Kentucky Judicial Form Retirement System

2025 Actuarial Experience Study

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August 1, 2025

Board of Trustees
Kentucky Judicial Form Retirement System
The Whitaker Bank Building
305 Ann Street, Suite 302
Frankfort, KY 40601

Subject: Results of the 2025 Actuarial Experience Study

Dear Members of the Board:

We are pleased to present our report of the 2025 Actuarial Experience Study for the Kentucky Judicial Form Retirement System (JFRS), based on experience through June 30, 2023. Our report includes a discussion of the recent experience of the System, presents our recommendations for new actuarial assumptions and methods, and provides information about the actuarial impact of these recommendations on the liabilities and other key actuarial measures of the Kentucky Judicial Retirement Plan and the Kentucky Legislators Retirement Plan.

With the Board's approval of the recommendations in this report, we believe the actuarial condition of the System will be more accurately portrayed. The Board's decisions should be based on the appropriateness of each recommendation, not on their collective effect on funding periods or unfunded liabilities.

This study was conducted in accordance with generally accepted actuarial principles and practices, and with the Actuarial Standards of Practice issued by the Actuarial Standards Board. The undersigned meet all of the Qualification Standards of the American Academy of Actuaries. In addition, all of the undersigned have extensive experience as retained public sector actuaries for several large, statewide public retirement systems.

We wish to thank the JFRS staff for their assistance in this project.

Sincerely,
Gabriel, Roeder, Smith & Company

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SECTION I

INTRODUCTION

Introduction

A periodic review and selection of the actuarial assumptions is one of many important components of understanding and managing the financial aspects of the Kentucky Judicial Form Retirement System (JFRS). Use of outdated or inappropriate assumptions can result in understated costs which will lead to higher future contribution requirements or perhaps an inability to pay benefits when due. Also, a single set of assumptions is typically not expected to be suitable forever. As the actual experience of the plan changes, the assumptions should be reviewed and adjusted accordingly.

It is important to recognize that the impact from various outcomes and the ability to adjust from experience deviating from the assumptions are not symmetric. Due to compounding economic forces, legal limitations, and moral obligations, outcomes from underestimating future liabilities are much more difficult to manage than outcomes of overestimates, and that un-symmetric risk should be considered when the assumption set, investment policy, and funding policy are created. As such, the assumption set used in the valuation process needs to represent the best estimate of the future experience of each plan and be at least as likely, if not more than likely, to overestimate the future liabilities versus underestimate them.

Using this strategic mindset, each assumption was analyzed compared to the actual experience of JFRS and general experience of other large public employee retirement systems. Changes in certain assumptions and methods are suggested upon this comparison to remove any bias that may exist and to perhaps add a slight margin for future adverse experience, where appropriate. Next, the assumption set as a whole was analyzed for consistency and to ensure that the projection of liabilities was reasonable and consistent with historical trends.

The following report provides our recommendations with regard to the significant actuarial assumptions.

In determining liabilities, contribution rates and funding periods for retirement plans, actuaries must make assumptions about the future. Among the principal assumptions that must be made are:

- Inflation rate
- Investment return rate
- Salary increase rates
- Mortality rates
- Termination rates
- Retirement rates

For some of these assumptions, such as the mortality rates, past experience provides important evidence about the future. For other assumptions, such as the investment return rate, the link between past and future results is much weaker. In either case, though, actuaries should review their assumptions periodically and determine whether these assumptions are consistent with actual past experience and with anticipated future experience.

In conducting experience studies, actuaries generally use data over a period of several years. This is necessary in order to gather enough data so that the results are statistically significant. In addition, if the study period is too short, the impact of the current economic conditions may lead to misleading results. It is known, for example, that the health of the general economy can impact salary increase rates. Using results gathered during a short-term economic expansion or contraction will not be representative of the long-term trends in this assumption.

Also, the adoption of legislation, plan improvements or changes in salary schedules will sometimes cause a short-term distortion in the experience. For example, if an early retirement window was opened during the study period, we would usually see a short-term spike in the number of retirements. Using a longer period prevents giving too much weight to such short-term effects. On the other hand, using a much longer period can increase the difficulty of identifying changes in behavior that may be occurring, such as a change in the ages at which members retire. In our view, using a five-year period ending June 30, 2023 is generally reasonable in review of most demographic assumptions. However, we have incorporated additional years of experience when our professional judgement believed it to be warranted. More detail is provided in each applicable section.

In the review of the demographic assumptions, we first determine the number of deaths, retirements, etc. that occurred during the period. Then we determine the number expected to occur, based on the current actuarial assumptions. The number “expected” is determined by multiplying the probability of the occurrence at the given age, by the “exposures” at that same age. For example, let’s assume there is a rate of retirement of 30% at age 55. The number of exposures can only be those members who are age 55 and eligible for retirement at that time. Thus, they are considered “exposed” to that assumption. Finally, we calculate 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 it varies significantly from this figure, it is a sign that a new assumption may be needed. However, in some cases we prefer to set our assumptions to produce an A/E ratio a little above or below 100%, in order to introduce some conservatism. Of course, we not only look at the assumptions as a whole, but we also review how well they fit the actual results by gender, by age, and by service.

Finally, we also consider the statistical credibility of the assumption, to make sure that the recommended assumption to fund as the long-term expected experience, is not an overreaction to limited actual experience. Please bear in mind that, while the recommended assumption set represents our best estimate, there are other reasonable assumption sets that could be supported. Some reasonable assumption sets would show higher or lower liabilities or costs.

SECTION II

SUMMARY OF RECOMMENDATIONS AND FISCAL IMPACT

Summary of Recommendations

Our recommendations for the actuarial assumptions to be used in the actuarial valuations for the Kentucky Judicial Retirement Plan and the Kentucky Legislators Retirement Plan, beginning with the June 30, 2025 actuarial valuation is summarized below.

Economic Assumptions

1. Inflation Assumption: Maintain the current assumption of 2.5% per annum

2. Investment and Administrative Expenses: Maintain the assumption that the current investment return assumption is net investment related expenses and continue to explicitly recognize administrative expenses in the actuarially determined contribution

3. Investment Return Assumption: Maintain the current assumption of 6.5% per annum

4. Cash Balance Interest Crediting Rate: Recommend increasing the assumed interest crediting rate to 6.6%

5. Salary Increases for Individual Members: Recommend maintaining the 3.5% annual salary increase assumption, but without the 1% annual salary increase that is currently assumed for the next 5 years

Demographic Assumptions:

6. Post-Retirement and Active Mortality: Update the base mortality tables to the newly released public retirement plans mortality tables (Pub-2016 for General Employees with Above-Median Income). Update the mortality improvement assumption to the ultimate rates of the most recently published mortality projection scale (U-MP2021).

7. Disabled Mortality: Update the base mortality tables to the newly released public retirement plans mortality tables (Pub-2016 for Disabled Retirees). Update the mortality improvement assumption to the ultimate rates of the most recently published mortality projection scale (U-MP2021).

8. Termination Rates: Continue to assume no termination prior to retirement for members of the Judicial Retirement Plan. Update the termination assumption for the Legislators Retirement Plan to a uniform 5.5% termination rate per year.

9. Retirement Rates: Decrease the retirement rates when a member is five years away from their normal retirement age and at ages above normal retirement age.

10. All Other Assumptions and Methods: No other changes recommended

Summary of Financial Impact of Recommendations

The following pages provide the actuarial impact of the recommended assumptions based on the June 30, 2023 actuarial valuation to provide stakeholder an understanding of the magnitude of the financial effect due to the change in the proposed assumptions. In actuality, these recommended assumptions will be first used when preparing the June 30, 2025 actuarial valuation.

Judicial Retirement Plan

	Pension	
	June 30, 2023 Valuation	Proposed Assumptions
Actuarial Accrued Liability	$ 382,515,060	$ 384,692,014
Actuarial Value of Assets	404,534,407	404,534,407
Unfunded Actuarial Accrued Liability	$ (22,019,347)	$ (19,842,393)
Funded Ratio	105.8%	105.2%
Employer Normal Cost	$ 2,138,315	$ 3,262,087
Administrative Expenses	357,500	357,500
Amortization of UAAL	(1,876,429)	(1,690,915)
Annual Required Contribution	$ 619,386	$ 1,928,672

	Insurance	
	June 30, 2023 Valuation	Proposed Assumptions
Actuarial Accrued Liability	$ 49,266,254	$ 50,405,726
Actuarial Value of Assets	127,826,347	127,826,347
Unfunded Actuarial Accrued Liability	$ (78,560,093)	$ (77,420,621)
Funded Ratio	259.5%	253.6%
Employer Normal Cost	$ 612,188	$ 929,639
Administrative Expenses	46,100	46,100
Amortization of UAAL	(6,694,677)	(6,597,574)
Annual Required Contribution	$ 0	$ 0

Summary of Financial Impact of Recommendations (continued)

Legislative Retirement Plan

	Pension	
	June 30, 2023 Valuation	Proposed Assumptions
Actuarial Accrued Liability	$ 68,059,010	$ 69,660,539
Actuarial Value of Assets	86,304,769	86,304,769
Unfunded Actuarial Accrued Liability	$ (18,245,759)	$ (16,644,230)
Funded Ratio	126.8%	123.9%
Employer Normal Cost	$ 195,925	$ 244,684
Administrative Expenses	208,400	208,400
Amortization of UAAL	(1,554,854)	(1,418,376)
Annual Required Contribution	$ 0	$ 0

	Insurance	
	June 30, 2023 Valuation	Proposed Assumptions
Actuarial Accrued Liability	$ 18,115,490	$ 18,585,282
Actuarial Value of Assets	67,838,824	67,838,824
Unfunded Actuarial Accrued Liability	$ (49,723,334)	$ (49,253,542)
Funded Ratio	374.5%	365.0%
Employer Normal Cost	$ 84,709	$ 144,737
Administrative Expenses	55,500	55,500
Amortization of UAAL	(4,237,287)	(4,197,253)
Annual Required Contribution	$ 0	$ 0

SECTION III

ANALYSIS OF EXPERIENCE AND RECOMMENDATIONS

Analysis of Experience and Recommendations

Actuaries are guided by the Actuarial Standards of Practice (ASOP) adopted by the Actuarial Standards Board (ASB). One of these standards is ASOP No. 27, Selection of Assumptions for Measuring Pension Obligations. This standard provides guidance to actuaries giving advice on selecting assumptions for measuring obligations under defined benefit plans. We believe the recommended assumptions in this report were developed in compliance with this standard.

We will begin by discussing the economic assumptions: inflation, the investment return rate, cash balance interest crediting rate, and the salary increase assumption for individuals.

Inflation and Investment Return Assumptions

As no one knows what the future holds, it is necessary for an actuary to estimate possible future economic outcomes. Recognizing that there is not one right answer, the current standard calls for an actuary to develop a reasonable economic assumption. A reasonable assumption is one that:

a. Is appropriate for the purpose of the measurement,
b. reflects the actuary's professional judgment,
c. considers historical and current economic data that is relevant as of the measurement date,
d. is an estimate of future experience; an observation of market data; or a combination thereof,
e. and has no significant bias except when provisions for adverse deviation or plan provisions that are difficult to measure are included.

However, the standard also explicitly advises an actuary not to give undue weight to recent experience. Each economic assumption should individually satisfy this standard. Furthermore, with respect to any particular valuation, each economic assumption should be consistent with every other economic assumption over the measurement period. Generally, the economic assumptions are much more subjective in nature than the demographic assumptions.

INFLATION ASSUMPTION

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 impacts the investment return assumption and the individual salary increase assumption. The current annual inflation assumption is 2.50%.

Please note that the inflation assumption is a relatively insignificant assumption for the retirement system as benefits provided by LRP and JRP do not have a direct link to price inflation. However, we use this as a building block for developing the relationship and consistency with other economic assumptions that are used in the actuarial valuation.

The table below shows the average inflation over various periods, ending December 2019 and December 2024.

	Average Annual Increase in CPI-U Periods Ending Dec. 2019	Average Annual Increase in CPI-U Periods Ending Dec. 2024
Last five (5) years	1.82%	4.20%
Last ten (10) years	1.75%	3.00%
Last fifteen (15) years	2.02%	2.56%
Last twenty (20) years	2.14%	2.56%
Last twenty-five (25) years	2.19%	2.55%
Last thirty (30) years	2.40%	2.52%

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

As you can see, recent high inflation has driven up the averages, but long-term averages still remain relatively low. However, we believe that forward-looking expectations provide a better insight for determining a reasonable range and selecting this economic assumption. The following are various forward-looking sources of expected emerging inflation.

Forecasts from Other Investment Consulting Firms

We examined the 2025 capital market assumption sets for 10 investment consulting firms and the average assumption for inflation was 2.41%, with a range of 2.21% to 2.60%.

Expectations Implied in the Bond Market

Another source of information about future inflation is the market for US Treasury bonds. Simplistically, the difference in yield between non-indexed and indexed treasury bonds should be a reasonable estimate of what the bond market expects on a forward-looking basis for inflation. As of the end of the first quarter of 2025, the difference for 20-year bonds implies that inflation over the next twenty years would average 2.40%. The difference in yield for 30-year bonds implies 2.22% inflation over the next 30 years.

However, this analysis is known to be imperfect as it does not reflect the inflation risk premium that buyers of US Treasury bonds often demand as well as possible differences in liquidity between US Treasury bonds and TIPS.

Forecasts from Social Security Administration

In the Social Security Administration's 2025 Trustees Report, the Office of the Chief Actuary is projecting a long-term average annual inflation rate of 2.40% under the intermediate cost assumption.

Survey of Professional Forecasters and Fed Policy

The Cleveland Federal Reserve and St. Louis Federal reserve both report 30-year expectations of 2.52% as of January 2025. Additionally, the Fed has openly stated that they have a target 2.00% inflation rate.

Recommendation

Although we have been experiencing high inflation as of late, we still see strong support for continuing to use 2.50% as the *long-term* inflation assumption for JFRS and recommend no change.

Investment and Administrative Expenses

Since the trust fund pays expenses in addition to member benefits and refunds, we must make some assumption about these. Almost all actuaries treat investment expenses as an offset to the investment return assumption. That is, the investment return assumption represents expected return after payment of investment expenses.

In regards to investment expenses, investment consulting firms periodically issue reports that describe their capital market assumptions. The 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. Some of the retirement systems may also employ active management investment strategies that result in higher investment expenses compared to strategies that invest in passive index funds. To understand the impact of active management, including active management fees, we have reviewed the funds' historical return experience on a net of fee basis and compared that to benchmark returns based on passive investment. Additional information related to the impact of active management as it relates to JFRS is included in the discussion of the investment return assumption.

Administrative Expenses

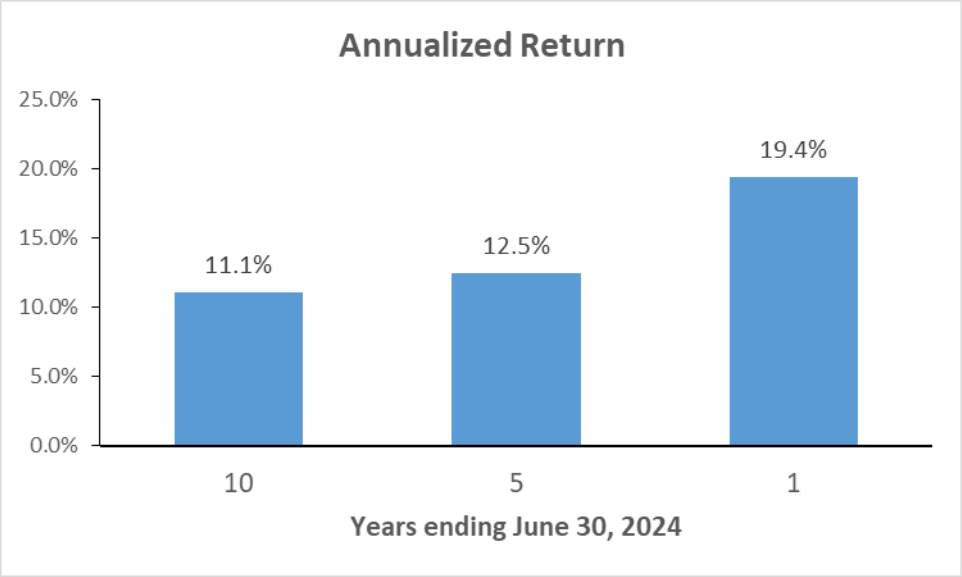
The actuarial valuations performed for JRP and LRP explicitly recognize administrative expenses in the anticipated annual payments from the plan that are based on the actual expenses incurred in the prior year. Using an explicit approach maximizes transparency, aligns better with the standards of the Governmental Accounting Standards Board, and maintains a parallel between the investment returns used by the investment consultant and the actuary. We recommend continued use of this approach.

INVESTMENT RETURN RATE

The investment return assumption is one of the principal assumptions used in the actuarial valuation of any retirement and OPEB plan. It is used to discount future expected benefit payments to the valuation date in order to determine the liabilities of the plan. Even a small change to this assumption can produce significant changes to the liabilities and contribution rates. Currently, it is assumed that future investment returns will average 6.50% per year, net of investment expenses.

Historic Market Returns

The chart below shows the historical annualized history of JFRS's market returns through FY 2024.



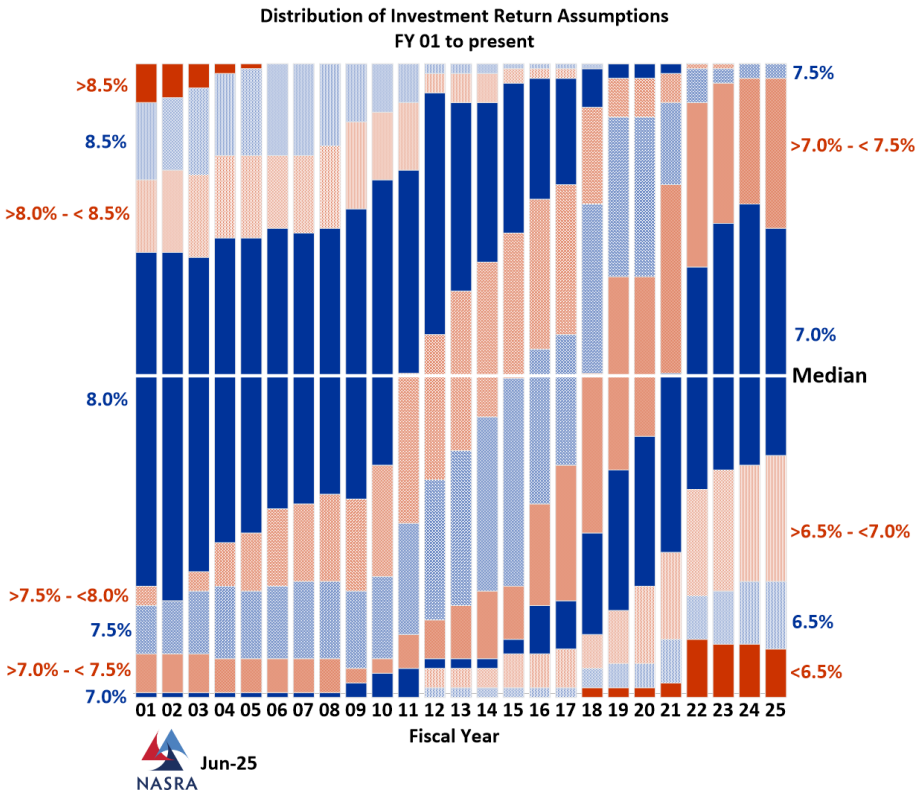
The returns in the chart above are market returns, net investment expenses, as reported in the Baird Trust June 30, 2024 investment report.

However, for this assumption, past performance, even averaged over a ten-year period, may not be a reliable indicator of future performance. The actual asset allocation of the trust fund will significantly impact the overall performance, so returns achieved under a different allocation are not meaningful.

More importantly, the real rates of return for many asset classes, especially equities, vary so dramatically from year to year that even a ten-year period is not long enough to provide reasonable guidance. There are strong reasons to believe the next twenty-five years will be different than the last twenty-five, in large part because current bond yields are significantly lower than bond yields 25 years ago.

Assumption Comparison to Peers

We do not recommend the selection of an investment return assumption based on prevalent information. However, it is still informative to stakeholders to identify where the investment return assumption for JFRS is compared to its peers. The chart below shows the distribution of the investment return assumptions, as reported by NASRA in June 2025. The current median and mode rate of return is 7.00%.



Asset Allocation

We believe the most appropriate approach to selecting an investment return assumption is to identify expected returns given the funds' asset allocation mapped to forward-looking capital market assumptions. Because GRS is a benefits consulting firm and does not provide investment consulting advice, we do not develop or maintain our own forecasts of capital market expectations. Instead, we utilized the forward-looking return expectations developed by the following investment consulting firms:

- Aon
- BNY Mellon
- Callan
- Cambridge
- Mercer Consulting
- NEPC
- RVK
- Wilshire

These investment consultants develop forward-looking return expectations for the next 7 to 10 years. Additionally, five of these firms (Aon, Cambridge, Mercer, NEPC, and RVK) develop return expectations over a longer, 20- to 30-year period. The assumptions were mapped to JFRS's investment policy which is currently 70% US large-cap equity and 30% US aggregate bond asset classes.

Throughout the last several years, we have noticed the capital markets and economic assumptions have changed at an accelerated pace, which has also resulted in investment consultants making changes to their forward-looking return expectations. As a result, we believe it is prudent to view and compare the return expectations based on the 2023, 2024, and 2025 capital market assumptions for decision making purposes. Using more than one consultant in the analysis also provides stakeholders an understanding on the magnitude of different forward-looking views of professional investment firms.

The following table provides the expected return (i.e. 50th percentile) and the probability of exceeding the current 6.50% return assumption.

		50th Percentiale Expected Return (Geometric)			Probability of Exeeding 6.50%		
	Investment Consultant	2025	2024	2023	2025	2024	2023
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
7 to 10 Year Expectations	1	4.9%	5.2%	6.2%	34%	37%	58%
	2	5.2%	5.8%	6.0%	36%	42%	56%
	3	5.6%	4.6%	5.4%	41%	32%	50%
	4	5.7%	5.3%	5.7%	43%	39%	60%
	5	6.6%	6.1%	6.5%	51%	46%	60%
	6	6.7%	7.0%	6.6%	52%	55%	55%
	7	6.7%	6.7%	7.0%	53%	52%	57%
	8	6.8%	6.8%	5.9%	53%	53%	48%
20 to 30 Year Expectations	1	4.9%	5.1%	5.3%	33%	35%	48%
	2	6.4%	5.9%	6.0%	49%	44%	59%
	3	6.6%	6.5%	6.6%	51%	50%	61%
	4	6.8%	6.4%	6.5%	53%	49%	58%
	5	7.2%	6.2%	6.7%	58%	47%	61%
7-10 Year Expectation Avg:		6.0%	5.9%	6.2%	45%	44%	55%
20-30 Year Expectation Avg:		6.4%	6.0%	6.2%	49%	45%	58%

We also note, that Baird Trust management utilizes an active management strategy with regard to fund investments in fixed income and equity securities which at a high level involves investing in quality companies that are considered leaders in their industry. A byproduct of that investment style leads to more control and less turnover that is more similar to a Berkshire Hathaway investment philosophy than investing in a passive index portfolio, such as the S&P500.

Section 3.7.3(d) of Actuarial Standards of Practice No. 27 states:

> Investment Manager Performance—Anticipating superior (or inferior) investment manager performance may be unduly optimistic (or pessimistic). The actuary should not assume that superior or inferior returns will be achieved, net of investment expenses, from an active investment management strategy compared to a passive investment management strategy unless the actuary believes, based on relevant supporting data, that such superior or inferior returns represent a reasonable expectation over the measurement period.

As such, we believe it is important and relevant to review the funds actual performance compared to benchmark investments in a comparable passive investment style. The following table is prepared by Baird Trust and is documented in their December 31, 2024 Quarterly Investment Report.

	Time Period (Years)					
	1	3	5	10	20	30
Judicial System						
Return - Net	21.18%	7.50%	12.34%	11.24%	9.34%	9.74%
Bechmark	18.09%	6.36%	10.56%	9.81%	8.32%	9.17%
Benefit of Active Management	**3.09%**	**1.14%**	**1.78%**	**1.43%**	**1.02%**	**0.57%**
Legislative System						
Return - Net	21.10%	7.54%	12.40%	11.28%	9.35%	9.73%
Bechmark	18.09%	6.36%	10.56%	9.81%	8.32%	9.17%
Benefit of Active Management	**3.01%**	**1.18%**	**1.84%**	**1.47%**	**1.03%**	**0.56%**

As the table shows, there is clear evidence that Baird's active management style has consistently provided meaningful returns and in our professional opinion may be considered when selecting an investment return assumption.

Recommendation

We believe the current 6.50% investment return assumption reasonable and recommend no change.

CASH BALANCE INTEREST CREDIT RATE ASSUMPTION

Members hired on or after January 1, 2014 earn benefits in the Hybrid cash balance plan, where their hypothetical account balance increases with member and employer pay credits and an interest credit based on the System's actual investment performance. Specifically, each year's interest credit is equal to a minimum of 4.0% plus 75% of the five-year geometric average actual return in excess of 4.0% (if any).

With the incorporation of a 4% minimum interest credit rate, it is possible for the interest credit rate to exceed the actual five-year geometric return. However, the use of a five-year average period does greatly reduce the likelihood that the 4% minimum interest credit would apply as well as the year-to-year volatility in the interest credit rate.

This plan has only been in place since 2014, which is not a sufficient time for analysis purposes. Rather, we believe it is more relevant to model a projected average compound interest credit rate stochastically based on the mean and variance expectations for the fund. We also look at the average compound interest credit to better reflect the anticipated accumulation of a members' account balance with interest over their career.

Recommendation

Our stochastic model using a 50th percentile return of 6.50% and a 12% standard deviation produced an average compound interest crediting rate of 6.60%, which is our recommended interest crediting rate assumption for the actuarial valuation.

SALARY INCREASE RATES

In order to project future benefits, the actuary must project future salary increases for individual members.

Salary increases for governmental employees can vary significantly from year to year. When the Commonwealth's revenues stall or increase slowly, salary increases often are small or nonexistent. During times of excess budgets, salary increases can be larger. Our experience across many governmental plans also shows several occasions in which salary increases will be low for a period of several years followed by a significant increase in a period of one to two years. Therefore, for this assumption in particular, we prefer to use data over a longer period in establishing our assumptions.

Most retirement systems utilize salary increase assumptions that include an element that depends on the member's age or service. It is typical to assume larger pay increases for younger or shorter-service employees. This is done in order to reflect pay increases that accompany step increases, changes in job responsibility, promotions, demonstrated merit, etc. However, the compensation provided to the members in JRP and LRP is unique and different as compensation for judges is set statutorily based on job title and legislator's salaries are based on per diem rates. As a result, salary for judges and legislators is not directly correlated to a member's service or age.

Below is a table showing the average annual salary increases over different time periods:

Time Period*	Judicial Average Salary	Legislative Per Diem
5 Years	3.6%	3.4%
10 Years	2.0%	1.7%
15 Years	1.4%	1.2%
20 Years	1.4%	1.5%

*Time period ending December 31, 2024 for judges and ending June 30, 2024 for legislators

Recommendation

The current salary increase assumption is 1% increases for the next five years and 3.5%, annually, thereafter for all judges and legislators. While we recognize that long-term salary increases have been less than 3.5%, mainly caused by the period from 2010-2017 where no salary increases were provided, recent salary increases have been higher. We recommend removing the 1% select assumption and assuming 3.5% annual salary increases for all years to reflect future expectations.

DEMOGRAPHIC ASSUMPTIONS

In this section, we will discuss the demographic assumptions: mortality, termination and retirement. Finally, we will discuss the actuarial methods used.

POST-RETIREMENT MORTALITY RATES

The calculated actuarial liabilities for JRP and LRP largely depend on how long retirees live. The longer a retiree lives, the longer the retiree receives benefits from the System resulting in a larger liability to each fund. We will discuss the mortality assumption in two parts, the recommended base mortality assumption, and the recommended mortality improvement assumption. The current base mortality assumption is based on the Pub-2010 Public Retirement Plans Mortality Table for General Employees with Above-Median Income (PubG-2010(A)). Both pension plans use the amount weighted versions while the insurance plans use the headcount weighted versions of these tables. Future improvement in mortality rates is assumed using the MP-2020 projection scale issued by the Society of Actuaries on a fully generational basis.

Recommended Base Mortality Assumption

When reviewing a base mortality assumption, we must first determine the credibility of the dataset to determine whether standard published tables should be used or if a statistical analysis of the System's data is warranted. Generally, we consider 1,000 deaths per gender the minimum necessary to be considered fully credible, however it is also preferable to develop a base mortality table with larger datasets to increase the statistical credibility that the base mortality assumption is closer to the true mortality experience of the system. The following table gives the number of deaths needed by gender to have a given level of confidence that the data is +/- X% of the actual pattern.

Statistical Confidence by Observed Deaths during the Experience Period

Std Score	Confidence	99%-101%	97%-103%	95%-105%	90%-110%	80%-120%
1.1503	75%	13,233	1,470	529	132	33
1.2816	80%	16,424	1,825	657	164	41
1.6449	90%	27,055	3,006	1,082	271	68
1.9600	95%	38,415	4,268	1,537	384	96
2.5758	99%	66,349	7,372	2,654	663	166

Combined (i.e. both the Judges and Legislators Plan) JFRS had 50 deaths over the experience period. Given the size of the data set, we are unable to assign any meaningful statistical credibility to the actual experience and the use of a standard mortality assumption is warranted. The Society of Actuaries recently conducted a study using data specific to the public sector and released updated Public Retirement Plan Mortality Tables (Pub-2016). Similar to the previous Pub-2010 tables, they include variants for employee groups and level of income, which has been found to be correlated with life expectancy in general.

Due to their relative income/wealth levels of the members in these systems, as well as their access to medical care, we believe it is reasonable to continue assuming that Kentucky judges and legislators will have higher life expectancies than the general population of public sector retirees. Therefore, we recommend updating to the most recently Society of Actuaries published public system mortality tables, the Pub-2016 for General Employees with Above-Median Income.

Recommended Mortality Improvement Assumption

The current mortality assumption includes a fully generational approach to projecting mortality improvement. Because of this strategy of building in continuous mortality improvement, life expectancies for today's younger active members are expected to be materially longer than those of today's retirees, and this has a significant impact on actuarial liabilities and contribution requirements.

Each year from 2014 through 2021, the Society of Actuaries issued a new mortality projection scale (Mortality Projection (MP)-2014, MP-2015, MP-2016, etc.). The MP tables are a two-dimensional improvement assumption that is a function of the age and calendar year. While the SOA updated the improvement rates in the select period, all tables eventually converge into approximately the same age-based scale after approximately 15 years (referred to as the ultimate rates of the table). In fact, it was not until the MP-2020 table, that these ultimate rates were modified at all and they remained consistent through the MP-2021 table. Following the COVID-19 pandemic, the SOA has not produced a new mortality projection table since MP-2021.

In order to balance the two objectives of reflecting the most recent data available, while maintaining stability of results from year to year, GRS recommends the use of the ultimate mortality improvement rates of the most recent mortality projection scale, which is referred to as U-MP2021.

Below is a table with the life expectancy for an age 65 retiree, in years, under the current and recommended mortality assumption. As shown below, the new assumption increases the life expectancy of a retiree by approximately 0.2 to 0.4 years.

Life Expectancy for an Age 65 Retiree in Years					
Assumption	Year of Retirement				
	2025	**2030**	**2035**	**2040**	**2045**
Current Assumption – Male	22.1	22.5	22.8	23.2	23.5
Recommended Assumption – Male	22.5	22.8	23.2	23.5	23.8
Current Assumption – Female	24.1	24.5	24.8	25.1	25.4
Recommended Assumption – Female	24.3	24.7	25.0	25.3	25.6

Pre-Retirement Mortality Assumption and Post-Retirement Mortality Assumption for Disabled Retirees

Both the pre-retirement mortality assumption and the post-retirement mortality assumption for disabled retirees have little impact on the actuarial valuation results. We recommend updating these to be consistent with the post-retirement mortality assumption (i.e. the Pub-2016 mortality table for General Employees with Above-Median Income and the Public -2016 mortality table for Disabled Retirees, both with generational mortality improvement using the ultimate rates of MP-2021).

TERMINATION RATES

The termination assumption is used to model the behavior of members leaving active membership in the System for any reason other than death, disability, or retirement. This applies whether the termination is voluntary or involuntary, and whether the member takes a refund or keeps his/her account balance on deposit.

Judicial Retirement Plan

Currently no terminations (other than death) are assumed to occur for judges prior to retirement eligibility. The Judicial Retirement Plan experienced only five terminations during the five-year experience period while none were expected. As the Hybrid Tier becomes a larger percentage of active population, we will continue to monitor the termination experience of this plan but, we believe that continuing to assume no termination prior to retirement for judges continues to be reasonable.

Legislative Retirement Plan

Current termination rates for legislators are based on a member's age using the SOA 2003 termination rate table. There were slightly more terminations than expected (20 actual terminations compared to 13 expected) during the study period. This is a desired outcome for this assumption as liability gains due to more than expected terminations can offset future potential losses from re-hired members and other liability experiences that can occur from this size of retirement system. For example, legislators may leave their position by losing an election or choosing not to rerun only to return a few years later in a subsequent election cycle. In this case, the plan experiences an actuarial loss due to the rehire of a legislator with prior service in the retirement system.

While the current assumption is a good fit in aggregate, the data suggests that rates of termination are not closely correlated with age or service. Therefore, we recommend updating the termination assumption to a uniform 5.5% per year when a member is more than 5 years away from eligibility for a normal retirement benefit (i.e. when retirement rates are assumed to be zero).

Legislative Retirement Plan
Termination Experience

				Assumed Rate		Expected Terminations		Actual/Expected	
Age	Actual Terminations	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2)/(7)	Proposed (2)/(8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 30	-	-	0.0%	0.0%	5.5%	-	-		
30-35	-	16	0.0%	10.1%	5.5%	2	1	0%	0%
35-40	2	18	11.1%	8.1%	5.5%	1	1	137%	202%
40-45	1	40	2.5%	6.6%	5.5%	3	2	38%	45%
45-50	2	26	7.7%	6.0%	5.5%	2	1	129%	140%
50-55	7	65	10.8%	5.3%	5.5%	3	4	203%	196%
55-60	1	46	2.2%	2.3%	5.5%	1	3	95%	40%
Over 60	7	51	13.7%	2.6%	5.5%	1	3	518%	250%
Total	20	262				13	14	153%	139%

RETIREMENT RATES

The retirement rates are used to model when an employee will commence their retirement allowance.

Under the traditional tier of benefits, judges and legislators are vested after eight years of state government service credit (alternatively, legislators are also vested after five years of legislative service). A member's retirement benefit is payable at his/her normal retirement age, or once the member has attained 27 years of state governmental service credit. The normal retirement age is 65, except that it shall be reduced by one year, but no more than five years total, for each five years of service credit in the plan. A member may retire before his/her retirement date, if vested, with a reduced benefit.

Under the hybrid tier of benefits, a member may retire at age 65 with at least five years of service or at least age 57 with so long as the member's age plus service adds to 87. Note, given the limited retirement experience of the membership earning hybrid plan benefits, we are applying the same retirement rates to both the traditional tier and hybrid tier members. While we recognize that the retirement experience of the hybrid members may differ from the traditional tier, we believe it is our best estimate of future retirement experience at this time.

The current assumption uses age-based rates with no retirement assumed when a member is more than 5 years from their normal retirement age. In general, there were fewer retirements than expected, which is consistent with the retirement trend found in the last experience investigation. Therefore, we recommend reducing the retirement rates when a member is five years away from their normal retirement age and at ages above normal retirement age.

During the experience period, there were only two retirements where the member was more than five years from their normal retirement age. Given the reduction in benefits applied as a member gets further from their normal retirement age, we believe it continues to be reasonable to assume no retirement during this period. Additionally, data shows a spike of approximately 20%-25% above the base assumption for members around the 27-year eligibility requirement. We believe continuing to assume a 20% increase (additive) in the retirement rates at the age a member reaches 27 years of service to continue to be reasonable.

The tables on the following page provide a full summary of the results and the recommended assumptions.

Judicial Retirement Plan
Retirement Experience

				Assumed Rate		Expected Retirements		Actual/Expected	
Age*	Actual Retirements	Total Exposures	Actual Rate	Current**	Proposed**	Current	Proposed	Current (2)/(7)	Proposed (2)/(8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
NRA-5	2	45	4.4%	15.0%	7.5%	7	3	30%	59%
NRA-4	3	27	11.1%	7.5%	7.5%	2	2	148%	148%
NRA-3	2	30	6.7%	7.5%	7.5%	2	2	89%	89%
NRA-2	2	31	6.5%	15.0%	15.0%	5	5	43%	43%
NRA-1	4	26	15.4%	20.0%	20.0%	5	5	77%	77%
NRA	3	33	9.1%	20.0%	20.0%	7	7	45%	45%
Above NRA	36	211	17.1%	33.3%	25.0%	70	53	51%	68%
Subtotal	52	403				98	77	53%	68%
Age 70	13	45	28.9%	100.0%	100.0%	45	45	29%	29%
Total	65	448				143	122	46%	53%

Legislative Retirement Plan
Retirement Experience

				Assumed Rate		Expected Retirements		Actual/Expected	
Age*	Actual Retirements	Total Exposures	Actual Rate	Current**	Proposed**	Current	Proposed	Current (2)/(7)	Proposed (2)/(8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
NRA-5	-	4	0.0%	15.0%	7.5%	1	0	0%	0%
NRA-4	-	6	0.0%	7.5%	7.5%	0	0	0%	0%
NRA-3	-	2	0.0%	7.5%	7.5%	0	0	0%	0%
NRA-2	1	8	12.5%	15.0%	15.0%	1	1	83%	83%
NRA-1	1	2	50.0%	20.0%	20.0%	0	0	250%	250%
NRA	1	15	6.7%	20.0%	20.0%	3	3	33%	33%
Above NRA	15	70	21.4%	33.3%	25.0%	23	18	64%	86%
Subtotal	18	107				29	23	62%	78%
Age 70	8	31	25.8%	100.0%	100.0%	31	31	26%	26%
Total	26	138				60	54	43%	48%

* NRA = Normal Retirement Age; no retirement assumed if more than five years away from NRA

** For members of the traditional tier only, an extra 20% rate is assumed at the age a member reaches 27 years of service credit.

Load for Non-Legislative Salaries

When calculating the retirement benefit from the Legislative Retirement Plan (LRP), the final average compensation includes earnings from non-legislative positions, which can be significantly higher than the legislative salary. Currently, data available for the actuarial valuation only includes a member's legislative salary. Any additional non-legislative salary is not known until a member retires, which can cause significant unexpected increases in liability for the pension plan.

Currently liabilities for members who could be impacted by this are increased by 40% to recognize the potential increase in plan liability. Of those members who are vested in an LRP retirement benefit but have not yet commenced retirement, we estimate that these benefits will be increased by approximately 73% due to non-legislative salary. After including the experience of recent LRP members who retired from active service with no impact from non-legislative session, we estimate an approximate impact on the actuarial accrued liability of 34% due to non-legislative salaries. Therefore, we believe the current assumption is still reasonable. However, given the significance of this assumption, we will continue to monitor and quantify the impact of this assumption with each full valuation performed.

Other Assumptions

There are other assumptions made in the course of a valuation, which have a minor impact on the valuation. We have reviewed each assumption and believe they are generally reasonable and recommend no changes to these other assumptions. All assumptions are summarized in Sections IV and V.

Disability Incidence Assumption

There are no disabilities assumed for the Judicial Retirement Plan or the Legislators Retirement Plan. Neither plan experienced new incidences of disability retirements during the experience period; however, it is our understanding that there has been an incidence between the end of the study period and the publication of this report. Given the rarity of a disability for these plans, we believe assuming no disability for these plans continues to be reasonable.

Cost-of-Living Adjustments

No future cost of living adjustments (COLA) are assumed for either pension plan. Per KRS 21.405, a 1.5% increase in retirement may be approved by the General Assembly if (1) the plan is greater than 100% funded and the plan can support an increase in retirement benefits without a reduction in the funding level below 100% or (2) if the General Assembly fully funds the cost of the benefit increase.

While the funded ratios of both pension plans are currently in excess of 100%, the General Assembly has not authorized a COLA since 2011. If a COLA is ever granted by the General Assembly at a future date, then the decision whether to incorporate future COLAs into the actuarial valuation will be reevaluated based on the facts and circumstances at that time.

Medical Participation Assumption

Currently the insurance plans assume that 100% of eligible members will elect healthcare coverage at retirement. Actual election rates are around 75% for recent retirements; however, this has been trending upwards. While we recognize that the current assumption may be slightly conservative, given the current funded status of the insurance funds and the relatively generous benefits provided by the plans (compared to the benefits provided to public employees and educators in the Commonwealth), we believe that it remains reasonable and appropriate.

Actuarial Cost Method

The individual Entry Age Normal cost method (EAN) is the current funding method being used to allocate the actuarial costs of each fund. The Entry Age Normal method will generally produce relatively level contribution amounts as a percentage of payroll from year-to-year, and allocates costs among various generations of taxpayers in a reasonable manner. It is by far the most commonly used actuarial cost method for large public retirement systems. We continue to believe this is the most appropriate funding method and recommend no change.

Actuarial Asset Method

The current method for developing the actuarial value of assets is based on a five-year asset smoothing method that will identify each year's investment gain or loss on a market value of asset basis, and recognize that amount at the rate of 20% per year. Under this method, an investment gain or loss that occurs in a particular year will be fully recognized in the actuarial value of assets after five years. This asset method is a very common asset valuation method used by large public retirement systems and the actual investment volatility experienced in FY 2021 and FY 2022 shows the relevance and importance of using this method for purposes of determining the actuarial valuation results. As a result, we recommend continued use of this asset smoothing method.

SECTION IV

SUMMARY OF RECOMMENDED ASSUMPTIONS – JUDICIAL RETIREMENT PLAN

Summary of Actuarial Assumptions and Methods

The following presents a summary of the actuarial assumptions and methods used in the valuation of the Judicial Retirement System. In general, the assumptions and methods used in the valuation are based on the actuarial experience study as of June 30, 2023 and adopted by the Board in August 2025.

Investment return rate:

Assumed annual rate of 6.50%, net of investment expenses

Price Inflation:

Assumed annual rate of 2.50%

Rates of Annual Salary Increase:

3.5% per year

Disability rates:

None assumed

Withdrawal rates (for causes other than disability and retirement):

None assumed

Mortality Assumption (pre and post retirement):

Pub-2016 Mortality Table for General Employees (above median), projected with ultimate rates from the Scale MP-2021 using a base year of 2016. No pre-retirement mortality is assumed for the hybrid tier. Pub-2016 Mortality Table for Disabled Retirees, projected with ultimate rates from the Scale MP-2021 using a base year of 2016, assumed for disabled retirees.

The following table provides the life expectancy for a healthy retiree in future years based on the assumption with full generational projection:

Life Expectancy for an Age 65 Retiree in Years					
Gender	**Year of Retirement**				
	2025	**2030**	**2035**	**2040**	**2045**
Male	22.5	22.8	23.2	23.5	23.8
Female	24.3	24.7	25.0	25.3	25.6

Retirement rates:

Assumed annual rates of retirement are shown below.

Age	Rate
Under NRA-5	0.0%
NRA-5	7.5%
NRA-4	7.5%
NRA-3	7.5%
NRA-2	15.0%
NRA-1	20.0%
NRA	20.0%
Above NRA	25.0%
Age 70	100.0%

Normal Retirement Age (NRA) is defined as age 65, except that it shall be reduced by one year, but no more than five years total, for each five years of service credit in the Plan.

In addition to these rates, for members of the traditional tier, an extra 20% is added to the retirement rate at the age a member reaches 27 years of service credit. For members with 27 years of service but under NRA-5, the retirement rate is assumed to be 20%.

Vested Termination: Vested terminated members are assumed to commence their retirement benefits at their normal retirement date. Members are assumed to elect a refund of member contributions if the value of their account balance exceeds the present value of the deferred benefit. Hybrid members are assumed to elect to receive a lump sum.

Pre-retirement death: Beneficiaries of current active members that die while active are assumed to commence their survivor benefits at the member's normal retirement date. No pre-retirement death assumed for hybrid members.

Marital status:

70% of active members are assumed to be married, with the female spouse 3 years younger than the male spouse, for the purposes of both pre- and post- retirement death benefits.

Dependent Children:

No dependent children assumed for the purposes of death benefits.

Form of Payment:

Members are assumed to elect a 50% joint survivor benefit if married. For hybrid members, members are assumed to elect to receive a lump sum equal to their account balance.

Cash Balance Interest Crediting Rate

Assumed annual rate of 6.60%

Other Assumptions

1. Individual salaries used to project benefits: For salary amounts prior to the valuation date, the salary from the last fiscal year is projected backward with the valuation salary scale assumption. For future salaries, the salary from the last fiscal year is projected forward with one year's salary scale.

2. Pay increase timing: Beginning of (fiscal) year. This is equivalent to assuming that reported salaries represent amounts paid to members during the year ending on the valuation date.

3. Decrement timing: Decrements of all types are assumed to occur mid-year. Decrement rates are used as described in this report, without adjustment for multiple decrement table effects.

4. Service: All members are assumed to accrue 1 year of benefit and eligibility service each year.

5. Eligibility testing: Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur

6. Incidence of Contributions: Contributions are assumed to be received continuously throughout the year based upon the computed percent of payroll shown in this report, and the actual payroll payable at the time contributions are made.

Health Care Participation Assumptions:

- 100% of future eligible retirees are assumed to elect coverage at retirement
- 70% of future retirees are assumed to elect spouse coverage.
- Future retirees are assumed to have a similar distribution by plan type as the current retirees.

Actuarial Cost Method:

Entry Age Normal, Level Percentage of Pay. The Entry Age Normal actuarial cost method allocates the System's actuarial present value of future benefits to various periods based upon service. The portion of the present value of future benefits allocated to years of service prior to the valuation date is the actuarial accrued liability, and the portion allocated to years following the valuation date is the present value of future normal costs. The normal cost is determined for each active member as the level percent of pay necessary to fully fund the expected benefits to be earned over the career of each individual active member. The normal cost is partially funded with active member contributions with the remainder funded by employer contributions.

Participant Data

Participant data was supplied in electronic text files.

The data for active and terminated members included date of birth, date of participation, benefit tier indicator, service, salary, employee contribution account balances, and employer pay credits for hybrid members. For retired members and beneficiaries, the data included date of birth, spouse's date of birth (where applicable), amount of monthly benefit, date of retirement, and form of payment.

Assumptions were made to correct for missing, bad, or inconsistent data. These had no material impact on the results presented.

SECTION V

SUMMARY OF RECOMMENDED ASSUMPTIONS – LEGISLATIVE RETIREMENT PLAN

Summary of Actuarial Assumptions and Methods

The following presents a summary of the actuarial assumptions and methods used in the valuation of the Legislators Retirement System. In general, the assumptions and methods used in the valuation are based on the actuarial experience study as of June 30, 2023 and adopted by the Board in August 2025.

Investment return rate:

Assumed annual rate of 6.50%, net of investment expenses

Price Inflation:

Assumed annual rate of 2.50%

Rates of Annual Salary Increase:

3.5% per year

Disability rates:

None assumed

Withdrawal rates (for causes other than disability and retirement):

5.5% per year

Mortality Assumption (pre and post retirement):

Pub-2016 Mortality Table for General Employees (above median), projected with ultimate rates from the Scale MP-2021 using a base year of 2016. No pre-retirement mortality is assumed for the hybrid tier. Pub-2016 Mortality Table for Disabled Retirees, projected with ultimate rates from the Scale MP-2021 using a base year of 2016, assumed for disabled retirees.

The following table provides the life expectancy for a healthy retiree in future years based on the assumption with full generational projection:

Life Expectancy for an Age 65 Retiree in Years					
Gender	**Year of Retirement**				
	2025	**2030**	**2035**	**2040**	**2045**
Male	22.5	22.8	23.2	23.5	23.8
Female	24.3	24.7	25.0	25.3	25.6

Retirement rates:

Assumed annual rates of retirement are shown below.

Age	Rate
Under NRA-5	0.0%
NRA-5	7.5%
NRA-4	7.5%
NRA-3	7.5%
NRA-2	15.0%
NRA-1	20.0%
NRA	20.0%
Above NRA	25.0%
Age 70	100.0%

Normal Retirement Age (NRA) is defined as age 65, except that it shall be reduced by one year, but no more than five years total, for each five years of service credit in the Plan.

In addition to these rates, for members of the traditional tier, an extra 20% is added to the retirement rate at the age a member reaches 27 years of service credit. For members with 27 years of service but under NRA-5, the retirement rate is assumed to be 20%.

Vested Termination: Vested terminated members are assumed to commence their retirement benefits at their normal retirement date. Members are assumed to elect a refund of member contributions if the value of their account balance exceeds the present value of the deferred benefit. Hybrid members are assumed to elect to receive a lump sum.

Pre-retirement death: Beneficiaries of current active members that die while active are assumed to commence their survivor benefits at the member's normal retirement date. No pre-retirement death assumed for hybrid members.

Marital status:

70% of active members are assumed to be married, with the female spouse 3 years younger than the male spouse, for the purposes of both pre- and post- retirement death benefits.

Dependent Children:

No dependent children assumed for the purposes of death benefits.

Form of Payment:

Members are assumed to elect a 50% joint survivor benefit if married. For hybrid members, members are assumed to elect to receive a lump sum equal to their account balance.

Cash Balance Interest Crediting Rate

Assumed annual rate of 6.60%

Non-Legislative Salary Load

Active and deferred vested liabilities for traditional tier members have been increased by 40% to reflect the potential impact of non-legislative salaries on future pension benefits.

Other Assumptions

1. Individual salaries used to project benefits: For salary amounts prior to the valuation date, the salary from the last fiscal year is projected backward with the valuation salary scale assumption. For future salaries, the salary from the last fiscal year is projected forward with one year's salary scale.

2. Pay increase timing: Beginning of (fiscal) year. This is equivalent to assuming that reported salaries represent amounts paid to members during the year ending on the valuation date.

3. Decrement timing: Decrements of all types are assumed to occur mid-year. Decrement rates are used as described in this report, without adjustment for multiple decrement table effects.

4. Service: All members are assumed to accrue 1 year of benefit and eligibility service each year.

5. Eligibility testing: Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur

6. Incidence of Contributions: Contributions are assumed to be received continuously throughout the year based upon the computed percent of payroll shown in this report, and the actual payroll payable at the time contributions are made.

Health Care Participation Assumptions:

- 100% of future eligible retirees are assumed to elect coverage at retirement
- 70% of future retirees are assumed to elect spouse coverage.
- Future retirees are assumed to have a similar distribution by plan type as the current retirees.

Actuarial Cost Method:

Entry Age Normal, Level Percentage of Pay. The Entry Age Normal actuarial cost method allocates the System's actuarial present value of future benefits to various periods based upon service. The portion of the present value of future benefits allocated to years of service prior to the valuation date is the actuarial accrued liability, and the portion allocated to years following the valuation date is the present value of future normal costs. The normal cost is determined for each active member as the level percent of pay necessary to fully fund the expected benefits to be earned over the career of each individual active member. The normal cost is partially funded with active member contributions with the remainder funded by employer contributions.

Participant Data

Participant data was supplied in electronic text files.

The data for active and terminated members included date of birth, date of participation, benefit tier indicator, service, salary, employee contribution account balances, and employer pay credits for hybrid members. For retired members and beneficiaries, the data included date of birth, spouse's date of birth (where applicable), amount of monthly benefit, date of retirement, and form of payment.

Assumptions were made to correct for missing, bad, or inconsistent data. These had no material impact on the results presented.