VIA ACTUARIAL SOLUTIONS

Minnesota Legislative Commission on Pensions and Retirement

Review of July 1, 2018 – June 30, 2022 Experience Study and Proposed Actuarial Assumptions

Minnesota State Retirement System
State Employees Retirement Fund

February 16, 2024




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Minnesota Legislative Commission on Pensions and Retirement
Centennial Office Building, 1st Floor
658 Cedar St.
St. Paul, MN 55155

Attn: Susan Lenczewski, Executive Director

Re: Review of MSRS SERF 2018-2022 Actuarial Experience Study

Commission Members:

This report presents our review of the July 1, 2018 – June 30, 2022 actuarial experience study for the Minnesota State Retirement System – State Employees Retirement Fund (MSRS SERF, or Plan).

This experience study was prepared by the Plan's retained actuary to develop assumptions for the July 1, 2024 actuarial valuation. The proposed assumptions are based on a review of the Plan's economic and demographic experience during the four-year period from July 1, 2018 through June 30, 2022.

The proposed assumptions were approved by MSRS's Board, and they have requested approval of the actuarial assumptions by the Legislative Commission on Pensions and Retirement (LCPR, or Commission) as required by Minnesota Statutes Section 356.215 Subd. 18.

Based on our review of the experience study report, we recommend the LCPR approve the proposed actuarial assumptions. The basis for our recommendation is described in the rest of this report. We also encourage the LCPR to consider actuarial methodology updates recommended by the Plan's actuary, some of which would require legislative action.

Purpose of the Study

This study was prepared at the request of the LCPR for the benefit and use of the LCPR and the State of Minnesota. Its sole purpose is to review the experience study and proposed actuarial assumptions and methods used to value the Plan's actuarial liabilities. These liabilities are used to complete various computations for financial reporting and funding/contribution purposes.

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Data Used in the Analysis

The results and recommendations in this report are based on the July 1, 2018 – June 30, 2022 experience study report dated June 29, 2023 and provided by MSRS SERF. Although we have reviewed the experience study for reasonability, we have not audited the underlying data and are relying on its substantial accuracy. If any data supplied are not accurate and complete, our conclusions and recommendations may differ significantly.

Actuarial Certification

To the best of our knowledge, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices.

Upon receipt of the report, the LCPR should notify us if you disagree with any information contained in the report or if you are aware of any information that would affect the results that has not been communicated to us. The report will be deemed final and acceptable to the LCPR unless you immediately notify us otherwise.

The undersigned credentialed actuaries are members of the American Academy of Actuaries and meet the Academy's Qualification Standards to render the actuarial opinion contained herein. We are available to answer questions on the material contained in the report or to provide explanations or further detail, as may be appropriate. We are not aware of any financial interest or relationship that could create a conflict of interest or impair the objectivity of our work.

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L/D/C/R:5/mjc/mws/emk

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Executive Summary

Based on the available data and supporting information, we recommend that the LCPR approve the actuarial assumption changes requested by the Minnesota State Retirement System (MSRS) for the State Employees Retirement Fund (MSRS SERF, or Plan), as required by Minnesota Statutes 356.215 Subd. 18. The proposed assumptions have already been approved by the MSRS's Board.

The proposed assumptions are based on a review of the Plan's recent experience (the four-year period from July 1, 2018 through June 30, 2022) prepared by the Plan's retained actuary. We believe that:

1. The methodology used to develop the assumptions is based on contemporary actuarial methods combined with a careful review or relevant reference data;
2. The recommended assumptions/methods are reasonable estimates of future experience; and
3. The recommended assumptions/methods are appropriate for determining the Plan's actuarial liabilities and calculating contribution rate sufficiency.

Our individual assumption reviews are summarized in more detail later in this report. We also provide our own recommendations regarding two assumptions:

- We recommend that that the State Board of Investment prepare a new asset liability study since the last one hasn't been updated since 2016. This study would provide an additional objective basis for the investment return assumption.
- We recommend that the LCPR coordinate a study to review the Combined Service Annuity assumption that was last updated by the LCPR's retained actuary in 2016.

The Plan's retained actuary also made several important actuarial method recommendations that we strongly support. Note that some of these proposed changes require statutory updates. The table below summarizes the retained actuary's method recommendations along with our additional comments.

Actuarial Method	Actuary's Notes
Unfunded liability amortization	**GRS recommendation**: *consider* an alternative amortization policy that steadily reduces the unfunded liability amount. Also monitor payroll growth assumption since low payroll growth can adversely affect funding progress. **VIA comment:** We agree with GRS and recommend adopting a new amortization policy of "layered" amortization bases that makes consistent progress towards eliminating the unfunded liability. We do not support the past practice of re-establishing a 30-year statutory amortization period.
Payroll projection method and delayed retirement assumption	**GRS recommendation:** Make LCPR Standards less prescriptive around payroll projection methods so that contribution rates are not understated. Also adjust Standards so actuary isn't forced to assume members over age 70 delay retirement by exactly one year. **VIA comment:** We support GRS' recommendations.

The rest of the report shows our comments for each actuarial assumption proposed by MSRS and their retained actuaries.

Economic Assumptions

Economic assumptions play a significant role in determining both the estimated amount of projected retiree payments and the "present value" of those payments (i.e., the discounted actuarial liabilities).

Some of these assumptions are based on system-specific experience (e.g., salary merit increases), while others are based on general market expectations (e.g., price inflation). The most important economic assumption is the expected investment return, which is based on a set of capital market assumptions applied to a fund's specific investment mix.

Guidance on selecting economic assumptions is provided by Actuarial Standard of Practice No. 27, Selection of Economic Assumptions for Measuring Pension Obligations (ASOP 27). When considering relevant economic assumption data, ASOP 27 outlines a recommended process for identifying and selecting reasonable assumptions. ASOP 27 also describes what it means for an assumption to be "reasonable". This guidance is summarized below.

ASOP 27 Sections 3.2 and 3.3 Process for Identifying and Selecting Reasonable Assumptions	ASOP 27 Section 3.6 Assessing Assumption Reasonability[1]
▪ Consider the purpose of the measurement and the characteristics of the obligation being measured ▪ Consider the materiality of the assumption to the measurement ▪ Identify the components of the assumption ▪ Evaluate relevant data ▪ Consider factors specific to the measurement and other general factors	▪ Is it appropriate for the measurement's purpose? ▪ Does it reflect the actuary's professional judgement? ▪ Does it consider historical and current data that is relevant as of the measurement date? ▪ Is the assumption significantly optimistic or pessimistic? If so, for what purpose?

Some of the most important economic assumption guidance is found in Section 3.4. It states that:

> *"…the actuary should review appropriate recent and long-term historical economic data. The actuary should not give undue weight to recent experience. The actuary should consider the possibility that some historical economic data may not be appropriate for use in developing assumptions for future periods due to changes in the underlying environment."*

This focus on forward-looking assumptions (instead of solely historical data) is consistent with the process used by many investment advisory firms to develop their own capital market assumptions. It recognizes that the current and future economic environment may be significantly different than it was several decades ago when many pension plans were established.

We support relying on forward-looking data instead of purely historical experience. The latter often represents the economic conditions of a particular time period (the selection of which is subjective) and may not adequately reflect future expectations. Although forward-looking assumptions may also be subjective, we believe they provide a more realistic basis for developing economic assumptions.

[1] The characteristics of a reasonable assumption in ASOP 27, Section 3.6 are paraphrased as questions here.

Additional important ASOP 27 guidance includes:

- The economic assumption should be "based on the actuary's estimate of future experience, the actuary's observation of the estimates inherent in market data, or a combination thereof."[2]
- There are a range of reasonable assumptions, and "different actuaries will apply different professional judgment and may choose different reasonable assumptions."[3]

The remainder of this section provides a summary of each recommended economic assumption, along with our review and commentary on these proposals. These assumptions include:

- Price inflation
- Wage inflation / payroll growth
- Pay increases for merit and seniority
- Investment return

[2] ASOP 27, Section 3.6.1
[3] ASOP 27, Section 3.6.2

Price Inflation

Price inflation is a building block for several of the other economic assumptions. Relevant guidance includes:

- ASOP 27 states that *"The actuary should review appropriate inflation data. These data may include consumer price indices, the implicit price deflator, forecasts of inflation, yields on government securities of various maturities, and yields on nominal and inflation-indexed debt".*
- The 2010 LCPR actuarial standards require assumed price inflation to be disclosed by the retained actuary and that it should be consistent among the assumptions for which it is a component.

Plan actuary's recommendation: Maintain inflation assumption of 2.25%

Plan actuary's rationale: Based on review of several data sources, including:

- Historical CPI-U data, both long-term and recent experience
- 2016 Asset Liability Study done by Callan for the SBI
- Federal Reserve System 2.0% target inflation rate
- Congressional Budget Office (CBO) publication of its Budget and Economic Outlook
- Survey of Professional Forecasters maintained by the Federal Reserve Bank of Philadelphia, along with expectations from the Federal Reserve Banks of Cleveland and St. Louis.
- Comparing spreads between nominal U.S. Treasury bonds and inflation-indexed treasury securities (TIPS)
- Social Security Trustees' annual report and forecast of future CPI-W (for Urban Wage Earners and Clerical Workers)
- Review of capital market assumption sets from 11 investment consulting firms

VIA review of price inflation assumption

We believe the recommended 2.25% price inflation assumption is still reasonable based on the supporting information provided by the Plan's actuary. However, some of the reference data has increased since the prior analysis so we recommend monitoring this assumption closely until the next experience study.

The Plan actuary cites many valid sources for maintaining the current long-term price inflation assumption. They take a holistic view of these data sources to inform their recommended assumption, instead of using a strictly formulaic approach.

We believe that the Plan actuary's development of the price inflation assumption meets the applicable Actuarial Standards of Practice and the LCPR's Actuarial Standards.

Wage Inflation and Payroll Growth

The **wage inflation** assumption is developed by adding "real" wage inflation to price inflation. It is used as a building block for the overall salary increase assumption.

The **payroll growth** assumption is important because it is used to amortize the unfunded liability as a level percent of payroll. If the assumption is set too high, then actual contributions could be lower than expected and pension costs would be shifted to future generations of taxpayers.

Relevant guidance includes:

- ASOP 27 recommends that the actuary consider "*historical compensation increases and practices of the plan sponsor and other plan sponsors in the same industry or geographic area; and historical national wage increases and productivity growth"*.
- ASOP 27 also mentions that actuaries should use a payroll growth assumption *"that is consistent but typically not identical to the compensation increase assumption. One approach may be to … reduce the compensation increase assumption by the effect of any assumed merit increases."*
- The LCPR Actuarial Standards have no specific wage inflation or payroll growth guidance for the Plan, other than a payroll growth definition in section VI.B.(3).

Plan actuary's recommendation: Maintain current 3.00% wage inflation/payroll growth assumption.

Plan actuary's rationale: Based on review of Plan wage increase data for long-service workers whose annual pay increases are driven almost entirely by wage inflation.

VIA review of wage inflation / payroll growth assumption

We believe the recommended 3.00% wage inflation / payroll growth assumption is reasonable, based on the supporting information provided by the Plan actuary.

Note that there was less supporting data for the 3.00% assumption in the July 1, 2018 – June 30, 2022 experience study compared to prior studies. The volatile inflationary environment of the past few years can make it difficult to evaluate long-term assumptions based on recent experience. We believe the Plan's actuary used appropriate reference data and interpretations to recommend retaining the current assumption. **However, we recommend including a summary of the Plan's historical payroll growth in the next experience study for comparative purposes.**

We believe the Plan actuary's use of the same assumption for both wage inflation and payroll growth purposes is reasonable and consistent with a stable population. We also believe that the Plan actuary's development of the wage inflation/payroll growth assumptions meets the applicable Actuarial Standards of Practice.

Pay Increases for Merit and Seniority

Pay increases for merit and seniority are in addition to price and wage inflation. It's an important assumption because members' projected benefits and associated Plan liabilities are based on final average salary at retirement or other termination of employment.

Assumed merit and seniority pay increases are much more system-specific than wage inflation assumptions. Relevant guidance includes:

- ASOP 27 recommends that, when developing compensation increase assumptions, the actuary should consider "the plan sponsor's current compensation practice and any anticipated changes in this practice; [and] current compensation distributions by age or service".
- The 2010 LCPR actuarial standards section VI.B.(2) provides specific guidance on how overall compensation increases should be analyzed (e.g., only measuring salary changes for members who are active on consecutive valuation dates). The implied merit and seniority factors can then be determined by subtracting the wage inflation assumption from the overall salary increase results.

Plan actuary's recommendation: Adjust the merit and seniority pay increase table to reflect July 1, 2018 – June 30, 2022 experience. Proposed rates are very similar to the prior rates, with a mix of slight increases and decreases at certain service levels.

Plan actuary's rationale: Proposed rates are adjusted from current rates to reflect observed experience. Actual and Expected gross salary increases over the period were reduced by the associated wage inflation amounts to calculate net Actual and Expected merit/seniority rates.[4] These net rates are then compared for populations at different service levels to determine any recommended adjustments.

VIA review of Merit and Seniority Pay Increase assumption

We believe the recommended merit and seniority pay increase table is reasonable, based on the supporting information provided by the Plan actuary.

The Plan actuary cites valid sources for their proposed changes to the merit and seniority pay increase table. Net increase rates are not substantially different from current rates, on average. The retained actuary's experience study contains a helpful chart on page C-4 illustrating the proposed adjustments.

We believe that the Plan actuary's development of the merit and seniority pay increase table meets the applicable Actuarial Standards of Practice. The analysis is also consistent with the processes specified in the LCPR's Actuarial Standards. However, Appendix A to the LCPR's standards will need to be amended to reflect the recommended changes.

[4] The retained actuary notes that this analysis is very sensitive to the estimated wage inflation component.

Investment Return

The assumed investment return is one of the most important assumptions affecting pension liability calculations. A high investment return assumption implies that higher investment returns (and lower contributions) will pay for future retiree benefits. A low investment return assumption implies that comparatively higher contributions are needed to fund future retiree payments. The investment return assumption is a key factor in allocating pension costs among current and future generations of employees and employers/taxpayers.

Relevant guidance includes:

- ASOP 27 provides substantial guidance on the data and statistical measures to be used when developing an investment return assumption. However, as mentioned earlier, we believe that some of the most instructive guidance is that

  "…the actuary should review appropriate recent and long-term historical economic data. The actuary should not give undue weight to recent experience. The actuary should consider the possibility that some historical economic data may not be appropriate for use in developing assumptions for future periods due to changes in the underlying environment."

- The LCPR's Actuarial Standards specify that *"The recommendation for the investment return assumption shall be based on analysis of the expected return in future years based on the target asset allocation and the capital market assumptions for each of those asset classes."*

  The Standards also state that "*The experience study report shall include capital market assumptions and expected return information provided by the State Board of Investment as well as other assumptions deemed appropriate by the Actuary. The recommendation for the investment return assumption shall disclose the underlying inflation assumption…"*

Plan actuary's recommendation: The Plan actuary believes that the current 7.0% investment return assumption is reasonable.

Plan actuary's rationale: Legislation passed earlier in 2023 lowered the statutory investment return assumption from 7.5% to 7.0%. The current experience study provides substantial data and analysis that supports the 7.0% assumption. The actuary's primary reference data is a comprehensive capital market assumption model based on a survey of 11 investment consulting firms.

VIA review of investment return assumption

We independently reviewed the 7.0% investment return assumption using data in the experience study report and our own capital market assumption model. **Based on this information, we agree with the retained actuary's conclusion that the current 7.0% investment return assumption is reasonable.**

We believe that the Plan actuary's rationale for validating the investment return assumption meets the applicable Actuarial Standards of Practice. Their analyses are also consistent with the process specified in section VI.B.(1) of the LCPR's Actuarial Standards.

In order to provide an additional objective basis for the investment return assumption, we recommend that the State Board of Investment prepare an updated asset liability study since the prior study hasn't been updated since 2016.

Demographic Assumptions

Demographic assumptions play a significant role in determining the likelihood of projected retiree payments; when they will start and end; and the resulting "present value" of those payments (i.e., the actuarial liabilities).

Some of these assumptions are based on system-specific experience (e.g., retirement rates) while others may be based on statistics for a larger group (e.g., disabled mortality), especially when the system's data set over the study period isn't large enough to be "credible" on its own. An important demographic assumption is healthy retiree mortality, which can be partially or fully based on system data for large groups like MSRS.

Guidance on selecting demographic assumptions is provided by Actuarial Standards of Practice No. 35, Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations (ASOP 35). When considering relevant demographic assumption data, ASOP 35 outlines considerations for identifying and selecting reasonable assumptions. ASOP 35 also describes what it means for an assumption to be "reasonable". This guidance is summarized below.

ASOP 35 Sections 3.2.1 and 3.2.2 Considerations for Identifying and Selecting Reasonable Assumptions	ASOP 35 Section 3.3.5 Assessing Assumption Reasonability[5]
▪ The purpose and nature of the measurement ▪ The plan provisions that will affect the timing and value of benefit payments ▪ The contingencies that give rise to benefit payments ▪ The materiality of the assumption to the measurement ▪ The characteristics of the obligation and covered group ▪ The universe of available assumptions, e.g., published tables or system experience studies	▪ Is it appropriate for the measurement's purpose? ▪ Does it reflect the actuary's professional judgement? ▪ Does it consider historical and current data that is relevant as of the measurement date? ▪ Is the assumption significantly optimistic or pessimistic? If so, for what purpose?

Additional important ASOP 35 guidance includes:

- The demographic assumptions should reflect "the actuary's estimate of future experience, the actuary's observation of the estimates inherent in market data …, or a combination thereof."[6]
- There are a range of reasonable assumptions, and "different actuaries will apply different professional judgment and may choose different reasonable assumptions."[7]

[5] The characteristics of a reasonable assumption in ASOP 35, Section 3.3.5 are paraphrased as questions here.
[6] ASOP 35, Section 3.2.5.d.
[7] ASOP 35, Section 3.3

The remainder of this section provides a summary of each recommended demographic assumption, along with our review and commentary on these proposals. These assumptions include:

- Retirement rates
- Withdrawal (i.e., termination before retirement eligibility)
- Disability
- Mortality
- Other demographic/non-economic assumptions

Retirement

Retirement rates are a key assumption because they determine when members' benefits are expected to begin. This has a substantial effect on liabilities and recommended contributions.

Retirement rates are entirely system-specific and heavily influenced by plan provisions. Relevant guidance includes:

- ASOP 35 recommends the actuary consider job-related factors, plan design and incentives, social insurance programs like Social Security and Medicare, and the availability of other employer plans like savings plans and postretirement health coverage.
- Section II.C.(2) of the LCPR Actuarial Standards requires retirement rates to be based on gender, age and/or years of service, or duration of eligibility unless experience shows otherwise. Section II.D.(4) requires that members active beyond the latest assumed retirement age should be assumed to work one year beyond the valuation date and then retire.
- Section VI.C. of the LCPR Actuarial Standards specifies the process to be followed when the retained actuary evaluates demographic assumptions.

Plan actuary's recommendation:

- Amend the LCPR actuarial standards to remove the required assumption that active members currently over age 70 will delay retirement and retire one year after the valuation date. Instead, the actuary recommends that the Plan assume these members retire mid-year like other members.
- Increase the rate of assumed 'unreduced retirements' at certain ages.
- Slightly modify the assumed Rule of 90 retirement rates (various ages will either have small increases, small decreases, or no adjustments).
- Slight adjustments to reduced early retirement rates for Tier 1 and Tier 2 members.

Plan actuary's rationale: The proposed rates are adjusted from current rates to reflect observed July 1, 2018 – June 30, 2022 experience. In general, proposed rates lie between current rates and observed experience.

The measurements were prepared on a liability-weighted basis since retirement decisions are often correlated with the value of expected pension benefits. There is also a note that the effect of the pandemic on retirement patterns was considered, and for this reason some of the proposed retirement rates were not adjusted as much as they otherwise would have been.

The Plan actuary also recommends no change to the retirement assumption for terminated vested members[8]. They provide commentary that the effect of this assumption is relatively minor since benefits are actuarially adjusted for any early retirements.

[8] Current assumption is that these members will choose a refund of employee contributions if greater than the actuarial value of a deferred annuity. Those expected to elect an annuity are assumed to defer receipt until normal retirement age.

VIA review of retirement rates

We believe the recommended retirement rates are reasonable based on the supporting information provided by the Plan actuary.

The Plan actuary has shown a thoughtful analysis of retirement rate experience. In addition, the proposed amendment to the LCPR Actuarial Standards for the delayed retirement assumption is reasonable.

We believe that the Plan actuary's development of proposed retirement rates meets the applicable Actuarial Standards of Practice and the LCPR Actuarial Standards. **However, the LCPR's Actuarial Standards will need to be amended to reflect the Plan actuary's proposed retirement assumption for members over age 70.**

Withdrawal (i.e., termination before retirement eligibility)

Withdrawal rates are an important assumption because they determine the extent to which members are expected to stay in covered employment and become eligible for benefits. This has a substantial effect on liabilities and contributions.

Withdrawal rates are heavily influenced by plan provisions. Relevant guidance includes:

- ASOP 35 recommends that, when developing withdrawal rates, the actuary should consider plan provisions as well as job-related factors like occupation, employment policies, work environment, unionization, hazardous conditions, and location.
- Section II.C.(2) of the LCPR Actuarial Standards requires withdrawal rates to be based on gender, age and/or years of service unless experience shows otherwise.
- Section VI.C. of the LCPR Actuarial Standards specifies the process to be followed when the retained actuary evaluates demographic assumptions.

Plan actuary's recommendation: Very slight adjustments to various service-based withdrawal rates for males and slightly lower rates at certain ages for females, so that expected rates are more consistent with actual experience.

Plan actuary's rationale: Proposed rates are adjusted from current rates to reflect observed July 1, 2018 – June 30, 2022 experience. In general, proposed rates lie between current rates and liability-weighted experience. The measurements were prepared on a liability-weighted basis since termination decisions are often correlated with the value of expected pension benefits. There is also a note that the effect of the pandemic on withdrawal patterns was considered, and for this reason some of the proposed withdrawal rates were not adjusted as much as they otherwise would have been.

VIA review of Withdrawal Rates

We believe the recommended withdrawal rates are reasonable based on the supporting information provided by the Plan actuary. Their continued use of separate gender-specific, service-based tables seems appropriate based on the data available.

The Plan actuary has shown a thoughtful analysis of withdrawal rate experience. We believe that the Plan actuary's development of proposed withdrawal rates meets the applicable Actuarial Standards of Practice and the LCPR Actuarial Standards.

Disability

Rates of disablement and disability recovery are significant assumptions for police, firefighters and other safety plans because incidence can be high and benefits are substantial. However, for general plans like MSRS SERF, disability incidence is generally lower and its effect on liabilities and contributions is correspondingly small.

Relevant guidance for disability rates includes:

- ASOP 35 recommends that, when developing disability rates, the actuary should consider:
  - the plan's definition of disability, e.g. whether it's based on the Social Security definition or a less stringent standard, and
  - the potential for recovery. The probability of recovery may be reflected by assuming a lower incidence of disability than the actuary might otherwise assume.
- Section II.C.(2) of the LCPR Actuarial Standards requires disability rates to be based on gender, age and/or type of disability (occupational or not) unless experience shows otherwise. Specific disability rates are not included in Appendix A to the LCPR Actuarial Standards.
- Section VI.C. of the LCPR Actuarial Standards specifies the process to be followed when the retained actuaries evaluate demographic assumptions.

Plan actuary's recommendation: Lower the expected disability rates so that they are more consistent with actual experience.

Plan actuary's rationale: Proposed rates are adjusted from current rates to reflect observed July 1, 2018 – June 30, 2022 experience, which was lower than expected. In general, proposed rates lie between the current rates and observed experience.

VIA review of disability rates

We believe the recommended disability rates are reasonable, based on the supporting information provided by the Plan actuary. Their continued use of separate gender-specific tables is also appropriate based on the data available.

The Plan actuary has shown a thoughtful analysis of disability experience, and they acknowledge that disability rates have a very minor effect on the Plan's liabilities. We believe that the Plan actuary's development of proposed disability rates meets the applicable Actuarial Standards of Practice and the LCPR Actuarial Standards.

Mortality

Mortality rates are an important assumption because they determine how long members' benefits are expected to be paid. Depending on plan size, mortality experience may or may not be fully credible. Many systems choose to base their mortality assumption on a published table that is then adjusted to either partially or fully recognize the plan's own experience. Relevant guidance includes:

- ASOP 35 recommends that, when developing mortality rates, the actuary should consider:
  - the possible use of different assumptions before and after retirement,
  - the use of a different assumption for disabled lives,
  - the use of different assumptions for different participant subgroups and beneficiaries, and
  - the effect of mortality improvement both before and after the measurement date.
- Section II.C.(2) of the LCPR Actuarial Standard requires mortality rates (pre-retirement, post-retirement, and survivor) to be based on gender and age unless experience shows otherwise.
- Section VI.C. of the LCPR Actuarial Standards specifies the process to be followed when the retained actuaries evaluate demographic assumptions.

Plan actuary's recommendation: Continue using the Pub-2010 mortality tables with rates adjusted to better fit observed plan experience and with future improvement projected using scale MP-2021. The recommended table adjustments are gender-distinct and vary for the following participant groups:

- Active members (i.e., pre-retirement mortality)
- Healthy retirees (i.e., post-retirement mortality)
- Disabled retirees

Proposed mortality rates are generally higher for healthy and disabled retirees, while the active member rates lower than the prior assumption. Separate beneficiary/survivor mortality tables were not recommended because of potential anti-selection bias and additional data needs.

Plan actuary's rationale: The actuary determined that the Plan data was fully credible since the covered population and observed mortality experience is sufficiently large. They provided data that supported using the Pub-2010 tables with appropriate adjustment factors.

Post-retirement mortality is presented on a benefit-weighted basis. This methodology reflects the observation that longevity is often highly correlated with income. Active member measurements are liability-weighted like other demographic assumptions. In general, proposed rates lie between current rates and observed experience.

VIA review of mortality rates

We believe the recommended mortality rates are reasonable, based on the supporting information provided by the Plan actuary. The Plan actuary has shown a thorough analysis of mortality rate experience. The proposed rates appear reasonable based on the available data. We also support their recommended generational mortality improvement scale and use of benefit-weighted analysis.

We believe that the Plan actuary's development of proposed mortality rates meets the applicable Actuarial Standards of Practice and the LCPR Actuarial Standards. Appendix A to the LCPR's standards will need to be amended to reflect the new recommendations.

Other Demographic Assumptions

There are several other demographic assumptions used to calculate the actuarial liabilities, but they have less effect on costs than the assumptions previously discussed. The proposed changes to these assumptions have a relatively small effect on liabilities and the recommendations are well supported. These assumptions and recommended actions are summarized in the table below.

Miscellaneous and Technical Assumptions	Recommendation
Marital status	Update
Beneficiary age	No change
Payment form	Update
Actuarial equivalence factors	Update
Missing participant data	Update
Miscellaneous assumptions	
Benefit service calculation	No change
Decrement operation	No change
Decrement timing	No change
Eligibility testing	No change
Forfeitures/contribution refunds	No change
Contribution timing	No change
Combined service annuity liability adjustments	No change
Pay increase timing	No change
Service credit accruals	No change

Actuarial Methods

The calculation of recommended contributions relies on several actuarial methods for determining the unfunded liability as well as developing an actuarial contribution that is intended to pay down (i.e., "amortize") the unfunded liability. They include:

- Asset valuation method
- Actuarial funding method
- Unfunded liability amortization period and method
- Post-retirement benefit increases
- Projected payroll

Most of these methods are prescribed by State Statute or the LCPR's Actuarial Standards. Selecting some of these methods is also influenced by ASOPs or other guidance, including:

- ASOP 4, Measuring Pension Obligations and Determining Pension Plan Costs or Contributions
- ASOP 44, Selection and Use of Asset Valuation Methods for Pension Valuations
- The Society of Actuaries Report of the Blue Ribbon Panel on Public Pension Plan Funding
- Conference of Consulting Actuaries Public Plans Community - Actuarial Funding Policies and Practices for Public Pension Plans

Although the latter two documents are non-binding for the actuarial profession, they provide useful considerations when selecting actuarial funding methods. We summarize the actuary's recommendations and our review below.

Asset Valuation Method

The retained actuary presents a discussion of the asset valuation method on page H-1 of the report. Their recommendation is to maintain the current asset valuation method, but that MSRS should continue to consider results based on both the Market Value of Assets and the Actuarial Value of Assets.

We agree with this recommendation since there may be temporary time periods in the future where the market value could substantially diverge from the actuarial value. Another option MSRS could consider is to refine the asset value method so that it cannot deviate by more than 20% from the Market Value of Assets.

Actuarial Funding Method

The retained actuary recommended continued use of the entry age actuarial cost method, and we agree with that recommendation.

Unfunded Liability Amortization Period and Method

The retained actuary recommends consideration[9] of "layered" amortization bases rather than amortizing unfunded liabilities over a single "closed" 30-year period. We agree because:

- A 30-year amortization period is so long that it can shift pension costs for current workers to future taxpayers, especially when applied as a level percent of payroll rather than as a level dollar amount. Contemporary actuarial funding policies generally target an amortization period of fewer than 30 years (e.g., 20 years).
- A single closed amortization period works well until the remaining years become short, at which time recommended contribution rates may become volatile because any changes are spread over a shorter and shorter period.

The retained actuary recommends maintaining the level percent of payroll amortization method but points out that combining long amortization periods with the level percent of payroll amortization method can lead to "negative amortization". Therefore, they recommend considering layered bases and shorter amortization periods as alternatives to the current amortization methods. They also recommend closely monitoring actual plan payroll growth so that current contribution levels aren't set too low.

Our observations of the amortization period and methods are:

- **We agree with the actuary's notes about extended amortization periods, and we recommend a layered amortization approach where each year's actuarial gain/loss is separately (and completely) amortized over a fixed period.** We do not support the ongoing re-establishment of new 30-year statutory amortization periods.
- We agree with maintaining the level percent of payroll amortization method as long as the assumed payroll growth rate is supported by actual payroll growth experience and future expectations.

Projected payroll

The retained actuary noted that the LCPR's Actuarial Standards prescribe a projected payroll calculation that is not consistent with best practices. We agree with this conclusion, and we also agree with the request that the standards be less prescriptive and more principles based.

[9] The layered amortization option is a "recommendation to consider" not a "recommendation to change" from the retained actuary.

Cost Impact

Section VI.E. of the LCPR's Actuarial Standards specifies that the systems must measure the cost impact of any assumption change. The measurement must present the change in "*the dollar amount of the UAAL, the change in the Actuarial Liability Funded Ratio, the change in the normal cost rate and the change in the UAAL contribution rate.*"

The Standards specify that the assumption changes should be measured in the following order:

1. Mortality
2. Retirement
3. Termination of employment
4. Disability
5. Salary increases
6. Interest rate/investment return assumption
7. Other
8. Payroll growth

MSRS provided an assumption request letter to the LCPR dated December 18, 2023 which lists the proposed assumption changes. They also provided a separate presentation from the retained actuary dated July 20, 2023 which summarized the required cost impact measurements.

The cost calculations contained all the required items (e.g., change in funded ratio and normal cost rate) and were presented in the following order:

- Interest rate/investment return assumption; then
- All other assumptions: merit/seniority pay increases, retirement, withdrawal, disability, mortality, marital status, form of payment, and missing participant data.

Since the discount rate reduction from 7.5% to 7.0% was changed in statute prior to the experience study, it's appropriate that the effect of this change was measured first. The assumption change recommendations from the experience study were then presented in aggregate. We believe it's reasonable to combine the assumption change measurements since many have only a minor effect on the liability. Our understanding is that the retained actuary can provide the liability change details for each individual assumption if needed.

The recommended demographic assumption changes are expected to decrease Plan liability measurements, increase funded status, and increase contribution sufficiency. The 2023 legislation that changed the valuation interest rate from 7.50% to 7.0% is expected to have the opposite effect.