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NEBRASKA PUBLIC EMPLOYEES RETIREMENT SYSTEMS

2019
STATE EMPLOYEES' RETIREMENT SYSTEM CASH BALANCE BENEFIT FUND

Actuarial Valuation Results
as of January 1, 2019
for State Fiscal Year Ending June 30, 2021

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TABLE OF CONTENTS

Sections **Page**

May 10, 2019

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 performed an actuarial valuation of the State Employees' Retirement System Cash Balance Benefit Fund as of January 1, 2019 for the purpose of determining the actuarial required contribution rate for the 2019 plan year. It is our understanding that any additional required State contributions for this plan year will be made on July 1, 2020 (State fiscal year end 2021). The major findings of the valuation are contained in this report, which reflects the benefit provisions in place on January 1, 2019. There was no change to the actuarial assumptions, methods or plan provisions from the prior valuation.

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. Active member data was provided to us by Ameritas, the record-keeper for the Plan. We found this information to be reasonably consistent and comparable with information used in the prior report. 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 State Employees' Retirement System Cash Balance Benefit Fund have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of the Fund and reasonable expectations); and which, in combination, offer the best estimate of anticipated experience affecting the Fund. 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 them as indicated in Appendix C.

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

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

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

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, FCA, MAAA
Chief Actuary

This report presents the results of the January 1, 2019 actuarial valuation of the State Employees' Retirement System Cash Balance Benefit Fund (Plan). The primary purposes of performing the actuarial valuation are to:

- Determine if member contributions and State contributions, as defined in statute, are sufficient to meet the funding policy defined under Nebraska state statutes for the plan year ending December 31, 2019 and, if not, the additional State contribution needed.
- Disclose asset and liability measurements as well as the current funded status of the State Cash Balance Benefit Fund on the valuation date.
- Compare actual and expected experience under the State Cash Balance Benefit Fund during the plan year beginning January 1, 2018 and ended December 31, 2018.
- Evaluate and disclose the key risks to funding the State Cash Balance Benefit Fund pursuant to Actuarial Standard of Practice Number 51.
- Analyze and report on trends in State Cash Balance Benefit Fund contributions, assets and liabilities over the past several years.
- Quantify the contribution rate available for benefit improvements, if any.

The Nebraska statutes require the State to make an additional contribution if the regular, payroll-related contributions by members (4.80% of pay) and the State (156% of member contributions) are insufficient to meet the actuarial required contribution for the plan year. Based on the results of the January 1, 2019 actuarial valuation, the contributions defined by statute are more than sufficient to meet the actuarially required contribution. **Therefore, there is no additional State contribution for this plan year (due in the State fiscal year ending June 30, 2021).**

State statutes provide that the Board may grant a dividend if the unfunded actuarial accrued liability is less than zero and the dividend granted would not increase the actuarial contribution rate above ninety percent of the actual contribution rate. The PERB also has a policy that sets out additional criteria for granting a dividend which requires the Plan be at least 100% funded on both a Funded Basis and a Current Value Basis before and after the dividend is granted. **For the 2019 Plan year, the criteria have not been met and a dividend may not be granted.**

The actuarial valuation results provide a "snapshot" view of the State Cash Balance Benefit Fund's financial condition on January 1, 2019. The excess of actuarial assets over the actuarial accrued liability decreased from $63.6 million last year to $9.9 million this year and the funded ratio decreased from 104.24% to 100.61%. The actuarial required contribution rate increased from 9.60% of pay in last year's valuation to 10.34% of pay in the current valuation. Several factors impacted the January 1, 2019 actuarial valuation results, including:

- Actual experience on Plan assets. The rate of return on the market value of assets was – 4.2%, as reported to the Nebraska Investment Council, but due to the impact of asset smoothing, the rate of return on the actuarial value of assets was +5.9%. This was lower than the assumed rate of return of 7.50% for 2018. As a result, there was an experience loss on the actuarial value of assets of $24.4 million.

- Actual demographic experience on Plan liabilities. The net impact of all liability experience was an actuarial gain of $4.0 million. The single largest source of liability experience was a gain due to a lower interest credit in 2018 than assumed (5.00% actual vs. 6.25% assumed).

Due to unfavorable investment experience in 2018, the net deferred (unrecognized) investment gain of $70.4 million in last year's valuation (difference between the market and actuarial values of assets) is now a net deferred loss of $86.2 million in this year's valuation. The deferred experience will be recognized in the asset smoothing method over the next four years. Unless there is favorable experience to offset the deferred investment loss, the Plan's funded status is expected to decrease as the investment experience is recognized and the actuarial contribution rate is expected to increase.

A summary of the key results from the January 1, 2019 actuarial valuation is shown in the following table. As it indicates, the statutory contribution rates are sufficient to meet the actuarial required contribution rate and no additional State contribution is required. Further detail on the valuation results can be found in the following sections of this Board Summary.

	January 1, 2019 Valuation Results	January 1, 2018 Valuation Results
Unfunded Actuarial Accrued Liability/(Surplus)	($9,860,229)	($63,632,381)
Funded Ratio using Actuarial Assets	100.61%	104.24%
Normal Cost Rate	10.48%	10.52%
UAAL Amortization Rate	(0.14%)	(0.92%)
Total Actuarial Required Contribution	10.34%	9.60%
Member Contribution Rate	(4.80%)	(4.80%)
Employer Contribution Rate	(7.49%)	(7.49%)
Total Contribution Rate	(12.29%)	(12.29%)
Contribution Shortfall/(Margin)	(1.95%)	(2.69%)
Additional State Contribution Amount	$0	$0

EXPERIENCE FOR THE LAST PLAN YEAR

Numerous factors contributed to the change in the Plan's assets, liabilities, and the actuarial contribution rate between January 1, 2018 and January 1, 2019. The components are examined in the following discussion.

MEMBERSHIP

In total, the number of members (both active and inactive) increased about 4%, from 22,275 to 23,259. The number of active members increased about 1%, from 12,836 in the 2018 valuation to 12,950 in the 2019 valuation, so the majority of the increase in total count was due to an increase in inactive membership.

The number of members receiving benefit payments increased from 1,814 to 2,027. This increase of nearly 12% reflects the election of 139 active members who retired during 2018 to receive at least part of their benefit as monthly income, along with 78 inactive vested members. In addition, there were 34 members in the Defined Contribution Plan who elected to receive part/all of their benefit as monthly income. The Cash Balance Plan is relatively young, having been implemented in 2003 for new hires and existing active members who elected to change coverage. As a result, the number of retirees is still fairly low in comparison to a mature retirement plan. Therefore, the number of new retirees is high, as a percentage, and is likely to continue in the foreseeable future until the size of the retiree group increases and stabilizes. The ability for active members who retire to elect to receive the full value of their benefit as a lump sum also creates variability in the number of new retirees each year.

ASSETS

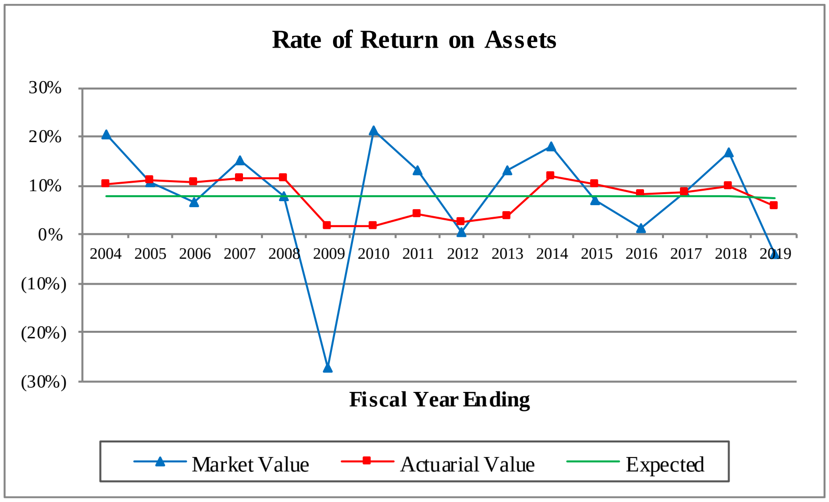
As of December 31, 2018, the State Employees' Retirement System Cash Balance Benefit Fund had net assets of $1.53 billion, when measured on a market value basis. This was a decrease of $103 million from the prior year. The market value of assets is not used directly in the calculation of the unfunded actuarial accrued liability or 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. The resulting amount is called the actuarial value of assets. In this year's valuation, the actuarial value of assets is $1.62 billion, an increase of $54 million 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, December 31, 2017	$	1,635.87	$	1,565.49
- Employer and Member Contributions	+	76.43	+	76.43
- Benefit Payments	-	121.91	-	121.91
- Administrative Expenses	-	1.40	-	1.40
- Transfers	+	7.74	+	7.74
- Net Investment Income	-	63.59	+	93.02
Net Assets, December 31, 2018	$	1,533.14	$	1,619.37
Estimated Rate of Return*		(4.2%)		5.9%

*Estimated rate of return for the Market Value basis is as reported by the Nebraska Investment Council.

The rate of return on the actuarial value of assets was 5.9%, which is lower than the assumed rate of return for 2018 of 7.50%. As a result, there was an experience loss on assets of $24.4 million. The difference between the market and actuarial value of assets of $86.2 million will be reflected over the next four years through the asset smoothing method if there are no offsetting gains from favorable investment experience.

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 (AAL) is that portion of the present value of future benefits that will not be paid by future normal costs. 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 the UAAL is reduced if the contributions to the State Cash Balance Benefit Fund exceed the normal cost for the year plus interest on the prior year's UAAL.

The unfunded actuarial accrued liability is shown as of January 1, 2019 in the following table:

	Actuarial Value of Assets	Market Value of Assets
Actuarial Accrued Liability	$1,609,507,057	$1,609,507,057
Value of Assets	1,619,367,286	1,533,143,166
Unfunded Actuarial Accrued Liability/(Surplus)	$ (9,860,229)	$ 76,363,891
Funded Ratio	100.61%	95.26%

Note that the funded ratio does not indicate whether or not the Plan has sufficient funds to settle all current obligations, nor is it necessarily indicative of the need for future funding.

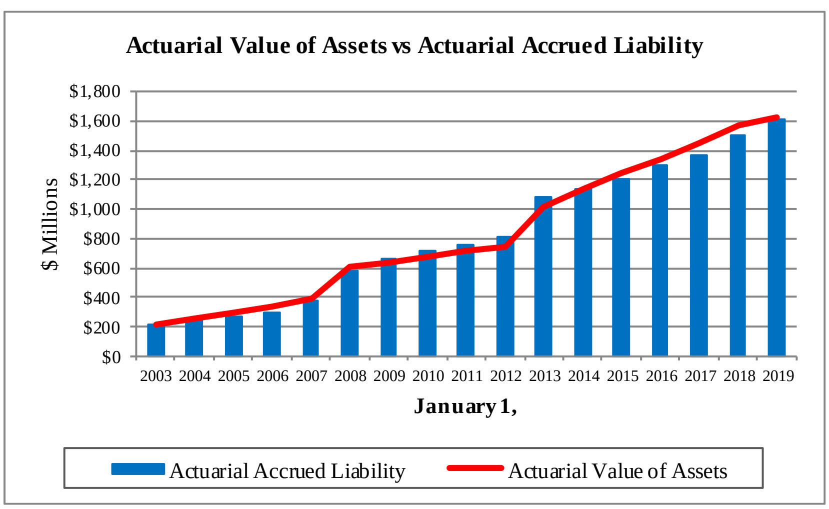
See Section 4 of the report for the detailed development of the UAAL.

The net decrease in the actuarial surplus (actuarial assets over actuarial liability) from January 1, 2018 to January 1, 2019 was $53.8 million. The components of this net change are shown in the following table (in millions):

	($ Millions)
Unfunded Actuarial Accrued Liability, January 1, 2018	($63.6)
- Expected change from amortization method	0.9
- Actual versus required contributions	(16.7)
- Investment experience	24.4
- Liability experience	(4.0)
- Dividend granted in 2018	56.3
- Other experience	(7.2)
Unfunded Actuarial Accrued Liability, January 1, 2019	($9.9)

As shown above, various components impacted the UAAL. Actuarial losses (gains), which result from actual experience that is less (more) 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 changes including dividends. As discussed earlier, the Plan experienced an actuarial loss on assets and a gain on liabilities. The largest single source of liability gain was from the actual interest credit of 5.00% for 2018 compared to the assumed rate of 6.25%. In total, the Plan experienced an actuarial loss of $20.4 million.

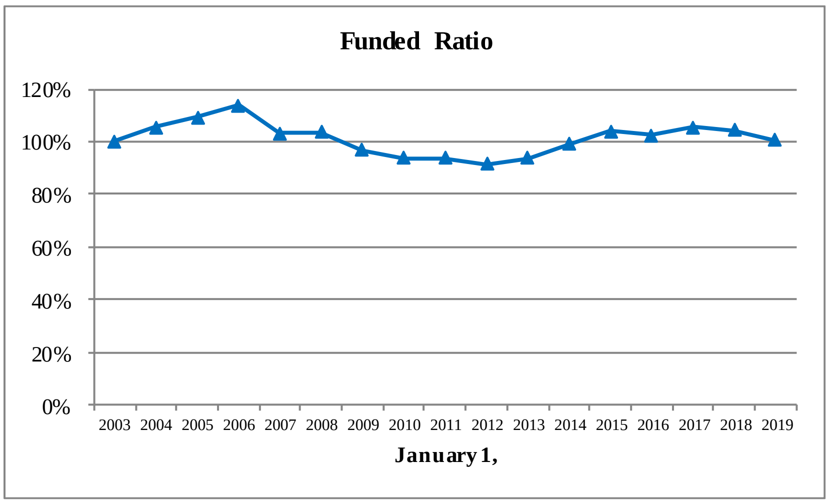
As shown in the following graph, the State Employees' Retirement System Cash Balance Benefit Fund liabilities have increased significantly along with the assets since the Plan began in 2003. The large increases observed in 2008 and 2013 reflect the transfer of members from the Defined Contribution Plan to the Cash Balance Plan due to new election periods provided by the legislature.



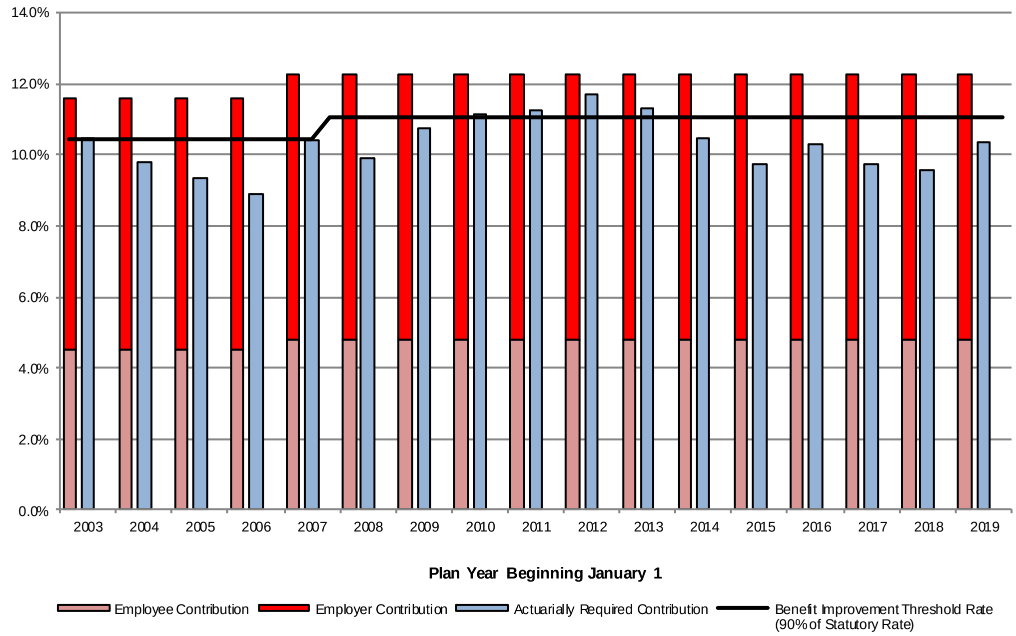
An evaluation of the UAAL on a pure dollar basis may not provide a complete analysis since only the difference between the assets and liabilities (which are both very large numbers) is reflected. Another way to evaluate the UAAL and the progress made in its funding is to track the funded ratio, the ratio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

	1/1/2015	1/1/2016	1/1/2017	1/1/2018	1/1/2019
Funded Ratio using Actuarial Assets	103.9%	102.5%	105.3%	104.2%	100.6%
Unfunded Actuarial Accrued Liability ($M)	($46.2)	($32.9)	($73.1)	($63.6)	($9.9)

The funded ratio over a longer period of years is shown in the following graph:



As a result of being 100% funded at the creation of the Plan in 2003 and contributing more than the actuarial required contribution in subsequent years (see the following graph), the funded ratio of the Plan has remained very strong during the entire period despite investment returns that were less than assumed in some years. Actual interest credits below the assumed rate during much of this period resulted in lower liabilities, thereby improving the funded ratio.



DIVIDEND DETERMINATION

Each year after the annual actuarial valuation results are received, the Board determines, based on the recommendation of the actuary, if a dividend can be paid. The amount of dividend, if any, is based on the criteria in the Board policy. **As the details on the following page disclose, the Board's criteria is not met and, therefore, no dividend may be granted in 2019.**

One of the criteria for granting a dividend is based on the Accumulated Benefit Obligation, a liability measurement based on the account balances for those not in pay status and the present value of future benefits as of the valuation date for those receiving benefits. This measure is intended to provide information regarding the Cash Balance Plan's funded status on an immediate, current-value basis and to provide comparability to individual account plans. This liability measure is not used in developing the funding numbers for the Plan, but it is used in determining the amount of dividend as well as whether a dividend can be granted. The Current Value funded ratio for the current and prior year is shown in the following table:

Funded Status		January 1, 2019		January 1, 2018
1. Cash Balance Accounts				
(a) Actives	$	944,477,460	$	917,663,513
(b) Inactives		281,725,422		247,306,580
(c) Total	$	1,226,202,882	$	1,164,970,093
2. Present Value of Benefits for Retirees and Beneficiaries		371,164,313		322,124,392
3. Total Accumulated Benefit Obligation	$	1,597,367,195	$	1,487,094,485
4. Market Value of Assets		1,533,143,166		1,635,873,881
5. Deficit/(Reserve) [3 - 4]	$	64,224,029	$	(148,779,396)
6. Funded Percentage on Market Value of Assets [4 / 3]		96.0%		110.0%

The criteria used to determine the amount of any dividend that can be granted includes:

A. The plan must maintain the 90% Benefit Threshold Rate after granting any dividend.

1. Statutory Contribution Rate (Total)	12.29%
2. Required Threshold for Benefit Improvement (90% of (1))	11.06%
3. Actuarial Required Contribution	10.34%
4. Rate Sufficiency/(Deficiency) [2 - 3]	0.72%

B. There must be a minimum 100% Funded Ratio on both the Funded Basis and the Current Value Basis, both before and after the dividend is granted.

January 1, 2019 Valuation Results Before Dividend:

	Funded Basis	**Current Value Basis**
(a) Liability	$1,609,507,057	$1,597,367,195
(b) Assets	1,619,367,286	1,533,143,166
(c) (Deficit)/Reserve [(b) - (a)]	$9,860,229	($64,224,029)
(d) Funded Ratio [(b) / (a)]	100.6%	96.0%

C. No dividend will be granted for a year where the annual interest credit rate exceeds the actuarial valuation rate.

D. The dividend plus the annual interest credit during the year cannot exceed 8.0% unless a majority of the PERB agrees.

State statutes provide that the Board may grant a dividend if the UAAL is less than zero (actuarial assets exceed actuarial liability) and the dividend granted would not increase the actuarial contribution rate above 90% of the statutory contribution rate. The actuarial required contribution rate of 10.34% of pay is less than 90% of the statutory contribution rate of 12.29%, or 11.06%. This difference of 0.72% of pay is potentially available for benefit improvements under state statutes, if the Plan's funded ratio exceeds 100%. In addition to the contribution rate requirement, the PERB's dividend policy also requires the funded ratio to exceed 100% on both the Funded Basis (actuarial accrued liability less actuarial assets) and a Current Value Basis (total accumulated benefit obligation less market value of assets). The January 1, 2019 actuarial valuation indicates that the funded ratios are 100.6% and 96.0%, respectively. **Therefore, the Plan has not met all of the requirements in the current valuation and a dividend may not be granted in 2019.** See Table 14 for more detail on the criteria for granting a dividend.

ACTUARIAL REQUIRED CONTRIBUTION RATE

The State Employees' Retirement System Cash Balance Benefit Fund is funded by statutory contribution rates for members (4.80% of pay) and the State (156% of the member rate). State statutes require the State to make an additional contribution if the regular, payroll-related contributions by employees and the State are insufficient to meet the actuarial required contribution for the plan year. The State contributions for the plan year, if any, are made on the July 1 following the plan year-end. Based on the results of the January 1, 2019 actuarial valuation, no additional State contribution is necessary for the current plan year.

Under the Entry Age Normal cost method, the actuarial contribution rate consists of two 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 "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 actuarial required contribution is equal to the normal cost rate plus an amortization payment on the UAAL. The amortization payment is the sum of the payments for each amortization base with payments over a 25-year period beginning on the date the base was established. If the UAAL is below zero, as is the case on January 1, 2019, all prior bases are considered to be fully funded and, therefore, are eliminated. See Section 5 of the report for the detailed development of the actuarial contribution rate, which is summarized in the following table:

Contribution Rates	January 1, 2019	January 1, 2018
Normal Cost Rate	10.48%	10.52%
UAAL Amortization Rate	(0.14%)	(0.92%)
Total Actuarial Required Contribution	10.34%	9.60%
Member Contribution Rate	(4.80%)	(4.80%)
Employer Contribution Rate	(7.49%)	(7.49%)
Total Contribution Rate	(12.29%)	(12.29%)
Contribution Shortfall/(Margin)	(1.95%)	(2.69%)

The actuarial required contribution rate for the current plan year is 10.34%. The member contribution rate of 4.80% and the State contribution rate of 7.49% (156% of 4.8%) result in a total statutory contribution rate of 12.29% of pay. As a result, a contribution margin of 1.95% exists for the 2019 plan year.

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

History of Expected State Contributions

Plan Year	State Contribution	Additional Contributions	Total
2004	$ 12,112,627	$ 0	$ 12,112,627
2005	13,618,155	0	13,618,155
2006	16,912,304	0	16,912,304
2007	24,266,326	0	24,266,326
2008	28,814,683	0	28,814,683
2009	32,461,469	0	32,461,469
2010	34,062,751	0	34,062,751
2011	33,645,530	0	33,645,530
2012	34,366,120	0	34,366,120
2013	37,486,962	0	37,486,962
2014	40,100,198	0	40,100,198
2015	41,715,205	0	41,715,205
2016	43,534,137	0	43,534,137
2017	45,159,444	0	45,159,444
2018	44,843,269	0	44,843,269
2019	45,579,800	0	45,579,800

Note: Information prior to Plan Year 2014 was produced by the prior actuary.

The actuarial required contribution rate, which is determined based on the snapshot of the Plan taken on the valuation date, will change each year as the deferred investment experience is recognized and other experience (both investment and demographic) impacts the Plan. 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 Fund 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 may be below the actuarial required contribution rate.

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 State Employees' Retirement System Cash Balance Benefit Fund.

SUMMARY OF PRINCIPAL RESULTS

		1/1/2019 Valuation		1/1/2018 Valuation	% Change
1. PARTICIPANT DATA					
Number of:					
Active Members		12,950		12,836	0.89%
Retired Members and Beneficiaries		2,027		1,814	11.74%
Disabled Members		0		0	N/A
Inactive Members		8,282		7,625	8.62%
Total Members		23,259		22,275	4.42%
Projected Annual Salaries of Active Members	$	608,704,588	$	598,868,441	1.64%
Annual Retirement Payments for Retired Members and Beneficiaries	$	37,937,345	$	33,149,488	14.44%
2. ASSETS AND LIABILITIES					
a. Market Value of Assets	$	1,533,143,166	$	1,635,873,881	(6.28%)
b. Actuarial Value of Assets		1,619,367,286		1,565,494,675	3.44%
c. Total Actuarial Accrued Liability		1,609,507,057		1,501,862,294	7.17%
d. Unfunded Actuarial Accrued Liability/(Surplus) [c - b]	$	(9,860,229)	$	(63,632,381)	(84.50%)
e. Funded Ratio (Actuarial Value of Assets) [b / c]		100.61%		104.24%	(3.48%)
f. Funded Ratio (Market Value of Assets) [a / c]		95.26%		108.92%	(12.54%)
3. CONTRIBUTION RATES AS A PERCENT OF PAYROLL					
Normal Cost		10.48%		10.52%	(0.38%)
Amortization of Unfunded Actuarial Accrued Liability		(0.14%)		(0.92%)	(84.78%)
Actuarial Required Contribution Rate		10.34%		9.60%	7.71%
Member Contribution Rate		(4.80%)		(4.80%)	0.00%
Employer Contribution Rate*		(7.49%)		(7.49%)	0.00%
Contribution Shortfall/(Margin)		(1.95%)		(2.69%)	(27.51%)
Additional State Contribution Amount	$	0	$	0	N/A

* 156% of member contribution rate

This report presents the actuarial valuation results of the State Employees' Retirement System Cash Balance Benefit Fund as of January 1, 2019. 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 State Employees' Retirement System Cash Balance Benefit Fund. Sections 4 and 5 describe how the obligations of the Plan are to be met under the actuarial cost method in use. Section 6 includes risk considerations related to the State Employees' Retirement System Cash Balance Benefit Fund. Section 7 includes other information for financial reporting.

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 January 1, 2019.
- Appendix C — A summary of the actuarial methods and assumptions used to estimate liabilities and determine contribution rates.
- Appendix D — A glossary of actuarial terms.

In many respects, an actuarial valuation can be thought of as an inventory process. The inventory is taken as of the actuarial valuation date, which for this valuation is January 1, 2019. On that date, the assets available for the payment of benefits are appraised. The assets are compared with the liabilities of the Plan, 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 Fund assets and liabilities.

Market Value of Assets

The current market value represents the "snapshot" or "cash-out" value of the Plan 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 of Plan assets at market value as of December 31, 2018 and December 31, 2017, in total and by investment category. Table 2 summarizes the change in the market value of assets from December 31, 2017 to December 31, 2018.

Actuarial Value of Assets

Neither the market value of assets, representing a "cash-out" value of State Employees' Retirement System Cash Balance Benefit Fund assets, nor the book values of assets, representing the cost of investments, may be the best measure of the Plan'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

STATE EMPLOYEES' RETIREMENT SYSTEM
CASH BALANCE BENEFIT FUND

MARKET VALUE OF ASSETS
by Investment Category

	December 31, 2018	December 31, 2017
1. Cash and Equivalents	$ 402,541	$ 187,659
2. Investments	1,585,959,440	1,681,212,716
3. Receivables and Prepaids	120,243,859	158,263,170
4. Accounts Payable	(173,462,674)	(203,789,664)
5. Net Assets Available for Pension Benefits [1 + 2 + 3 + 4]	$ 1,533,143,166	$ 1,635,873,881

TABLE 2

STATE EMPLOYEES' RETIREMENT SYSTEM
CASH BALANCE BENEFIT FUND

CHANGE IN MARKET VALUE OF ASSETS

		December 31, 2018		December 31, 2017
1. Beginning Market Value of Assets	$	1,635,873,881	$	1,416,086,648
2. Contributions				
(a) Member (includes purchased service)	$	29,854,372	$	29,127,571
(b) Employer		46,580,471		45,437,713
(c) State appropriations		0		0
(d) Total	$	76,434,843	$	74,565,284
3. Transfers Between Plans				
(a) From Defined Contribution Plans	$	7,735,118	$	3,591,366
(b) Between Cash Balance Plans		0		0
(c) Net Transfers	$	7,735,118	$	3,591,366
4. Receivable Transfer from Defined Contribution Benefit Fund	$	0	$	0
5. Expenditures				
(a) Benefit payments and refunds	$	121,911,299	$	94,358,979
(b) Administrative expenses		1,398,690		1,293,454
(c) Total	$	123,309,989	$	95,652,433
6. Net Investment Income	$	(63,590,687)	$	237,283,016
7. Ending Market Value of Assets [1 + 2(d) + 3(c) + 4 - 5(c) + 6]	$	1,533,143,166	$	1,635,873,881
8. Rate of Return on Market Value of Assets*		(4.2%)		16.8%

*Estimated rate of return for December 31, 2018 is as reported to the Nebraska Investment Council.

TABLE 3

STATE EMPLOYEES' RETIREMENT SYSTEM
CASH BALANCE BENEFIT FUND

DEVELOPMENT OF ACTUARIAL VALUE OF ASSETS

	Year End			
	12/31/2015	12/31/2016	12/31/2017	12/31/2018
1. Actuarial Value of Assets, Beginning of Year	$ 1,246,042,982	$ 1,337,161,184	$ 1,443,560,434	$ 1,565,494,675
2. Unrecognized Return Beginning of Year	$ 58,993,426	$ (26,710,146)	$ (27,473,786)	$ 70,379,206
3. Contributions During Year				
(a) Member	$ 27,798,721	$ 28,775,358	$ 29,127,571	$ 29,854,372
(b) Employer	43,339,706	44,894,300	45,437,713	46,580,471
(c) State appropriations	0	0	0	0
(d) Total	$ 71,138,427	$ 73,669,658	$ 74,565,284	$ 76,434,843
4. Net Transfers	$ 5,849,328	$ 5,115,400	$ 3,591,366	$ 7,735,118
5. Receivable Transfer from Defined Contribution Benefit Fund	$ 0	$ 0	$ 0	$ 0
6. Benefit Payments During Year	$ 85,278,057	$ 84,773,402	$ 94,358,979	$ 121,911,299
7. Expected Investment Income on (1), (2), (3), (4) and (6) at 7.50%*	$ 100,825,067	$ 101,332,237	$ 109,130,590	$ 121,300,827
8. Actual Return on Market Value, Net of All Expenses	$ 13,704,932	$ 111,623,954	$ 235,989,562	$ (64,989,377)
9. Return to be Spread, End of Year [8 - 7]	$ (87,120,135)	$ 10,291,717	$ 126,858,972	$ (186,290,204)

*7.75% for Year End 12/31/2017 and prior.

TABLE 3
(continued)

STATE EMPLOYEES' RETIREMENT SYSTEM
CASH BALANCE BENEFIT FUND

8. Return to be Spread

Year	Return to be Spread	Unrecognized Percent	Unrecognized Return
2018	($186,290,204)	80%	($149,032,163)
2017	126,858,972	60%	76,115,383
2016	10,291,717	40%	4,116,687
2015	(87,120,135)	20%	(17,424,027)
			($86,224,120)

9. Total Market Value of Assets as of January 1, 2019	$1,533,143,166
10. Total Actuarial Value of Assets as of January 1, 2019 [9 - 8]	$1,619,367,286
11. Asset Ratios	
(a) Actuarial Value to Market Value [10 / 9]	105.62%
(b) Market Value to Actuarial Value [9 / 10]	94.68%

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 State Employees' Retirement System Cash Balance Benefit Fund as of the valuation date, January 1, 2019. In this section, the discussion will focus on the commitments (future benefit payments) of the Plan, which are referred to as its liabilities.

Table 4 contains an analysis of the actuarial present value of all future benefits (PVFB) for contributing members, inactive members, retirees and their beneficiaries.

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

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

Actuarial Accrued Liability

A fundamental principle in financing the liabilities of a 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 State Employees' Retirement System Cash Balance Benefit Fund. By statute, the Entry Age Normal actuarial cost method is used to develop the actuarial accrued liability.

TABLE 4

STATE EMPLOYEES' RETIREMENT SYSTEM
CASH BALANCE BENEFIT FUND

PRESENT VALUE OF FUTURE BENEFITS (PVFB)
AS OF JANUARY 1, 2019

1. Active Employees		
(a) Retirement	$	1,156,495,186
(b) Withdrawal		217,852,298
(c) Death		24,431,082
(d) Total	$	1,398,778,566
2. Inactive Vested Members		272,329,508
3. Inactive Nonvested Members		9,395,914
4. Disabled Members		0
5. Retirees		358,050,932
6. Beneficiaries		13,113,381
7. Total Present Value of Future Benefits [1(d) + 2 + 3 + 4 + 5 + 6]	$	2,051,668,301

TABLE 5

STATE EMPLOYEES' RETIREMENT SYSTEM
CASH BALANCE BENEFIT FUND

ACTUARIAL ACCRUED LIABILITY
AS OF JANUARY 1, 2019

1. Present Value of Future Benefits for Active Members	$	1,398,778,566
2. Present Value of Future Normal Costs for Active Members	$	442,161,244
3. Actuarial Accrued Liability for Active Members [1 - 2]	$	956,617,322
4. Actuarial Accrued Liability for Inactive Members	$	652,889,735
5. Total Actuarial Accrued Liability [3 + 4]	$	1,609,507,057
6. Actuarial Value of Assets	$	1,619,367,286
7. Unfunded Actuarial Accrued Liability/(Surplus) [5- 6]	$	(9,860,229)

TABLE 6

STATE EMPLOYEES' RETIREMENT SYSTEM
CASH BALANCE BENEFIT FUND

ACTUARIAL BALANCE SHEET

ASSETS				
Actuarial Value of Assets			$	1,619,367,286
Unfunded Actuarial Accrued Liability/(Surplus)				(9,860,229)
Present Value of Future Normal Costs			$	442,161,244
Total Assets			$	2,051,668,301
LIABILITIES				
Present Value of Future Benefits				
Active members				
Retirement	$	1,156,495,186		
Withdrawal		217,852,298		
Death		24,431,082		
Total			$	1,398,778,566
Inactive members				281,725,422
Retirees, disabilities and beneficiaries				371,164,313
Total Liabilities			$	2,051,668,301

TABLE 7

STATE EMPLOYEES' RETIREMENT SYSTEM
CASH BALANCE BENEFIT FUND

ACTUARIAL GAIN/(LOSS)

Liabilities			
1.	Actuarial Accrued Liability as of January 1, 2018	$	1,501,862,294
2.	Normal Cost During 2018		56,801,033
3.	Benefit Payments During Plan Year Ending December 31, 2018		(121,911,299)
4.	Transfers from Defined Contribution Plan		7,735,118
5.	Interest on Items 1 - 4 at 7.50%		112,695,546
6.	Dividend Granted in 2018		56,311,516
7.	Expected Actuarial Accrued Liability as of January 1, 2019	$	1,613,494,208
8.	Actuarial Accrued Liability as of January 1, 2019	$	1,609,507,057
Assets			
9.	Actuarial Value of Assets as of January 1, 2018	$	1,565,494,675
10.	Contributions During Plan Year Ending December 31, 2018		76,434,843
11.	Benefit Payments During Plan Year Ending December 31, 2018		(121,911,299)
12.	Transfers from Defined Contribution Plan		7,735,118
13.	Interest at 7.50%		116,022,387
14.	Expected Actuarial Value of Assets as of January 1, 2019	$	1,643,775,724
15.	Actuarial Value of Assets as of January 1, 2019	$	1,619,367,286
Gain / (Loss)			
16.	Actuarial Gain / (Loss) on Liabilities [7 - 8]	$	3,987,151
17.	Actuarial Gain / (Loss) on Assets [15 - 14]	$	(24,408,438)
18.	Total Actuarial Gain / (Loss) for Plan Year Ending December 31, 2018 [16 + 17]	$	(20,421,287)

TABLE 8

STATE EMPLOYEES' RETIREMENT SYSTEM
CASH BALANCE BENEFIT FUND

GAIN/(LOSS) ANALYSIS BY SOURCE

Liability Sources		Gain/(Loss)
Retirement	$	(2,721,000)
Termination		101,000
Disability		0
Mortality		455,000
Salary		158,000
New Entrants/Rehires		(6,017,000)
Interest Credit		11,801,000
DC Transfers Upon Retirement		1,968,000
Miscellaneous		(1,758,000)
Total Liability Gain/(Loss)	$	3,987,000
Asset Gain/(Loss)	$	(24,408,000)
Net Actuarial Gain/(Loss)	$	(20,421,000)

TABLE 9

STATE EMPLOYEES' RETIREMENT SYSTEM
CASH BALANCE BENEFIT FUND

PROJECTED BENEFIT PAYMENTS
AS OF JANUARY 1, 2019

Plan Year Ending December 31,	Active Employees	Retired and Disabled Members and Beneficiaries	Total
2019	$ 74,737,000	$ 38,144,000	$ 112,881,000
2020	80,529,000	37,857,000	118,386,000
2021	85,612,000	37,349,000	122,961,000
2022	88,687,000	36,807,000	125,494,000
2023	91,842,000	36,281,000	128,123,000
2024	94,480,000	35,878,000	130,358,000
2025	95,249,000	35,116,000	130,365,000
2026	97,032,000	34,396,000	131,428,000
2027	99,283,000	33,760,000	133,043,000
2028	100,469,000	32,768,000	133,237,000
2029	101,735,000	31,935,000	133,670,000
2030	102,923,000	30,902,000	133,825,000
2031	103,884,000	29,798,000	133,682,000
2032	105,515,000	28,523,000	134,038,000
2033	107,015,000	26,986,000	134,001,000
2034	109,125,000	25,411,000	134,536,000
2035	111,499,000	23,676,000	135,175,000
2036	114,230,000	22,103,000	136,333,000
2037	116,266,000	20,745,000	137,011,000
2038	118,215,000	18,926,000	137,141,000
2039	120,634,000	17,343,000	137,977,000
2040	123,003,000	15,994,000	138,997,000
2041	125,562,000	14,606,000	140,168,000
2042	128,374,000	13,199,000	141,573,000
2043	131,502,000	11,796,000	143,298,000
2044	134,518,000	10,419,000	144,937,000
2045	137,397,000	9,088,000	146,485,000
2046	139,788,000	7,825,000	147,613,000
2047	142,543,000	6,646,000	149,189,000
2048	144,271,000	5,565,000	149,836,000

Note: Cash flows are the expected future non-discounted payments to current members. These amounts assume members terminating before retirement eligibility will elect a lump sum distribution of their cash balance account. 50% of members eligible for retirement will elect a monthly annuity, payable for life with 5 years certain, and 50% will elect a lump sum distribution of their cash balance account. These numbers exclude refund payouts to any current vested or nonvested inactives.

The previous two sections were devoted to a discussion of the assets and liabilities of the State Employees' Retirement System Cash Balance Benefit Fund. 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 January 1, 2019 actuarial valuation will be used to determine the actuarial required employer contribution rate to the State Employees' Retirement System Cash Balance Benefit Fund for the plan year ending December 31, 2019. Any additional State contributions are expected to be deposited on July 1, 2020 (State fiscal year 2021). 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/(surplus), as of January 1, 2019, is developed. Table 11 develops the actuarial required contribution rate for the State Employees' Retirement System Cash Balance Benefit Fund and the amount of any additional 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

STATE EMPLOYEES' RETIREMENT SYSTEM
CASH BALANCE BENEFIT FUND

SCHEDULE OF AMORTIZATION BASES

Amortization Bases	Original Amount	January 1, 2019 Remaining Payments	Date of Last Payment	Outstanding Balance as of January 1, 2019	Annual Contribution*
2019 Unfunded Actuarial Accrued Liability Base	(9,860,229)	25	1/1/2044	(9,860,229)	(853,153)
Total				**$ (9,860,229)**	**$ (853,153)**

* Contribution amount reflects mid-year timing.

1. Total UAAL Amortization Payments	$	(853,153)
2. Projected Payroll for 2019 Plan Year	$	608,704,588
3. UAAL Amortization Payment Rate		(0.14%)

Per State Statute Sect. 84-1319 (4)(b), because the UAAL as of January 1, 2019 is zero or less than zero, all prior amortization bases are considered fully funded and the UAAL is reinitialized.

TABLE 11

STATE EMPLOYEES' RETIREMENT SYSTEM
CASH BALANCE BENEFIT FUND

ACTUARIAL REQUIRED CONTRIBUTION RATE
and
DEVELOPMENT OF ADDITIONAL STATE CONTRIBUTION

1. Normal Cost		
(a) Amount	$	57,538,583
(b) Expected pay for current actives		548,989,012
(c) Normal Cost Rate as % of pay		10.48%
2. Amortization Cost		
(a) Amount		(853,153)
(b) Expected pay for all actives		608,704,588
(c) Amortization Rate as % of pay		(0.14%)
3. Total Actuarial Required Contribution Rate [1(c) + 2(c)]		10.34%
4. Statutory Contribution Rates		
(a) Member		4.80%
(b) Employer (156% of Member)		7.49%
(c) Total		12.29%
5. Additional Required State Contribution [3 - 4(c), not less than 0.00%]		0.00%
6. Expected pay for all actives during 2019		608,704,588
7. Additional Required State Contribution for FYE 2021 [5 * 6 * $1.075^{.5}$, but not less than 0]	$	0

TABLE 12

STATE EMPLOYEES' RETIREMENT SYSTEM
CASH BALANCE BENEFIT FUND

HISTORICAL CONTRIBUTION RATES

Plan Year	Statutory Contribution Rate Employee	Employer	Total	Actuarial Rate	Margin/ (Shortfall)
2003	4.54%	7.08%	11.62%	10.47%	1.15%
2004	4.53%	7.07%	11.60%	9.78%	1.82%
2005	4.53%	7.07%	11.60%	9.37%	2.23%
2006	4.54%	7.08%	11.62%	8.92%	2.70%
2007	4.80%	7.49%	12.29%	10.40%	1.89%
2008	4.80%	7.49%	12.29%	9.92%	2.37%
2009	4.80%	7.49%	12.29%	10.77%	1.52%
2010	4.80%	7.49%	12.29%	11.17%	1.12%
2011	4.80%	7.49%	12.29%	11.28%	1.01%
2012	4.80%	7.49%	12.29%	11.70%	0.59%
2013	4.80%	7.49%	12.29%	11.32%	0.97%
2014	4.80%	7.49%	12.29%	10.45%	1.84%
2015	4.80%	7.49%	12.29%	9.72%	2.57%
2016	4.80%	7.49%	12.29%	10.30%	1.99%
2017	4.80%	7.49%	12.29%	9.73%	2.56%
2018	4.80%	7.49%	12.29%	9.60%	2.69%
2019	4.80%	7.49%	12.29%	10.34%	1.95%

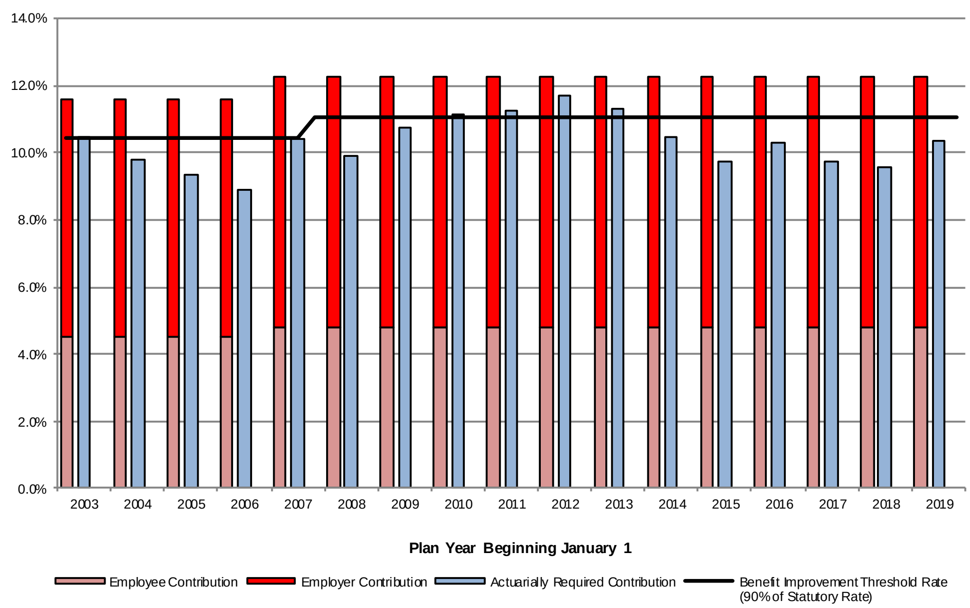


TABLE 13

STATE EMPLOYEES' RETIREMENT SYSTEM
CASH BALANCE BENEFIT FUND

FUNDING EXCESS AVAILABLE FOR
BENEFIT IMPROVEMENT

1. Total Statutory Contribution Rate		12.29%
2. Benefit Improvement Threshold Rate (90% of (1))		11.06%
3. Actuarially Required Contribution Rate		10.34%
4. Unfunded Actuarial Accrued Liability	$	(9,860,229)
5. Requirements for Using Excess for Benefit Improvements		
a. Rate Sufficiency: (3) < (2)		Yes
b. No UAAL: (4) < 0		Yes
6. Funding Excess Available for Benefit Improvements		
As a rate of Pay: (2) - (3), not less than 0%		0.72%

TABLE 14

STATE EMPLOYEES' RETIREMENT SYSTEM
CASH BALANCE BENEFIT FUND

DIVIDEND DETERMINATION

Each year after the annual actuarial valuation results are received, the Board determines, based on the recommendation of the actuary, if a benefit improvement can be made. If it is determined that the benefit improvement should be a dividend payment to individual member Cash Balance accounts and that sufficient reserves exist, the dividend granted must meet the following criteria:

A. The plan must maintain the 90% Benefit Threshold Rate after granting any dividend.
B. There must be a minimum 100% Funded Ratio on both the Funded Basis and the Current Value Basis, both before and after the dividend is granted.
C. No dividend will be granted for a year where the annual interest credit rate exceeds the actuarial valuation interest rate.
D. The dividend plus the annual interest credit during the year cannot exceed 8.0% unless a majority of the PERB agrees.

	Funded Basis	Current Value Basis
1. January 1, 2019 Valuation Results Before Dividend:		
(a) Liability	$1,609,507,057	$1,597,367,195
(b) Assets	1,619,367,286	1,533,143,166
(c) (Deficit)/Reserve [(b) - (a)]	$9,860,229	($64,224,029)
2. Amount Available for Dividend (Lesser of 1(c) on Funded Basis or Current Value Basis)		$0
3. Account Balances as of December 31, 2018		$1,226,202,882
4. Maximum Dividend [2 / 3]		0.00%
5. Annual Interest Credit for 2018		5.00%
6. 2018 Interest Credit Plus Maximum Dividend [4 + 5]		5.00%
7. January 1, 2019 Valuation Results After Maximum Dividend:		
(a) Actuarial Contribution Rate		10.34%
(b) Benefit Improvement Threshold Rate		11.06%
(c) Is (a) < (b)? **[Criteria A]**		**Yes**
(d) Funded Ratio on a Funded Basis		100.6%
(e) Funded Ratio on a Current Value Basis		96.0%
(f) Are (d) and (e) both at least 100%? **[Criteria B]**		**No**
8. Is (5) < actuarial assumed interest rate (7.50%)? **[Criteria C]**		**Yes**
9. Is (6) greater than 8.00%? **[Criteria D]** - Any dividend over 3.00% can only be granted if the majority of the PERB agrees.		**No**

Actuarial Standards of Practice are issued by the Actuarial Standards Board and are binding on credentialed actuaries practicing in the United States. These standards generally identify what the actuary should consider, document and disclose when performing an actuarial assignment. In September, 2017, Actuarial Standard of Practice Number 51, *Assessment and Disclosure of Risk in Measuring Pension Obligations*, (ASOP 51) was issued as final with application to measurement dates on or after November 1, 2018. This ASOP, which applies to funding valuations, actuarial projections, and actuarial cost studies of proposed plan changes, is first applicable for the January 1, 2019 actuarial valuation for the State Employees' Retirement System Cash Balance Benefit Fund (System).

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. ASOP 51 defines risk as the potential of actual future measurements to deviate from expected results due to actual experience that is different than the actuarial assumptions.

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

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

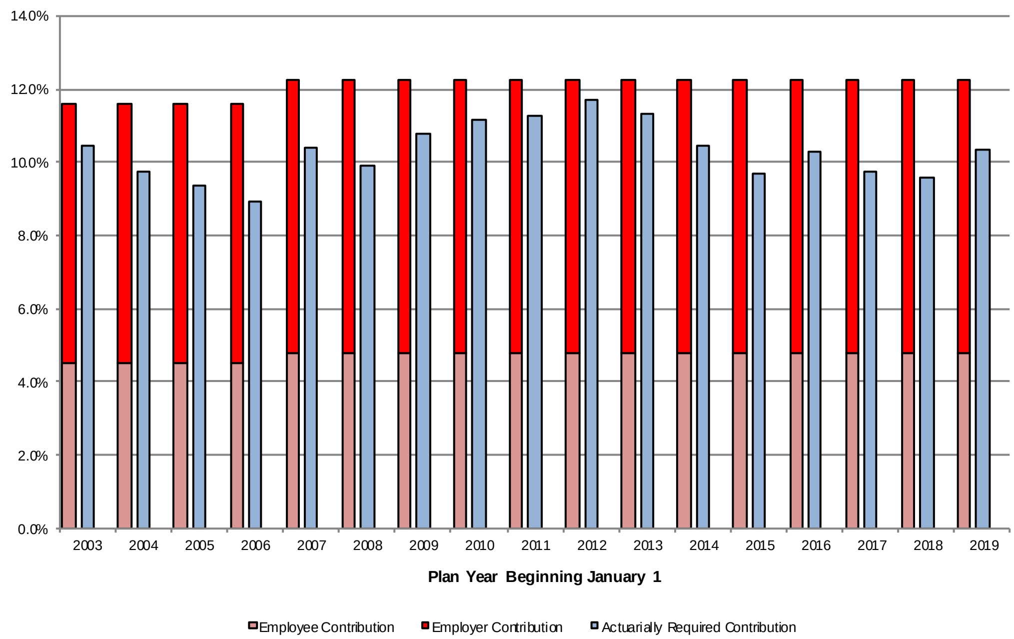
- economic risks, such as investment return and price inflation;
- demographic risks such as mortality, payroll growth, aging population including impact of baby boomers, and retirement ages;
- contribution risk, i.e., the potential for contribution rates to be too high for the plan sponsor/employer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

The Nebraska State Cash Balance Benefit Fund is somewhat unique in the public pension arena as there are very few standalone Cash Balance Plans that are sponsored by governmental employers. Most public defined benefit plans are traditional final average pay plans. The State Cash Balance Plan was created in 2003. Participants in the State Defined Contribution Plan at that time were allowed to elect coverage in the Cash Balance Plan and all new members became participants in the Cash Balance Plan. If members of the Defined Contribution Plan elected coverage in the Cash Balance Plan, their account balance in the Defined Contribution Plan was transferred to the Cash Balance Plan. As a result, the Cash Balance Plan was fully funded at inception, i.e., no unfunded actuarial accrued liability existed. In addition, the fixed employee and employer contribution rates at that time were higher than the actuarial contribution rate. As a result, the funded status of the Cash Balance Plan has remained very strong even with investment returns that have, at times, been lower than the actuarial assumption.

The following discussion addresses the qualitative analysis of key risks to funding the Plan.

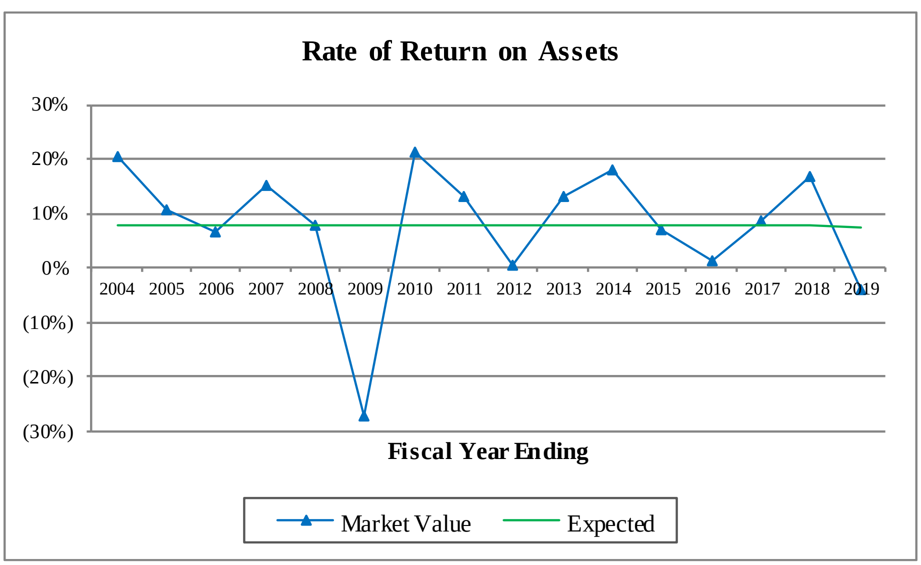
Actual vs Actuarial Contributions

There is a direct correlation between healthy, well-funded retirement plans and consistent contributions at least equal to the full actuarial contribution rate each year. The employee and employer contribute a fixed contribution rate, set by statute. If those contribution rates are insufficient to fund the full actuarial contribution rate, the State is required by statute to make an additional contribution. Since the Plan was created, no additional State contributions have been necessary, but the statutory requirement to fund the full actuarial contribution rate is a very strong positive factor in evaluating the risk associated with the Plan's future funding. As the following graph shows, the Plan has consistently contributed more than the actuarial contribution rate since inception in 2003.



Investment Return Risk

The most significant risk factor for the State Employees' Retirement System Cash Balance Benefit Fund is investment return because of the volatility of annual returns and the size of plan assets compared to payroll (see Table 15). A perusal of historical returns reveals that the actual return each year is rarely close to the average return for the same period and often varies significantly from the expected return.



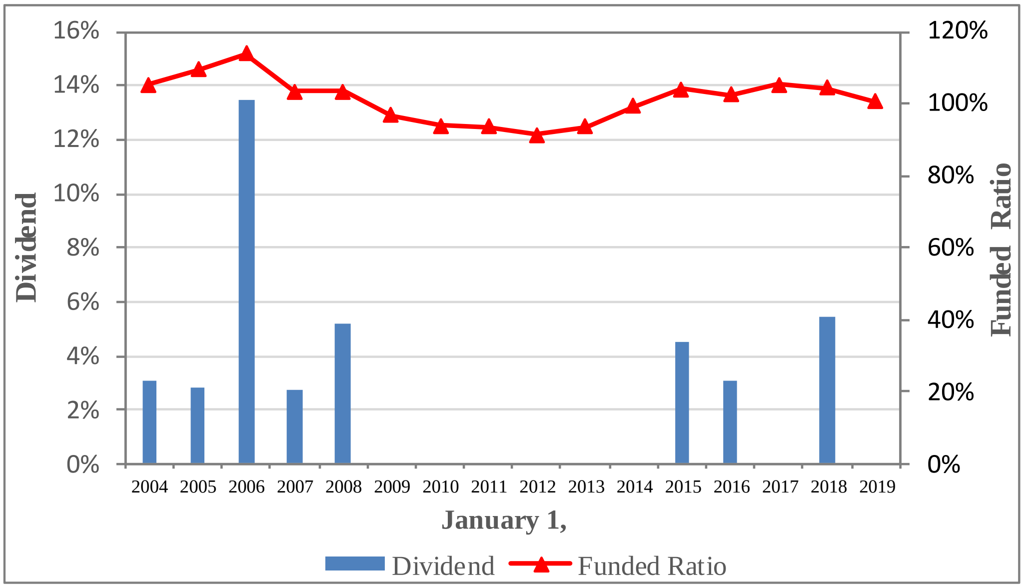
This volatility is to be expected, given the underlying capital market assumptions and the Plan's asset allocation. However, that volatility in investment returns can lead to volatility in the actuarial contribution rate. The Plan uses an asset smoothing method that recognizes the difference between the actual and expected return on the market value of assets equally over five years. As that experience is recognized, the resulting actuarial gain/loss is amortized over 25 years. These actuarial methodologies help to mitigate the impact of the investment volatility, but movement in the actuarial contribution rate can still be significant if there is a large difference between the actual and expected return (such as occurred in 2008) or lower/higher than expected returns over a long, sustained period. However, one important consideration that has an offsetting impact on the impact of investment volatility is the dividend policy for the Nebraska State Cash Balance Plan. If returns are significantly below the expected return (in one year or over a period of years), the funded ratio of the Plan will decline. To the extent the funded ratio drops below 100%, no dividend will be granted by the Board (see discussion below for more details). This will tend to reduce the liabilities and have a positive impact on the Plan's funding and the actuarial contribution rate.

Interest Credits

As a cash balance plan design, the plan provisions include the basis for the interest crediting rate that is paid on members' account balances each year. The interest crediting rate for the State Cash Balance Plan is variable since it is defined as the greater of (1) federal mid-term rate plus 1.5% or (2) 5.0%. The interest crediting rate will impact each member's account balance and, therefore, the benefit actually paid from the system.

Often when investment returns are low, interest rates may also be low (as has been the case over the last ten years). As a result, the actual interest credits made to participant account balances have been lower than the long-term assumption used in the actuarial valuation. When this occurs, an actuarial gain is generated which tends to partially offset the actuarial loss due to investment returns.

In addition to the statutory interest crediting rate, the law provides that additional interest credits (called "dividends") may be credited to participant accounts under certain circumstances. The Nebraska State Cash Balance Plan has several guardrails in place to protect the funded status of the State Cash Balance Plan while providing benefit improvements to participants when appropriate. First, statutorily no benefit improvement can be granted unless the Plan is more than 100% funded and any improvement cannot result in an actuarial contribution rate that is more than 90% of the statutory contribution rate (employee plus employer). This requirement ensures that a contribution margin will still exist after the benefit improvement is granted. The Board's Dividend Policy sets additional criteria that must be met before a dividend maybe granted, with the intent of protecting the Plan's funding. The key requirement is that the Plan must be at least 100% funded, <u>after the dividend is granted</u>, on both a funded basis (actuarial assets/actuarial liability) and on a current value basis (market value of assets/market value of liabilities). These policies have served the State Cash Balance Plan well as dividends have been granted in eight of the last 15 years, but the Plan remains fully funded on an actuarial basis.



Demographic Risks

Mortality

A key demographic risk for all retirement systems, including the State Employees' Retirement System, is improvements in mortality (longevity) greater than anticipated. While the actuarial assumptions reflect small, continuous improvements in mortality experience over time and these assumptions are refined every experience study, the risk arises because there is a possibility of some sudden shift, perhaps from a significant medical breakthrough that could quickly increase liabilities. Likewise, there is some possibility of a significant public health crisis that could result in a significant number of additional deaths in a short time period, which would also be significant, although more easily absorbed. While either of these events could happen, it represents a small probability and thus represents much less risk than the volatility associated with investment returns. The fact that a portion of Plan liability is paid as a lump sum minimizes the mortality risk for this Plan compared to more traditional plans with a final average pay plan design.

Retirement Age and Election of Form of Payment

For traditional final average pay defined benefit plans, the age at which members elect to retire can create significant actuarial gains/losses especially when there is subsidized early retirement benefits. For a cash balance plan, retirement at an earlier age automatically results in a lower benefit. The account value is smaller and the annuity factor is large so the resulting benefit amount (account value divided by the annuity factor) is smaller. Essentially, the value of benefit is about the amount in the member's cash balance account. As a result, retirement age is not a significant risk for most cash balance plans.

The plan provisions of the State Cash Balance Plan provide that a member may elect to receive a full lump sum at retirement, an annuity (monthly benefit) based on the full account balance, or a combination of the two (partial lump sum and a reduced monthly benefit). If a member elects to receive a lump sum at retirement, the liability at that time is the lump sum payable and all future risk is removed from the Plan. However, if part/all of the member's benefit is paid as monthly income for life the amount of liability may be different than the account balance. In addition, there is both investment return and mortality risk associated with the member's election of an annuity option. To the extent members are given the option to select the form of payment, some degree of anti-selection against the Plan may exist as generally healthier members will elect to receive benefits payable over their lifetime. If less healthy members elect to receive the lump sum and healthy members elect to receive benefits for life, it could result in higher liabilities.

Whether or not the Plan experiences anti-selection, the use of an assumption regarding the percentage of account balances at retirement that will be paid as lump sums versus monthly income introduces the potential for a difference in the actual versus expected behavior of members, i.e., it creates risk. Although actuarial gains or losses are to be expected, the magnitude of these amounts are not expected to be significant when compared to other experience (investment return and interest credits). Nonetheless, these election assumptions are included in the experience studies that are performed every four years so the existing assumptions can be changed when appropriate.

Maturity Measurements

The following exhibits summarize some historical information that helps indicate how certain key risk metrics have changed over time. This Plan is relatively "young", having been created in 2003. Most public retirement systems have been in existence at least 50 years. The three windows that permitted members of the Defined Contribution Plan to elect coverage in the Cash Balance Plan did have an impact on the maturity measures as illustrated on the next few pages.

TABLE 15

STATE EMPLOYEES' RETIREMENT SYSTEM
CASH BALANCE BENEFIT FUND

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*
January 1, 2003	$216,677,627	$135,913,965	1.59	1.4%
January 1, 2004	277,389,953	171,324,288	1.62	1.4%
January 1, 2005	322,198,427	192,618,880	1.67	1.4%
January 1, 2006	356,545,585	238,874,344	1.49	1.3%
January 1, 2007	421,242,149	323,982,997	1.30	1.1%
January 1, 2008	624,015,867	384,708,712	1.62	1.4%
January 1, 2009	469,855,291	433,397,447	1.08	0.9%
January 1, 2010	594,342,682	454,776,381	1.31	1.1%
January 1, 2011	689,162,482	449,206,006	1.53	1.3%
January 1, 2012	702,495,027	458,826,702	1.53	1.3%
January 1, 2013	1,033,413,956	500,493,490	2.06	1.8%
January 1, 2014	1,223,694,851	535,526,147	2.29	2.0%
January 1, 2015	1,305,036,408	557,094,081	2.34	2.0%
January 1, 2016	1,310,451,038	581,385,381	2.25	1.9%
January 1, 2017	1,416,086,648	603,090,871	2.35	2.0%
January 1, 2018	1,635,873,881	598,868,441	2.73	2.4%
January 1, 2019	1,533,143,166	608,704,588	2.52	2.2%

Note: Information before January 1, 2014 was produced by the prior actuary.

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

The assets at January 1, 2019 are 252% of payroll, so underperforming the investment return assumption by 10.00% (i.e., earn -2.50% for one year) creates an actuarial loss of $153 million, 25.2% of payroll. While the actual impact of the return would be mitigated in the first year by the asset smoothing method and amortization of the UAL, the actuarial contribution rate would increase by 2.2% over five years. This illustrates the significant risk associated with volatile investment returns.

TABLE 16

STATE EMPLOYEES' RETIREMENT SYSTEM
CASH BALANCE BENEFIT FUND

HISTORICAL CASH FLOWS

Plans with negative cash flows will experience increased sensitivity to investment return volatility. Cash flows, for this purpose, are measured as contributions less benefit payments. If the System has negative cash flows and then experiences returns below the assumed rate, there are fewer assets to be reinvested to earn the higher returns that typically follow. This Plan is relatively "young" so negative cash flows are not a concern at this point in time.

Year End	Market Value of Assets (MVA)	Contributions	Benefit Payments	Net Cash Flow	Net Cash Flow as a Percent of MVA
December 31, 2003	$277,389,953	$18,403,766	$5,476,107	$12,927,659	4.66%
December 31, 2004	322,198,427	21,546,033	9,504,842	12,041,191	3.74%
December 31, 2005	356,545,585	24,352,428	15,439,938	8,912,490	2.50%
December 31, 2006	421,242,149	27,314,569	21,347,497	5,967,072	1.42%
December 31, 2007	624,015,867	37,604,476	25,781,020	11,823,456	1.89%
December 31, 2008	469,855,291	47,928,407	31,887,783	16,040,624	3.41%
December 31, 2009	594,342,682	49,769,285	29,844,631	19,924,654	3.35%
December 31, 2010	689,162,482	50,464,626	38,826,644	11,637,982	1.69%
December 31, 2011	702,495,027	51,086,870	46,220,387	4,866,483	0.69%
December 31, 2012	1,033,413,956	52,959,199	46,687,002	6,272,197	0.61%
December 31, 2013	1,223,694,851	64,256,371	64,841,779	(585,408)	(0.05%)
December 31, 2014	1,305,036,408	68,059,628	73,527,209	(5,467,581)	(0.42%)
December 31, 2015	1,310,451,038	71,138,427	85,278,057	(14,139,630)	(1.08%)
December 31, 2016	1,416,086,648	73,669,658	84,773,402	(11,103,744)	(0.78%)
December 31, 2017	1,635,873,881	74,565,284	94,358,979	(19,793,695)	(1.21%)
December 31, 2018	1,533,143,166	76,434,843	121,911,299	(45,476,456)	(2.97%)

Note: Information before January 1, 2014 was produced by the prior actuary.

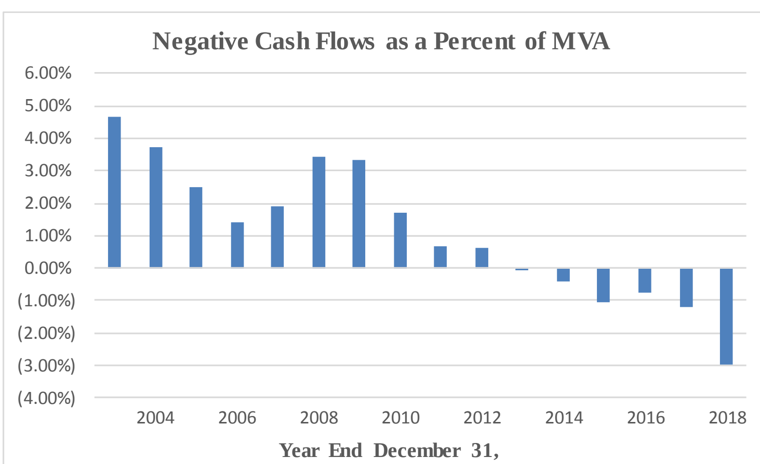


TABLE 17

STATE EMPLOYEES' RETIREMENT SYSTEM
CASH BALANCE BENEFIT FUND

LIABILITY MATURITY MEASURES

Most public sector retirement systems have been in operation for many years. As a result, they have aging plan populations, and in some cases declining active populations, resulting in an increasing ratio of retirees to active members and a growing percentage of retiree liability. As has been discussed earlier, the Nebraska State Plan was just created in 2003 so a much small portion of the total liability is due to retirees. In addition, the Plan offers members the option to elect payment of their retirement benefit as a lump sum which also reduces the amount of ongoing retiree liability.

Actuarial Valuation Date	Retiree Liability (a)	Total Actuarial Accrued Liability (b)	Retiree Percentage (a) / (b)	Covered Payroll (c)	Ratio (b) / (c)
January 1, 2003	$0	$216,203,727	0.0%	$135,913,965	1.59
January 1, 2004	3,981,837	241,192,355	1.7%	171,324,288	1.41
January 1, 2005	8,439,159	272,300,201	3.1%	192,618,880	1.41
January 1, 2006	19,327,260	300,852,371	6.4%	238,874,344	1.26
January 1, 2007	26,712,802	379,734,639	7.0%	323,982,997	1.17
January 1, 2008	32,751,090	586,829,526	5.6%	384,708,712	1.53
January 1, 2009	44,489,774	658,249,398	6.8%	433,397,447	1.52
January 1, 2010	59,249,816	714,408,952	8.3%	454,776,381	1.57
January 1, 2011	75,648,181	762,680,399	9.9%	449,206,006	1.70
January 1, 2012	96,570,447	813,285,510	11.9%	458,826,702	1.77
January 1, 2013	131,942,250	1,077,957,772	12.2%	500,493,490	2.15
January 1, 2014	155,644,560	1,139,772,796	13.7%	535,526,147	2.13
January 1, 2015	186,782,282	1,199,841,066	15.6%	557,094,081	2.15
January 1, 2016	230,126,630	1,304,297,557	17.6%	581,385,381	2.24
January 1, 2017	268,028,666	1,370,454,658	19.6%	603,090,871	2.27
January 1, 2018	322,124,392	1,501,862,294	21.4%	598,868,441	2.51
January 1, 2019	371,164,313	1,609,507,057	23.1%	608,704,588	2.64

Note: Information before January 1, 2014 was produced by the prior actuary.

See graph on following page.

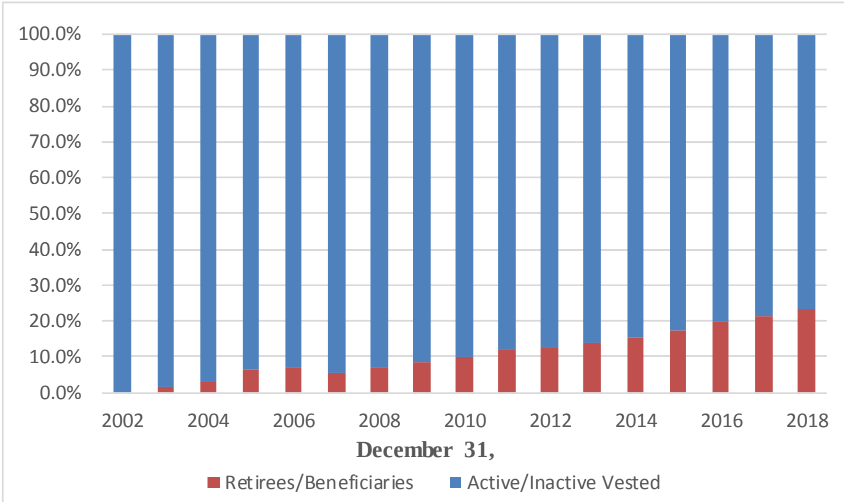

100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
2002
2004
2006
2008
2010
2012
2014
2016
2018
December 31,
Retirees/Beneficiaries
Active/Inactive Vested

TABLE 18

STATE EMPLOYEES' RETIREMENT SYSTEM
CASH BALANCE BENEFIT FUND

HISTORICAL MEMBER COUNTS

Valuation Date January 1,	Number of Active Members	Number of Retired Members	Active/ Retired
2003	3,964	0	
2004	5,163	46	112.24
2005	5,894	75	78.59
2006	6,890	194	35.52
2007	9,051	263	34.41
2008	10,878	329	33.06
2009	11,323	420	26.96
2010	11,739	500	23.48
2011	11,200	599	18.70
2012	11,263	737	15.28
2013	11,956	910	13.14
2014	12,536	1,052	11.92
2015	12,928	1,222	10.58
2016	13,084	1,436	9.11
2017	13,226	1,615	8.19
2018	12,836	1,814	7.08
2019	12,950	2,027	6.39

Note: Information before January 1, 2014 was produced by the prior actuary.

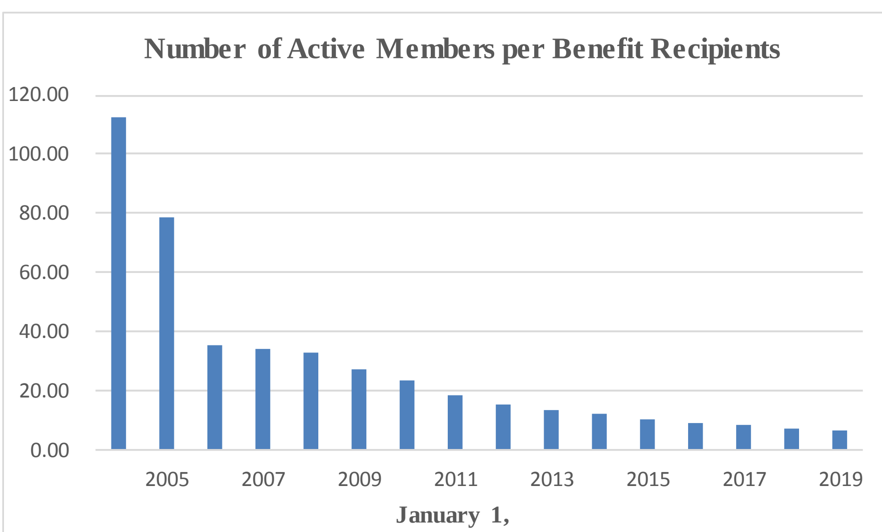


TABLE 19

STATE EMPLOYEES' RETIREMENT SYSTEM
CASH BALANCE BENEFIT FUND

COMPARISON OF VALUATION RESULTS UNDER ALTERNATE INVESTMENT RETURN ASSUMPTIONS

This exhibit compares the key January 1, 2019 valuation results under five (5) different investment return assumptions to illustrate the impact of different assumptions on the funding of the System. Note that only the investment return assumption is changed, as identified in the heading below. All other assumptions, including the assumed interest crediting rate, are unchanged for purposes of this analysis.

Investment Return Assumption	7.00%	7.25%	7.50%	7.75%	8.00%
Contributions					
Normal Cost Rate	11.13%	10.80%	10.48%	10.18%	9.90%
UAAL Amortization Rate	0.82%	0.34%	(0.14%)	(0.62%)	(1.09%)
Total Actuarial Required Contribution	11.95%	11.14%	10.34%	9.56%	8.81%
Member Contribution Rate	(4.80%)	(4.80%)	(4.80%)	(4.80%)	(4.80%)
Employer Contribution Rate	(7.49%)	(7.49%)	(7.49%)	(7.49%)	(7.49%)
Total Contribution Rate	(0.34%)	(1.15%)	(1.95%)	(2.73%)	(3.48%)
Actuarial Value of Assets ($ in thousands)	$1,619,367	$1,619,367	$1,619,367	$1,619,367	$1,619,367
Actuarial Accrued Liability	$1,679,315	$1,643,648	$1,609,507	$1,576,814	$1,545,493
Unfunded Actuarial Accrued Liability	$59,948	$24,281	($9,860)	($42,553)	($73,874)
Funded Ratio	96.43%	98.52%	100.61%	102.70%	104.78%

The actuarial accrued liability is a measure intended to help the reader assess (i) a retirement system's funded status on a going concern basis and (ii) progress being made toward accumulating the assets needed to pay benefits as due. Allocation of the actuarial present value of projected benefits between past and future service was based on service using the Entry Age Normal actuarial cost method. Entry age was established by subtracting credited service from current age on the valuation date. The Entry Age Normal actuarial accrued liability was determined as part of an actuarial valuation of the plan as of January 1, 2019. The actuarial assumptions used in determining the actuarial accrued liability can be found in Appendix C.

The Schedule of Funding Progress provides information about whether the financial strength of the Plan is improving or deteriorating over time.

The Schedule of Contributions from Employers and Other Contributing Entities provides historical information about the actuarial required contribution and the percentage of the actuarial required contribution that was actually contributed.

TABLE 20

STATE EMPLOYEES' RETIREMENT SYSTEM
CASH BALANCE BENEFIT FUND

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]
January 1, 2003	$216,677,627	$216,203,727	($473,900)	100.2%	$135,913,965	(0.3%)
January 1, 2004	254,175,882	241,192,355	(12,983,527)	105.4%	171,324,288	(7.6%)
January 1, 2005	297,573,422	272,300,201	(25,273,221)	109.3%	192,618,880	(13.1%)
January 1, 2006	342,729,602	300,852,371	(41,877,231)	113.9%	238,874,344	(17.5%)
January 1, 2007	392,442,206	379,734,639	(12,707,567)	103.3%	323,982,997	(3.9%)
January 1, 2008	606,552,428	586,829,526	(19,722,902)	103.4%	384,708,712	(5.1%)
January 1, 2009	637,539,094	658,249,398	20,710,304	96.9%	433,397,447	4.8%
January 1, 2010	670,591,669	714,408,952	43,817,283	93.9%	454,776,381	9.6%
January 1, 2011	714,131,805	762,680,399	48,548,594	93.6%	449,206,006	10.8%
January 1, 2012	743,970,954	813,285,510	69,314,556	91.5%	458,826,702	15.1%
January 1, 2013	1,009,414,476	1,077,957,772	68,543,296	93.6%	500,493,490	13.7%
January 1, 2014	1,130,203,298	1,139,772,796	9,569,498	99.2%	535,526,147	1.8%
January 1, 2015	1,246,042,982	1,199,841,066	(46,201,916)	103.9%	557,094,081	(8.3%)
January 1, 2016	1,337,161,184	1,304,297,557	(32,863,627)	102.5%	581,385,381	(5.7%)
January 1, 2017	1,443,560,434	1,370,454,658	(73,105,776)	105.3%	603,090,871	(12.1%)
January 1, 2018	1,565,494,675	1,501,862,294	(63,632,381)	104.2%	598,868,441	(10.6%)
January 1, 2019	1,619,367,286	1,609,507,057	(9,860,229)	100.6%	608,704,588	(1.6%)

Note: Information before January 1, 2014 was produced by the prior actuary.

TABLE 21

STATE EMPLOYEES' RETIREMENT SYSTEM
CASH BALANCE BENEFIT FUND

SCHEDULE OF CONTRIBUTIONS FROM EMPLOYERS
AND OTHER CONTRIBUTING ENTITIES

	Actuarial Required Contributions			
Plan Year Ending	State	State Additional	Total	Percent Contributed
December 31, 2002	$9,307,484	$0	$9,307,484	100%
December 31, 2003	11,474,951	0	11,474,951	100%
December 31, 2004	13,129,236	0	13,129,236	100%
December 31, 2005	14,835,174	0	14,835,174	100%
December 31, 2006	16,001,418	0	16,001,418	100%
December 31, 2007	22,913,163	0	22,913,163	100%
December 31, 2008	29,208,772	0	29,208,772	100%
December 31, 2009	30,321,032	0	30,321,032	100%
December 31, 2010	30,679,003	0	30,679,003	100%
December 31, 2011	31,088,483	0	31,088,483	100%
December 31, 2012	32,096,097	0	32,096,097	100%
December 31, 2013	32,632,176	0	32,632,176	120%
December 31, 2014	30,257,227	0	30,257,227	137%
December 31, 2015	27,409,029	0	27,409,029	158%
December 31, 2016	31,976,196	0	31,976,196	140%
December 31, 2017	29,732,380	0	29,732,380	153%
December 31, 2018	28,745,685	0	28,745,685	162%

Note: Information prior to December 31, 2013 was produced by the prior actuary.

RECORD RECONCILIATION

	Active Members*	Inactive Members*	Retirees, Beneficiaries, and Disableds	Total
Total Number of Data Records Submitted by NPERS	15,259	10,582	2,726	28,567
Number of County records removed	0	0	(684)	(684)
a) DC Participant	(2,165)	(1,408)	0	(3,573)
b) Death	0	0	0	0
c) Assumed Inactive				
- Benefits due	(189)	189	0	0
- Cashed out	0	0	0	0
d) Null Balance	(1)	(838)	0	(839)
e) Termination Date after Valuation Date	46	(46)	0	0
f) Also Listed as Retired	0	(197)	0	(197)
g) Benefits Expired	0	0	(22)	(22)
h) QDRO spouse	0	0	0	0
i) Beneficiaries Due a Refund	0	0	0	0
j) Member Death - Certain Period Not Expired	0	0	7	7
k) Date of Death after Valuation Date	0	0	0	0
Net Change	(2,309)	(2,300)	(699)	(5,308)
Number of Members Included in the Valuation as of January 1, 2019	12,950	8,282	2,027	23,259

* Based on data file received from Ameritas.

MEMBER DATA RECONCILIATION

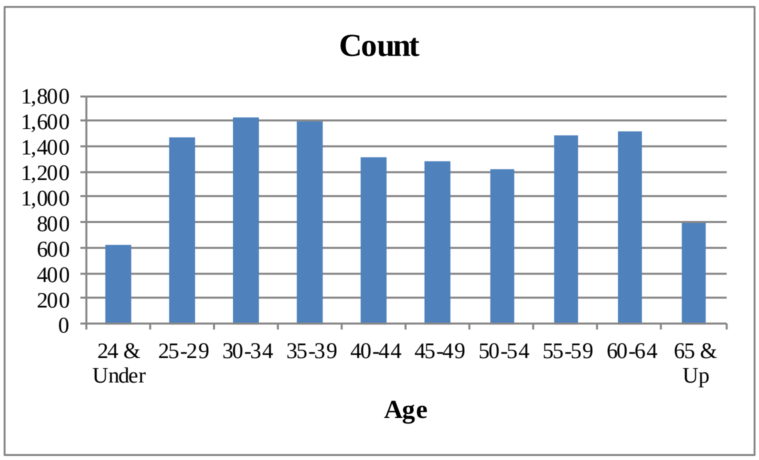
	Active Members	Inactive Vested	Inactive Non-vested	Retirees and Beneficiaries	Total
As of January 1, 2018	12,836	2,955	4,670	1,814	22,275
Changes in status					
a) Retirement	(139)	(78)	0	217	0
b) Death	(2)	(1)	0	(25)	(28)
c) Non-vested terminations	(505)	0	505	0	0
d) Vested terminations	(807)	807	0	0	0
e) Contribution refund	(702)	(396)	(534)	0	(1,632)
f) Beneficiaries in receipt	0	0	0	19	19
g) Disability retirements	0	0	0	0	0
h) Return to active service	222	(77)	(145)	0	0
i) Expired benefits	0	0	0	(32)	(32)
j) Data adjustments	0	0	0	0	0
Total changes in status	(1,933)	255	(174)	179	(1,673)
Transferred from DC Plan	0	0	0	34	34
New entrants	2,047	106	470	0	2,623
Net change	114	361	296	213	984
As of January 1, 2019	12,950	3,316	4,966	2,027	23,259

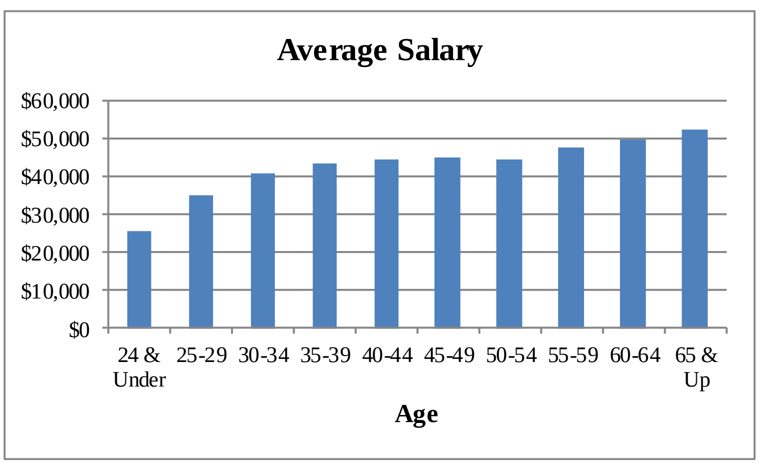
SUMMARY OF MEMBERSHIP DATA

A. ACTIVE MEMBERS	January 1, 2019	January 1, 2018	% Change
1. Number of Active Members	12,950	12,836	0.9%
2. Reported Salary	$ 559,600,197	$ 550,155,075	1.7%
3. Accumulated Contributions			
(a) Employee Cash Balance Account	$ 365,576,404	$ 354,896,362	3.0%
(b) Employer Cash Balance Account	578,901,056	562,767,151	2.9%
(c) Total Cash Balance Account	$ 944,477,460	$ 917,663,513	2.9%
4. Active Member Averages			
(a) Age	44.6	44.9	(0.7%)
(b) Service	8.8	9.1	(3.3%)
(c) Compensation	$ 43,212	$ 42,860	0.8%
(d) Cash Balance Account	$ 72,933	$ 71,491	2.0%
B. INACTIVE MEMBERS			
1. Number of Inactive Members			
(a) System vested	3,316	2,955	12.2%
(b) System nonvested (refund only)	4,966	4,670	6.3%
(c) Total	8,282	7,625	8.6%
2. Total Vested Cash Balance Account	$ 272,329,508	$ 239,020,929	13.9%
3. Inactive Members Averages			
(a) Age (vesteds only)	49.8	50.5	(1.4%)
(b) Vested Cash Balance Account	$ 82,126	$ 80,887	1.5%
C. RETIREES, DISABLEDS, AND BENEFICIARIES			
1. Number of Members Receiving Benefits			
(a) Retired	1,899	1,694	12.1%
(b) Disabled	0	0	0.0%
(c) Beneficiaries	128	120	6.7%
(d) Total	2,027	1,814	11.7%
2. Total Annual Benefit Payments			
(a) Retired	$ 36,131,152	$ 31,567,120	14.5%
(b) Disabled	0	0	0.0%
(c) Beneficiaries	1,806,193	1,582,368	14.1%
(d) Total	$ 37,937,345	$ 33,149,488	14.4%

ACTIVE MEMBERS
AS OF JANUARY 1, 2019

	Count of Members			Prior Year Reported Salary		
Age	Male	Female	Total	Male	Female	Total
24 & Under	288	342	630	$ 8,234,317	$ 7,822,521	$ 16,056,838
25-29	662	804	1,466	24,649,604	26,272,778	50,922,382
30-34	769	852	1,621	33,001,189	33,016,156	66,017,345
35-39	660	941	1,601	30,838,970	38,691,999	69,530,969
40-44	573	737	1,310	27,592,671	30,359,981	57,952,652
45-49	548	742	1,290	26,175,732	31,525,868	57,701,600
50-54	499	720	1,219	24,006,567	29,752,055	53,758,622
55-59	570	921	1,491	29,977,374	40,815,170	70,792,544
60-64	641	882	1,523	34,867,630	40,478,520	75,346,150
65 & Up	370	429	799	22,650,348	18,870,747	41,521,095
Total	5,580	7,370	12,950	$ 261,994,402	$ 297,605,795	$ 559,600,197



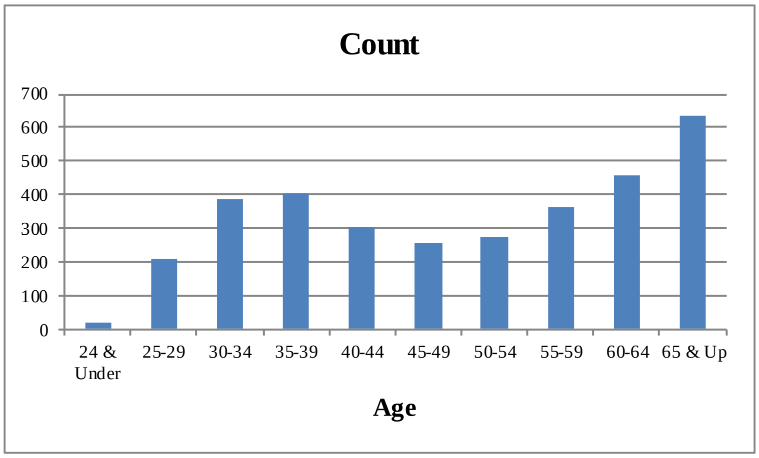


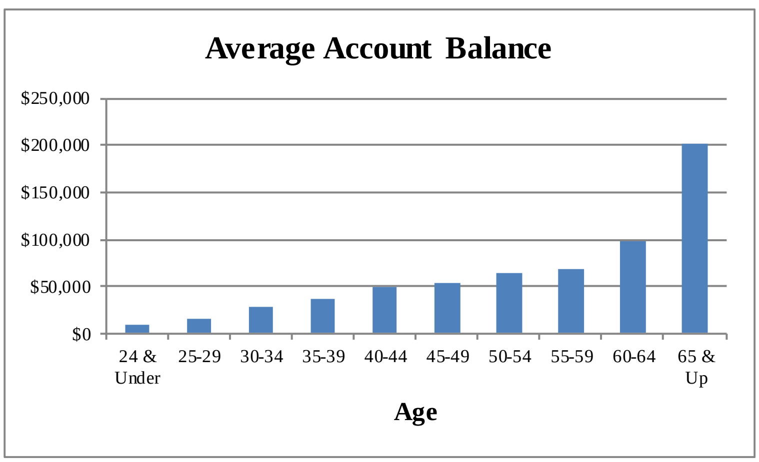
AGE AND SERVICE DISTRIBUTION
AS OF JANUARY 1, 2019

Age		0-4	5-9	10-14	15-19	20-24	25-29	30-34	Over 34	Total
24 & Under	Number	624	6	0	0	0	0	0	0	630
	Reported Salary	$ 15,888,358	$ 168,480	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 16,056,838
	Average Sal.	$ 25,462	$ 28,080	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 25,487
25-29	Number	1,256	204	6	0	0	0	0	0	1,466
	Reported Salary	$ 42,187,928	$ 8,460,983	$ 273,471	$ 0	$ 0	$ 0	$ 0	$ 0	$ 50,922,382
	Average Sal.	$ 33,589	$ 41,475	$ 45,579	$ 0	$ 0	$ 0	$ 0	$ 0	$ 34,736
30-34	Number	975	528	117	1	0	0	0	0	1,621
	Reported Salary	$ 35,549,416	$ 24,666,152	$ 5,782,658	$ 19,119	$ 0	$ 0	$ 0	$ 0	$ 66,017,345
	Average Sal.	$ 36,461	$ 46,716	$ 49,424	$ 19,119	$ 0	$ 0	$ 0	$ 0	$ 40,726
35-39	Number	753	461	357	30	0	0	0	0	1,601
	Reported Salary	$ 28,323,168	$ 21,338,396	$ 18,265,942	$ 1,603,463	$ 0	$ 0	$ 0	$ 0	$ 69,530,969
	Average Sal.	$ 37,614	$ 46,287	$ 51,165	$ 53,449	$ 0	$ 0	$ 0	$ 0	$ 43,430
40-44	Number	590	299	295	119	7	0	0	0	1,310
	Reported Salary	$ 22,006,173	$ 14,114,291	$ 15,096,081	$ 6,369,848	$ 366,259	$ 0	$ 0	$ 0	$ 57,952,652
	Average Sal.	$ 37,299	$ 47,205	$ 51,173	$ 53,528	$ 52,323	$ 0	$ 0	$ 0	$ 44,239
45-49	Number	513	299	267	157	50	4	0	0	1,290
	Reported Salary	$ 19,164,209	$ 14,011,602	$ 13,496,186	$ 8,159,105	$ 2,651,477	$ 219,021	$ 0	$ 0	$ 57,701,600
	Average Sal.	$ 37,357	$ 46,862	$ 50,548	$ 51,969	$ 53,030	$ 54,755	$ 0	$ 0	$ 44,730
50-54	Number	449	240	244	125	102	58	0	1	1,219
	Reported Salary	$ 16,157,319	$ 10,464,460	$ 11,538,534	$ 6,495,470	$ 5,521,592	$ 3,524,635	$ 0	$ 56,612	$ 53,758,622
	Average Sal.	$ 35,985	$ 43,602	$ 47,289	$ 51,964	$ 54,133	$ 60,770	$ 0	$ 56,612	$ 44,101
55-59	Number	439	263	241	151	97	213	83	4	1,491
	Reported Salary	$ 17,745,324	$ 11,098,608	$ 11,533,764	$ 7,733,873	$ 5,030,825	$ 12,212,890	$ 5,245,003	$ 192,257	$ 70,792,544
	Average Sal.	$ 40,422	$ 42,200	$ 47,858	$ 51,218	$ 51,864	$ 57,338	$ 63,193	$ 48,064	$ 47,480
60-64	Number	281	229	242	156	80	160	310	65	1,523
	Reported Salary	$ 11,163,778	$ 10,042,872	$ 10,910,509	$ 7,341,501	$ 4,261,992	$ 8,768,355	$ 19,121,096	$ 3,736,047	$ 75,346,150
	Average Sal.	$ 39,729	$ 43,855	$ 45,085	$ 47,061	$ 53,275	$ 54,802	$ 61,681	$ 57,478	$ 49,472
65 & Up	Number	97	131	146	81	51	64	81	148	799
	Reported Salary	$ 4,260,650	$ 5,926,815	$ 6,104,623	$ 3,764,800	$ 2,842,898	$ 3,300,622	$ 4,796,542	$ 10,524,145	$ 41,521,095
	Average Sal.	$ 43,924	$ 45,243	$ 41,812	$ 46,479	$ 55,743	$ 51,572	$ 59,217	$ 71,109	$ 51,966
Total	Number	5,977	2,660	1,915	820	387	499	474	218	12,950
	Reported Salary	$ 212,446,323	$ 120,292,659	$ 93,001,768	$ 41,487,179	$ 20,675,043	$ 28,025,523	$ 29,162,641	$ 14,509,061	$ 559,600,197
	Average Sal.	$ 35,544	$ 45,223	$ 48,565	$ 50,594	$ 53,424	$ 56,163	$ 61,525	$ 66,555	$ 43,212

INACTIVE VESTED MEMBERS
AS OF JANUARY 1, 2019

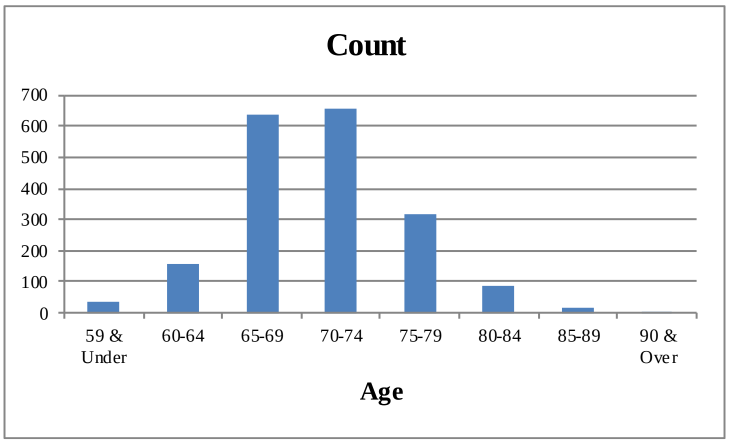
	Count of Members			Account Balances		
Age	Male	Female	Total	Male	Female	Total
24 & Under	8	10	18	$ 76,869	$ 72,467	$ 149,336
25-29	97	112	209	1,512,138	1,836,475	3,348,613
30-34	170	218	388	5,099,106	5,634,897	10,734,003
35-39	170	235	405	6,798,429	8,459,698	15,258,127
40-44	119	186	305	5,791,676	8,992,603	14,784,279
45-49	99	159	258	6,468,003	7,167,624	13,635,627
50-54	110	167	277	8,722,633	8,784,987	17,507,620
55-59	133	232	365	11,083,571	13,949,746	25,033,317
60-64	170	288	458	16,178,393	28,344,166	44,522,559
65 & Up	289	344	633	70,481,402	56,874,625	127,356,027
Total	1,365	1,951	3,316	$132,212,220	$ 140,117,288	$ 272,329,508

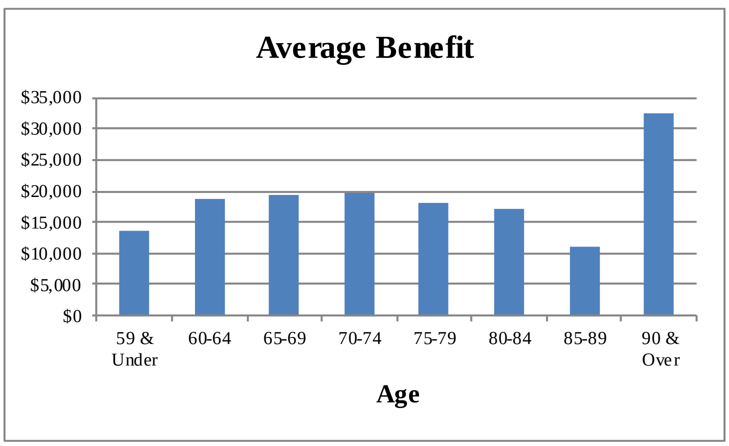




RETIRED MEMBERS
AS OF JANUARY 1, 2019

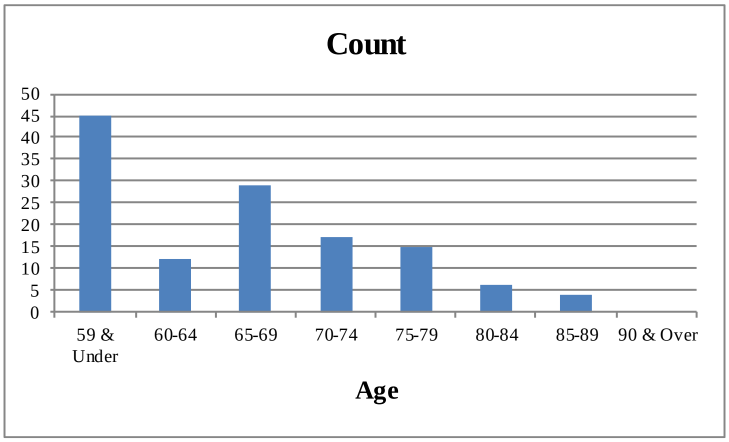
	Count of Members			Annual Benefits		
Age	Male	Female	Total	Male	Female	Total
59 & Under	13	23	36	$ 186,217	$ 306,050	$ 492,267
60-64	65	93	158	1,332,010	1,603,501	2,935,511
65-69	258	376	634	5,710,869	6,623,745	12,334,614
70-74	330	324	654	7,698,729	5,266,721	12,965,450
75-79	152	162	314	3,484,773	2,213,910	5,698,683
80-84	35	52	87	811,610	673,056	1,484,666
85-89	4	10	14	41,577	113,494	155,071
90 & Over	0	2	2	0	64,890	64,890
Total	857	1,042	1,899	$ 19,265,785	$ 16,865,367	$ 36,131,152

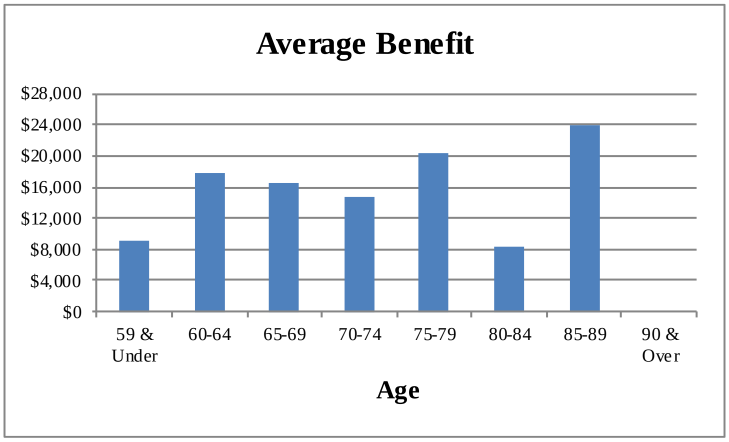




BENEFICIARIES RECEIVING BENEFITS AS OF JANUARY 1, 2019

	Count of Members			Annual Benefits		
Age	Male	Female	Total	Male	Female	Total
59 & Under	21	24	45	$ 205,721	$ 208,513	$ 414,234
60-64	7	5	12	96,403	116,690	213,093
65-69	6	23	29	45,427	433,908	479,335
70-74	5	12	17	81,910	167,606	249,516
75-79	3	12	15	61,116	242,921	304,037
80-84	1	5	6	1,019	48,773	49,792
85-89	3	1	4	72,627	23,559	96,186
90 & Over	0	0	0	0	0	0
Total	46	82	128	$ 564,223	$ 1,241,970	$ 1,806,193





Membership
All permanent, full-time employees of the State who work one-half or more of the regularly scheduled hours during each pay period shall begin immediate participation in the State Employees' Retirement System as of January 1, 2007 or date of hire, if later. All permanent, part-time employees who have attained the age of eighteen may exercise the option to begin immediate participation in the State Employees' Retirement System.

Existing members of the State Employees' Retirement System could have elected, during the period beginning September 1, 2012 and ending October 31, 2012 to participate in the Cash Balance benefit. If no election was made by October 31, 2012, the member was treated as though he or she elected to continue participating in the Defined Contribution benefit as provided in the State Employees' Retirement Act.

Existing members of the State Employees' Retirement System could have elected, during the period beginning November 1, 2007 and ending December 31, 2007 to participate in the Cash Balance Benefit Fund. If no election was made by December 31, 2007, the member was treated as though he or she elected to continue participating in the Defined Contribution Plan as provided in the State Employees' Retirement Act.

Existing members of the State Employees' Retirement System could have elected, during the period beginning October 1, 2002, and ending December 31, 2002, to participate in the Cash Balance Benefit Fund. If no election was made by January 1, 2003, the member was treated as though he or she elected to continue participating in the Defined Contribution Plan as provided in the State Employees' Retirement Act. For a member who first participates in the retirement system on or after January 1, 2003, he or she shall automatically participate in the Cash Balance Benefit Fund subject to plan eligibility requirements.

Compensation Considered
Compensation means gross wages or salaries payable to the member for personal services performed during the plan year, overtime pay, member retirement contributions, and amounts contributed by the member to plans under sections 125, 403(b) and 457 of the Internal Revenue Code or any other section of the code which defers or excludes such amounts from income.

Member Contributions
Members of the State Employees' Retirement System shall contribute an amount equal to four and eight-tenths percent (4.8%) of annual compensation to the fund. The member contribution shall be credited to the employee cash balance account.

Employer Contributions
The State shall contribute at a rate of 156% of the members' contributions to the fund. The State contribution shall be credited to the employer cash balance account.

Interest Credit Rate
Interest credit rate means the greater of (a) five percent or (b) the applicable federal mid-term rate as published by the Internal Revenue Service as of the first day of the calendar quarter for which interest credits are credited, plus one and one-half percent, such rate to be compounded annually.

Interest Credits
Interest credits means the amount credited to the employee cash balance account and the employer cash balance account daily. Such interest credit for each account shall be determined by applying the daily portion of the interest credit rate to the account balance at the end of the previous day.

Retirement Age
A member is eligible for retirement after attaining age 55.

Service
Service is defined to mean the actual total length of employment with the State and is not interrupted by a) temporary or seasonal suspension of service that does not terminate the member's employment, b) leave of absence authorized by the State for no longer than twelve months, c) leave of absence due to disability or d) leave due to military service.

Retirement Allowance
Upon attainment of age 55, regardless of service, the retirement allowance shall be equal to the accumulated employee and employer cash balance accounts including interest credit, annuitized for payment in the normal form. Also available are additional forms of payment allowed under the plan which are actuarially equivalent to the normal form including the option of a full lump sum or partial lump sum.

Normal Form of Payment
The normal form of payment under the Cash Balance Benefit Fund is a single life annuity with five-year certain, payable monthly. Members will have the option to convert their cash balance account to a monthly annuity with built in cost-of-living adjustments of 2.5% annually. This monthly benefit and all other options allowed under the Plan will be of actuarial equivalence to the accumulated employee and employer cash balance accounts including interest credits.

Optional Form of Payment
Optional forms of payment include a lump sum and the following annuities (with or without a 2.5% COLA): life annuity, modified cash refund, certain and life annuity (5, 10 or 15 years), certain only annuity (5, 10, 15 or 20 years) and joint and survivor annuity (50%, 75% or 100%).

Deferred Vested Allowance
A member who terminates with at least 3 years of participation in the system, including eligibility and vesting credit, may choose to leave his employee and employer cash balance accounts in the Plan and be eligible to receive a vested monthly allowance at retirement age or request a distribution of his employee and employer cash balance accounts plus interest credit, with no future benefit payable from the plan.

Severance Benefits
A member who terminates with less than 3 years of participation in the system, including eligibility and vesting credit, may elect to receive a distribution of his/her employee cash balance account including interest credit, with no future benefit payable from the plan.

Disability Allowance
If a member becomes disabled prior to retirement, the member shall receive the total amount of his/her accumulated employee and employer cash balance accounts including interest credits, as a lump sum or converted into a monthly annuity, as defined under the retirement allowance.

Pre-retirement Death Allowance

If a member dies prior to retirement, the surviving spouse, designated beneficiary (if different), or estate shall receive the total amount of his/her accumulated employee and employer cash balance accounts including interest credit, as a lump sum or converted into a monthly annuity, as defined under the retirement allowance.

Defined Contribution Transfers at Retirement

Upon retirement, members participating in the Defined Contribution Benefit Fund may elect to annuitize their accumulated account balance and receive a monthly benefit payment from the Cash Balance Benefit Fund. The accumulated account balance is transferred from the Defined Contribution Plan to the Cash Balance Benefit Fund upon the retirement of a Defined Contribution member electing an annuity. The actuarial assumptions used to convert the accumulated account balance to monthly income are (i) the 1994 Group Annuity Mortality Table with a 50% male / 50% female mix, and (ii) the interest rate in accordance with Nebraska State Statute 84-1319.

Benefit Improvements

In accordance with Section 84-1319 of the Nebraska State Statutes, the Public Employees' Retirement Board may grant benefit improvements if the unfunded actuarial accrued liability is less than zero, but in no event will such improvement result in an actuarially required contribution rate in excess of 90% of the total statutory contribution rate.

Dividend Policy

Under Nebraska Statutes, the Board may grant a dividend in addition to the regular interest credit if the UAAL is less than $0 (i.e. a surplus exists) and the actuarial contribution after the extra dividend is no more than 90% of the scheduled contribution rate. Additionally, the Board has adopted a policy that also requires that the Accumulated Benefit Obligation be completely funded.

Year Issued	Dividend %	For Time Period
2018	5.460%	1/1/2017 – 12/31/2017
2017	3.070%	1/1/2016 – 12/31/2016
2016	0.000%	1/1/2015 – 12/31/2015
2015	4.530%	1/1/2014 – 12/31/2014
2014	0.000%	1/1/2013 – 12/31/2013
2013	0.000%	1/1/2012 – 12/31/2012
2012	0.000%	1/1/2011 – 12/31/2011
2011	0.000%	1/1/2010 – 12/31/2010
2010	0.000%	1/1/2009 – 12/31/2009
2009	0.000%	1/1/2008 – 12/31/2008
2008	5.180%	1/1/2007 – 12/31/2007
2007	2.730%	1/1/2006 – 12/31/2006
2006	13.500%	1/1/2005 – 12/31/2005
2005	2.800%	1/1/2004 – 12/31/2004
2004	3.088%	1/1/2003 – 12/31/2003

Changes in Plan Provisions Since the Prior Year

There have been no changes in plan provisions since the prior actuarial valuation.

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 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 90 and determining an average normal cost rate which is the related to the total payroll of active members under age 90. The actuarial assumptions shown in this section 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 normal costs are now 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 benefit 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. The unfunded actuarial accrued liability is funded with a level dollar payment amount over 25 years from January 1, 2009 and subsequent changes in the unfunded actuarial accrued liability are funded with a closed level dollar payment over 25 years from the date established. If the unfunded actuarial accrued liability becomes negative, prior changes to the unfunded liability are eliminated and the current unfunded actuarial accrued liability is amortized with a closed level dollar payment over 25 years.

Under this 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.

2. **Calculation of the Actuarial Value of Assets:** Effective January 1, 2003, the actuarial value of assets was initiated at Market Value and equals the sum of the employee and employer cash balance accounts. In future years, the actuarial value of assets will be based on a five-year smoothing method with phase-in 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 at the valuation date is reduced by the sum of the following, each determined after January 1, 2003:

   (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.
   (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 and (2) the expected return on Actuarial Value. The expected return on Actuarial Value includes interest on the previous year's unrecognized return.

B. VALUATION PROCEDURES

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

The compensation amounts used in the projection of benefits and liabilities for active members were prior plan year compensations.

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).

Changes in Methods and Procedures Since the Prior Year
There have been no changes in the actuarial methods or procedures since the prior valuation.

ECONOMIC ASSUMPTIONS

1. Investment Return — 7.50% per annum, compounded annually, net of expenses.

2. Inflation — 2.75% per annum, compounded annually.

3. Interest Crediting Rate on Cash Balance Accounts — 6.25% per annum, compounded annually.

4. Annuitization Rate of Member & Employer Accumulated Balances — 7.75% per annum, compounded annually, for members hired before January 1, 2018 (set statutorily).

5. Salary Scale

Service	Annual Increase
0	4.93%
1	4.80
2	4.60
3	4.29
4	4.06
5	3.98
6	3.94
7	3.93
8	3.88
9	3.85
10	3.81
11	3.80
12	3.76
13	3.72
14	3.70
15	3.67
16	3.63
17	3.60
18	3.59
19	3.56
20+	3.50

DEMOGRAPHIC ASSUMPTIONS

1. Mortality

a. Healthy lives - Active members — RP-2014 White Collar Table for Employees (100% of male rates for males, 55% of female rates for females), projected generationally with MP-2015.

b. Healthy lives – Retired members and beneficiaries — RP-2014 White Collar Table for Employees, set back two years, scaled (males: under 80, 1.008; over 80, 1.449; females: under 85, .924; over 85, 1.5855; geometrically blended), projected generationally from 2013 with a SOA projection scale tool using a 0.5% ultimate 2035 rate in 2035.

c. Disabled lives — Not applicable

d. Healthy mortality rates and projection scale are shown below at sample ages:

	Pre-retirement Mortality	
	Mortality Rate	
Sample Age	Males	Females
20	0.03%	0.01%
30	0.03	0.01
40	0.04	0.02
50	0.12	0.05
60	0.33	0.11

	Post-retirement Mortality	
	Mortality Rate	
Sample Age	Males	Females
50	0.23%	0.17%
60	0.47	0.31
70	1.03	0.82
80	3.65	2.28
90	14.57	12.63

	Projection Scale – Post-retirement Mortality					
	Scale (2020)		Scale (2030)		Scale (2040)	
Sample Age	Males	Females	Males	Females	Males	Females
50	0.0252	0.0144	0.0080	0.0052	0.0050	0.0050
60	0.0083	0.0051	0.0066	0.0059	0.0050	0.0050
70	0.0088	0.0121	0.0061	0.0057	0.0050	0.0050
80	0.0114	0.0104	0.0057	0.0058	0.0050	0.0050
90	0.0109	0.0104	0.0057	0.0057	0.0046	0.0046

e. Mortality for Annuitization of Employee and Employer Cash Balance Accounts — 1994 Group Annuity Mortality Table, with 50 % Male, 50% Female blending for members hired before January 1, 2018 (set statutorily).

Sample Age	Mortality Rate	Life Expectancy (Years)
55	0.34%	28.0
60	0.62	23.5
65	1.16	19.4
70	1.87	15.7
75	2.99	12.2
80	5.07	9.3

2. Retirement

Graduated rates by retirement age after 5 years of service.

Age	Annual Rates
55-60	5.0%
61	8.0
62	12.0
63	12.0
64	15.0
65	30.0
66	30.0
67-79	25.0
80	100.0

3. Termination

Graduated rates by age and service.

Service	Rate
<1	30.0%
1	22.0
5	14.0
10	7.0
15	3.5
20	3.0
25+	2.0

4. Disability

None.

OTHER ASSUMPTIONS

1. Payment Assumptions

As shown in the table below, 50% of all members eligible for retirement are assumed to be paid in the form of an annuity and the other 50% in the form of a lump sum, and 100% of members eligible for all other types of benefits are assumed to be paid in the form of a lump sum. Deferred vested and non-vested members are assumed to take a refund of their account balance as of the valuation date.

Benefit	Assumed Form of Payment
Retirement	50% Lump Sum / 50% Annuity*
Vested	Lump Sum
Non-vested	Lump Sum
Disability	Lump Sum
Death	Lump Sum

*Five-year certain and life annuity.

2. Cost of Living Adjustment

None assumed, except 2.5% per year is used for retirees electing annuity payments with a COLA feature.

Changes in Assumptions Since the Prior Year

There have been no changes in assumptions since the prior actuarial valuation.

Actuarial Accrued Liability	The difference between the actuarial present value of system benefits and the actuarial value of future normal costs. Also referred to as "accrued liability" or "actuarial liability".
Actuarial Assumptions	Estimates of future experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and salary increases. Decrement assumptions (rates of mortality, disability, turnover and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (salary increases and investment income) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation.
Accrued Service	Service credited under the system which was rendered before the date of the actuarial valuation.
Actuarial Equivalent	A single amount or series of amounts of equal actuarial value to another single amount or series of amounts, computed on the basis of appropriate assumptions.
Actuarial Cost Method	A mathematical budgeting procedure for allocating the dollar amount of the actuarial present value of retirement system benefit between future normal cost and actuarial accrued liability. Sometimes referred to as the "actuarial funding method".
Experience Gain (Loss)	The difference between actual experience and 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 liability" or "unfunded accrued liability".