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NEBRASKA PUBLIC EMPLOYEES RETIREMENT SYSTEMS

2018
COUNTY EMPLOYEES' RETIREMENT SYSTEM CASH BALANCE BENEFIT FUND

Actuarial Valuation Results
as of January 1, 2018
for State Fiscal Year Ending June 30, 2020

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May 14, 2018

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 County Employees' Retirement System Cash Balance Benefit Fund as of January 1, 2018 for the purpose of determining the actuarial required contribution rate for the 2018 plan year. It is our understanding that any additional required State contributions for this plan year will be made on July 1, 2019 (State fiscal year end 2020). The major findings of the valuation are contained in this report, which reflects the benefit provisions in place on January 1, 2018. At their meeting on October 17, 2016, the Board adopted a new set of actuarial assumptions, based on recommendations in the experience study. Although adopted late in 2016, this is the first valuation report that utilizes the new set of assumptions. In addition to the assumption changes, the 2017 Nebraska Legislature passed Legislative Bill 415 (LB 415), which grants the Board authority to determine the actuarial basis used to calculate annuity rates (which impact monthly benefit amounts) for members hired on or after January 1, 2018. Due to the valuation date, there are no members in this valuation who are affected and, therefore, this change had no impact on the current valuation results.

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 Ameritus, the recordkeeper 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 County 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.

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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

SECTION 1 – BOARD SUMMARY

This report presents the results of the January 1, 2018 actuarial valuation of the County Employees' Retirement System Cash Balance Benefit Fund (Plan). The primary purposes of performing the actuarial valuation are to:

- Determine if member contributions and matching employer contributions, as defined in statute, are sufficient to meet the funding policy defined under Nebraska state statutes for the plan year ending December 31, 2018 and, if not, the additional State contribution needed.
- Disclose asset and liability measurements as well as the current funded status of the County Cash Balance Benefit Fund on the valuation date.
- Compare actual and expected experience under the County Cash Balance Benefit Fund during the plan year beginning January 1, 2017 and ended December 31, 2017.
- Analyze and report on trends in the County Cash Balance Benefit Fund contributions, assets and liabilities over the past several years.
- Quantify the contribution rate available for benefit improvements, if any.

At their meeting on October 17, 2016, the Board adopted a new set of actuarial assumption, as recommended by the actuary in the experience study. Although adopted in 2016, this is the first valuation report that utilizes the new assumptions. Below is a summary of the key assumption changes:

- Investment return assumption was lowered from 7.75% to 7.50%.
- Price inflation assumption was lowered from 3.25% to 2.75%.
- General wage growth was lowered from 4.00% to 3.50%.
- Covered payroll growth assumption decreased from 4.00% to 3.50%.
- Individual salary increase assumption was lowered by 0.50% in order to remain consistent with the general wage growth assumption.
- Assumed cash balance interest crediting rate was lowered from 6.75% to 6.25%.
- Mortality assumption was changed to the RP-2014 While Collar Mortality Table, with adjustments made to better reflect observed experience. Generational mortality improvements are modeled using a System-specific projection scale.
- Termination rates were changed to a service-based assumption.

The change in the actuarial assumptions increased the actuarial accrued liability by $7.8 million and the total actuarial required contribution rate by 0.11% of pay. The impact of the assumption changes on the January 1, 2018 valuation results is summarized in the following table (in millions):

	Old Assumptions	New Assumptions	Difference
Actuarial Accrued Liability (AAL)	$449.6	$457.4	$7.8
Actuarial Value of Assets (AVA)	491.5	491.5	0.0
Unfunded AAL (UAAL)	$ (41.8)	$ (34.1)	$7.8
Funded Ratio	109.31%	107.45%	(1.86%)
Normal Cost Rate	10.28%	10.11%	(0.17%)
UAAL Amortization Rate	(1.42%)	(1.14%)	0.28%
Total Required Contribution Rate	8.86%	8.97%	0.11%
Contribution Shortfall/(Margin)	(2.77%)	(2.66%)	0.11%
Additional State Contribution Amount	$ 0	$ 0	$0

Note: Numbers may not add due to rounding.

In addition to the assumption changes, the 2017 Nebraska Legislature passed Legislative Bill 415 (LB 415), which grants the Board the authority to determine the actuarial basis used to calculate annuity rates (which impacts benefit amounts) for members hired on or after January 1, 2018. This change does not affect any members in the current valuation and, therefore, has no impact on the current valuation results.

The Nebraska statutes require the State to make an additional contribution if the regular, payroll-related contributions by members (4.50% of pay for most members) and the County employers (150% of member contributions for most members) are insufficient to meet the actuarial required contribution for the plan year. Based on the results of the January 1, 2018 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, 2020).**

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 2018 Plan year, the criteria have been met and a dividend may be granted.** The maximum dividend payable on December 31, 2017 account balances is 8.42% (see Table 14). However, based on the Board's policy, the dividend plus the annual interest credit for the year cannot exceed 8.00% unless a majority of the Board agrees. The annual interest credit for 2017 was 5.00%, so a dividend in excess of 3.00% would exceed 8.00% and require a majority vote by the Board.

The actuarial valuation results, which do not reflect the impact of any dividend granted by the Board in 2018, provide a "snapshot" view of the County Cash Balance Benefit Fund's financial condition on January 1, 2018. The excess of actuarial assets over the actuarial accrued liability increased from $22.4 million last year to $34.1 million this year and the funded ratio increased from 105.35% to 107.45%. In addition, the actuarial required contribution rate decreased from 9.50% of pay in last year's valuation to 8.97% of pay in the current valuation. Several factors impacted the January 1, 2018 actuarial valuation results, including:

- Changes to the actuarial assumptions resulted in a $7.8 million increase in the AAL and a decrease in the normal cost rate of 0.17%.

- Actual experience on Plan assets. The rate of return on the market value of assets was 16.4%, but due to the impact of asset smoothing, the rate of return on the actuarial value of assets was 9.4%. This exceeded the assumed rate of return for 2017 (7.75%). As a result, there was an experience gain on assets of $7.3 million.

- Actual demographic experience on Plan liabilities. The single largest source of liability experience was a gain due to a lower interest credit in 2017 than assumed (5.00% actual vs. 6.75% assumed). The net impact of all experience was a gain of $7.2 million.

Due to favorable investment experience in 2017, the net deferred (unrecognized) investment loss of $9.4 million in last year's valuation (difference between the market and actuarial values of assets) is now a net deferred gain of $20.0 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 unfavorable experience to offset the deferred investment gain, the Plan's funded status is expected to improve as the investment experience is recognized.

A summary of the key results from the January 1, 2018 actuarial valuation is shown in the following table. As the table indicates, the statutory contribution rates are sufficient to meet the actuarial required contribution rate and no additional State contribution is required. Further detail on the valuation results can be found in the following sections of this Board Summary.

	January 1, 2018 Valuation Results	January 1, 2017 Valuation Results
Unfunded Actuarial Accrued Liability/(Surplus)	($34,058,428)	($22,409,605)
Funded Ratio using Actuarial Assets	107.45%	105.35%
Normal Cost Rate	10.11%	10.28%
UAAL Amortization Rate	(1.14%)	(0.78%)
Total Actuarial Required Contribution	8.97%	9.50%
Member Contribution Rate	(4.69%)	(4.69%)
Employer Contribution Rate	(6.94%)	(6.94%)
Total Contribution Rate	(11.63%)	(11.63%)
Contribution Shortfall/(Margin)	(2.66%)	(2.13%)
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, 2017 and January 1, 2018. The components are examined in the following discussion.

MEMBERSHIP

In total, the number of members (both active and inactive) increased about 3%, from 9,921 to 10,256. The number of active members increased slightly from 6,683 in the 2017 valuation to 6,710 in the 2018 valuation, an increase of 0.40%.

The number of members receiving benefit payments increased from 569 to 630. This increase of more than 10% reflects the election of 51 active members who retired during 2017 to receive at least part of their benefit as monthly income, along with 18 inactive vested members. In addition, there were 5 members in the Defined Contribution Plan that 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.

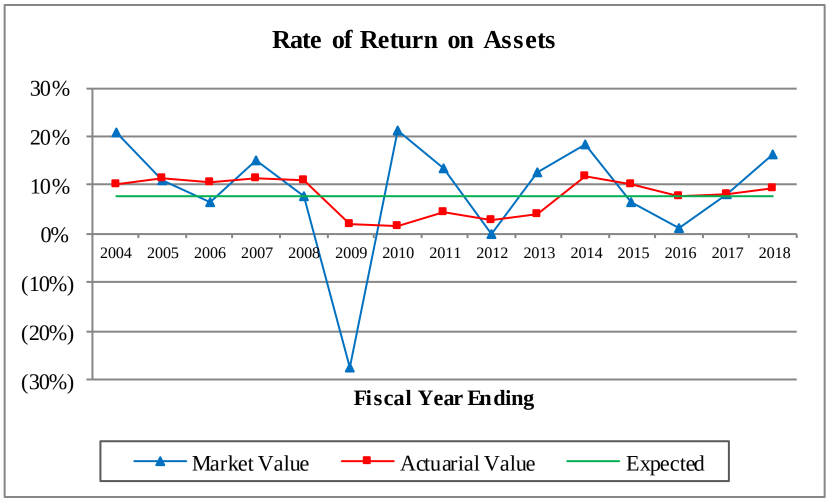
ASSETS

As of December 31, 2017, the County Employees' Retirement System Cash Balance Benefit Fund had net assets of $511.5 million, when measured on a market value basis. This was an increase of $79.8 million from the prior year. The market value of assets is not used directly in the calculation of the unfunded actuarial accrued liability and the actuarial required contribution rate. An asset valuation method, which smoothes the effect of market fluctuations, is used to determine the value of assets used in the valuation. The resulting amount is called the actuarial value of assets. In this year's valuation, the actuarial value of assets is $491.5 million, an increase of $50.3 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, 2016	$	431.77	$	441.19
- Employer and Member Contributions	+	29.75	+	29.75
- Benefit Payments	-	21.93	-	21.93
- Administrative Expenses	-	0.75	-	0.75
- Transfers	+	0.62	+	0.62
- Net Investment Income	+	72.07	+	42.60
Net Assets, December 31, 2017	$	511.53	$	491.48
Estimated Rate of Return		16.4%		9.4%

The rate of return on the actuarial value of assets was 9.4%, which exceeds the assumed rate of return for 2017 of 7.75% (the new assumption of 7.50% applies prospectively beginning in 2018). As a result, there was an experience gain on assets of $7.3 million. The difference between the market and actuarial value of assets of $20.0 million will be reflected over the next four years through the asset smoothing method if there are no offsetting losses from unfavorable 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, 2018 in the following table:

	Actuarial Value of Assets	Market Value of Assets
Actuarial Accrued Liability	$457,424,951	$457,424,951
Value of Assets	491,483,379	511,530,924
Unfunded Actuarial Accrued Liability/(Surplus)	($34,058,428)	($54,105,973)
Funded Ratio	107.45%	111.83%

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.

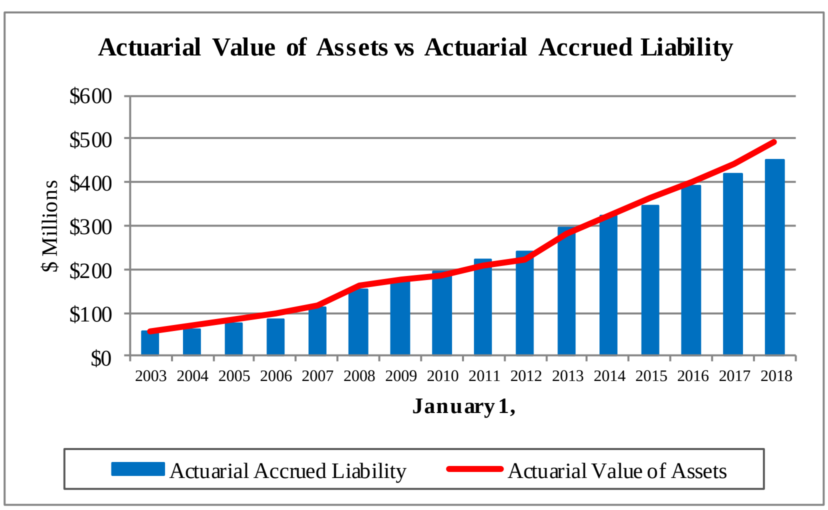
See Section 4 of the report for the detailed development of the unfunded actuarial accrued liability.

The net decrease in the UAAL from January 1, 2017 to January 1, 2018 was $11.7 million. The components of this net change are shown in the following table (in millions):

	($ Millions)
Unfunded Actuarial Accrued Liability, January 1, 2017	($22.4)
- Expected increase from amortization method	0.3
- Actual versus expected contributions	(5.6)
- Investment experience	(7.3)
- Liability experience	(7.2)
- Dividend granted in 2017	1.8
- Impact of assumption changes	7.8
- Other experience	(1.5)
Unfunded Actuarial Accrued Liability, January 1, 2018	($34.1)

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 gain on both assets and liabilities. The largest single source of liability gain was from the actual interest credit of 5.00% for 2017 compared to the assumed interest crediting rate of 6.75% for the 2017 plan year. In total, the Plan experienced an actuarial gain of $14.5 million.

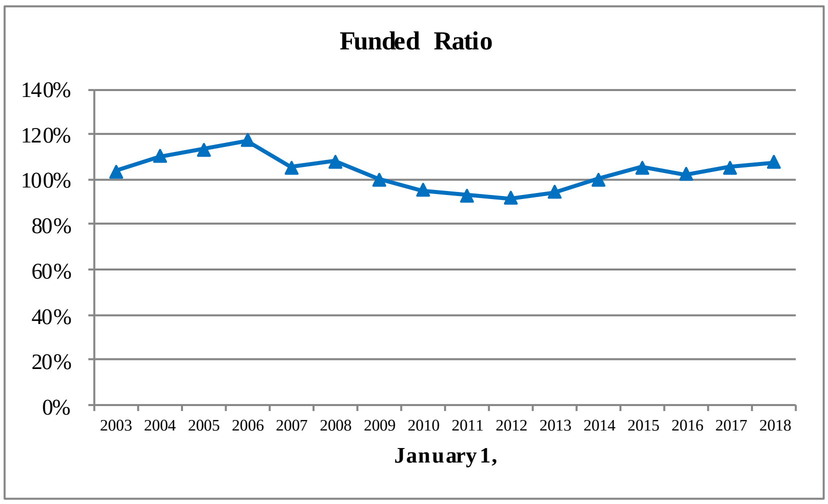
As shown in the following graph, the County Employees' Retirement System Cash Balance Benefit Fund liabilities have increased significantly along with the assets over the last 15 years. The large increases observed in 2008 and 2013 reflect the transfer of members from the Defined Contribution Plan to the Cash Balance Plan due to new election periods provided by the legislature.



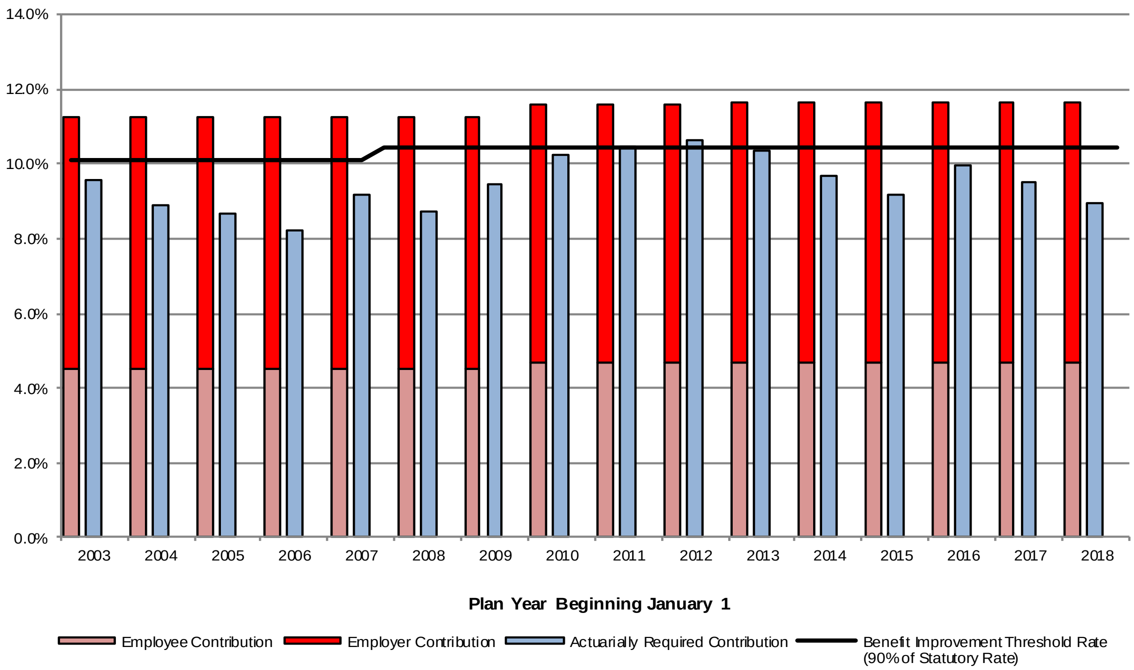
An evaluation of the UAAL on a pure dollar basis may not provide a complete analysis since only the difference between the assets and liabilities (which are both very large numbers) is reflected. Another way to evaluate the UAAL and the progress made in its funding is to track the funded ratio, the ratio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

	1/1/2014	1/1/2015	1/1/2016	1/1/2017	1/1/2018
Funded Ratio using Actuarial Assets	100.3%	105.4%	102.4%	105.4%	107.5%
Unfunded Actuarial Accrued Liability ($M)	($0.9)	($18.9)	($9.2)	($22.4)	($34.1)

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. 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.

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, 2018	January 1, 2017
1. Cash Balance Accounts		
(a) Actives	$ 341,253,378	$ 325,575,652
(b) Inactives	62,962,423	54,370,695
(c) Total	$ 404,215,801	$ 379,946,347
2. Present value of benefits for retirees and beneficiaries	59,209,021	49,881,528
3. Total accumulated benefit obligation	$ 463,424,822	$ 429,827,875
4. Market Value of Assets	511,530,924	431,768,012
5. Deficit/(Reserve) [3 - 4]	$ (48,106,102)	$ (1,940,137)
6. Funded percentage on Market Value of Assets [4 / 3]	110.4%	100.5%

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)	11.63%
2. Required Threshold for Benefit Improvement (90% of (1))	10.46%
3. Actuarial Required Contribution	8.97%
4. Rate Sufficiency/(Deficiency) [2 - 3]	1.49%

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, 2018 Valuation Results Before Dividend:

	Funded Basis	Current Value Basis
(a) Liability	$457,424,951	$463,424,822
(b) Assets	491,483,379	511,530,924
(c) (Deficit)/Reserve [(b) - (a)]	$34,058,428	$48,106,102
(d) Funded Ratio [(b) / (a)]	107.4%	110.4%

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.

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 8.97% of pay is less than 90% of the statutory contribution rate of 11.63% or 10.46%. This difference of 1.49% 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, 2018 actuarial valuation indicates that the funded ratios are 107.4% and 110.4%, respectively. **Therefore, the Plan has met all of the requirements in the current valuation and a dividend may be granted in 2018.** See Table 14 for more detail on the criteria for granting a dividend and the maximum dividend payable this year.

ACTUARIAL REQUIRED CONTRIBUTION RATE

The County Employees' Retirement System Cash Balance Benefit Fund is funded by statutory contribution rates for members (4.50% of pay for most members) and employers (150% of the member rate for most members). State statutes require the State to make an additional contribution if the regular, payroll-related contributions by employees and employers 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, 2018 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, 2018, 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, 2018	January 1, 2017
Normal Cost Rate	10.11%	10.28%
UAAL Amortization Rate	(1.14%)	(0.78%)
Total Actuarial Required Contribution	8.97%	9.50%
Member Contribution Rate	(4.69%)	(4.69%)
Employer Contribution Rate	(6.94%)	(6.94%)
Total Contribution Rate	(11.63%)	(11.63%)
Contribution Shortfall/(Margin)	(2.66%)	(2.13%)

The actuarial required contribution rate for the current plan year is 8.97%. The effective member contribution rate of 4.69% and employer contribution rate of 6.94% result in a total statutory contribution rate of 11.63% of pay. As a result, a contribution margin of 2.66% exists for the 2018 plan year.

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

History of Expected County Contributions			
Plan Year	County Contribution	Additional Contributions	Total
2004	$ 4,092,294	$ 0	$ 4,092,294
2005	4,577,184	0	4,577,184
2006	5,949,740	0	5,949,740
2007	7,659,110	0	7,659,110
2008	9,524,951	0	9,524,951
2009	11,156,102	0	11,156,102
2010	12,316,843	0	12,316,843
2011	12,730,571	0	12,730,571
2012	13,393,553	0	13,393,553
2013	14,073,352	0	14,073,352
2014	14,331,841	0	14,331,841
2015	15,226,497	0	15,226,497
2016	16,564,360	0	16,564,360
2017	17,666,494	0	17,666,494
2018	18,003,148	0	18,003,148

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.

SUMMARY OF PRINCIPAL RESULTS

		1/1/2018 Valuation		1/1/2017 Valuation	% Change
1. PARTICIPANT DATA					
Number of:					
Active Members		6,710		6,683	0.40%
Retired Members and Beneficiaries		630		569	10.72%
Disabled Members		0		0	N/A
Inactive Members		2,916		2,669	9.25%
Total Members		10,256		9,921	3.38%
Projected Annual Salaries of Active Members	$	259,411,357	$	254,560,438	1.91%
Annual Retirement Payments for Retired Members and Beneficiaries	$	6,808,117	$	5,979,668	13.85%
2. ASSETS AND LIABILITIES					
a. Market Value of Assets	$	511,530,924	$	431,768,012	18.47%
b. Actuarial Value of Assets		491,483,379		441,187,867	11.40%
c. Total Actuarial Accrued Liability		457,424,951		418,778,262	9.23%
d. Unfunded Actuarial Accrued Liability/(Surplus) [c - b]	$	(34,058,428)	$	(22,409,605)	51.98%
e. Funded Ratio (Actuarial Value of Assets) [b / c]		107.45%		105.35%	1.99%
f. Funded Ratio (Market Value of Assets) [a / c]		111.83%		103.10%	8.47%
3. CONTRIBUTION RATES AS A PERCENT OF PAYROLL					
Normal Cost		10.11%		10.28%	(1.65%)
Amortization of Unfunded Actuarial Accrued Liability		(1.14%)		(0.78%)	46.15%
Actuarial Required Contribution Rate		8.97%		9.50%	(5.58%)
Member Contribution Rate*		(4.69%)		(4.69%)	0.00%
Employer Contribution Rate**		(6.94%)		(6.94%)	0.00%
Contribution Shortfall/(Margin)		(2.66%)		(2.13%)	24.88%
Additional State Contribution Amount	$	0	$	0	N/A

* Includes additional member contribution rates of 1% or 2% of pay for commissioned law-enforcement officers.
** 150% of member contribution rate plus additional rates of 1% or 2% of pay for commissioned law-enforcement officers.

SECTION 2 – SCOPE OF THE REPORT

This report presents the actuarial valuation results of the County Employees' Retirement System Cash Balance Benefit Fund as of January 1, 2018. 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 County 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 other information related to the historical funding of the System.

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, 2018.
- 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.

SECTION 3 – ASSETS

In many respects, an actuarial valuation can be thought of as an inventory process. The inventory is taken as of the actuarial valuation date, which for this valuation is January 1, 2018. On that date, the assets available for the payment of benefits are appraised. The assets are compared with the liabilities of the County Employees' Retirement System Cash Balance Benefit Fund, which are generally in excess of assets. The actuarial process then leads to a method of determining the contributions needed by members and employers in the future to balance the Plan 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, 2017, and December 31, 2016, in total and by investment category. Table 2 summarizes the change in the market value of assets from December 31, 2016 to December 31, 2017.

Actuarial Value of Assets

Neither the market value of assets, representing a "cash-out" value of County 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

COUNTY EMPLOYEES' RETIREMENT SYSTEM
CASH BALANCE BENEFIT FUND

MARKET VALUE OF ASSETS
by Investment Category

	December 31, 2017	December 31, 2016
1. Cash and Equivalents	$ 52,939	$ 62,619
2. Investments	524,493,902	449,167,013
3. Receivables and Prepaids	49,067,645	20,726,054
4. Accounts Payable	(62,083,562)	(38,187,674)
5. Net Assets Available for Pension Benefits [1 + 2 + 3 + 4]	$ 511,530,924	$ 431,768,012

TABLE 2

COUNTY EMPLOYEES' RETIREMENT SYSTEM
CASH BALANCE BENEFIT FUND

CHANGE IN MARKET VALUE OF ASSETS

		December 31, 2017		December 31, 2016
1. Beginning Market Value of Assets	$	431,768,012	$	391,428,009
2. Contributions				
(a) Member (includes purchased service)	$	12,000,061	$	11,352,667
(b) Employer		17,752,388		16,935,811
(c) State appropriations		0		0
(d) Total	$	29,752,449	$	28,288,478
3. Transfers Between Plans				
(a) From Defined Contribution Plans	$	619,284	$	1,678,510
(b) Between Cash Balance Plans		0		0
(c) Net Transfers	$	619,284	$	1,678,510
4. Receivable Transfer from Defined Contribution Benefit Fund	$	0	$	0
5. Expenditures				
(a) Benefit payments and refunds	$	21,934,437	$	22,092,412
(b) Administrative Expenses		750,056		649,709
(c) Total	$	22,684,493	$	22,742,121
6. Net Investment Income	$	72,075,672	$	33,115,136
7. Ending Market Value of Assets [1 + 2(d) + 3(c) + 4 - 5(c) + 6]	$	511,530,924	$	431,768,012
8. Rate of Return on Market Value of Assets		16.4%		8.2%

TABLE 3

COUNTY EMPLOYEES' RETIREMENT SYSTEM
CASH BALANCE BENEFIT FUND

DEVELOPMENT OF ACTUARIAL VALUE OF ASSETS

	Year End							
		12/31/2014		12/31/2015		12/31/2016		12/31/2017
1. Actuarial Value of Assets, Beginning of Year	$	323,882,230	$	366,266,592	$	400,003,569	$	441,187,867
2. Unrecognized Return Beginning of Year	$	26,682,548	$	16,079,486	$	(8,575,560)	$	(9,419,855)
3. Contributions During Year								
(a) Member	$	10,327,540	$	10,966,403	$	11,352,667	$	12,000,061
(b) Employer		15,268,274		16,068,670		16,935,811		17,752,388
(c) State appropriations		0		0		0		0
(d) Total	$	25,595,814	$	27,035,073	$	28,288,478	$	29,752,449
4. Net Transfers	$	835,282	$	826,843	$	1,678,510	$	619,284
5. Receivable Transfer from Defined Contribution Benefit Fund	$	0	$	0	$	0	$	0
6. Benefit Payments During Year	$	17,750,010	$	23,080,849	$	22,092,412	$	21,934,437
7. Expected Investment Income on (1), (2), (3), (4) and (6) at 7.75%	$	27,498,886	$	29,813,631	$	30,635,117	$	33,782,866
8. Actual Return on Market Value, Net of All Expenses	$	23,100,214	$	4,300,864	$	32,465,427	$	71,325,616
9. Return to be Spread, End of Year [8 - 7]	$	(4,398,672)	$	(25,512,767)	$	1,830,310	$	37,542,750

TABLE 3
(continued)

COUNTY EMPLOYEES' RETIREMENT SYSTEM
CASH BALANCE BENEFIT FUND

8. Return to be Spread

Year	Return to be Spread	Unrecognized Percent	Unrecognized Return
2017	37,542,750	80%	$30,034,200
2016	1,830,310	60%	1,098,186
2015	(25,512,767)	40%	(10,205,107)
2014	(4,398,672)	20%	(879,734)
			$20,047,545

9. Total Market Value of Assets as of January 1, 2018	$511,530,924
10. Total Actuarial Value of Assets as of January 1, 2018 [9 - 8]	$491,483,379
11. Asset Ratios	
(a) Actuarial Value to Market Value [10 / 9]	96.08%
(b) Market Value to Actuarial Value [9 / 10]	104.08%

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 County Employees' Retirement System Cash Balance Benefit Fund as of the valuation date, January 1, 2018. 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, 2018.

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 County 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

COUNTY EMPLOYEES' RETIREMENT SYSTEM
CASH BALANCE BENEFIT FUND

PRESENT VALUE OF FUTURE BENEFITS (PVFB)
AS OF JANUARY 1, 2018

1. Active Employees		
(a) Retirement	$	431,506,057
(b) Withdrawal		86,155,600
(c) Death		13,482,274
(d) Total	$	531,143,931
2. Inactive Vested Members		60,621,982
3. Inactive Nonvested Members		2,340,441
4. Disabled Members		0
5. Retirees		56,918,758
6. Beneficiaries		2,290,263
7. Total Present Value of Future Benefits [1(d) + 2 + 3 + 4 + 5 + 6]	$	653,315,375

TABLE 5

COUNTY EMPLOYEES' RETIREMENT SYSTEM
CASH BALANCE BENEFIT FUND

ACTUARIAL ACCRUED LIABILITY
AS OF JANUARY 1, 2018

1. Present Value of Future Benefits for Active Members	$	531,143,931
2. Present Value of Future Normal Costs for Active Members	$	195,890,424
3. Actuarial Accrued Liability for Active Members [1 - 2]	$	335,253,507
4. Actuarial Accrued Liability for Inactive Members		122,171,444
5. Total Actuarial Accrued Liability [3 + 4]		457,424,951
6. Actuarial Value of Assets		491,483,379
7. Unfunded Actuarial Accrued Liability/(Surplus) [5- 6]	$	(34,058,428)

TABLE 6

COUNTY EMPLOYEES' RETIREMENT SYSTEM
CASH BALANCE BENEFIT FUND

ACTUARIAL BALANCE SHEET

ASSETS				
Actuarial Value of Assets			$	491,483,379
Unfunded Actuarial Accrued Liability/(Surplus)				(34,058,428)
Present Value of Future Normal Costs			$	195,890,424
Total Assets			$	653,315,375
LIABILITIES				
Present Value of Future Benefits				
Active members				
Retirement	$	431,506,057		
Withdrawal		86,155,600		
Death		13,482,274		
Total			$	531,143,931
Inactive members				62,962,423
Retirees, disabilities and beneficiaries				59,209,021
Total Liabilities			$	653,315,375

TABLE 7

COUNTY EMPLOYEES' RETIREMENT SYSTEM
CASH BALANCE BENEFIT FUND

ACTUARIAL GAIN/(LOSS)

Liabilities			
1.	Actuarial Accrued Liability as of January 1, 2017	$	418,778,262
2.	Normal Cost During 2017		24,062,431
3.	Benefit Payments During Plan Year Ending December 31, 2017		(21,934,437)
4.	Transfers from Defined Contribution Plan		619,284
5.	Interest on Items 1 - 4 at 7.75%		33,509,603
6.	Dividend Granted in 2017		1,838,521
7.	Assumption Changes		7,781,664
8.	Expected Actuarial Accrued Liability as of January 1, 2018	$	464,655,328
9.	Actuarial Accrued Liability as of January 1, 2018	$	457,424,951
Assets			
10.	Actuarial Value of Assets as of January 1, 2017	$	441,187,867
11.	Contributions During Plan Year Ending December 31, 2017		29,752,449
12.	Benefit Payments During Plan Year Ending December 31, 2017		(21,934,437)
13.	Transfers from Defined Contribution Plan		619,284
14.	Interest at 7.75%		34,512,905
15.	Expected Actuarial Value of Assets as of January 1, 2018	$	484,138,068
16.	Actuarial Value of Assets as of January 1, 2018	$	491,483,379
Gain / (Loss)			
17.	Actuarial Gain / (Loss) on Liabilities [8 - 9]	$	7,230,377
18.	Actuarial Gain / (Loss) on Assets [16 - 15]	$	7,345,311
19.	Total Actuarial Gain / (Loss) for Plan Year Ending December 31, 2017 [17 + 18]	$	14,575,688

TABLE 8

COUNTY EMPLOYEES' RETIREMENT SYSTEM
CASH BALANCE BENEFIT FUND

GAIN/(LOSS) ANALYSIS BY SOURCE

Liability Sources		Gain/(Loss)
Retirement	$	358,000
Termination		531,000
Disability		0
Mortality		64,000
Salary		155,000
New Entrants/Rehires		(2,233,000)
Interest Credit		6,605,000
DC Transfers Upon Retirement		322,000
Miscellaneous		1,428,000
Total Liability Gain/(Loss)	$	7,230,000
Asset Gain/(Loss)	$	7,346,000
Net Actuarial Gain/(Loss)	$	14,576,000

TABLE 9

COUNTY EMPLOYEES' RETIREMENT SYSTEM
CASH BALANCE BENEFIT FUND

PROJECTED BENEFIT PAYMENTS
AS OF JANUARY 1, 2018

Plan Year Ending December 31,	Active Employees	Retired and Disabled Members and Beneficiaries	Total
2018	$ 25,296,000	$ 6,789,000	$ 32,085,000
2019	27,024,000	6,629,000	33,653,000
2020	29,353,000	6,507,000	35,860,000
2021	31,367,000	6,177,000	37,544,000
2022	32,825,000	5,964,000	38,789,000
2023	34,219,000	5,797,000	40,016,000
2024	35,672,000	5,609,000	41,281,000
2025	36,848,000	5,306,000	42,154,000
2026	38,197,000	5,124,000	43,321,000
2027	39,746,000	4,949,000	44,695,000
2028	40,641,000	4,761,000	45,402,000
2029	41,568,000	4,654,000	46,222,000
2030	42,645,000	4,393,000	47,038,000
2031	43,737,000	4,115,000	47,852,000
2032	44,397,000	3,862,000	48,259,000
2033	44,738,000	3,558,000	48,296,000
2034	45,453,000	3,355,000	48,808,000
2035	46,586,000	3,111,000	49,697,000
2036	47,238,000	2,910,000	50,148,000
2037	47,867,000	2,668,000	50,535,000
2038	47,942,000	2,452,000	50,394,000
2039	48,362,000	2,249,000	50,611,000
2040	49,705,000	2,047,000	51,752,000
2041	49,770,000	1,846,000	51,616,000
2042	50,828,000	1,650,000	52,478,000
2043	51,370,000	1,462,000	52,832,000
2044	52,161,000	1,281,000	53,442,000
2045	53,480,000	1,113,000	54,593,000
2046	53,761,000	956,000	54,717,000
2047	54,113,000	813,000	54,926,000

Note: Cash flows are the expected future non-discounted payments to current members. These amounts assume members terminating before reaching retirement eligibility will elect a lump sum distribution of their cash balance account. 40% of members eligible for retirement will elect a monthly annuity, payable for life with 5 years certain, and 60% will elect a lump sum distribution of their cash balance account. These payments exclude refund payouts to any current vested or nonvested inactives.

SECTION 5 – EMPLOYER CONTRIBUTIONS

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, 2018 actuarial valuation will be used to determine the actuarial required employer contribution rate to the County Employees' Retirement System Cash Balance Benefit Fund for the plan year ending December 31, 2018. Any additional State contributions, if required, are expected to be deposited on July 1, 2019 (State fiscal year 2020). 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, 2018, is developed. Table 11 develops the actuarial required contribution rate for the County 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

COUNTY EMPLOYEES' RETIREMENT SYSTEM
CASH BALANCE BENEFIT FUND

SCHEDULE OF AMORTIZATION BASES

Amortization Bases	Original Amount	January 1, 2018 Remaining Payments	Date of Last Payment	Outstanding Balance as of January 1, 2018	Annual Contribution*
2018 Unfunded Actuarial Accrued Liability Base	(34,058,428)	25	1/1/2043	(34,058,428)	(2,946,894)
Total				**$ (34,058,428)**	**$ (2,946,894)**

* Contribution amount reflects mid-year timing.

1. Total UAAL Amortization Payments	$	(2,946,894)
2. Projected Payroll for 2018 Plan Year	$	259,411,357
3. UAAL Amortization Payment Rate		(1.14%)

Per State Statute Sect. 84-1319 (4)(b), because the UAAL as of January 1, 2018 is zero or less than zero, all prior amortization bases are considered fully funded and the UAAL is reinitialized.

TABLE 11

COUNTY EMPLOYEES' RETIREMENT SYSTEM
CASH BALANCE BENEFIT FUND

ACTUARIAL REQUIRED CONTRIBUTION RATE
and
DEVELOPMENT OF ADDITIONAL STATE CONTRIBUTION

1. Normal Cost		
(a) Amount	$	23,837,629
(b) Expected pay for current actives		235,820,059
(c) Normal Cost Rate as % of pay		10.11%
2. Amortization Cost		
(a) Amount		(2,946,894)
(b) Expected pay for all actives		259,411,357
(c) Amortization Rate as % of pay		(1.14%)
3. Total Actuarial Required Contribution Rate [1(c) + 2(c)]		8.97%
4. Statutory Contribution Rates		
(a) Member*		4.69%
(b) Employer**		6.94%
(c) Total		11.63%
5. Additional Required State Contribution [3 - 4(c), not less than 0.00%]		0.00%
6. Expected pay for all actives during 2018		259,411,357
7. Additional Required State Contribution payable July 1, 2019 [5 * 6 * $1.075^{.5}$, but not less than $0]	$	0

* Includes additional member contribution rates of 1% or 2% of pay for commissioned law-enforcement officers.

** 150% of employee contribution rate plus additional rates of 1% or 2% of pay for commissioned law-enforcement officers.

TABLE 12

COUNTY EMPLOYEES' RETIREMENT SYSTEM
CASH BALANCE BENEFIT FUND

HISTORICAL CONTRIBUTION RATES

Plan Year	Statutory Contribution Rate Employee	Employer	Total	Actuarial Rate	Margin/ (Shortfall)
2003	4.50%	6.75%	11.25%	9.56%	1.69%
2004	4.50%	6.75%	11.25%	8.91%	2.34%
2005	4.50%	6.75%	11.25%	8.67%	2.58%
2006	4.50%	6.75%	11.25%	8.21%	3.04%
2007	4.50%	6.75%	11.25%	9.19%	2.06%
2008	4.50%	6.75%	11.25%	8.74%	2.51%
2009	4.50%	6.75%	11.25%	9.47%	1.78%
2010	4.68%	6.93%	11.61%	10.25%	1.36%
2011	4.67%	6.92%	11.59%	10.47%	1.12%
2012	4.68%	6.93%	11.61%	10.65%	0.96%
2013	4.69%	6.94%	11.63%	10.36%	1.27%
2014	4.69%	6.94%	11.63%	9.66%	1.97%
2015	4.69%	6.94%	11.63%	9.19%	2.44%
2016	4.69%	6.94%	11.63%	9.95%	1.68%
2017	4.69%	6.94%	11.63%	9.50%	2.13%
2018	4.69%	6.94%	11.63%	8.97%	2.66%

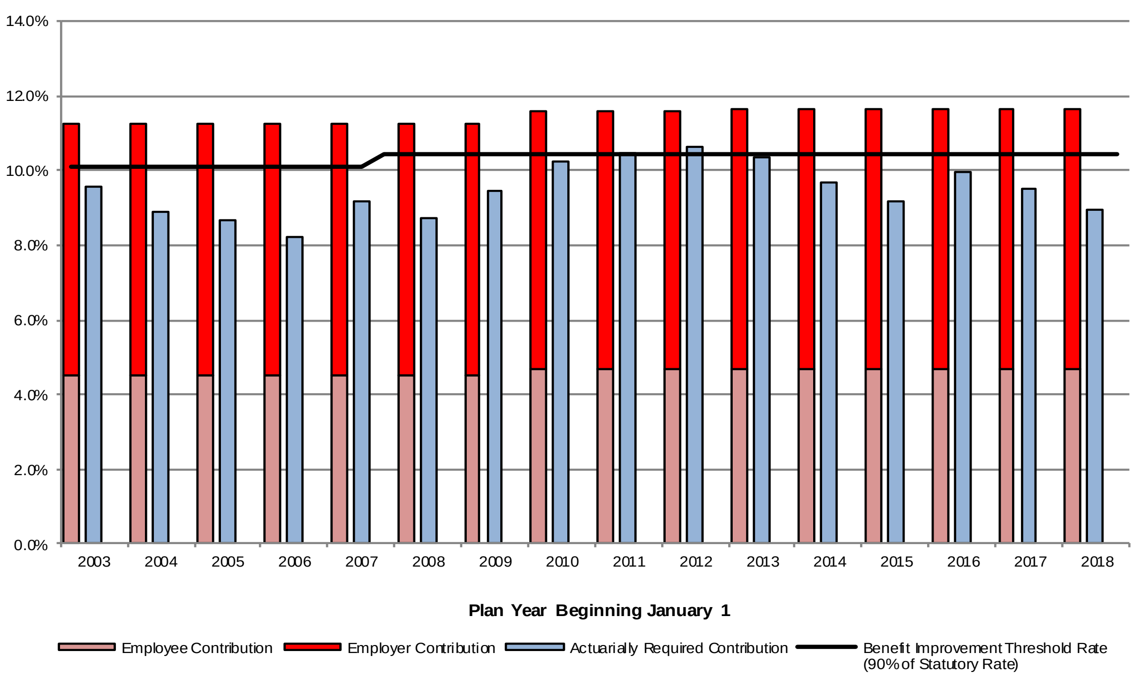


TABLE 13

COUNTY EMPLOYEES' RETIREMENT SYSTEM
CASH BALANCE BENEFIT FUND

FUNDING EXCESS AVAILABLE FOR
BENEFIT IMPROVEMENT

1. Total Statutory Contribution Rate		11.63%
2. Benefit Improvement Threshold Rate (90% of (1))		10.46%
3. Actuarially Required Contribution Rate		8.97%
4. Unfunded Actuarial Accrued Liability	$	(34,058,428)
5. Requirements for Using Excess for Benefit Improvement		
a. Rate Sufficiency: (3) < (2)		Yes
b. No UAAL: (4) < 0		Yes
6. Funding Excess Available for Benefit Improvement		
As a rate of pay: (2) - (3), not less than 0%		1.49%

TABLE 14

COUNTY 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, 2018 Valuation Results Before Dividend:		
(a) Liability	$457,424,951	$463,424,822
(b) Assets	491,483,379	511,530,924
(c) (Deficit)/Reserve [(b) - (a)]	$34,058,428	$48,106,102
2. Amount Available for Dividend (Lesser of 1(c) on Funded Basis or Current Value Basis)		$34,058,428
3. Account Balances as of December 31, 2017		$404,215,801
4. Maximum Dividend [2 / 3]		8.42%
5. Annual Interest Credit for 2017		5.00%
6. 2017 Interest Credit Plus Maximum Dividend [4 + 5]		13.42%
7. January 1, 2018 Valuation Results After Maximum Dividend:		
(a) Actuarial Contribution Rate		10.11%
(b) Benefit Improvement Threshold Rate		10.46%
(c) Is (a) < (b)? **[Criteria A]**		**Yes**
(d) Funded Ratio on a Funded Basis		100.0%
(e) Funded Ratio on a Current Value Basis		102.8%
(f) Are (d) and (e) both at least 100%? **[Criteria B]**		**Yes**
8. Is (5) < actuarial assumed interest rate (7.50%)? **[Criteria C]**		**Yes**
9. Is (6) greater than 8.00%? **[Criteria D]**		**Yes**
- Any dividend over 3% can only be granted if the majority of the PERB agrees.		

SECTION 6 – OTHER INFORMATION

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, 2018. 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 15

COUNTY 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, 2018	$491,483,379	$457,424,951	($34,058,428)	107.4%	$259,411,357	(13.1%)
January 1, 2017	441,187,867	418,778,262	(22,409,605)	105.4%	254,560,438	(8.8%)
January 1, 2016	400,003,569	390,785,123	(9,218,446)	102.4%	238,679,544	(3.9%)
January 1, 2015	366,266,592	347,369,862	(18,896,730)	105.4%	219,401,973	(8.6%)
January 1, 2014	323,882,230	322,994,373	(887,857)	100.3%	206,510,678	(0.4%)
January 1, 2013	281,261,645	297,572,626	16,310,981	94.5%	202,786,048	8.0%
January 1, 2012	220,662,783	240,195,114	19,532,331	91.9%	193,269,158	10.1%
January 1, 2011	206,036,302	221,080,026	15,043,724	93.2%	183,967,790	8.2%
January 1, 2010	187,109,554	196,773,040	9,663,486	95.1%	177,732,220	5.4%
January 1, 2009	175,765,930	175,293,953	(471,977)	100.3%	165,275,589	(0.3%)

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

TABLE 16

COUNTY EMPLOYEES' RETIREMENT SYSTEM
CASH BALANCE BENEFIT FUND

SCHEDULE OF CONTRIBUTIONS FROM EMPLOYERS AND OTHER CONTRIBUTING ENTITIES

	Actuarial Required Contributions			
Plan Year Ending	Counties	State Additional	Total	Percent Contributed
December 31, 2017	$12,244,357	$0	$12,244,357	145%
December 31, 2016	12,554,544	0	12,554,544	135%
December 31, 2015	9,873,089	0	9,873,089	163%
December 31, 2014	10,263,581	0	10,263,581	149%
December 31, 2013	11,497,969	0	11,497,969	124%
December 31, 2012	12,696,338	0	12,696,338	100%
December 31, 2011	11,908,346	0	11,908,346	100%
December 31, 2010	11,370,059	0	11,370,059	100%
December 31, 2009	10,555,174	0	10,555,174	100%
December 31, 2008	9,839,409	0	9,839,409	100%

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	7,747	3,807	2,461	14,015
Number of State records removed	0	0	(1,824)	(1,824)
a) DC Participant	(969)	(642)	0	(1,611)
b) Death	0	0	0	0
c) Assumed Inactive				
- Benefits due	(77)	77	0	0
- Cashed out	0	0	0	0
d) Null Balance	0	(268)	0	(268)
e) Termination Date after Valuation Date	9	(9)	0	0
f) Also Listed as Retired	0	(49)	0	(49)
g) Benefits Expired	0	0	(7)	(7)
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	0	0
k) Date of Death after Valuation Date	0	0	0	0
Net Change	(1,037)	(891)	(1,831)	(3,759)
Number of Members Included in the Valuation as of January 1, 2018	6,710	2,916	630	10,256

* Based on data file received from Ameritas.

MEMBER DATA RECONCILIATION

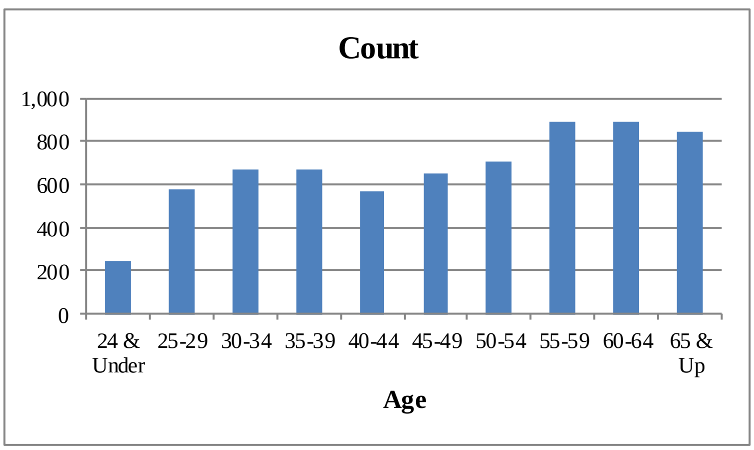
	Active Members	Inactive Vested	Inactive Non-Vested	Retirees and Beneficiaries	Total
As of January 1, 2017	6,683	1,164	1,505	569	9,921
Changes in status					
a) Retirement	(51)	(18)	0	69	0
b) Death	(1)	0	0	(12)	(13)
c) Non-vested terminations	(252)	0	252	0	0
d) Vested terminations	(339)	339	0	0	0
e) Contribution refund	(312)	(168)	(184)	0	(664)
f) Beneficiaries in receipt	0	0	0	14	14
g) Disability retirements	0	0	0	0	0
h) Return to active service	57	(29)	(28)	0	0
i) Expired benefits	0	0	0	(15)	(15)
j) Data adjustments	(37)	(24)	(33)	0	(94)
Total changes in status	(935)	100	7	56	(772)
Transferred from DC Plan	0	0	0	5	5
New entrants	962	25	115	0	1,102
Net Change	27	125	122	61	335
As of January 1, 2018	6,710	1,289	1,627	630	10,256

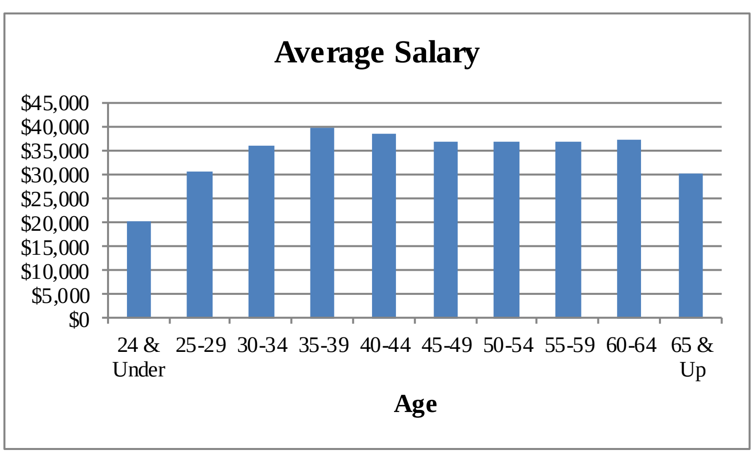
SUMMARY OF MEMBERSHIP DATA

A. ACTIVE MEMBERS		January 1, 2018		January 1, 2017	% Change
1. Number of Active Members		6,710		6,683	0.4%
2. Reported Salary	$	236,365,694	$	231,825,936	2.0%
3. Accumulated Contributions					
(a) Employee Cash Balance Account	$	136,733,083	$	130,340,223	4.9%
(b) Employer Cash Balance Account		204,520,295		195,235,429	4.8%
(c) Total Cash Balance Account	$	341,253,378	$	325,575,652	4.8%
4. Active Member Averages					
(a) Age		48.2		48.1	0.2%
(b) Service		8.6		8.5	1.2%
(c) Compensation	$	35,226	$	34,689	1.5%
(d) Cash Balance Account	$	50,857	$	48,717	4.4%
B. INACTIVE MEMBERS					
1. Number of Inactive Members					
(a) Vested		1,289		1,164	10.7%
(b) Nonvested (refund only)		1,627		1,505	8.1%
(c) Total		2,916		2,669	9.3%
2. Total Vested Cash Balance Account	$	60,621,982	$	52,255,346	16.0%
3. Inactive Members Averages					
(a) Age (vesteds only)		53.4		53.7	(0.6%)
(b) Vested Cash Balance Account	$	47,030		44,893	4.8%
C. RETIREES, DISABLEDS, AND BENEFICIARIES					
1. Number of Members					
(a) Retired		569		521	9.2%
(b) Disabled		0		0	0.0%
(c) Beneficiaries		61		48	27.1%
(d) Total		630		569	10.7%
2. Total Annual Benefit Payments					
(a) Retired	$	6,469,058	$	5,694,091	13.6%
(b) Disabled		0		0	0.0%
(c) Beneficiaries		339,059		285,577	18.7%
(d) Total	$	6,808,117	$	5,979,668	13.9%

ACTIVE MEMBERS
AS OF JANUARY 1, 2018

	Count of Members			Prior Year Reported Salary		
Age	Male	Female	Total	Male	Female	Total
24 & Under	138	109	247	$ 3,003,920	$ 2,009,863	$ 5,013,783
25-29	286	291	577	9,258,974	8,412,825	17,671,799
30-34	340	329	669	13,408,352	10,744,561	24,152,913
35-39	340	332	672	14,466,472	12,155,731	26,622,203
40-44	290	278	568	11,864,227	9,924,085	21,788,312
45-49	326	325	651	12,934,927	11,001,492	23,936,419
50-54	364	339	703	14,391,065	11,466,459	25,857,524
55-59	400	489	889	15,568,023	17,269,386	32,837,409
60-64	471	422	893	18,050,810	15,071,756	33,122,566
65 & Up	543	298	841	15,342,637	10,020,129	25,362,766
Total	3,498	3,212	6,710	$ 128,289,407	$ 108,076,287	$ 236,365,694



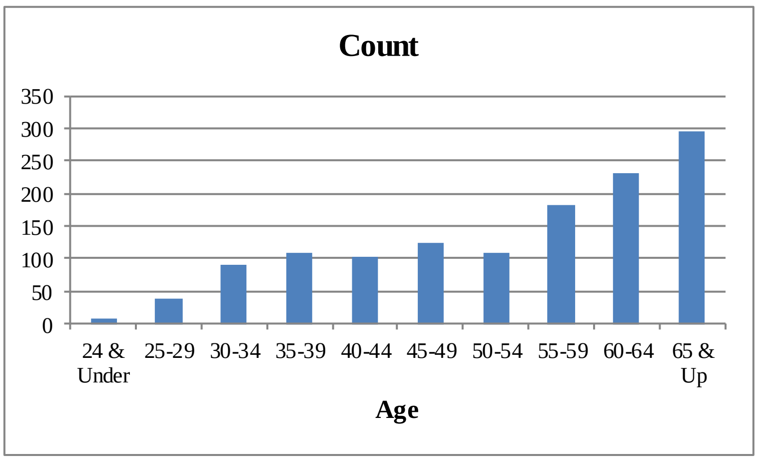


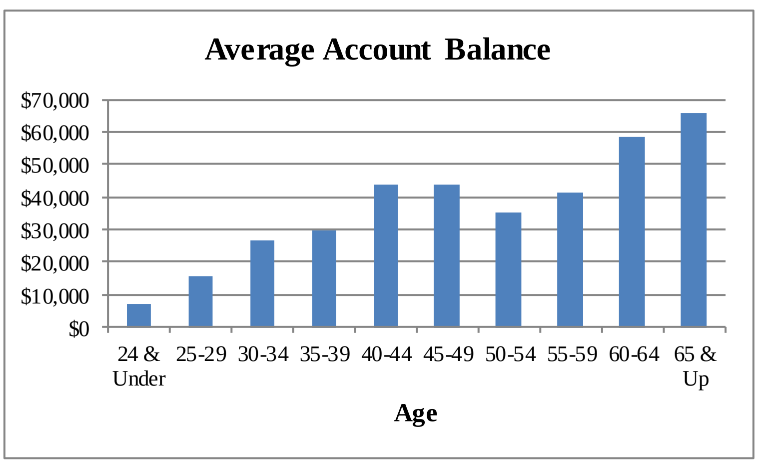
AGE AND SERVICE DISTRIBUTION
AS OF JANUARY 1, 2018

Age		0-4	5-9	10-14	15-19	20-24	25-29	30-34	Over 34	Total
24 & Under	Number	246	1	0	0	0	0	0	0	247
	Reported Salary	$ 4,984,037	$ 29,746	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 5,013,783
	Average Sal.	$ 20,260	$ 29,746	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 20,299
25-29	Number	503	73	1	0	0	0	0	0	577
	Reported Salary	$ 14,733,286	$ 2,885,164	$ 53,349	$ 0	$ 0	$ 0	$ 0	$ 0	$ 17,671,799
	Average Sal.	$ 29,291	$ 39,523	$ 53,349	$ 0	$ 0	$ 0	$ 0	$ 0	$ 30,627
30-34	Number	428	196	45	0	0	0	0	0	669
	Reported Salary	$ 13,142,299	$ 8,881,040	$ 2,129,574	$ 0	$ 0	$ 0	$ 0	$ 0	$ 24,152,913
	Average Sal.	$ 30,706	$ 45,311	$ 47,324	$ 0	$ 0	$ 0	$ 0	$ 0	$ 36,103
35-39	Number	316	194	157	5	0	0	0	0	672
	Reported Salary	$ 9,848,268	$ 8,230,481	$ 8,299,963	$ 243,491	$ 0	$ 0	$ 0	$ 0	$ 26,622,203
	Average Sal.	$ 31,165	$ 42,425	$ 52,866	$ 48,698	$ 0	$ 0	$ 0	$ 0	$ 39,616
40-44	Number	262	142	124	32	8	0	0	0	568
	Reported Salary	$ 7,449,326	$ 6,050,707	$ 6,213,388	$ 1,689,767	$ 385,124	$ 0	$ 0	$ 0	$ 21,788,312
	Average Sal.	$ 28,433	$ 42,611	$ 50,108	$ 52,805	$ 48,140	$ 0	$ 0	$ 0	$ 38,360
45-49	Number	285	162	139	43	19	3	0	0	651
	Reported Salary	$ 7,749,338	$ 6,355,161	$ 6,129,546	$ 2,410,109	$ 1,186,852	$ 105,413	$ 0	$ 0	$ 23,936,419
	Average Sal.	$ 27,191	$ 39,229	$ 44,097	$ 56,049	$ 62,466	$ 35,138	$ 0	$ 0	$ 36,769
50-54	Number	280	161	141	56	23	38	4	0	703
	Reported Salary	$ 7,981,368	$ 5,776,846	$ 6,029,937	$ 2,555,272	$ 1,090,049	$ 2,149,535	$ 274,517	$ 0	$ 25,857,524
	Average Sal.	$ 28,505	$ 35,881	$ 42,766	$ 45,630	$ 47,393	$ 56,567	$ 68,629	$ 0	$ 36,782
55-59	Number	277	204	172	64	42	72	58	0	889
	Reported Salary	$ 7,596,598	$ 7,451,671	$ 6,773,440	$ 2,649,406	$ 1,866,154	$ 3,467,217	$ 3,032,923	$ 0	$ 32,837,409
	Average Sal.	$ 27,425	$ 36,528	$ 39,380	$ 41,397	$ 44,432	$ 48,156	$ 52,292	$ 0	$ 36,937
60-64	Number	258	164	167	84	45	71	69	35	893
	Reported Salary	$ 6,824,920	$ 5,790,109	$ 6,264,941	$ 3,705,386	$ 1,899,569	$ 3,173,309	$ 3,382,784	$ 2,081,548	$ 33,122,566
	Average Sal.	$ 26,453	$ 35,306	$ 37,515	$ 44,112	$ 42,213	$ 44,695	$ 49,026	$ 59,473	$ 37,091
65 & Up	Number	175	168	188	73	50	66	91	30	841
	Reported Salary	$ 3,694,459	$ 4,174,265	$ 5,339,924	$ 2,282,572	$ 1,877,284	$ 2,794,365	$ 3,551,319	$ 1,648,578	$ 25,362,766
	Average Sal.	$ 21,111	$ 24,847	$ 28,404	$ 31,268	$ 37,546	$ 42,339	$ 39,025	$ 54,953	$ 30,158
Total	Number	3,030	1,465	1,134	357	187	250	222	65	6,710
	Reported Salary	$ 84,003,899	$ 55,625,190	$ 47,234,062	$ 15,536,003	$ 8,305,032	$ 11,689,839	$ 10,241,543	$ 3,730,126	$ 236,365,694
	Average Sal.	$ 27,724	$ 37,969	$ 41,653	$ 43,518	$ 44,412	$ 46,759	$ 46,133	$ 57,387	$ 35,226

INACTIVE VESTED MEMBERS
AS OF JANUARY 1, 2018

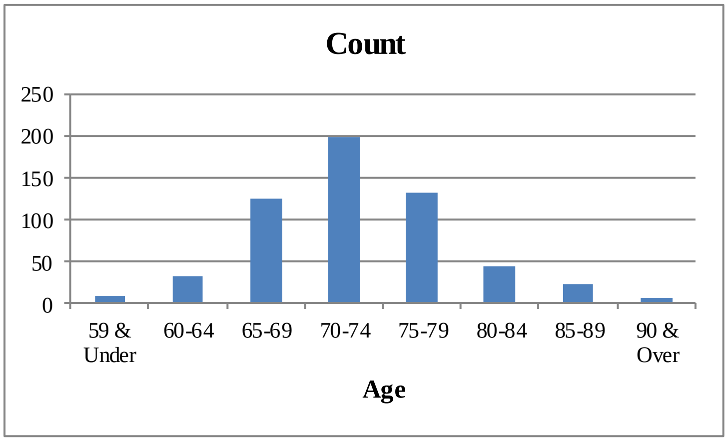
	Count of Members			Account Balances		
Age	Male	Female	Total	Male	Female	Total
24 & Under	4	3	7	$ 31,162	$ 17,634	$ 48,796
25-29	20	17	37	374,272	201,429	575,701
30-34	45	46	91	1,356,542	1,089,760	2,446,302
35-39	54	55	109	1,723,065	1,501,002	3,224,067
40-44	43	59	102	2,161,534	2,300,065	4,461,599
45-49	45	80	125	2,673,159	2,792,446	5,465,605
50-54	46	64	110	1,490,035	2,394,461	3,884,496
55-59	81	102	183	4,197,723	3,357,505	7,555,228
60-64	105	126	231	7,083,897	6,459,897	13,543,794
65 & Up	158	136	294	10,924,138	8,492,256	19,416,394
Total	601	688	1,289	$ 32,015,527	$ 28,606,455	$ 60,621,982

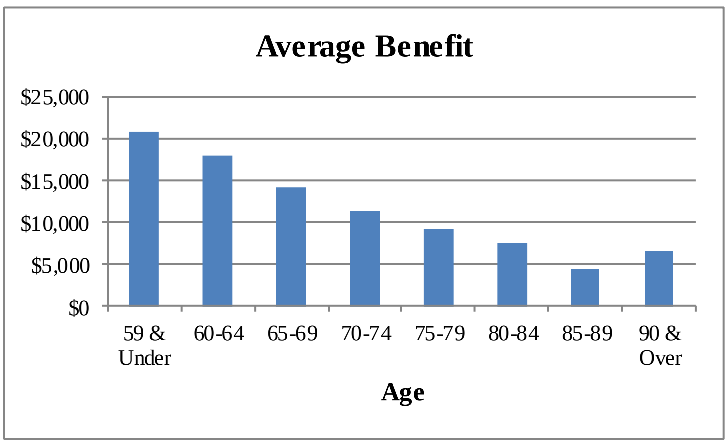




RETIRED MEMBERS
AS OF JANUARY 1, 2018

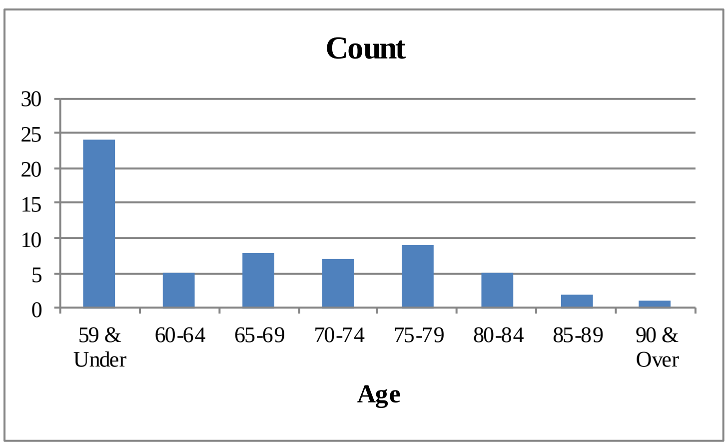
	Count of Members			Annual Benefits		
Age	Male	Female	Total	Male	Female	Total
59 & Under	4	6	10	$ 97,324	$ 111,436	$ 208,760
60-64	21	12	33	415,322	177,086	592,408
65-69	64	61	125	1,095,384	660,421	1,755,805
70-74	109	88	197	1,273,974	947,918	2,221,892
75-79	68	63	131	595,567	619,043	1,214,610
80-84	29	16	45	250,960	86,129	337,089
85-89	16	6	22	80,980	17,778	98,758
90 & Over	5	1	6	29,785	9,951	39,736
Total	316	253	569	$ 3,839,296	$ 2,629,762	$ 6,469,058

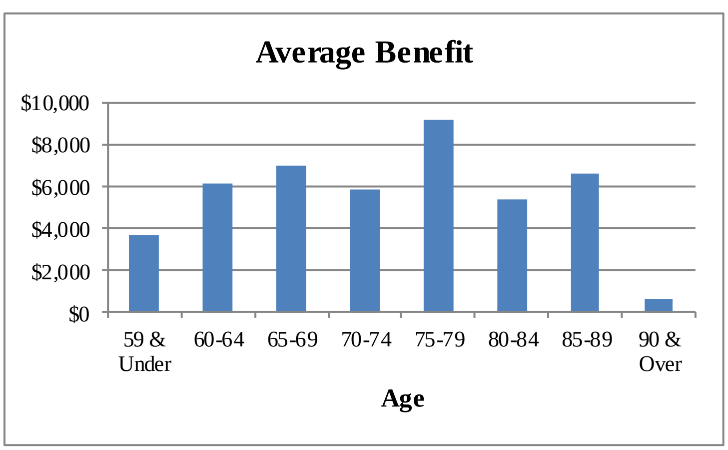




BENEFICIARIES RECEIVING BENEFITS
AS OF JANUARY 1, 2018

	Count of Members			Annual Benefits		
Age	Male	Female	Total	Male	Female	Total
59 & Under	13	11	24	$ 51,640	$ 36,923	$ 88,563
60-64	1	4	5	4,682	26,186	30,868
65-69	1	7	8	9,218	46,773	55,991
70-74	2	5	7	9,912	30,722	40,634
75-79	1	8	9	3,717	78,576	82,293
80-84	0	5	5	0	26,847	26,847
85-89	0	2	2	0	13,250	13,250
90 & Over	0	1	1	0	613	613
Total	18	43	61	$ 79,169	$ 259,890	$ 339,059





Membership
All permanent full-time employees of a participating County who work one-half or more of the regularly scheduled hours during each pay period shall begin immediate participation in the County Employees' Retirement System as of January 1, 2007 or date of hire, if later. Participation is voluntary for permanent, part-time employees who are age 18 or older and permanent part-time seasonable employees age 18 or older. Full-time elected officials shall begin participation upon taking office.

Existing members of the County 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 Fund. 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 plan as provided in the County Employees' Retirement Act.

Existing members of the County 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 County Employees' Retirement Act.

Existing members of the County 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 County 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 County Employees' Retirement System shall contribute an amount equal to four and one-half percent (4.5%) of annual compensation to the fund. The member contribution shall be credited to the employee cash balance account. In addition, commissioned law enforcement personnel shall contribute an extra amount equal to one percent (1%) of annual compensation if their county's population is less than 85,000 and an extra two percent (2%) of annual compensation if their county's population is more than 85,000.

Employer Contributions
The County shall contribute at a rate of 150% of the members' contributions to the fund. The County contribution shall be credited to the employer cash balance account. The participating counties will also match the additional contribution made by commissioned law enforcement personnel at a rate of 100%.

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 a participating County 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 County 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 credits, 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 Plan 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 credits, 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 credits, 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 credits, 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 Plan may elect to annuitize their accumulated account balance and receive a monthly benefit payment. This benefit is paid from the Cash Balance Benefit Fund so the member's DC account balance amount is transferred 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 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 23-2317 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 Obligation be completely funded.

Year Issued	Dividend %	For Time Period
2017	0.510%	1/1/2016 – 12/31/2016
2016	0.000%	1/1/2015 – 12/31/2015
2015	5.810%	1/1/2014 – 12/31/2014
2014	0.290%	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	5.340%	1/1/2007 – 12/31/2007
2007	2.730%	1/1/2006 – 12/31/2006
2006	16.400%	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

The 2017 Nebraska State Legislature passed Legislative Bill 415 (LB 415), which changes the actuarial basis used to calculate annuity rates for cash balance members hired on or after January 1, 2018. This change had no impact on the current valuation results.

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 80 and determining an average normal cost rate which is the related to the total payroll of active members under age 80. 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, 2010 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 actuarial 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 — Graduated rates by service.

Service	Annual Increase
0	8.00%
1	6.70
2	5.50
3	4.70
4	4.20
5	4.00
6	3.85
7	3.80
8	3.80
9	3.80
10+	3.80

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.

Age	Annual Rates
55-60	4.5%
61	5.0%
62-64	10.0%
65-66	20.0%
67-69	15.0%
70-79	20.0%
80	100.0%

3. Termination

Graduated rates by age and service.

Service	Rate
<1	25.00%
1	20.00
5	11.50
10	6.00
15	4.75
20	3.50
25	2.25
26+	2.00

4. Disability

None.

OTHER ASSUMPTIONS

1. Payment Assumptions

As shown in the table below, 40% of all members eligible for retirement are assumed to be paid in the form of an annuity and the other 60% 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	60% Lump Sum / 40% 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

At their meeting on October 17, 2016, the Board adopted a new set of actuarial assumptions, as recommended in the experience study. Although adopted in 2016, this is the first valuation report that utilizes the new set of assumptions. Below is a summary of the key assumption changes:

- Investment return assumption was lowered from 7.75% to 7.50%.
- Price inflation assumption was lowered from 3.25% to 2.75%.
- General wage growth was lowered from 4.00% to 3.50%.
- Covered payroll growth assumption decreased from 4.00% to 3.50%.
- Individual salary increase assumption was lowered by 0.50% in order to remain consistent with the general wage growth assumption.
- Assumed cash balance interest crediting rate was lowered from 6.75% to 6.25%.
- Mortality assumption was changed to the RP-2014 While Collar Mortality Table, with adjustments made to better reflect observed experience. Generational mortality improvements are modeled using a System-specific projection scale.
- Termination rates were changed to a service-based assumption.

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".