tier 1 members was lowered from 2.15% to 2.10%.
- General wage inflation assumption was lowered from 3.15% to 3.05%.
- Payroll growth assumption was lowered from 3.15% to 3.05%.

Actuarial Accrued Liability	The difference between the actuarial present value of system benefits and the actuarial value of future normal costs. Also referred to as "accrued liability" or "actuarial 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 single amount or series of amounts, computed on the basis of appropriate assumptions.
Actuarial Cost Method	A mathematical budgeting procedure for allocating the dollar amount of the actuarial present value of retirement system benefit between future normal cost and actuarial accrued liability. Sometimes referred to as the "actuarial funding method".
Experience Gain (Loss)	The difference between actual experience and 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 lump sum payment.
Normal Cost	The actuarial present value of retirement system benefits allocated to the current year by the actuarial cost method.
Unfunded Actuarial Accrued Liability	The difference between actuarial accrued liability and the valuation assets. Sometimes referred to as "unfunded actuarial accrued liability" or "unfunded accrued liability.