

NEBRASKA PUBLIC EMPLOYEES RETIREMENT SYSTEMS

Report of an Actuarial Audit
March 10, 2022





March 10, 2022

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

Members of the Board:

Gabriel, Roeder, Smith & Company (GRS) is pleased to present this report of an actuarial audit of the 2021 actuarial valuations for the Nebraska Public Employees Retirement System (NPERS). Specifically, we reviewed the following actuarial valuations:

Retirement System	Valuation Date
State Employees' Retirement System Cash Balance Benefit Fund	January 1, 2021
County Employees' Retirement System Cash Balance Benefit Fund	January 1, 2021
School Retirement System	July 1, 2021
State Patrol Retirement System	July 1, 2021
Judges Retirement System	July 1, 2021

We are grateful to NPERS staff and Cavanaugh Macdonald Consulting, the retained actuary, for their cooperation throughout the actuarial audit process.

This actuarial audit involves an independent verification and analysis of the assumptions, procedures, methods, and conclusions used by the retained actuary in the 2021 actuarial valuations of NPERS and to ensure that the conclusions are reasonable and conform to the appropriate Standards of Practice as promulgated by the Actuarial Standards Board.

GRS is pleased to report to the Public Employees Retirement Board (the Board), in our professional opinion, the 2021 actuarial valuations prepared by the retained actuary provide a fair and reasonable assessment of the financial position of the five retirement systems administered by NPERS, the actuarial valuations are based on reasonable assumptions and methods, and the reports generally comply with the Actuarial Standards of Practice.

In general, we consider this to be a "clean" actuarial audit. Throughout this report we make a number of suggestions for ways to improve the work product going forward. We hope that the retained actuary, the NPERS staff, and the Board find these items helpful. Thank you for the opportunity to work on this assignment.

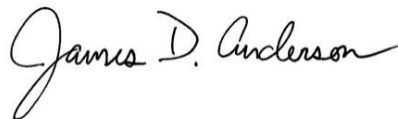
Public Employees Retirement Board
Nebraska Public Employees Retirement System
March 10, 2022
Page 2

Mr. Falls and Mr. Anderson are independent of the plan sponsor. They are Fellows of the Society of Actuaries, Enrolled Actuaries, Members of the American Academy of Actuaries, and meet the Qualification Standards of the American Academy of Actuaries. Finally, the undersigned are experienced in performing valuations for large public retirement systems.

Respectfully submitted,
Gabriel, Roeder, Smith & Company



R. Ryan Falls, FSA, EA, MAAA
Senior Consultant



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Table of Contents

Section I	Executive Summary.....	2
Section II	General Actuarial Audit Procedure	6
Section III	Actuarial Assumptions	9
Section IV	Actuarial Methods.....	27
Section V	Actuarial Valuation Results	30
Section VI	Content of the Valuation Report	36
Section VII	Observations on Cash Balance Dividends	40
Section VIII	Final Remarks.....	46



SECTION I

EXECUTIVE SUMMARY

Executive Summary

The Nebraska Public Employees Retirement System (NPERS) engaged Gabriel, Roeder, Smith & Company (GRS) for an actuarial audit of the 2021 actuarial valuations prepared for NPERS. The 2021 actuarial valuations included the following:

Retirement System	Valuation Date
State Employees' Retirement System Cash Balance Benefit Fund	January 1, 2021
County Employees' Retirement System Cash Balance Benefit Fund	January 1, 2021
School Retirement System	July 1, 2021
State Patrol Retirement System	July 1, 2021
Judges Retirement System	July 1, 2021

The scope of this actuarial audit includes the following:

- Analyze the appropriateness of the actuarial assumptions;
- Review the actuarial assumptions and methodology for compliance with generally recognized and accepted actuarial principles and practices which are consistent with Actuarial Standards of Practice, the Code of Professional Conduct, and the Qualifications Standards for Public Statements of Actuarial Opinion of the American Academy of Actuaries;
- Evaluate the data used for performance of the 2021 actuarial valuations, the degree to which the data is sufficient to support the conclusions of the 2021 actuarial valuations, and the use and appropriateness of any assumptions made regarding the data;
- Conduct a replication of the valuation results using the same data, methods, and assumptions used by the retained actuary in the 2021 actuarial valuations; and
- Assess whether the 2021 actuarial valuations appropriately reflect information pursuant to Actuarial Standards of Practice.

The purpose of this report is to:

- Provide an evaluation and express an opinion regarding the reasonableness and accuracy of the valuation results (including a determination of actuarial accrued liability, normal cost, and actuarially determined contributions), actuarial assumptions and appropriateness, and application of the actuarial cost method for the 2021 actuarial valuations; and
- Include any recommendations regarding reasonable alternatives to the actuarial assumptions used in the 2021 actuarial valuations.

Summary of our Review

Based on our review of the census data, experience study documents, liability replications, and actuarial valuation reports, we believe the 2021 actuarial valuations for NPERS are reasonable, based on reasonable assumptions and methods, and the reports generally comply with the Actuarial Standards of Practice.

We feel it is important to step back and commend the State of Nebraska, the Nebraska Public Employees Retirement System and the Public Employees Retirement Board on their governance of the five retirement systems covered by this actuarial audit. The commitment to correctly managing and funding



these systems is clear. We offer the following recommendations that we believe could further enhance the funding and administration of NPERS going forward.

Actuarial Assumptions

1. The Board should consider adopting the ultimate economic assumption to provide the most appropriate reporting of the funded status, contribution requirements, and potential margin for additional dividends for the plans. We acknowledge that this may require the Board to explore possible modifications to the contribution requirements to assist the employer in ramping up to the contribution levels under the new assumption set.
2. In the next experience study, we recommend that the retained actuary conduct a more detailed analysis of lump sum election rates for the Cash Balance Funds while exploring potential differences by age and considering the enhanced value for members hired before January 1, 2018 electing the annuity option.
3. We recommend that the retained actuary review the observed “actual/expected” ratio for the Schools termination decrement in the next experience study and closely consider what the most appropriate margin should be for this assumption. Given that the School System liabilities decreased as a result of the 2021 experience study, we encourage the retained actuary to monitor this assumption closely prior to the next experience study to ensure that it tracks with actual liability experience over time and consider making updates to the assumption prior to the next experience study.

Actuarial Methods

4. We believe the Actuarial Cost Method and the Asset Valuation Method used by the retained actuary are reasonable for this purpose and appropriately applied in the 2021 actuarial valuations.

Actuarial Valuation Results

5. We believe that the valuation results were developed in a reasonable manner based on the current application of the stated data, assumptions and methods. We were able to replicate the 2021 actuarial valuation results of all five plans within acceptable tolerances.
6. We recommend that the retained actuary review their current procedures for determining the sources of gains and losses to ensure that the reoccurring losses attributed to “new entrants/rehires” are being categorized correctly and, if necessary, included in the normal cost component of the ARC.

Content of Valuation Report

7. In general, the actuarial valuation report complied with the applicable Actuarial Standards of Practice. In order to improve the ability of the report to communicate the assumptions, methods and plan provisions incorporated into the actuarial valuation, we recommend that the retained actuary incorporate the noted enhancements in future actuarial valuation reports.



Observations on Cash Balance Dividends

8. The Board should consider accelerating the phase in of the assumptions and incorporate the ultimate assumptions into the 2022 actuarial valuation, especially with regards to the determination of the maximum dividend.
9. We encourage the Board and the retained actuary review all of the observations and suggestions regarding Cash Balance Dividends in this Section of the report to improve the consistency and affordability of the Cash Balance Dividends going forward.

SECTION II

GENERAL ACTUARIAL AUDIT PROCEDURE

General Actuarial Audit Procedure

At the commencement of this engagement, GRS requested the information necessary to thoroughly review the work product of the retained actuary. Specifically, GRS received and reviewed the following items:

- 2021 actuarial valuation reports for the five retirement systems covered by the actuarial audit;
- 2020 Experience Study for the four-year period ending June 30, 2019 or December 31, 2019;
- Nebraska Investment Council Long-Term Policy Allocation Goals for NPERS;
- A preliminary set of census data for plan participants and beneficiaries as of January 1, 2021 and July 1, 2021 originally provided by NPERS to the retained actuary for the actuarial valuations;
- A final set of census data for plan participants and beneficiaries as of January 1, 2021 and July 1, 2021 used by the retained actuary for the actuarial valuations; and
- Detailed liability calculations from the retained actuary for a sampling of 58 members across all of the five plans to assist in the plan-wide liability replication.

In performing our review, we:

- Reviewed descriptions of member benefits and applicable statutes to understand the benefits provided by each of the five retirement systems administered by NPERS;
- Reviewed the appropriateness of the actuarial assumptions and methods;
- Reviewed actuarial valuation reports;
- Replicated the actuarial valuation results, including the determination of actuarial accrued liability, normal cost, and actuarially determined contributions; and
- Reviewed the detailed liability calculation of the sample lives to ensure that the calculations were consistent with the stated plan provisions, actuarial methods and assumptions.

The actuarial audit observations, which follow, are based on our review of this information and subsequent correspondence with the retained actuary for clarification and further documentation.

Key Actuarial Concepts

An actuarial valuation is a detailed statistical simulation of the future operation of a retirement system using the set of actuarial assumptions adopted by the governing board. It is designed to simulate all of the dynamics of such a retirement system for each current participant of the plan, including:

- Accrual of future service,
- Changes in benefits,
- Leaving the plan through retirement, disability, withdrawal, or death, and
- Determination of and payment of benefits from the plan.

This simulated dynamic is applied to each active member in the plan and results in a set of expected future benefit payments for that member. Discounting those future payments for the likelihood of survival at the assumed rate of investment return produces the Total Present Value of Plan Benefits (TPV) for that participant. The actuarial cost method will allocate this TPV between the participant's past service (actuarial accrued liability) and future service (future normal costs).



We believe that an actuarial audit should not focus on finding differences in actuarial processes and procedures utilized by the consulting actuary and the auditing actuary. Rather, our intent is to identify and suggest improvements to the process and procedures utilized by the retained actuary for NPERS. In performing this actuarial audit, we attempted to limit our discussions regarding opinion differences and focus our attention on the accuracy of the calculations of the liability and costs, completeness and reliability of reporting, and compliance with the Actuarial Standards of Practice that apply to the work performed by the retained actuary.

These key actuarial concepts will be discussed in more detail throughout this report.

Actuarial Qualifications

The January 1, 2021 actuarial valuation reports for the two Cash Balance Funds and the July 1, 2021 actuarial valuation reports for the three traditional Defined Benefit Systems were signed by Ms. Patrice A. Beckham, FSA, EA, FCA, MAAA and Mr. Brent A. Banister Ph.D., FSA, EA, FCA, MAAA. Based on the information provided by the online actuarial directory sponsored by the Society of Actuaries, Ms. Beckham and Mr. Banister have attained the actuarial credentials noted on the signature line of the actuarial valuation report and are compliant with the Society of Actuaries Continuing Professional Development requirement.

SECTION III

ACTUARIAL ASSUMPTIONS

Actuarial Assumptions

Overview

For any pension plan, actuarial assumptions are selected that are intended to provide reasonable estimates of future expected events, such as retirement, turnover, and mortality. These assumptions, along with an actuarial cost method, the employee census data, and the plan's provisions, are used to determine the actuarial liabilities and the overall actuarially determined funding requirements for the plan. The true cost to the plan over time will be the actual benefit payments and expenses required by the plan's provisions for the participant group under the plan. To the extent the actual experience deviates from the assumptions, experience gains and losses will occur. These gains (losses) then serve to reduce (increase) future actuarially determined contributions and increase (reduce) the funded ratio. The actuarial assumptions should be individually reasonable and consistent in the aggregate, and should be reviewed periodically to ensure that they remain appropriate.

The Actuarial Standards Board ("ASB") provides guidance on establishing actuarial assumptions for a retirement program through the following Actuarial Standards of Practices (ASOP):

- (1) ASOP No. 4, *Measuring Pension Obligations and Determining Pension Plan Costs or Contributions*
- (2) ASOP No. 23, *Data Quality*
- (3) ASOP No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations*
- (4) ASOP No. 35, *Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations*
- (5) ASOP No. 44, *Selection and Use of Asset Valuation Methods for Pension Valuations*
- (6) ASOP No. 51, *Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions*
- (7) ASOP No. 56, *Modelling*

We generally reviewed the application of the ASOPs applicable on the valuation dates of January 1, 2021 for the two Cash Balance Funds and July 1, 2021 for the three traditional Defined Benefit Systems. Subsequent changes to the ASOPs will have to be reflected in future actuarial valuation reports.

Each of the actuarial valuation reports for NPERS contain descriptions of the actuarial assumptions which were used in the 2021 actuarial valuations. Additionally, the retained actuary published an actuarial experience study report, dated December 21, 2020. We conducted a thorough review of these documents in order to assess the reasonableness of the assumptions used in the actuarial valuations.

Actuarial assumptions for the valuation of retirement programs are of two types: (i) demographic assumptions, and (ii) economic assumptions. We have assessed the reasonableness of both types as part of this actuarial audit.



Demographic Assumptions

General

These assumptions simulate the movement of participants into and out of plan coverage and between status types. Key demographic assumptions are:

- turnover among active members,
- retirement patterns among active members, and
- healthy retiree mortality.

In addition, there are a number of other demographic assumptions with less substantial impact on the results of the process, such as:

- disability incidence and mortality among disabled benefit recipients,
- mortality among active members,
- percent of active members who are married and the relationship of the ages of participants and spouses, and
- benefit elections upon retirement or termination.

Experience Study Process

Demographic assumptions for retirement programs are normally established by statistical studies of recent actual experience, called experience studies. Such studies underlie the assumptions used in the valuations.

In an experience study, the actuary first determines the number of deaths, retirements, etc. that occurred during the experience period. Then the actuary determines the number “expected” to occur, based on the current actuarial assumptions. Finally, the actuary calculates the A/E ratio, where “A” is the actual number (of retirements, for example) and “E” is the expected number. If the current assumptions were “perfect”, the A/E ratio would be 100%. When the A/E ratio varies much from 100%, it is a sign that new assumptions may be needed. (However, the actuary may prefer to set assumptions to produce an A/E ratio a little above or below 100%, in order to introduce some conservatism.)

The actuary can further enhance the “count-weighted” process, described above, by using a “liability-weighted” experience analysis. A liability-weighted analysis will generally use amounts such as benefits or liabilities to “weight” and review the experience. From the perspective of the retirement assumption, selecting an assumption based on headcount-weighting is consistent with estimating expected retirements, but selecting an assumption based on amount-weighting is consistent with minimizing gains and losses associated with expected retirements. By weighting the data by benefit amounts, the actuary gives more weight to members who have larger benefits (and thus have larger liabilities). The same concepts apply when the amount-weighted approach is applied to other demographic assumptions such as mortality and termination.

We commend the retained actuary for performing demographic analyses both on a “count-weighted” and “liability-weighted” basis and generally giving the liability-weighted experience more credibility than the headcount-weighted results.



Assumption Setting

Once it is determined whether or not an assumption needs adjustment, setting the new assumption depends upon the extent to which the current experience is an indicator of the long-term future.

- Full credibility may be given to the current experience. Under this approach, the new assumptions are set very close to recent experience.
- Alternatively, the recent experience might be given only partial credibility. Thus, the new assumptions may be set by blending the recent experience with the prior assumption.
- If recent experience is believed to be atypical of the future, such knowledge is taken into account.
- Finally, it may be determined that the size of the plan does not provide a large enough sample to make the data credible. In such cases, the experience of the plan may be disregarded and the assumption is set based upon industry standards for similar groups.

Actuarial Standards of Practice (ASOP) No. 35, *Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations*, applies to actuaries when they are selecting demographic assumptions. In accordance with ASOP No. 35, an actuary should identify the types of demographic assumptions to use for a specific measurement. In doing so, the actuary should determine the following:

- a) The purpose and nature of the measurement;
- b) The plan provisions or benefits and factors that will affect the timing and value of any potential benefit payments;
- c) The characteristics of the obligation to be measured (such as measurement period, pattern of plan payments over time, open or closed group, and volatility);
- d) The contingencies that give rise to benefits or result in loss of benefits;
- e) The significance of each assumption; and
- f) The characteristics of the covered group.

Not every contingency requires a separate assumption. For example, for a plan that is expected to provide benefits of equal value to employees who voluntarily terminate employment, become disabled, or retire, the actuary may use an assumption that reflects some or all of the above contingencies in combination rather than selecting a separate assumption for each.

Observations on Demographic Assumptions

Overall, it appears that the current demographic assumptions are reasonable. Below, we offer general observations and considerations for the retained actuary based on our experiences with similar plans.

Healthy Retiree Mortality

The most important demographic assumption is post-retirement mortality because this assumption is a predictor of how long pension payments will be made. The stated post-retirement mortality assumption for all five plans is based on the Pub-2010 General Members (Above Median) mortality table. The retained actuary also applies a one-year set back (treating a retiree as having the mortality of someone one-year younger) for both males and female as well as scaling the female mortality rates by 95%.



The retained actuary chose to combine the mortality experience for all five plans in order to assess the mortality experience. To further enhance the credibility of the analysis, the retained actuary included four additional years of mortality experience which was observed as part of the 2016 experience study.

The analysis indicates that the “actual/expected” ratio on a liability-weighted basis was 108% for males and 105% for females. Exhibits C-1 and C-2 indicate that the new assumptions result in a ratio of 98% for males and 98% for females.

As the retained actuary discusses in the experience study report, the Society of Actuaries released a series of new mortality tables in 2019 based solely on the mortality experience of public sector employees. The tables, referred to as the Pub-2010 tables, reflect the results of the first comprehensive mortality study for public sector employees. Further, these mortality tables were published for various employee groups, including teachers, public safety, and general employees. We certainly acknowledge the tradition and simplicity behind using a common mortality table for all five systems. However, we encourage the retained actuary to consider the Pub-2010 public safety mortality tables for the public safety groups in the next experience study.

In general, the new assumptions are reasonable for each of the five systems. As the retained actuary notes in the experience study report, there are reasons to believe that retirees in the Judges System could exhibit longer life expectancy than average retiree in this analysis (primarily the School System retirees). Further, annuitants in the Cash Balance Funds could exhibit better life expectancy due to the anti-selection for retirees electing to receive the annuity option in lieu of the lump sum. As a result, we recommend that the retained actuary monitor the mortality experience closely for each plan to ensure that no consistent bias emerges in any of the plans.

Mortality Improvement

The retained actuary utilizes a generational mortality assumption to incorporate future mortality improvements into the actuarial valuation using the MP-2019 mortality improvement scale, modified to use 75% of the ultimate improvement rates. The retained actuary provides very little rationale about why they chose to scale the ultimate rates in the table by 75%.

We encourage the retained actuary to include further rationale in the next experience study report to support recommended adjustments to the standard mortality improvement scales.

DB Systems: Departures (Retirement, Termination, Disability and Active Mortality)

The experience study reviewed the actual experience on a “count-weighted” and “liability-weighted” basis for the School System, Judges System and State Patrol System for departures related to retirement, termination, disability and active mortality. In general, the experience study report does a good job considering the retirement provisions for each System and summarizing the experience separately for each System. Further, the current assumptions were developed to be consistent with the actual experience over the 2021 experience study period for each System.

The only comment we have on these assumptions is that it is not clear why the retained actuary lowered the male termination rates for the Schools System. The “liability-weighted” experience for this group resulted in an “actual/expected” ratio of 93% which indicates that less members are terminating than the current assumptions anticipate. This indicates that the School System liabilities would actually be higher if



the assumption was set closer to the actual experience. Further, the actuarial valuation reports for the Schools System indicate a large actuarial loss every year from the termination decrement over the experience period.

We recommend that the retained actuary review the observed “actual/expected” ratio for the School System termination decrement in the next experience study and closely consider what the most appropriate margin should be for this assumption. Given that the School System liabilities decreased as a result of the 2020 experience study, we encourage the retained actuary to monitor this assumption closely prior to the next experience study to ensure that it tracks with actual liability experience over time and consider making updates to the assumption prior to the next experience study.

Cash Balance Funds: Departures

The 2020 experience study attempts to track the experience for retirements and terminations for active cash balance members. Since distributions from the Cash Balance Funds for death and disability are the same as terminations, the retained actuary cannot generally distinguish from the data the reason an active member terminates from employment (nor is the reason necessarily relevant).

Further, age 55 is considered “retirement” by the Cash Balance Funds primarily due to the possible tax consequences of taking a distribution prior to that age. However, that distinction does not necessarily impact the plan liabilities.

For the next experience study, the retained actuary may want to consider analyzing all of the departure experience (from all sources) together, possibly by age and service, to develop a more universal departure assumption with a smoother transition of the assumption rates from “less than 55” to “over 55”.

Cash Balance Funds: Lump Sum versus Annuity

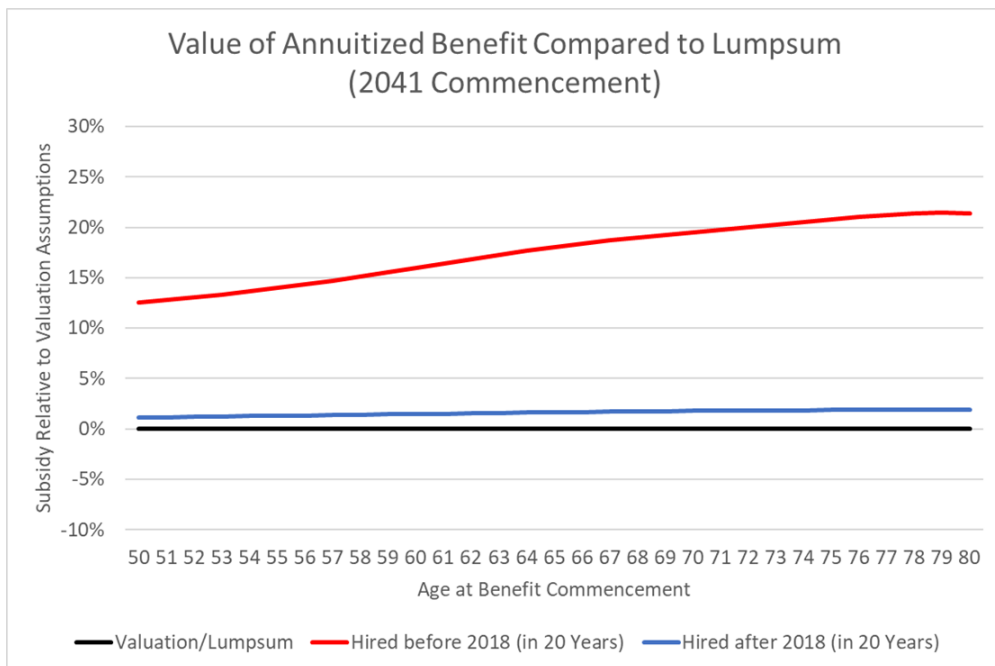
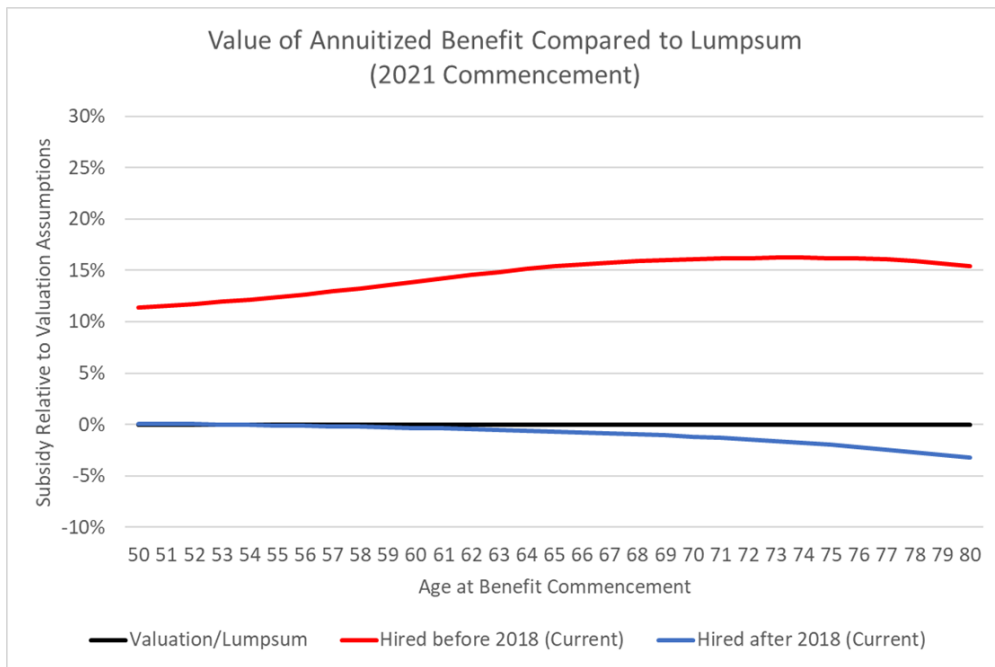
The actuarial assumptions currently anticipate that every member leaving active service due to termination, disability and active mortality will take a full lump sum distribution of their balance. Further, members “retiring” on, or after, age 55 are assumed to take 50% as a lump sum distribution and 50% as an annuity. Based on the discussion presented in the experience study report, it appears that the retained actuary analyzed the experience and set this assumption based on the behaviors of all retiring members in aggregate.

Theoretically, the lump sum and the annuity would have the exact same value (from the plan’s perspective) if the balances were converted to an annuity based on the exact same interest and mortality assumption used for the actuarial valuation. However, this is not how the account balances are converted to annuities in the Cash Balance Funds.

- For members hired before January 1, 2018, balances are converted at 7.75% with a blend of the 1994 Group Annuity Mortality Table. It appears that the Board intends to maintain these conversion factors into the future.
- For members hired after January 1, 2018, balances are converted at 7.00% (ultimately) with a static version of the tables used for the actuarial valuation (projected to 2040). These factors appear to be updated with each experience study, as needed.

Over the long term, the conversion factors for members hired after January 1, 2018 will approximate the mortality used in the actuarial valuation, assuming they continue to be updated. However, the conversion factors for members hired before January 1, 2018 represent a much more valuable benefit than the lump sum (from the plan’s perspective). As time goes on, the value of this implicit benefit increases as life expectancy increases with the valuation assumptions but the conversation factors are not expected to change. The implicit benefit would increase even further if the Board were to lower the investment return assumption again in the future.

As illustrated on the following chart, the conversion factors used for members hired before January 1, 2018 provide approximately a 15% greater benefit when compared to the valuation assumptions. In 20 years, this benefit increases to closer to 20%.



As a result of this increased value, the 50% of retirements hired before January 1, 2018 that are assumed to take a lump are electing a notably less valuable benefit. If 100% of retirements (for members hired before January 1, 2018) were assumed to take the annuity (in lieu of the lumpsum) then the Actuarial Accrued Liability for active members would increase by approximately 6%.

In the next experience study, we recommend that the retained actuary conduct a more detailed analysis of lump sum election rates for the Cash Balance Funds while exploring potential differences by age and considering the enhanced value for members hired before January 1, 2018 electing the annuity option.

Economic Assumptions

General

Economic assumptions simulate the impact of economic forces on the amounts and values of future benefits. Key economic assumptions are the assumed rate of investment return and assumed rates of future salary increase. All economic assumptions are built upon an underlying inflation assumption.

ASOP No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations*, applies to actuaries when they are selecting economic assumptions. ASOP No. 27 states that each economic assumption selected by the actuary should be reasonable. For this purpose, an assumption is reasonable if it has the following characteristics:

- a) It is appropriate for the purpose of the measurement;
- b) It reflects the actuary's professional judgment;
- c) It takes into account historical and current economic data that is relevant as of the measurement date;
- d) It reflects the actuary's estimate of future experience, the actuary's observation of the estimates inherent in market data, or a combination thereof; and
- e) It has no significant bias (i.e., it is not significantly optimistic or pessimistic), except when provisions for adverse deviation or plan provisions that are difficult to measure are included and disclosed, or when alternative assumptions are used for the assessment of risk.

Additionally, ASOP No. 27 states that communications regarding actuarial reports subject to this standard should contain the following:

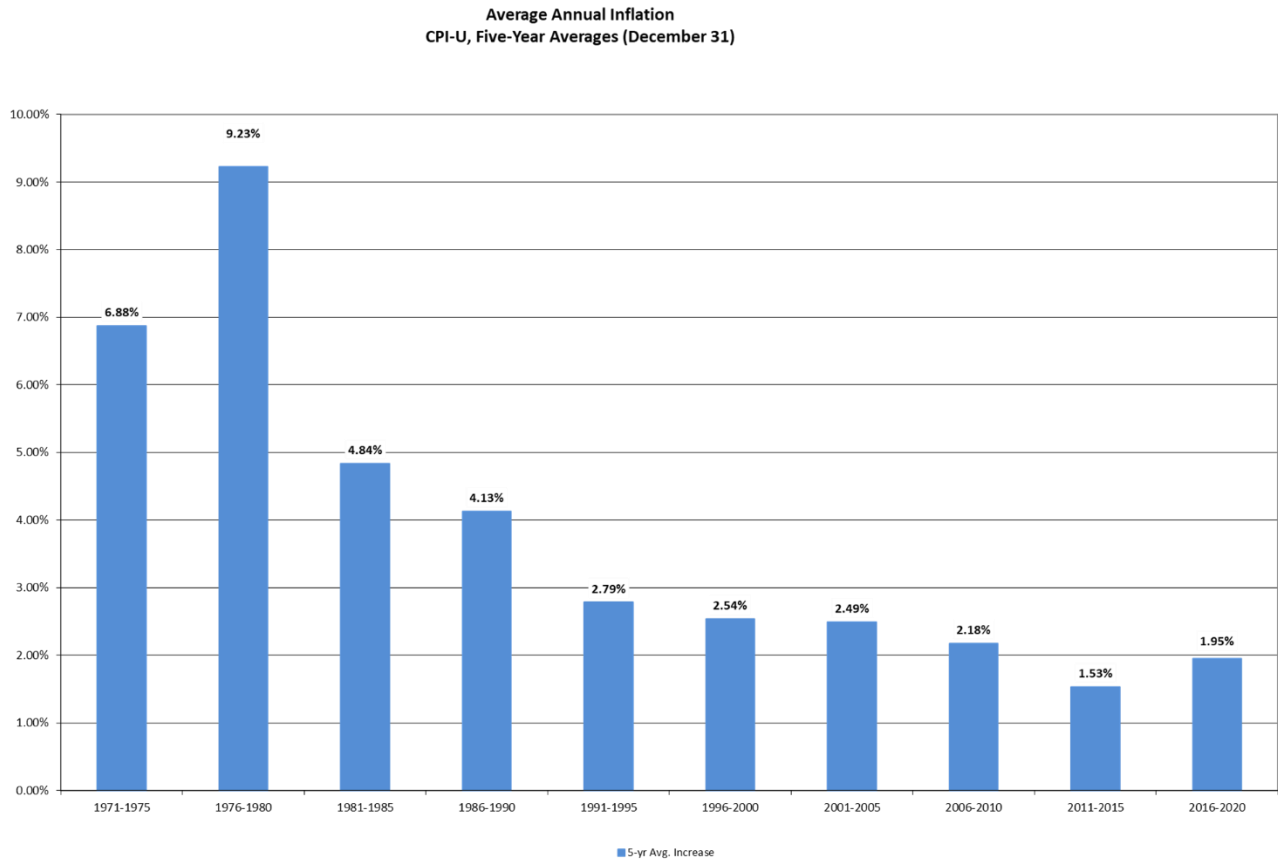
- a) A description of each significant assumption used in the measurement and whether the assumption represents an estimate of future experience, and
- b) A description of the information and analysis used in selecting each economic assumption that has a significant effect on the measurement.

The primary discussion in this section will focus on the ultimate recommendations made by the retained actuary in the 2020 experience study report. The Board ultimately elected to phase into the new economic assumptions over a four-year period and this phase-in approach will be addressed at the end of the section. We have also presented a number of metrics from both 2020 and 2021 to demonstrate the notable change in forward-looking assumptions over the one-year period following the completion of the actuarial experience study.

Inflation

By “inflation,” we mean price inflation, as measured by annual increases in the Consumer Price Index (CPI). This inflation assumption underlies most of the other economic assumptions. It primarily impacts investment return, salary increases, payroll growth, cash balance interest credits and future COLAs. The ultimate annual inflation assumption for all five plans is 2.35%.

The following chart shows the average annual inflation in each of the ten consecutive five-year periods over the last fifty years:



Source: Bureau of Labor Statistics, CPI-U, all items, not seasonally adjusted

The table below shows the average inflation over various periods, ending both in December 2020 and December 2021:

Periods	Average Annual Increase in CPI-U Period Ending December 2020	Average Annual Increase in CPI-U Period Ending December 2021
Last five (5) years	1.95%	2.92%
Last ten (10) years	1.74%	2.14%
Last fifteen (15) years	1.89%	2.18%
Last twenty (20) years	2.04%	2.31%
Last thirty (25) years	2.14%	2.28%
Last thirty (30) years	2.25%	2.37%
Since 1913 (first available year)	3.09%	3.13%

Source: Bureau of Labor Statistics, CPI-U, all items, not seasonally adjusted

As you can see, inflation has been relatively low over the last thirty years. However, the recent spike in inflation has increased the averages over every time period.

We examined the 2020 and 2021 capital market assumption sets for 13 investment consulting firms and summarized the average and range of assumptions below. Most of the investment consulting firms, in setting their capital market assumptions, currently assume that inflation will be less than 2.50%. It should be noted that the majority of these investment consulting firms set their assumptions based on approximately a ten-year outlook. We also examined longer-term (approximately 20 to 30-years) capital market assumption sets for six investment consulting firms.

	Shorter-Term (approx. 10 years)	Longer-Term (approx. 20-30 years)
<i>Number of Firms</i>	13	6
2020 Capital Market Assumptions		
Range for Inflation	1.75% to 2.30%	1.80% to 2.60%
Average Inflation	2.09%	2.27%
2021 Capital Market Assumptions		
Range for Inflation	1.92% to 3.10%	2.11% to 2.31%
Average Inflation	2.19%	2.21%

There are also many other organizations that determine forward-looking expectations for inflation based various market indicators. A summary of these expectations can be found in the following table:

Forward-Looking Price Inflation Forecasts		
	End of Fourth Quarter, 2020	End of Fourth Quarter, 2021
Congressional Budget Office^b		
5-Year Annual Average	1.68%	2.58%
10-Year Annual Average	1.94%	2.49%
Federal Reserve Bank of Philadelphia^c		
5-Year Annual Average	2.00%	2.90%
10-Year Annual Average	2.12%	2.55%
Federal Reserve Bank of Cleveland^d		
10-Year Expectation	1.42%	1.76%
20-Year Expectation	1.69%	1.94%
30-Year Expectation	1.90%	2.09%
Federal Reserve Bank of St. Louis^e		
10-Year Breakeven Inflation	1.81%	2.46%
20-Year Breakeven Inflation	2.01%	2.51%
30-Year Breakeven Inflation	2.00%	2.27%
U.S. Department of the Treasury^f		
10-Year Breakeven Inflation	1.90%	2.37%
20-Year Breakeven Inflation	1.94%	2.42%
30-Year Breakeven Inflation	2.08%	2.32%
50-Year Breakeven Inflation	2.13%	2.38%
100-Year Breakeven Inflation	2.17%	2.43%
Social Security Trustees^g		
Ultimate Intermediate Assumption	2.40%	2.40%

^aBy Gabriel, Roeder, Smith & Company.

^b*An Update to the Economic Outlook: 2020 to 2030*, Release Date: July 2020, Consumer Price Index (CPI-U), Percentage Change from Year to Year, 5-Year Annual Average (2020 - 2024), 10-Year Annual Average (2020 - 2029). The Budget and Economic Outlook: 2021 to 2031, Release Date: July 2021, Consumer Price Index (CPI-U), Percentage Change from Year to Year, 5-Year Annual Average (2021 - 2025), 10-Year Annual Average (2021 - 2030).

^c*Fourth Quarter 2020 Survey of Professional Forecasters*, Release Date: November 16, 2020, Headline CPI, Annualized Percentage Points, 5-Year Annual Average (2020 - 2024), 10-Year Annual Average (2020 - 2029). Fourth Quarter 2021 Survey of Professional Forecasters, Release Date: November, 15, 2021, Headline CPI, Annualized Percentage Points, 5-Year Annual Average (2021 - 2025), 10-Year Annual Average (2021 - 2030).

^dInflation Expectations, Model output date: December 1, 2020 and December 1, 2021.

^eThe breakeven inflation rate represents a measure of expected inflation derived from X-Year Treasury Constant Maturity Securities and X-Year Treasury Inflation-Indexed Constant Maturity Securities. Observation date: December, 2020 and December, 2021.

^f*The Treasury Breakeven Inflation (TBI) Curve*, Monthly Average Rates, December, 2020 and December, 2021.

^g*The 2020 Annual Report of The Board of Trustees of The Federal Old-Age And Survivors Insurance and Federal Disability Insurance Trust Funds*, April 22, 2020, Long-range (75-year) assumptions, Intermediate, Consumer Price Index (CPI-W), for 2024 and later. The 2021 Annual Report of The Board of Trustees of The Federal Old-Age And Survivors Insurance and Federal Disability Insurance Trust Funds, August 31, 2021, Long-range (75-year) assumptions, Intermediate, Consumer Price Index (CPI-W), for 2024 and later.

We believe the ultimate inflation assumption of 2.35% is reasonable based on the information presented above.

Administrative and Investment-Related Expenses

Since the trust fund pays investment and administrative expenses from plan assets, it is necessary to incorporate the expected expenses into the actuarial valuation. Plan expenses may be explicitly assumed as a direct increase to the annual normal cost or implicitly assumed by developing an investment return assumption as a net return after payment of plan expenses. The 2021 actuarial valuations include an explicit expense assumption for administrative expenses and an implicit expense assumption for investment expenses. We believe that these are appropriate methods for the actuarial valuations of all five systems.

The following section will analyze how the investment expenses are incorporated into the investment return assumption.

Investment Return

The investment return assumption is one of the principal assumptions in any actuarial valuation. It is used to discount future expected benefit payments to the valuation date to determine the liabilities of the retirement system. Even a small change to this assumption can produce significant changes to the liabilities and contribution rates.

The investment return assumption for the 2021 actuarial valuations was 7.30% for all five systems which is based on a 2.65% inflation assumption plus an annual real rate of return of 4.65%, net of investment expenses paid from the trust. The assumption is phasing into a return assumption of 7.00%, based on a 2.35% inflation assumption plus an annual real rate of return of 4.65%.

Independent Assessment

We believe an appropriate approach to reviewing an investment return assumption is to determine the median expected portfolio return given the retirement system's target allocation and a given set of capital market assumptions. NPERS' assets are held and invested by the Nebraska Investment Council (NIC). Per NIC, the long-term policy allocation goals are:

Asset Class	Target
U.S. Equities	27.0%
Non-U.S. Equities	11.5%
Global Equities	19.0%
Fixed Income	30.0%
Private Equity	5.0%
Real Estate	7.5%
Total	100.0%

Because GRS is a benefits consulting firm and does not develop or maintain its own capital market assumptions, we reviewed assumptions developed and published by the following investment consulting firms:

- JP Morgan
- NEPC
- Callan
- Mercer
- Wilshire
- Meketa
- Verus
- RV Kuhns
- Blackrock
- BNY Mellon
- Aon
- Cambridge
- VOYA (for 2020)

These investment consulting firms issue reports that describe their capital market assumptions, which include their estimates of expected returns, volatility, and correlations. While these assumptions are developed based upon historical analysis, many of these firms also incorporate forward-looking adjustments to better reflect near-term expectations.

We started with the policy allocation goals for NIC and the investment firms’ capital market assumptions for 2020 and 2021. We determined, for each firm, the expected nominal return rate based on NIC’s policy allocation goal and then subtracted that investment consulting firm’s expected inflation to arrive at their expected real return in column. Then we added back NPERS’s ultimate 2.35% inflation to arrive at an expected nominal return, net of investment expenses.

It should be noted that the majority of these investment consulting firms set their assumptions based on approximately a ten-year outlook. We also examined longer-term (approximately 20 to 30-years) capital market assumption sets for six of the investment consulting firms noted above.

In addition to examining the expected one-year return, it is important to review anticipated volatility of the investment portfolio and understand the range of long-term net returns that could be expected to be produced by the investment portfolio. Therefore, the following table also provides the 50th percentile of the geometric average of the expected nominal return.

The results of the 2021 survey were generally lower capital market assumptions than 2020 for most asset classes, in some cases substantially lower. This is perhaps due in part to the decrease in bond yields in 2020 to record lows and the high stock market at the end of 2020 (resulting in the contrarian expectation of lower future stock market returns). Looking back to 2019, return expectations were somewhat higher than prior years for some survey participants, perhaps in part due to an increase in bond yields and a decrease in the stock market at the end of 2018. If we consider the three-year average of return expectations, the general decreasing trend is more apparent and the short-term fluctuations are diminished.

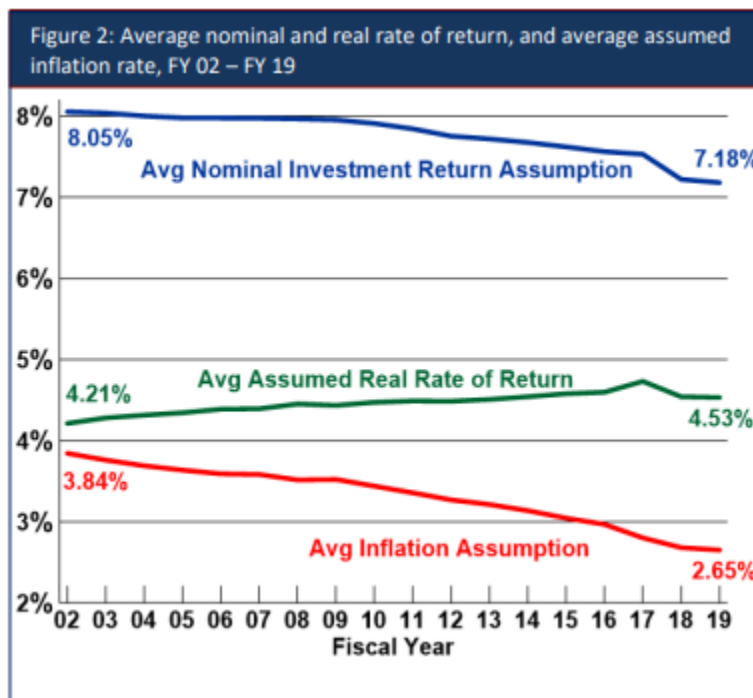
	2020 Capital Market Assumptions	2021 Capital Market Assumptions	Three-Year Average of Capital Market Assumptions
Shorter-Term (Arithmetic)	6.9%	6.4%	6.9%
Shorter-Term (Geometric)	6.2%	5.6%	6.2%
Longer-Term (Arithmetic)	7.8%	7.4%	
Longer-Term (Geometric)	7.1%	6.6%	



The forward-looking capital market assumptions and return forecasts developed by investment consulting firms already reflect expected investment expenses. Their return estimates for core investments (i.e., fixed income, equities, and real estate) are generally based on anticipated returns produced by passive index funds that are net of investment related fees. Investment return expectations for the alternative asset class such as private equity and hedge funds are also net of investment expenses. Therefore, we did not make any additional adjustments to account for investment related expenses. This analysis also assumes that investment managers will generate enough alpha to at least cover the cost of the active management. No additional alpha for active management has been considered.

Peer Comparisons

As a point of reference, the following table presents the results of the most recent survey conducted by the National Association of State Retirement Administrators (NASRA) pertaining to investment return assumptions, along with the historical progression of the survey results. This most recent survey (as of February 2021) indicates that the average investment return assumption is 7.18% (comprised of an average inflation assumption of 2.65% and an average real rate of return of 4.53%). When reviewing peer group information like this, it is important to keep in mind the potential timing lag between experience studies and the reporting lag until the new assumptions are actually reflected in actuarial valuations.



There could certainly be reasons for peer systems to have different investment return assumption. If a retirement system is different from peers then the key is for that retirement system to be able to articulate the reasons why they are different from peers.

Investment Consultant for NIC

A pension fund’s investment consultant (or NIC’s investment consultant, in this case) provides an important perspective when setting the investment return assumption since they generally understand the investment strategy the best. The current investment consultant for NIC is Aon.



According to presentations posted to NIC's website,

	2020 Capital Market Assumptions	2021 Capital Market Assumptions
10-Year Forecast	5.7%	5.7%
30-Year Forecast	6.3%	6.2%

In both years, the Aon uses an underlying inflation assumption of 2.1%.

These forecasts imply a real rate of return of approximately 3.6% for the 10-year forecast and 4.1% for the 30-year forecast.

Shorter-Term versus Longer-Term

We recognize that there is no “right” answer in deciding which time horizon to use in establishing the investment return assumption. Some will argue that since public plans are long-term investors, that 20 to 30-year horizons are more appropriate to use than 10-year horizons for setting the investment return assumption. We also believe it is critical to understand the impact on the plan in the short-term if the 10-year capital market expectations are realized. While we do not believe that longer-term horizons should be ignored, we believe the actuary should consider the 10-year horizon expectations for at least the following reasons:

- (i) While it is true that public plans are long-term investors, most public plans have significant liability commitments coming due in the next 10 to 15 years.
- (ii) In many instances, we have seen rationale from investment consultants that indicate that their longer-term capital market assumptions assume a resumption of long-term equilibrium relationships between asset classes (i.e., reversion to the mean).
- (iii) Many investment consulting firms consider 10-year assumptions to be “long-term” (page 4 from the 2021 Horizon Survey).
- (iv) In many instances, it is difficult to rationalize the differences between the 10-year and 20-year capital market assumptions. For example, we often see notable differences between the 10-year and 20-year capital market assumptions. To produce the 20-year expectation, that means that years 11 through 20 have to produce outsized returns for the second 10-year period. One would have to ask, “What is expected to be that much different between the second 10 years and the first 10 years?”
- (v) A public employee retirement system that fails to meet its return assumptions for a 10-year period is likely to come under severe pressure to reduce benefits, increase contributions, or both with the effective end result being that promises that were made are not kept.

Summary

We believe the current assumed net real rate of return of 4.65% is reasonable. Further, the ultimate investment return assumption of 7.00% is also reasonable based on many of the forward-looking estimates available.



Salary-Related Assumptions

In general, we found the recommendations for the salary-related assumptions (general wage inflation, payroll growth, and merits increases) to be reasonable and consistent with our observations with similar retirement systems.

We do have one minor observation related to the salary assumptions for the Judges. Statewide Judges plans generally cover a fixed group of judicial positions and where the compensation is well-established based on the specific judicial position held. As a result, there is very little ability for judges to receive any type of individual merit increases beyond the increases provided to all judicial positions. With this type of structured workforce and compensation, it is reasonable to expect the individual salaries to increase at the same rate as the plan-wide payroll. Prior to the 2020 experience study, the individual salary increases and the payroll growth were both assumed to be 3.50%. However, the 2020 experience study introduced a merit increase assumption of 0.25% for the judges for conservatism. While conservative, these assumptions seem incompatible in the long term. We recommend the retained actuary monitor this assumption and confirm that the merit assumption is reasonable in the next experience study.

Phase-In of Economic Assumptions

Inputs versus Outputs

At the conclusion of the 2020 experience study, the Board made a series of the thoughtful decisions to reduce the economic assumptions. Further, these assumption changes will be phased in over a four-year period. Most notably, the investment return assumption will be lowered from 7.50% for the 2020 valuation to 7.00% for the 2024 valuation. This phase-in approach is generally used to avoid an immediate and significant change to the funded status and the resulting contribution requirements of the plan. A summary of the phase-in follows:

	2020	2021	2022	2023	2024
	Valuation	Valuation	Valuation	Valuation	Valuation
	<i>Prior</i>	<i>Phase Yr1</i>	<i>Phase Yr2</i>	<i>Phase Yr3</i>	<i>Ultimate</i>
Price inflation	2.75%	2.65%	2.55%	2.45%	2.35%
Real rate of return	<u>4.75%</u>	<u>4.65%</u>	<u>4.65%</u>	<u>4.65%</u>	<u>4.65%</u>
Investment return	7.50%	7.30%	7.20%	7.10%	7.00%
General wage inflation	3.50%	3.15%	3.05%	2.95%	2.85%
Interest crediting rate	6.25%	6.15%	6.10%	6.05%	6.00%

As a result of the phase-in, the entire actuarial valuation for 2021 was prepared based on the assumptions associated with the first year of the phase in. This approach is sometimes referred to as “smoothing the inputs” because the inputs into the model, the assumptions, are being phased in.

The alternative approach would be for the Board to immediately adopt the recommended assumptions and then adjust the funding policy to smooth any potential impact on the contributions. One example of this would be to break a potentially large increase in the unfunded liability resulting from an experience study into four separate amortization bases, with 25% incorporated into the ARC immediately, 25% deferred one year, 25% deferred two years, and the final 25% deferred three years. This is sometimes referred to “smoothing the outputs”.



Our preferred approach is for the Board to adopt the ultimate assumptions so the most appropriate funded status and long-term contribution requirements are clear. Further, the Board could consider ways to smooth the contributions to the Judges and State Patrol Systems (the only two plans with additional contribution requirements), if needed. This approach would also give the Board the complete set of information when they are considering additional dividends and other benefit enhancements. We do acknowledge that the Board may have limited ability to modify the contribution policy since much of the policy is dictated in statute.

We have further comments on the phase-in approach in Section VII, as it pertains to determining the most appropriate dividend for the Cash Balance Funds.

Reasonable in the Interim

Another aspect of the phase-in is that the retained actuary needs to affirmatively state that the intermediate assumptions are reasonable for every actuarial measurement until the ultimate assumptions are reflected.

The experience study provided thorough analysis of why the proposed assumption set was appropriate, defensible and the optimal choice. However, the introduction of the phase-in approach did not provide support as to why each intermediate step of the phase-in was appropriate. For example, there was no evidence provided on the reasonableness of the 7.4% assumption used in the 2021 valuation. In addition, it is unclear why the assumptions would be phased-in as it does not appear the change in assumptions would impact the contributions for the largest plans, which is the most common rationale for phasing in assumption changes.

At the time of the experience study and the 2021 actuarial valuations, the intermediate assumption of 2.65% may have been on the high-end of a reasonable range and thus the 7.30% may have also been on the high-end of a reasonable range. However, the intermediate assumption is much more reasonable in light of the up-tick in inflation during 2021 and recent increase in forward-looking expectations for inflation.

Summary

The Board should consider adopting the ultimate economic assumptions to provide the most appropriate reporting of the funded status, contribution requirements, and potential margin for additional dividends for the plans. We acknowledge that this may require the Board exploring possible modifications to the contribution requirements to assist the employer in ramping up to the contribution levels under the new assumption sets.

Section Summary

The set of actuarial assumptions and methods, taken in combination, is reasonable and generally established in accordance with ASOP No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations*, and ASOP No. 35, *Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations*.

We have the following recommendations regarding the actuarial assumptions:

- The Board should consider adopting the ultimate economic assumptions to provide the most appropriate reporting of the funded status, contribution requirements, and potential margin for additional dividends for the plans. We acknowledge that this may require the Board exploring possible modifications to the contribution requirements to assist the employer in ramping up to the contribution levels under the new assumption sets.
- In the next experience study, we recommend that the retained actuary conduct a more detailed analysis of lump sum election rates for the Cash Balance Funds while exploring potential differences by age and considering the enhanced value for members hired before January 1, 2018 electing the annuity option.
- We recommend that the retained actuary review the observed “actual/expected” ratio for the School System termination decrement in the next experience study and closely consider what the most appropriate margin should be for this assumption. Given that the School System liabilities decreased as a result of the 2020 experience study, we encourage the retained actuary to monitor this assumption closely prior to the next experience study to ensure that it tracks with actual experience over time and consider making updates to the assumption prior to the next experience study.

SECTION IV

ACTUARIAL METHODS

Actuarial Methods

The ultimate cost of the retirement systems administered by NPERS is equal to the benefits paid plus the expenses related to operating the plans. This cost is funded through contributions to each of the five plans plus the investment return on accumulated contributions which are not immediately needed to pay benefits or expenses. The projected level and timing of the contributions needed to fund the ultimate cost are determined by the actuarial assumptions, plan provisions, participant characteristics, investment experience, and the actuarial cost method.

Actuarial Cost Method

An actuarial cost method is a mathematical process for allocating the dollar amount of the total present value of plan benefits (TPV) between future normal costs and actuarial accrued liability (AAL). The retained actuary uses the Entry Age Normal actuarial cost method (EAN Method) for all five actuarial valuations. The description of the method varies slightly between the reports for the two Cash Balance Funds and the reports for the three DB Systems, but the method is generally characterized by:

- (1) Normal Cost – the level percent of pay contribution paid from each participant’s date of hire to date of retirement, which will accumulate enough assets at retirement to fund the participant’s projected benefits from retirement to death.
- (2) Actuarial Accrued Liability – the assets which would have accumulated to date had contributions been made at the level of the normal cost since the date of the first benefit accrual, if all actuarial assumptions had been exactly realized, and there had been no benefit changes.

The EAN Method is the most prevalent funding method in the public sector. It is appropriate for the public sector because it produces costs that remain stable over time, resulting in intergenerational equity for taxpayers. Therefore, the retained actuary’s stated methods for allocating the liabilities of the five retirement systems administered by NPERS are certainly in line with national trends.

Asset Valuation Method

The market value of assets can experience significant short-term swings, which can cause large fluctuations in the development of the contributions necessary to eliminate the UAAL. Thus, many systems use an asset valuation method which dampens these short-term volatilities to achieve more stability in the employer contribution. A good asset valuation method places value on a retirement system’s assets which are related to the current market value, but which will also produce a smoother pattern of costs.

ASOP No. 44, *Selection and Use of Asset Valuation Methods for Pension Valuations*, provides a framework for the determination of the actuarial value of assets (AVA), emphasizing that the method should: (1) bear a reasonable relationship to the market value of assets (MVA), (2) recognize investment gains and losses over an appropriate time period, and (3) avoid systematic bias that would overstate or understate the AVA in comparison to MVA.

The 2021 actuarial valuations determine the smoothed asset valuation method by spreading the difference between each year’s expected return and actual return over a five-year period. Specifically,



the Actuarial Value of Assets is equal to the MVA at the actuarial valuation date, less the sum of the following:

1. 80% of the return to be spread during the first year preceding the valuation date,
2. 60% of the return to be spread during the second year preceding the valuation date,
3. 40% of the return to be spread during the third year preceding the valuation date, and
4. 20% of the return to be spread during the fourth year preceding the valuation date.

Additionally, the actuarial valuation reports include this description: “The return to be spread is the difference between (1) the actual investment return on the Market Value and (2) the expected return on the Actuarial Value. The expected return on the Actuarial Value includes interest on the previous year’s unrecognized return.” Based on our understanding of this method, we noted that the previous year’s Actuarial Value plus the previous year’s unrecognized return equals the previous year’s Market Value. As a result, describing the expected return as the “expected return on the Actuarial Value” plus the “interest on the previous year’s unrecognized return” could be more simply stated as “the expected return is based on the Market Value”. Also, the tables in the report that calculate the “return to be spread” could be simplified, accordingly. Updating and simplifying this description could improve the understanding of the method.

The smoothing method used for the 2021 actuarial valuations for NPERS is common among public employee retirement systems. We feel that this method complies with ASOP No. 44. Additionally, this method is reasonable and appropriately applied for the valuation.

Section Summary

We believe the Actuarial Cost Method and the Asset Valuation Method used by the retained actuary are reasonable for this purpose and appropriately applied in the 2021 actuarial valuations.

SECTION V

ACTUARIAL VALUATION RESULTS

Actuarial Valuation Results

Benefits

Every employer is different and every employer's plan is different. Each employer has a set of workforce and financial needs that dictate the type of retirement benefit that is most appropriate for their employees. Additionally, the amount of resources available to allocate to the plan will dictate the level of benefits provided by the plan. Regardless of the reasons for the benefit design, the employer must understand the liability and contribution requirements associated with the benefits promised. As a result, the actuarial valuation and the resulting funding policy contribution must properly reflect the benefit structure of the plan.

In general, the benefits promised by five retirement systems covered by this actuarial audit were reasonably incorporated in the 2021 actuarial valuations for each system.

Data

As part of our actuarial audit, we received the preliminary set of census data for plan participants and beneficiaries originally provided by NPERS to the retained actuary for the 2021 actuarial valuations for all five retirement systems. Additionally, we received the final set of census data for plan participants and beneficiaries used by the retained actuary for the 2021 actuarial valuations.

We used this data, along with the census summaries included in the valuation report, to review the valuation data process. Additionally, we reviewed the valuation procedures and assumptions made with regards to the data. In total, we believe that the final valuation data used by the retained actuary is sufficient to support the conclusions of the 2021 actuarial valuations.

The description of the data procedures in the actuarial valuation reports for the two Cash Balance Funds could be enhanced by noting that they use fractional years of service to annualize pay for new hires.

Replication of Actuarial Valuation Results

We utilized the entire census data files and replicated the 2021 actuarial valuation results and the contribution development for all five retirement systems. Using the assumptions and methods used by the retained actuary for the 2021 actuarial valuations, we were able to replicate the results very closely.

Generally accepted actuarial standards and practices provide actuaries with the basic mathematics and framework for calculating the actuarial results. When it comes to applying those actuarial standards to complex calculations, differences may exist due to individual opinion on the best way to make those complex calculations or other differences may occur due to nuances in the valuation software programming. This may lead to differences in the calculated results, but these differences should not be material.

In the aggregate, GRS replicated the retained actuary's results with acceptable tolerances. A comparison of major results is shown on the following pages.

	State		Diff
	GRS	CMC	
a. Active PVB	1,529,256,401	1,565,476,784	(2.3%)
b. Active AAL	1,019,171,658	1,015,045,132	0.4%
c. Annuitant AAL	450,569,296	450,310,795	0.1%
d. Inactive AAL	330,056,424	330,056,424	0.0%
e. Total AAL [b+c+d]	1,799,797,378	1,795,412,351	0.2%
f. Actuarial Value of Assets	1,868,791,699	1,868,791,699	
g. Unfunded AAL [e-f]	-68,994,321	-73,379,348	
h. Prior Amortization Bases	0	0	
i. New Amortization Base	-5,870,806	-6,243,933	
j. Projected Payroll	705,837,784	705,837,784	
k. Normal Cost	10.40%	10.65%	(0.25%)
l. Administrative Expenses	0.21%	0.21%	0.00%
m. Amortization Rate [(h+i)/j]	-0.83%	-0.88%	0.05%
Actuarial Required			
n. Contribution Rate [k+l+m]	9.78%	9.98%	(0.20%)

	County		Diff
	GRS	CMC	
a. Active PVB	632,635,329	641,049,662	(1.3%)
b. Active AAL	414,968,259	409,711,449	1.3%
c. Annuitant AAL	89,939,747	89,873,106	0.1%
d. Inactive AAL	99,827,513	99,827,513	0.0%
e. Total AAL [b+c+d]	604,735,519	599,412,068	0.9%
f. Actuarial Value of Assets	615,825,288	615,825,288	
g. Unfunded AAL [e-f]	-11,089,769	-16,413,220	
h. Prior Amortization Bases	0	0	
i. New Amortization Base	-943,641	-1,396,620	
j. Projected Payroll	298,718,046	298,718,046	
k. Normal Cost	10.01%	10.25%	(0.24%)
l. Administrative Expenses	0.27%	0.27%	0.00%
m. Amortization Rate [(h+i)/j]	-0.32%	-0.47%	0.15%
Actuarial Required			
n. Contribution Rate [k+l+m]	9.96%	10.05%	(0.09%)

	Schools		Diff
	GRS	CMC	
a. Active PVB	8,500,372,046	8,543,315,080	(0.5%)
b. Active AAL	5,989,227,914	5,917,998,392	1.2%
c. Annuitant AAL	8,003,951,106	7,969,759,950	0.4%
d. Inactive AAL	392,465,804	391,734,846	0.2%
e. Total AAL [b+c+d]	14,385,644,824	14,279,493,188	0.7%
f. Actuarial Value of Assets	13,909,828,154	13,909,828,154	
g. Unfunded AAL [e-f]	475,816,670	369,665,034	
h. Prior Amortization Bases	106,914,956	106,914,956	
i. New Amortization Base ¹	-42,257,676	-49,040,720	
j. Projected Payroll	2,235,203,829	2,235,203,829	
k. Normal Cost	12.76%	12.93%	(0.17%)
l. Administrative Expenses	0.16%	0.16%	0.00%
m. Amortization Rate [(h+i)/j]	2.89%	2.59%	0.30%
Actuarial Required			
n. Contribution Rate [k+l+m]	15.81%	15.68%	0.13%

¹ Includes the amortization payment for the Omaha Service Annuity

	State Patrol		Diff
	GRS	CMC	
a. Active PVB	250,696,515	250,011,418	0.3%
b. Active AAL	175,136,611	175,918,706	(0.4%)
c. Annuitant AAL	359,295,583	355,959,053	0.9%
d. Inactive AAL	8,629,688	8,698,694	(0.8%)
e. Total AAL [b+c+d]	543,061,882	540,576,453	0.5%
f. Actuarial Value of Assets	489,208,407	489,208,407	
g. Unfunded AAL [e-f]	53,853,475	51,368,046	
h. Prior Amortization Bases	4,931,294	4,931,294	
i. New Amortization Base	-409,331	-568,149	
j. Projected Payroll	32,005,893	32,005,893	
k. Normal Cost	30.26%	29.85%	0.41%
l. Administrative Expenses	0.26%	0.26%	0.00%
m. Amortization Rate [(h+i)/j]	14.13%	13.63%	0.50%
Actuarial Required			
n. Contribution Rate [k+l+m]	44.65%	43.74%	0.91%

	Judges		Diff
	GRS	CMC	
a. Active PVB	130,384,514	129,571,213	0.6%
b. Active AAL	84,746,556	84,519,433	0.3%
c. Annuitant AAL	130,838,973	130,046,659	0.6%
d. Inactive AAL	2,353,412	2,372,892	(0.8%)
e. Total AAL [b+c+d]	217,938,941	216,938,984	0.5%
f. Actuarial Value of Assets	218,471,110	218,471,110	
g. Unfunded AAL [e-f]	-532,169	-1,532,126	
h. Prior Amortization Bases	0	0	
i. New Amortization Base	-34,005	-97,902	
j. Projected Payroll	25,689,918	25,689,918	
k. Normal Cost	24.90%	24.28%	0.62%
l. Administrative Expenses	0.31%	0.31%	0.00%
m. Amortization Rate [(h+i)/j]	-0.13%	-0.38%	0.25%
Actuarial Required			
n. Contribution Rate [k+l+m]	25.08%	24.21%	0.87%

Disclosure of Gain/Loss

The 2021 actuarial valuation reports for all five plans include Table 8, titled “Gain/(Loss) Analysis by Source”. This table quantifies the reasons why the Unfunded Actuarial Accrued Liability (UAAL) changed differently than expected from the prior year.

If the assumptions and methods for the valuation are reasonable, the individual sources identified in this table should average out to roughly zero over time. This result would indicate that there is no consistent “bias” in the assumptions and methods. For example, there will almost always be an “Asset Gain/(Loss)” in the actuarial valuation because of the underlying asset volatility. However, we expect these asset gains and losses would average approximately zero over time if the assumption is set appropriately.

If any of these sources are always expected to be a “gain” or always expected to be a “loss” then the assumptions and/or methods should be updated to ensure these factors are considered in determining the funded status of the plan and the resulting contribution requirements. In the case of recurring losses, a plan would theoretically never be able to eliminate the UAAL because there will always be a new layer of liability loss emerging each year.

Focusing on the State Cash Balance Fund, the largest liability change (in magnitude) in the UAAL each year (outside of the cost of extra dividends) is always a “loss” (or increase in the UAAL) for “new entrants/rehires”. Over the past five years, these losses have increased the AAL for the State Cash Balance Fund by \$29.8 million, or 2.9% of the current Active AAL. A summary of the annual “losses” for “new entrants/rehires” associated with each of the plans is provided below, along with a comparison of the five-year total to the 2021 Active AAL:

	State Fund	County Fund	Schools	State Patrol	Judges
2020	\$6,290,000	\$3,439,000	\$30,789,000	\$484,000	\$125,000
2019	7,178,000	3,945,000	29,888,000	984,000	177,000
2018	6,017,000	2,663,000	25,843,000	562,000	142,000
2017	5,133,000	2,233,000	25,689,000	318,510	106,155
2016	5,230,000	2,120,000	21,106,088	314,826	166,052
Total	\$29,848,000	\$14,400,000	\$133,315,088	\$2,663,336	\$716,207
% of 2021 Active AAL	2.9%	3.5%	2.3%	1.5%	0.8%

Since all of the plans should expect to have new members every year, we believe it is unusual that this amount should be included in the reconciliation of the UAAL. There are two likely scenarios that we believe the retained actuary should closely consider before the next actuarial valuation:

1. Each of the five plans receive contributions from the members and the State on the payroll of all new members and rehires. Since these contributions generally exceed the average normal cost for each plan, it is unlikely that the UAAL (liabilities minus assets) should increase due to these new members and rehires in the magnitude shown in Table 8. In this case, it is likely that the liability loss is being incorrectly attributed to new members and the retained actuary should review their current procedures for determining the sources of gains and losses.
2. If the new members and rehires are truly coming into the plan with a sizable liability, after accounting for the contributions received on their pay, then the retained actuary should consider adding a load to the Actuarial Required Contribution, possibly in the normal cost, to account for the anticipated annual liability loss associated with these new members.

Currently, these losses are technically included with the “experience base” each year and amortized over 25 years in accordance with the funding policy. Given the nature of the event (i.e., being hired or rehired), we believe it would be more appropriate to include this cost, if necessary, into the current year ARC as part of the normal cost.

Section Summary

We believe that the valuation results were developed in a reasonable manner based on the current application of the stated data, assumptions and methods.

We recommend that the retained actuary review their current procedures for determining the sources of gains and losses to ensure that the reoccurring losses attributed to “new entrants/rehires” are being categorized correctly and, if necessary, included in the normal cost component of the ARC.

SECTION VI

CONTENT OF THE VALUATION REPORT

Content of the Valuation Report

ASOP No. 4, *Measuring Pension Obligations and Determining Pension Plan Costs or Contributions*, and ASOP No. 41, *Actuarial Communications*, provide guidance for measuring pension obligations and communicating the results. These Standards list specific elements to be included, either directly or by references to prior communication, in pension actuarial communications. The pertinent items that should be included in an actuarial valuation report on a pension plan should include:

- The name of the person or firm retaining the actuary and the purposes that the communication is intended to serve.
- A statement as to the effective date of the calculations, the date as of which the participant and financial information were compiled, and the sources and adequacy of such information.
- An outline of the benefits being discussed or valued and of any significant benefits not included in the actuarial determinations.
- A summary of the participant information, separated into significant categories such as active, retired, and terminated with future benefits payable. Actuaries are encouraged to include a detailed display of the characteristics of each category and reconciliation with prior reported data.
- A description of the actuarial assumptions, the cost method and the asset valuation method used. Changes in assumptions and methods from those used in previous communications should be stated and their effects noted. If the actuary expects that the long-term trend of costs resulting from the continued use of present assumptions and methods would result in a significantly increased or decreased cost basis, this should also be communicated.
- A summary of asset information and derivation of the actuarial value of assets. Actuaries are encouraged to include an asset summary by category of investment and reconciliation with prior reported assets showing total contributions, benefits, investment return, and any other reconciliation items.
- A statement of the findings, conclusions, or recommendations necessary to satisfy the purpose of the communication and a summary of the actuarial determinations upon which these are based. The communication should include applicable actuarial information regarding financial reporting. Actuaries are encouraged to include derivation of the items underlying these actuarial determinations.
- A disclosure of any facts which, if not disclosed, might reasonably be expected to lead to an incomplete understanding of the communication.

We have reviewed the actuarial valuation report prepared by the retained actuary and have noted a few modifications to the report that would allow the report to adhere more closely with ASOP Nos. 4, 41, 51 and 56.

Actuarial Standard of Practice No. 51, *Assessment and Disclosure of Risk in Measuring Pension Obligations (ASOP 51)* – When performing a funding valuation of a pension plan, ASOP 51 guides actuaries to provide certain assessments and disclosures in the actuarial communication associated with risk that actual future measurements may differ significantly from expected future measurements. The additional disclosures required by this standard are intended to help users of the actuarial valuation gain a better understanding of risks inherent in the measurements of pension obligations and actuarially determined pension plan contributions. ASOP 51 provides a list of examples of risks to assess, including: investment risk, asset/liability mismatch risk, interest rate risk, longevity and other demographic risks, and contribution risk.



Section 6 of all five of the 2021 actuarial valuation reports, titled “Risk Considerations”, was added to the report in response to ASOP 51. We would like to commend the retained actuary on a very thorough and informative discussion of the risks applicable to each of the five plans. We hope the Board finds these discussions to be a valuable insight into the long-term sustainability of NPERS.

Actuarial Standard of Practice No. 56, Modeling (ASOP 56) – ASOP 56 provides guidance to actuaries when performing actuarial services with respect to designing, developing, selecting, modifying, using, reviewing, or evaluating models. This Standard requires certain disclosures by the retained actuary as part of an actuarial valuation of the pension plan.

The fourth paragraph of the actuarial certification letter states that, “In order to prepare the results in this report, we have utilized appropriate actuarial models that were developed for this purpose.” ASOP 56 “requires disclosure of the reliance of models developed by others, if any.” It can be reasonably inferred that the retained actuary’s use of the word “utilized” suggests that the some of the models used were developed by others. We believe that in order to more fully comply with the ASOP, the retained actuary should consider explicitly claiming ownership of the models utilized or disclose the extent of reliance of models designed, developed, or modified by others.

ASOP 56 also requires the actuary to disclose:

- Material inconsistencies, if any, among assumptions, and known reasons for such inconsistencies;
- Unreasonable output resulting from the aggregation of assumptions, if material; and
- Material limitations and known weaknesses.

While the retained actuary’s silence on the above points may imply that no such effects exist, we believe the disclosure would benefit from explicit statements saying so.

Accumulated Benefit Obligation

The Board’s dividend policy for the Cash Balance Funds incorporates an additional measure of the plans’ funded status, referred to as the Current Value. The liability measure used to determine the Current Value funded status is based on the Accumulated Benefit Obligation (ABO). The ABO is calculated using a recognized actuarial cost method but it is different from the Entry Age Normal actuarial cost method that is used for all of the other liability calculations for the Cash Balance Funds. There is a brief definition of the ABO measure in the Board Summary section of these reports. We believe the communication of the Current Value measurement could be further enhanced with a more thorough description of the ABO. Most importantly, it would helpful to note that the ABO is based on the account balances as of the valuation date and not any type of projected cash balance. We believe this enhancement would help the average reader of the valuation report to better understand the difference in the two liability measures.

Consideration for Executive Summary

Each of the 2021 actuarial valuation reports starts off with “Section 1 – Board Summary” which is generally a 13-page comprehensive summary of the notable results of the actuarial valuations. We believe it would enhance the communication of the key actuarial valuation results to add an Executive Summary to the beginning of each actuarial valuation report which would be used to present the most important results from the actuarial valuation on, presumably, one page. This Executive Summary could



include metrics like the funded status, additional contributions necessary, and the maximum dividends which are amounts that some readers of the valuation report may need to find quickly.

Appendix C – Summary of Actuarial Assumptions

The presentation of actuarial methods and assumptions is generally complete and understandable. The methods described in this section are reasonable and appropriate for public retirement plans.

We do have the following suggestions to improve the overall communication of the valuation assumptions.

Form of Payment – For the School System, the report states: “Members who terminated vested are assumed to take a refund of contributions if it is more valuable than their deferred benefit.” Through the replication process, it was determined this assumption only applies to current active members who are assumed to terminate vested in the future. This assumption is reasonable and we recommend that the retained actuary update the description of this assumption in the School System actuarial valuation report.

Section Summary

In general, the actuarial valuation report complied with the applicable Actuarial Standards of Practice. In order to improve the ability of the report to communicate the assumptions, methods and plan provisions incorporated into the actuarial valuation, we recommend that the retained actuary incorporate the noted enhancements in future actuarial valuation reports.

SECTION VII

OBSERVATIONS ON CASH BALANCE DIVIDENDS

Observations on Cash Balance Dividends

State statutes provide that the Board may grant a dividend for the two Cash Balance Funds 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.

As a result of the 2021 actuarial valuations, the State Cash Balance Fund could grant a maximum dividend of 5.55% (in addition to the 5.00% annual interest credit) and the County Cash Balance Fund could grant a maximum dividend of 2.82%.

One of the most important decisions the Board makes on an annual basis is to determine, in consultation with their actuary, the size of the dividend to grant each year (assuming the dividend policy indicates that a dividend is payable). Any dividend granted serves as a permanent benefit increase for active members that cannot be taken back if the plan's funded status deteriorates. The dividends also have a significant impact on each plan's funded status since the Cash Balance Funds are relatively young plans and the majority of the plan liability is attributable to active members.

This section will summarize our observations relating to: (1) the importance and complexity of the assumption for future dividends, and (2) the annual calculation of the maximum dividend that can be granted by the Board.

Setting the Assumption

The assumed interest crediting rate for the Cash Balance Funds is 6.15% for the 2021 actuarial valuations and the assumption is scheduled to phase down to 6.00% for the 2024 actuarial valuations. This assumption incorporates both: (a) the base interest crediting rate (greater of 5% and the applicable federal mid-term rate plus 1.5%), plus (b) future discretionary dividends.

In the 2020 experience study report, the extent of the analysis on this assumption appears to be summarized by this statement: "Historically, actual interest credits and dividends have been about 1% lower than the actual return." This type of analysis for setting the assumed interest crediting rate would seem akin to setting the investment return assumption based on the historical returns. Based on comments received from the retained actuary during the actuarial audit process, it is our understanding that stochastic modeling was also used to help estimate the most appropriate forward-looking assumptions for the effective annual cash balance interest credits. We encourage the retained actuary to provide additional details on this procedure in the next experience study report.

Given the importance of this assumption, we recommend the continued use of an analytical and forward-looking analysis to develop a reasonable assumption for the interest crediting rate. It should be noted that it is not straight-forward to analyze this assumption since the amount of the dividend is very dependent on the funded status of the Cash Balance Funds when the dividend is granted. The Actuarial Standards of Practice would refer to the dividend as a "plan provision that is difficult to measure" which generally requires a more complex analysis for assumption setting.

Two possible methods for analyzing the assumption for interest crediting rates are noted below. However, there could be many other possible ways to assess this assumption.

1. **Stochastic Projection** – The retained actuary could prepare a stochastic projection of the actuarial valuation results for the next 20-30 years and determine the average dividend that could be granted in the future based on thousands of possible scenarios.
2. **Implied Dividend** – Given the constraints of the dividend policy (no UAAL and 90% of the statutory contribution rates), the actuary could solve for the assumed interest crediting rate, taken in combination with all the other assumptions, that produces a normal cost rate equal to 90% of the statutory contribution rates. It could be reasonable to expect the average interest credits (including dividends) to converge to this rate over time. For the State Cash Balance Fund, we followed this process based on the ultimate economic assumptions and, coincidentally, the implied interest crediting rate was very close to 6.00%.

Circular Nature of Maximum Dividend Calculation

The current procedures for determining the maximum dividend incorporates an assumption for future dividends into the UAAL and ARC calculations. In this situation, a higher dividend assumption today (which would increase the UAAL and increase the ARC) could result in lower maximum dividends today. Alternatively, a lower dividend assumption today (which would decrease the UAAL and decrease the ARC) could result in higher maximum dividends today.

Based on this procedure, it is plausible that the actuarial valuation results indicate that a dividend is not payable in the current year, but by just a small margin. This situation would imply that a dividend cannot be payable in the current year because a dividend is not payable for every year in the future. It appears that this may have been the case when the dividend policy indicated that no dividend was payable as a result of the January 1, 2019 actuarial valuation of the State Cash Balance Fund.

The current dividend policy can lead to an “all or nothing” approach. We encourage the Board to consider modifying the current dividend policy to provide additional options when a dividend is not payable in the current year. An example alternative could be to re-apply the dividend policy with a lower assumption for future dividends (i.e., lowering the assumed interest crediting rate from 6.0% to 5.5%).

Ultimately, this comment intends to provide the Board with an opportunity to grant a dividend in the current year even if a dividend could not be granted for every single year in the future.

Phase in of Assumptions

As previously noted, the Board elected to phase into the economic assumptions recommended by the retained actuary as part of the 2020 experience study. Specifically, the assumption changes will be phased in over a four-year period. This phase-in approach is generally used to avoid an immediate and significant change to the funded status and the resulting contribution requirements of the plan. A summary of the phase-in follows:

	2020	2021	2022	2023	2024
	Valuation	Valuation	Valuation	Valuation	Valuation
	<i>Prior</i>	<i>Phase Yr1</i>	<i>Phase Yr2</i>	<i>Phase Yr3</i>	<i>Ultimate</i>
Price inflation	2.75%	2.65%	2.55%	2.45%	2.35%
Real rate of return	<u>4.75%</u>	<u>4.65%</u>	<u>4.65%</u>	<u>4.65%</u>	<u>4.65%</u>
Investment return	7.50%	7.30%	7.20%	7.10%	7.00%
General wage inflation	3.50%	3.15%	3.05%	2.95%	2.85%
Interest crediting rate	6.25%	6.15%	6.10%	6.05%	6.00%

As a result of the phase-in, the entire actuarial valuation for 2021 was prepared based on the assumptions associated with the first year of the phase in. Most importantly, the maximum dividend was calculated based on the funded status and normal cost using the intermediate assumptions (namely, the 7.30% investment return assumption). The maximum dividend of 5.55% determined as part of the 2021 actuarial valuation was appropriate based on the assumptions used for the 2021 actuarial valuation.

It is worth noting that the Board believed that the ultimate assumptions, to be effective for the 2024 actuarial valuation, are appropriate for the long-term. Using these ultimate assumptions, a dividend would still have been payable based on the 2021 actuarial valuation but the maximum dividend would have been smaller. Essentially, a 5.55% dividend was appropriate based on the intermediate phased-in assumptions but it would have exceeded the Board’s dividend policy if the maximum dividend was calculated based on the ultimate assumptions.

The dividends granted during the four-year phase-in period will ultimately be incorporated into the actuarial valuation in 2024, and beyond, based on the ultimate assumptions. If the maximum dividends are granted based on the intermediate assumptions during the phase-in period then these dividends will ultimately be more expensive in 2024, and beyond. This procedure will most likely result in larger dividends during the short-term and reduce the size and likelihood of dividends over the longer-term.

We have two recommendations based on this situation:

1. In addition to calculating the maximum dividend based on the intermediate assumption sets, we recommend that the retained actuary also calculate the maximum dividend based on the ultimate assumptions and communicate this lower maximum amount to the Board. This additional amount will enhance the Board’s understanding about the level of dividend that is sustainable for the longer-term.
2. Alternatively, the Board should consider accelerating the phase in of the assumptions and incorporate the ultimate assumptions into the 2022 actuarial valuation. Using the ultimate assumptions for the 2022 and 2023 valuation will ensure that the dividends granted in those two years are determined in a manner that is most consistent with the cost of the plan for the longer-term. As noted in Section III, the Board could possibly modify the contribution requirements to assist the employer in ramping up to any new contribution requirements.

Level Dollar Amortization

The amortization component of the Actuarial Required Contribution (ARC) for the Cash Balance Funds is calculated as a level dollar payment over a closed 25 year period. The resulting level dollar payment is converted to a “percent of pay” by dividing by the projected payroll for the upcoming year. If all



assumptions are met then this amortization payment would be expected to decrease in magnitude as the dollar payment stays level but the payroll increases.

This shrinking amortization payment (as a percentage of pay) can be seen in the following five-year projection of the amortization payment for the County Cash Balance Fund:

Year	Amortization Payment [1]	Projected Payroll [2]	Amortization Payment as a Percent of Pay [3=1/2]
2021	\$(1,396,620)	\$298,718,046	-0.47%
2022	(1,396,620)	308,127,664	-0.45%
2023	(1,396,620)	317,833,685	-0.44%
2024	(1,396,620)	327,845,446	-0.43%
2025	(1,396,620)	338,172,578	-0.41%

Since the assets of the County Cash Balance Fund exceed the liabilities of the plan, the amortization payment is actually an offset, or reduction, to the ARC. As you can see in the following table, the ARC is expected to increase over time.

Year	Normal Cost [4]	Administrative Expenses [5]	Amortization Payment as a Percent of Pay [3]	Projected ARC [6=4+5+3]
2021	10.25%	0.27%	-0.47%	10.05%
2022	10.25%	0.27%	-0.45%	10.07%
2023	10.25%	0.27%	-0.44%	10.08%
2024	10.25%	0.27%	-0.43%	10.09%
2025	10.25%	0.27%	-0.41%	10.11%

Further, the margin between the Statutory Contribution Rate and the ARC is expected to decrease over time.

Year	Statutory Contribution Rate [7]	90% Threshold for Benefit Improvement [8=7*90%]	Projected ARC [6]	Rate Sufficiency/ (Deficiency) [9=8-6]
2021	11.63%	10.46%	10.05%	0.41%
2022	11.63%	10.46%	10.07%	0.39%
2023	11.63%	10.46%	10.08%	0.38%
2024	11.63%	10.46%	10.09%	0.37%
2025	11.63%	10.46%	10.11%	0.35%

In general, a level dollar amortization is an attribute of a strong funding policy. However, it may provide too big of a “credit” in situations where the plan is overfunded, like the County Cash Balance Fund. We recommend that the Board consider an enhancement to the amortization policy (strictly for purposes of

applying the dividend policy) that is designed to develop an ARC that is expected to remain more level as a percent of pay in the future when the plan is overfunded. This approach would be more consistent with the statement on page 27 of the County Cash Balance Fund report that the “contributions are computed in accordance with a level percent-of-payroll funding objective”.

If the amortization payment was calculated to be a level percent of pay (strictly for purposes of applying the dividend policy), the ARC would be calculated as follows. Further, the ARC would be expected to remain more level as a percentage of pay in the future and the margin for determining the maximum dividend would also be expected to remain more level as a percentage of pay.

	Level Percent of Pay Amortization	Level Dollar Amortization
a. Normal Cost	10.25%	10.25%
b. Administrative Expenses	0.27%	0.27%
c. Amortization Payment	<u>-0.35%</u>	<u>-0.47%</u>
d. Actuarial Required Contribution [a+b+c]	10.17%	10.05%
e. 90% Threshold	10.46%	10.46%
f. Rate Sufficiency/(Deficiency) [e-d]	0.29%	0.41%

It should be noted that the 90% threshold (and, thus, this observation) can only impact the maximum dividend calculation when the normal cost (plus the administrative expenses) exceeds the 90% threshold. The normal cost (including administrative expenses) for the State Cash Balance Fund is currently less than the 90% threshold (10.86% compared to 11.06%). However, the normal cost for the County Cash Balance Fund is currently more than the 90% threshold (10.52% compared to 10.46%).

Section Summary

The procedures for granting dividends in the two Cash Balance Funds are a very important responsibility for the Board. We offer the following recommendations which should help to provide more consistent dividends over time.

- The Board should consider accelerating the phase in of the assumptions and incorporate the ultimate assumptions into the 2022 actuarial valuation, especially with regards to the determination of the maximum dividend.
- We encourage the Board and the retained actuary review all of the observations and suggestions regarding Cash Balance Dividends in this Section of the report to improve the consistency and affordability of the Cash Balance Dividends going forward.

We hope you find these recommendations helpful.



SECTION VIII

FINAL REMARKS

Final Remarks

The auditing actuarial firm, Gabriel, Roeder, Smith & Company (GRS), is independent of the retained actuarial firm. The auditing actuaries are not aware of any conflict of interest that would impair the objectivity of this work.

We have presented many suggestions for areas where we believe the product can be improved. The retained actuary has access to information and a long history of retirement systems similar to NPERS. We understand that the retained actuary may agree with some of our recommendations, while rejecting others. We ask that the retained actuary and NPERS consider our recommendations carefully. We hope that the retained actuary and NPERS find these suggestions useful.

