# Public Employees' Retirement System of the State of Nevada

## Actuarial Valuation and Review

As of June 30, 2022



Segal

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November 21, 2022

Public Employees' Retirement Board of the State of Nevada
693 West Nye Lane
Carson City, Nevada 89703

Dear Retirement Board Members:

We are pleased to submit this Actuarial Valuation and Review as of June 30, 2022 for the Public Employees' Retirement System of Nevada (PERS). It summarizes the actuarial data used in the valuation, establishes the actuarially determined contribution requirements for the 2022-2023 plan year and analyzes the preceding year's experience.

This report was prepared in accordance with generally accepted actuarial principles and practices at the request of the Board to assist in administering the Plan. The census and financial information on which our calculations are based were provided by System staff. That assistance is gratefully acknowledged.

Segal does not audit the data provided. The accuracy and comprehensiveness of the data is the responsibility of those supplying the data. To the extent we can, however, Segal does review the data for reasonableness and consistency. Based on our review of the data, we have no reason to doubt the substantial accuracy of the information on which we have based this report and we have no reason to believe there are facts or circumstances that would affect the validity of these results.

The measurements shown in this actuarial valuation may not be applicable for other purposes. Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period); and changes in plan provisions or applicable law.

The actuarial calculations were completed under the supervision of Mark Hamwee, FSA, MAAA, Enrolled Actuary. We are members of the American Academy of Actuaries and we meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein. To the best of our knowledge, the information supplied in the actuarial valuation is complete and accurate. Further, in our opinion, the assumptions as approved by the Board are based upon our analysis and recommendations. In our opinion, the assumptions are reasonable and take into account the experience of the Plan and reasonable expectations.

We look forward to reviewing this report at your next meeting and to answering any questions.

Sincerely,

Segal

| | | |
|---|---|---|
| Brad Ramirez, FSA, MAAA, EA<br>Vice President & Consulting Actuary | Mark Hamwee, FSA, MAAA, EA<br>Vice President & Actuary | Todd Tauzer, FSA, CERA, FCA, MAAA<br>Vice President & Actuary |

MAM/jl

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# Section 1: Actuarial Valuation Summary

## Purpose and Basis

This report has been prepared by Segal to present a valuation of the Public Employees' Retirement System of the State of Nevada as of June 30, 2022. The valuation was performed to determine whether the assets and contribution rates are sufficient to provide the prescribed benefits, and establish contributions which fully fund the System's liabilities over time. Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements; and changes in plan provisions or applicable law.

The contribution requirements presented in this report are based on:

- The benefit provisions of the Public Employees' Retirement Act;
- The characteristics of covered active members, inactive vested members, retired members, disabled members, beneficiaries, and survivors as of June 30, 2022, provided by System staff;
- The assets of the Plan as of June 30, 2022, provided by System staff;
- Economic assumptions regarding future salary increases, investment earnings, and Consumer Price Index adopted by the Board for the June 30, 2022 valuation;
- Other actuarial assumptions regarding member terminations, retirement, death, etc. adopted by the Board for the June 30, 2022 valuation; and
- The funding policy adopted by the Retirement Board.

In preparing this valuation, we have employed generally accepted actuarial methods and assumptions to evaluate the Plan's assets, liabilities and future contribution requirements. Our calculations are based upon member data and financial information provided to us by System staff. This information has not been audited by us, but it has been reviewed and found to be consistent, both internally and with prior year's information.

The contribution requirements are determined as a percentage of payroll. The contribution rates provide for both Normal Cost and a contribution to amortize any unfunded or overfunded actuarial accrued liabilities. In this valuation, we have applied the funding policy adopted by the Retirement Board in September 2005, modified in May 2012, and amended in October 2021 and November 2022. Details of the funding policy are provided in *Section 4, Exhibit 2*.

A schedule of current amortization balances and payments may be found in *Section 3, Exhibit H*.

The actuarial assumptions were adopted by the Board following acceptance of Segal's June 30, 2020 Experience Study recommendations, as described in our report dated September 10, 2021.

## Valuation Highlights

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1. The results of this valuation reflect a change in the plan's funding policy adopted by the Board effective June 30, 2022. The outstanding balance of all Regular amortization bases, except for the initial base dated June 30, 2004, have been combined and re-amortized over a closed 20-year period as of June 30, 2022. The outstanding balance of all Police/Fire amortization bases, including the initial base dated June 30, 2004, have been combined and re-amortized over a closed 20-year period as of June 30, 2022.

   This change to the funding policy extends the amortization payments on the current unfunded actuarial accrued liability (UAAL) over a longer period of time, resulting in lower contribution requirements for several upcoming years. In particular, this change decreased the June 30, 2022 actuarially determined contribution rates by 1.54% of payroll for Regular and by 6.03% of payroll for Police/Fire.

   However, extending the amortization payments will increase the contribution requirements in the later years of the 20-year re-amortization compared to the prior funding policy, and will increase the total amount of interest paid on the UAAL over the next 20 years. This change was adopted in the context of extraordinary factors in the current environment, including significant strengthening of actuarial assumptions, adverse market conditions, and high inflation.

2. The results of this valuation continue to reflect changes in the actuarial assumptions adopted by the Board for the June 30, 2021 valuation. The immediate recognition of these changes would have increased the actuarially determined contribution rates in that valuation by 7.92% of payroll for Regular and by 15.04% of payroll for Police/Fire. The Board adopted a four-year phase-in of the cost impact of the changes in actuarial assumptions, meaning one fourth of the cost impact would be recognized in each of the actuarial valuations as of June 30, 2021, 2022, 2023, and 2024. As of June 30, 2022, one half of this impact has been recognized in the actuarially determined contribution requirements for the current period, and one half will be deferred across the next two years.

3. Segal strongly recommends an actuarial funding method that targets 100% funding of the actuarial accrued liability. Generally, this implies payments that are ultimately at least enough to cover normal cost, interest on the UAAL and its principal balance. The funding policy adopted by the Board meets this standard. However, the statutory contribution rates are only updated every two years and implemented one year after the valuation date at which they were determined. Additionally, the Board adopted a four-

year phase-in of the cost impact of the 2021 assumption changes. These factors tend to delay full payments on the normal cost and the unfunded actuarial accrued liability, particularly when contribution rates are increasing.

The actual contributions made during the year ended June 30, 2022 of $1,702 million for Regular and $506 million for Police/Fire were insufficient to reduce the UAAL due to the difference between the statutory rates and the actuarially determined contributions and due to the four-year phase-in of the cost impact of the 2021 assumption changes. Due to the required delay in statutory contribution rate changes, these contributions were 93% and 90% of the actuarially determined contributions (which had been lowered by the four-year phase-in of the cost impact of the 2021 assumption changes) for Regular and Police/Fire, respectively.[1]

The statutory contributions projected to be made during the upcoming year ending June 30, 2023 are not expected to be sufficient to reduce the UAAL (before accounting for any potential investment or other experience gains during the plan year). Due to the required delay in statutory contribution rate changes, the statutory contributions for the upcoming year are projected to be 89% and 88% of the actuarially determined contributions (which have been lowered by the four-year phase-in of the cost impact of the 2021 assumption changes) for Regular and Police/Fire, respectively.[2]

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4. The funded ratio (the ratio of the actuarial value of assets to the actuarial accrued liability) is 74.8% for Regular and 74.6% for Police/Fire, compared to the prior year funded ratio of 75.3% for Regular and 75.6% for Police/Fire. This ratio is one measure of funding status and its history is a measure of funding progress. The funded ratio measured on a market value basis is 75.2% for Regular and 75.0% for Police/Fire, compared to 86.4% for Regular and 86.7% for Police/Fire as of the prior valuation date. These measurements are not necessarily appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligation or the need for, or the amount of, future contributions.

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5. The UAAL on an actuarial value of assets basis is $14.1 billion for Regular and $4.3 billion for Police/Fire, compared to the prior year values of $12.9 billion for Regular and $3.8 billion for Police/Fire. The unfunded actuarial accrued liability on a market value basis is $13.9 billion for Regular and $4.2 billion for Police/Fire, compared to the prior year values of $7.1 billion for Regular and $2.1 billion for Police/Fire.

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6. There were actuarial experience losses due to a greater than expected change in the Consumer Price Index (9.06% versus 2.50% expected), which resulted in greater than expected post-retirement benefit increases (PRBIs) for continuing retirees, beneficiaries and survivors over the next several years. These losses amounted to $1,163 million for Regular and $376 million for Police/Fire. These losses increased the actuarially determined contribution rates by 1.34% of payroll for Regular and by 2.21% of payroll for Police/Fire.

[1] If the actuarially determined contribution rates were calculated without any adjustment for the phase-in, these ratios of actual contributions to actuarially determined contributions would be 78% and 73% for Regular and Police/Fire, respectively.

[2] If the actuarially determined contribution rates were calculated without any adjustment for the phase-in, these ratios of projected contributions to actuarially determined contributions would be 79% and 77% for Regular and Police/Fire, respectively.

There were actuarial experience losses due to individual salary and service increases greater than expected for continuing active Regular and Police/Fire members; this amounted to a $47 million loss for Regular members and a $46 million loss for Police/Fire members. The average actual salary increase for continuing active members during 2021-2022 was 5.8% for Regular members and 6.7% for Police/Fire members. These losses increased the actuarially determined contribution rates by 0.05% of payroll for Regular and by 0.27% of payroll for Police/Fire.

7. For Regular, the actuarial loss from total plan experience is $1,418 million, or 2.54% of actuarial accrued liability. For Police/Fire, the actuarial loss from total plan experience is $545 million, or 3.25% of actuarial accrued liability.

8. The Regular active population increased between June 30, 2021 and June 30, 2022, leading to an increase in the rate payroll of 4.30% compared to the assumed increase of 3.50%, which decreased the actuarially determined contribution rate by 0.13% of payroll. The Police/Fire active population decreased over the same period, leading to an increase in the rate payroll of 0.59% compared to the assumed increase of 3.50%, which increased the actuarially determined contribution rate by 0.79% of payroll.

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9. Actuarially determined contributions may increase or decrease from year to year even if all assumptions are exactly met. For both Regular and Police/Fire members, the actuarially determined contribution rates for 2022 increased from the previous year. Both groups saw an increase due to a net liability loss and a contribution loss, partially offset by the change in funding policy and an investment gain after smoothing. The Police/Fire group also saw an increase due to payroll growth less than expected. The required contributions also increased due to the continued phase-in of the cost impact of the 2021 assumption changes.

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10. The Public Employees' Retirement Act requires an adjustment in the statutory contribution rates on July 1 of each odd-numbered year based on the actuarially determined rates indicated in the actuarial valuation report for the immediately preceding even-numbered year.[1] In other words, contribution rate adjustments are driven by valuation results as of July 1 of even-numbered years. Because this valuation calculates the actuarially determined contribution rates for a Plan year beginning July 1 of an odd-numbered year, an adjustment in the statutory contribution rate is required as a result of this valuation.

    Rates are only adjusted upward if the new rates are more than 0.50% higher than the existing rate for Employer-Pay members and if the new rates (for each the employee and the employer) are more than 0.25% higher for Employee/Employer members. Rates are only adjusted downward if the new rates are more than 2.00% lower than the existing rate for Employer-Pay members (and adjusted only by the amount in excess of 2.00%) and if the new rates (for each the employee and the employer) are more than 1.00% lower than the existing rate for Employee/Employer Members (and adjusted only by the amount in excess of 1.00%). Rates for each the employee and the employer are rounded to the nearest 0.25% of payroll. Since the actuarially determined rates from this valuation were not within the ranges previously noted for Regular and Police/Fire members and since this valuation year is an even numbered year, the following adjustments in the statutory contribution rates for Regular and Police/Fire members are required for fiscal years July 1, 2023 through June 30, 2025 as a result of this valuation.

[1] For the valuations as of June 30, 2021, 2022, and 2023, the required contribution rates used in this determination were lowered by the four-year phase-in of the cost impact of the 2021 assumption changes.

# Section 1: Actuarial Valuation Summary

**Summary of Contribution Rates**

| | Regular | Police/Fire |
|---|---|---|
| **Employer-Pay:**[1] | | |
| Statutory Rate for Fiscal Years July 1, 2021 through June 30, 2023 (as determined from the June 30, 2020 valuation) | 29.75% | 44.00% |
| Required Contribution Rate per June 30, 2022 Actuarial Valuation[3] | 33.61% | 49.95% |
| Statutory Rate for Fiscal Years July 1, 2023 through June 30, 2025 (as determined from the June 30, 2022 valuation) | 33.50% | 50.00% |
| **Employee/Employer-Pay:**[2] | | |
| Statutory Rate for Fiscal Years July 1, 2021 through June 30, 2023 (as determined from the June 30, 2020 valuation) | 31.00% | 45.50% |
| Required Contribution Rate per June 30, 2022 Actuarial Valuation[3] | 35.02% | 51.38% |
| Statutory Rate for Fiscal Years July 1, 2023 through June 30, 2025 (as determined from the June 30, 2022 valuation) | 35.00% | 51.50% |

1 See cost-sharing mechanism in NRS 286.421.

2 See cost-sharing mechanism in NRS 286.410.

3 The required contribution rates were lowered by the four-year phase-in of the cost impact of the 2021 assumption changes. The required contribution rates reflect the second year of the phase-in. The actuarially determined contribution rates without any adjustment for the phase-in are 37.57% for Regular Employer-Pay, 38.96% for Regular Employee/Employer-Pay, 57.49% for Police/Fire Employer-Pay, and 58.76% for Police/Fire Employee/Employer-Pay.

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11. The rate of investment return on the market value of assets for 2021-2022 for the PERS Fund was -5.06% and was 27.23% for the preceding year.

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12. The smoothed returns on the actuarial value of assets for 2021-2022 for the PERS Fund were 8.55% for Regular and 8.52% for Police/Fire due to gradual recognition of current and prior years' investment gains and losses. This resulted in an actuarial gain of approximately $506 million for Regular and $148 million for Police/Fire when measured against last year's assumed rate of return of 7.25%. The actuarial investment gain decreased the actuarially determined contribution rates by 0.58% of payroll for Regular and by 0.87% of payroll for Police/Fire.
13. The ratio of the actuarial value of assets to the market value of assets for the PERS Fund is 99.50%. In the preceding year's valuation, this ratio was 87.14%.

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14. As indicated in *Section 2, Subsection B* of this report, the investment gains and losses not yet recognized as of June 30, 2022 net to gains of approximately $216 million for Regular and $56 million for Police/Fire, compared to unrecognized net gains of approximately $5,795 million and $1,721 million in the previous valuation, respectively. Under the asset smoothing method the

unrecognized net gains will be recognized in the determination of the actuarial value of assets for funding purposes in the next few years, but in a somewhat non-level (uneven) pattern as shown in the footnote on page 24. In particular, there will be gains recognized in the next three years, followed by a large loss recognized in the fourth year. If, over the coming years, the System were to earn a net market value return equivalent to a 7.25% net return on an actuarial value basis, and all other actuarial assumptions are met, the contribution requirements would fluctuate over the next few years, including increases attributable to the continued phase-in of the cost impact of the 2021 assumption changes.

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15. The June 30, 2022 unrecognized net investment gains of $272 million represent about 0.5% of the PERS Fund market value of assets. Unless offset by future investment losses or other unfavorable experience, the recognition of the $272 million net market gain is expected to have an impact on the System's future funded ratio and actuarial contribution requirement. This potential impact may be illustrated as follows:
    a. If the net deferred gain were recognized immediately in the actuarial value of assets, the funded ratio would increase from 74.8% to 75.2% for Regular members and increase from 74.6% to 75.0% for Police/Fire members.
    b. If the net deferred gain were recognized immediately in the actuarial value of assets, the required contribution rates would decrease as follows:

| | **2022/2023 Required Contribution Rate[1]** | **2022/2023 Rate Reflecting Deferred Gains** |
|---|---|---|
| **Regular:** | | |
| Employer-Pay | 33.61% | 33.36% |
| Employee/Employer-Pay | 35.02% | 34.77% |
| **Police/Fire:** | | |
| Employer-Pay | 49.95% | 49.62% |
| Employee/Employer-Pay | 51.38% | 51.05% |

[1] The required contribution rates were lowered by the four-year phase-in of the cost impact of the 2021 assumption changes.

16. The June 30, 2022 valuation reflects benefit adjustments made by the System due to the post-retirement benefit increase (PRBI) audit performed by System staff. We understand that the PRBI audit has been completed and is no longer in process.
17. The actuarial valuation report as of June 30, 2022 is based on financial data as of that date. Changes in the value of assets subsequent to that date, to the extent that they exist, are not reflected.
18. In 2009, the Critical Labor Shortage (CLS) program was extended through June 30, 2015 but restrictions on eligible positions were added. This program allows PERS retirees to return to work without facing the usual suspension of retirement benefits.

Subsequently, the 2015 “sunset” was removed and the program was made permanent. As of the valuation date, there were a total of 237 retired PERS members currently active and reenrolled in PERS under this provision. This program has a minimal effect on System costs.

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19. Actuarial Standard of Practice No. 51 (ASOP 51) requires actuaries to identify and assess risks that “may reasonably be anticipated to significantly affect the plan’s future financial condition”. Examples of key risks listed that are particularly relevant to PERS are asset/liability mismatch risk, investment risk, and longevity risk. The standard also requires an actuary to consider if there is any ongoing contribution risk to the plan, however it does not require the actuary to evaluate the particular ability or willingness of contributing entities to make contributions when due, nor does it require the actuary to assess the likelihood or consequences of future changes in applicable law.

    The actuary’s assessment can be strictly a qualitative discussion about potential adverse experience and the possible effect on future results, but it may also include quantitative numerical demonstrations where informative. The actuary is also encouraged to consider a recommendation as to whether a more detailed assessment or risk report would be significantly beneficial for the intended user in order to examine particular financial risks. When making that recommendation, the actuary will take into account such factors as the plan’s design, risk profile, maturity, size, funded status, asset allocation, cash flow, possible insolvency and current market conditions.

    Because the actuarial valuation results are dependent on a fixed set of assumptions and data as of a specific date, there is risk that emerging results may differ, perhaps significantly, as actual experience is fluid and will not exactly track current assumptions. This potential divergence may have a significant impact on the future financial condition of the plan. We have not been engaged to perform a detailed analysis of the potential range of the impact of risk relative to the System’s future financial condition, but have included a brief discussion of key risks that may affect the System in *Section 2, Subsection F*. A more detailed assessment of the risks tailored to specific interests or concerns of the Board would provide the Board with a better understanding of the inherent risks and is recommended. This assessment would further discuss and highlight information and risks particular to PERS such as detailed historical experience and key events, growing plan maturity, heightened contribution sensitivity to asset and liability changes, and projected sensitivity to potential future investment returns through selected scenario or stress test projections.

20. It is important to note that this actuarial valuation is based on plan assets as of June 30, 2022. The Plan’s funded status does not reflect short-term fluctuations of the market, but rather is based on the market values on the last day of the plan year. Moreover, this actuarial valuation does not include any possible short-term or long-term impacts on mortality of the covered population that may emerge after June 30, 2022 due to COVID-19. Segal is available to prepare projections of potential outcomes of market conditions and other demographic experience upon request.

## Summary of Key Valuation Results

| | Total (Regular and Police/Fire Combined) | |
|---|---|---|
| | **2022** | **2021** |
| **Actuarially determined contribution rates for plan year beginning July 1:**[1] | | |
| Required under funding policy | 36.51% | 34.79% |
| **Funding elements for plan year beginning July 1:** | | |
| Normal cost, including administrative expenses[2] | 21.43% | 21.58% |
| Total rate payroll[3] | $7,126,962,737 | $6,874,802,300 |
| Market value of assets (MVA) | $54,514,012,008 | $58,458,484,355 |
| Actuarial value of assets (AVA) | $54,242,120,678 | $50,942,455,021 |
| Actuarial accrued liability (AAL) | $72,568,906,707 | $67,577,781,457 |
| Unfunded actuarial accrued liability on AVA basis | $18,326,786,029 | $16,635,326,436 |
| Funded ratio on actuarial value basis (AVA / AAL) | 74.7% | 75.4% |
| Funded ratio on market value basis (MVA / AAL) | 75.1% | 86.5% |
| **Demographic data for plan year beginning July 1:** | | |
| Number of retired members and beneficiaries | 79,049 | 75,955 |
| Number of inactive vested members | 19,511 | 18,871 |
| Number of active members | 108,635 | 106,930 |
| Total salary[4] | $6,340,156,736 | $6,186,437,424 |
| Average salary | $58,362 | $57,855 |

1 Average rate for the combined Regular and Police/Fire Employer-Pay and Employee/Employer-Pay plans. The required contribution rates were lowered by the four-year phase-in of the cost impact of the 2021 assumption changes. The required contribution rates for 2021 and 2022 reflect the first and second years of the phase-in, respectively.
2 The normal cost rate shown here reflects the full cost impact of the 2021 assumption changes without phase-in.
3 Based on actual pay for prior year, annualized for new hires and part-time employees, and projected one year using individual salary increase assumption.
4 Based on actual pay for prior year, without adjustment and without reflecting the limitation on compensation for members hired on or after July 1, 2015.

## Summary of Key Valuation Results (continued)

| | Regular | | Police/Fire | |
|---|---|---|---|---|
| | 2022 | 2021 | 2022 | 2021 |
| **Actuarially determined contribution rates for plan year beginning July 1:**[1] | | | | |
| Required contributions for Employer-Pay[2] | 33.61% | 31.78% | 49.95% | 48.09% |
| Required contributions for Employee/Employer-Pay[3] | 35.02% | 33.19% | 51.38% | 49.60% |
| **Funding elements for plan year beginning July 1:** | | | | |
| Normal cost, including administrative expenses[4] | | | | |
| Employer-Pay[2] | 18.99% | 19.10% | 32.50% | 32.37% |
| Employee/Employer-Pay[3] | 20.38% | 20.48% | 33.77% | 33.64% |
| Total rate payroll[5] | $5,957,884,949 | $5,712,528,001 | $1,169,077,788 | $1,162,274,299 |
| Market value of assets (MVA) | $41,942,108,337 | $45,039,540,275 | $12,571,903,671 | $13,418,944,080 |
| Actuarial value of assets (AVA) | $41,726,204,714 | $39,244,062,118 | $12,515,915,964 | $11,698,392,903 |
| Actuarial accrued liability (AAL) | $55,797,289,031 | $52,105,527,476 | $16,771,617,676 | $15,472,253,981 |
| Unfunded actuarial accrued liability on AVA basis | $14,071,084,317 | $12,861,465,358 | $4,255,701,712 | $3,773,861,078 |
| Funded ratio on actuarial value basis (AVA / AAL) | 74.8% | 75.3% | 74.6% | 75.6% |
| Funded ratio on market value basis (MVA / AAL) | 75.2% | 86.4% | 75.0% | 86.7% |
| **Demographic data for plan year beginning July 1:** | | | | |
| Number of retired members and beneficiaries | 68,550 | 65,988 | 10,499 | 9,967 |
| Number of inactive vested members | 18,471 | 17,904 | 1,040 | 967 |
| Number of active members | 95,785 | 93,796 | 12,850 | 13,134 |
| Total salary[6] | $5,267,320,827 | $5,118,606,683 | $1,072,835,909 | $1,067,830,741 |
| Average salary | $54,991 | $54,572 | $83,489 | $81,303 |

[1] The required contribution were lowered by the four-year phase-in of the cost impact of the 2021 assumption changes. The required contribution rates for 2021 and 2022 reflect the first and second years of the phase-in, respectively.
[2] See cost-sharing mechanism in NRS 286.421.
[3] See cost-sharing mechanism in NRS 286.410.
[4] The normal cost rate shown here reflects the full cost impact of the 2021 assumption changes without phase-in.
[5] Based on actual pay for prior year, annualized for new hires and part-time employees, and projected one year using individual salary increase assumption.
[6] Based on actual pay for prior year, without adjustment and without reflecting the limitation on compensation for members hired on or after July 1, 2015.

## Important Information About Actuarial Valuations

An actuarial valuation is a budgeting tool with respect to the financing of future projected obligations of a pension plan. It is an estimated forecast – the actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan.

In order to prepare a valuation, Segal relies on a number of input items. These include:

| | |
|---|---|
| **Plan of benefits** | Plan provisions define the rules that will be used to determine benefit payments, and those rules, or the interpretation of them, may change over time. Even where they appear precise, outside factors may change how they operate. It is important to keep Segal informed with respect to plan provisions and administrative procedures, and to review the plan summary included in our report to confirm that Segal has correctly interpreted the plan of benefits. |
| **Participant data** | An actuarial valuation for a plan is based on data provided to the actuary by the System. Segal does not audit such data for completeness or accuracy, other than reviewing it for obvious inconsistencies compared to prior data and other information that appears unreasonable. It is important for Segal to receive the best possible data and to be informed about any known incomplete or inaccurate data. |
| **Assets** | The valuation is based on the market value of assets as of the valuation date, as provided by the System. The System uses an "actuarial value of assets" that differs from market value to gradually reflect year-to-year changes in the market value of assets in determining the contribution requirements. |
| **Actuarial assumptions** | In preparing an actuarial valuation, Segal projects the benefits to be paid to existing plan participants for the rest of their lives and the lives of their beneficiaries. This projection requires actuarial assumptions as to the probability of death, disability, withdrawal, and retirement of each participant for each year. In addition, the benefits projected to be paid for each of those events in each future year reflect actuarial assumptions as to salary increases and cost-of-living adjustments. The projected benefits are then discounted to a present value, based on the assumed rate of return that is expected to be achieved on the plan's assets. There is a reasonable range for each assumption used in the projection and the results may vary materially based on which assumptions are selected. It is important for any user of an actuarial valuation to understand this concept. Actuarial assumptions are periodically reviewed to ensure that future valuations reflect emerging plan experience. While future changes in actuarial assumptions may have a significant impact on the reported results that does not mean that the previous assumptions were unreasonable. |
| **Models** | Segal valuation results are based on proprietary actuarial modeling software. The actuarial valuation models generate a comprehensive set of liability and cost calculations that are presented to meet regulatory, legislative and client requirements. Our Actuarial Technology and Systems unit, comprised of both actuaries and programmers, is responsible for the initial development and maintenance of these models. The models have a modular structure that allows for a high degree of accuracy, flexibility and user control. The client team programs the assumptions and the plan provisions, validates the models, and reviews test lives and results, under the supervision of the responsible actuary. |

# Section 1: Actuarial Valuation Summary

The user of Segal's actuarial valuation (or other actuarial calculations) should keep the following in mind:

| |
|---|
| The actuarial valuation is prepared at the request of the System. Segal is not responsible for the use or misuse of its report, particularly by any other party. |
| An actuarial valuation is a measurement of the plan's assets and liabilities at a specific date. Accordingly, except where otherwise noted, Segal did not perform an analysis of the potential range of future financial measures. The actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan. Future contribution requirements may differ from those determined in the valuation because of:<br>• Differences between actual experience and anticipated experience;<br>• Changes in actuarial assumptions or methods;<br>• Changes in statutory provisions; and<br>• Differences between the contribution rates determined by the valuation and those adopted by the Board. |
| Some actuarial results in this report are not rounded, but that does not imply precision. |
| If the System is aware of any event or trend that was not considered in this valuation that may materially change the results of the valuation, Segal should be advised, so that we can evaluate it. |
| Segal does not provide investment, legal, accounting, or tax advice. Segal's valuation is based on our understanding of applicable guidance in these areas and of the plan's provisions, but they may be subject to alternative interpretations. The System should look to their other advisors for expertise in these areas. |

As Segal has no discretionary authority with respect to the management or assets of the Plan, it is not a fiduciary in its capacity as actuaries and consultants with respect to the Plan.

# Section 2: Actuarial Valuation Results

## A. Member Data

### Regular Members

The Actuarial Valuation and Review considers the number and demographic characteristics of covered members, including active members, inactive vested members, retired members and beneficiaries.

This section presents a summary of significant statistical data on the Regular member group.

More detailed information for this valuation year and the preceding valuation can be found in *Section 3, Exhibits A, B, and C*.

Regular Member Population: 2013 – 2022

| Year Ended June 30 | Active Members | Inactive Vested Members | Retired Members and Beneficiaries | Ratio of Non-Actives to Actives |
|---|---|---|---|---|
| 2013 | 87,193 | 13,009 | 45,796 | 0.67 |
| 2014 | 88,709 | 13,851 | 48,283 | 0.70 |
| 2015 | 91,124 | 14,206 | 50,877 | 0.71 |
| 2016 | 93,030 | 14,795 | 53,484 | 0.73 |
| 2017 | 93,276 | 15,763 | 55,975 | 0.77 |
| 2018 | 94,615 | 15,714 | 58,561 | 0.79 |
| 2019 | 96,072 | 16,409 | 61,104 | 0.81 |
| 2020 | 98,228 | 16,475 | 63,376 | 0.81 |
| 2021 | 93,796 | 17,904 | 65,988 | 0.89 |
| 2022 | 95,785 | 18,471 | 68,550 | 0.91 |

## Regular Members (continued)

### Active Members

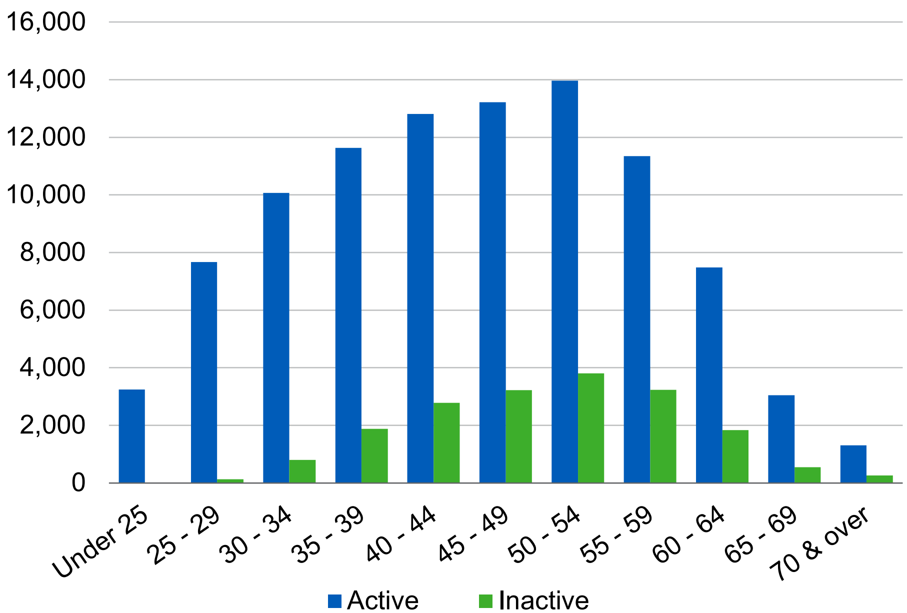
Plan costs are affected by the age, years of service and salaries of active members. In this year's valuation, there were 95,785 active members with an average age of 45.7, average years of service of 9.8 years and an average salary of $54,991. The 93,796 active members in the prior valuation had an average age of 45.8, average service of 10.0 years and average salary of $54,572.

### Inactive Members

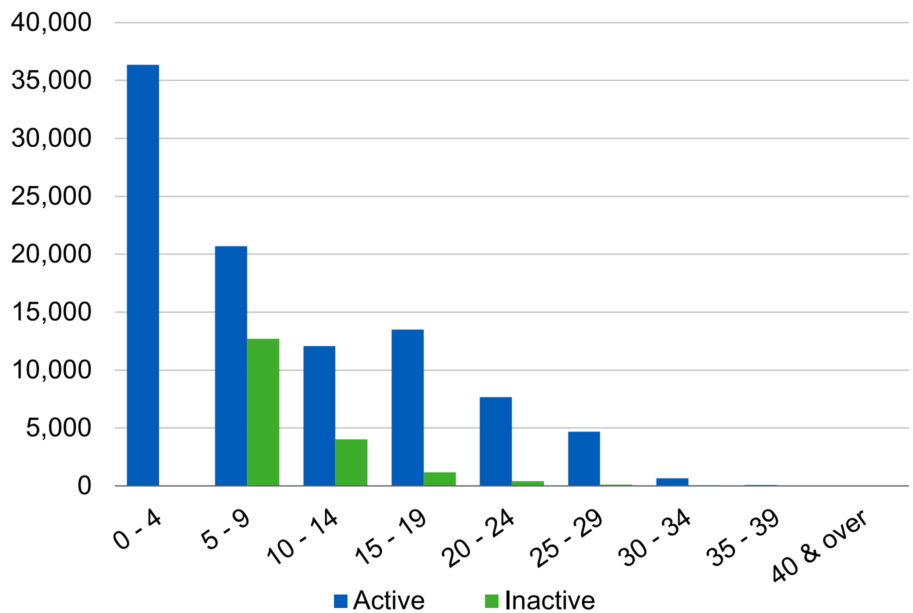
In this year's valuation, there were 18,471 members with a vested right to a deferred or immediate vested benefit versus 17,904 members in the prior valuation. The average age and service of these members is 50.2 and 9.1 years, as compared to 50.4 and 9.4 as of last year's valuation date.

Distribution of Active and Inactive Regular Members as of June 30, 2022

Active and Inactive Members by Age




Active and Inactive Members by Service



## Regular Members (continued)

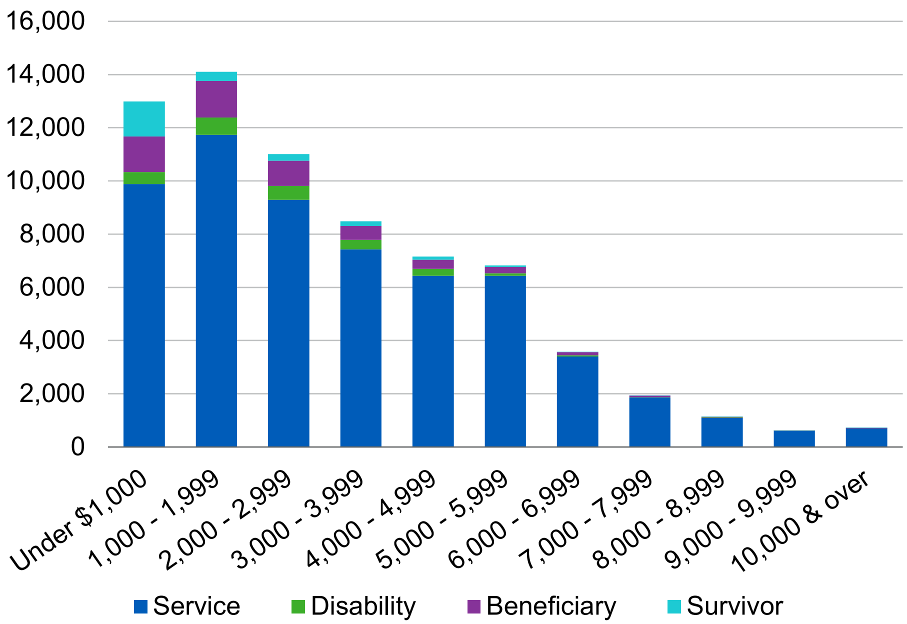
### Retired Members and Beneficiaries

As of June 30, 2022, 61,268 retired members and 7,282 beneficiaries and survivors were receiving total monthly benefits of $216,849,925. Of these, 1,980 retired members and 54 beneficiaries and survivors were receiving annual benefits of at least $100,000, which represents 3.0% of all retirees, beneficiaries and survivors.

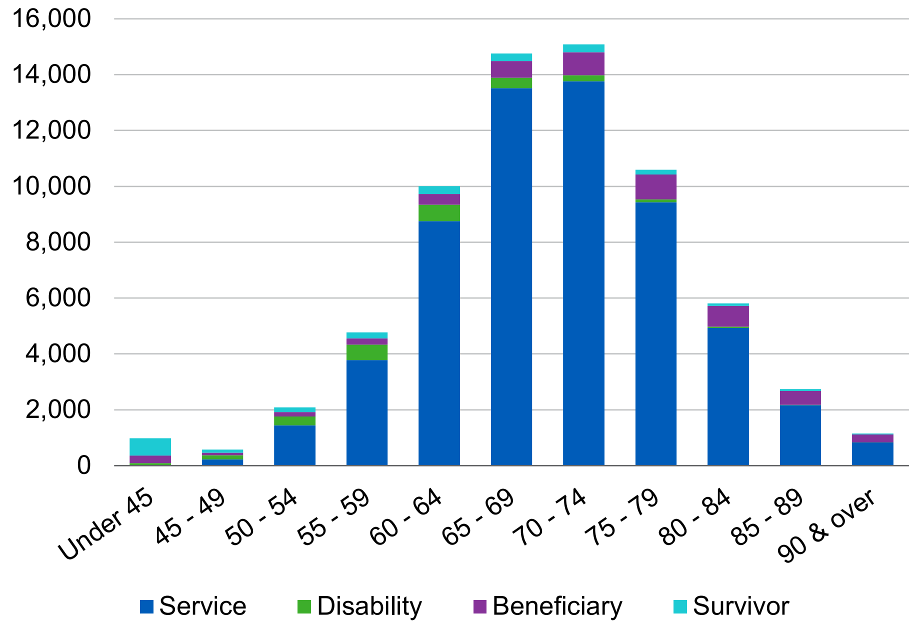
For comparison, in the previous valuation there were 59,069 retired members and 6,919 beneficiaries and survivors receiving monthly benefits of $201,766,582, with 2.5% of those receiving annual benefits of at least $100,000.

Distribution of Regular Retired Members and Beneficiaries as of June 30, 2022

Retired Members and Beneficiaries by Type and Monthly Amount




Retired Members and Beneficiaries by Type and Age



## A. Member Data (continued)

### Police/Fire Members

The Actuarial Valuation and Review considers the number and demographic characteristics of covered members, including active members, inactive vested members, retired members and beneficiaries.

This section presents a summary of significant statistical data on the Police/Fire member group.

More detailed information for this valuation year and the preceding valuation can be found in *Section 3, Exhibits A, B, and C*.

Police/Fire Member Population: 2013 – 2022

| Year Ended June 30 | Active Members | Inactive Vested Members | Retired Members and Beneficiaries | Ratio of Non-Actives to Actives |
|---|---|---|---|---|
| 2013 | 11,845 | 730 | 6,634 | 0.62 |
| 2014 | 11,813 | 782 | 6,925 | 0.65 |
| 2015 | 11,984 | 826 | 7,282 | 0.68 |
| 2016 | 12,137 | 844 | 7,696 | 0.70 |
| 2017 | 12,525 | 905 | 8,155 | 0.72 |
| 2018 | 12,891 | 893 | 8,547 | 0.73 |
| 2019 | 13,095 | 932 | 8,952 | 0.75 |
| 2020 | 13,587 | 923 | 9,365 | 0.76 |
| 2021 | 13,134 | 967 | 9,967 | 0.83 |
| 2022 | 12,850 | 1,040 | 10,499 | 0.90 |

## Police/Fire Members (continued)

### Active Members

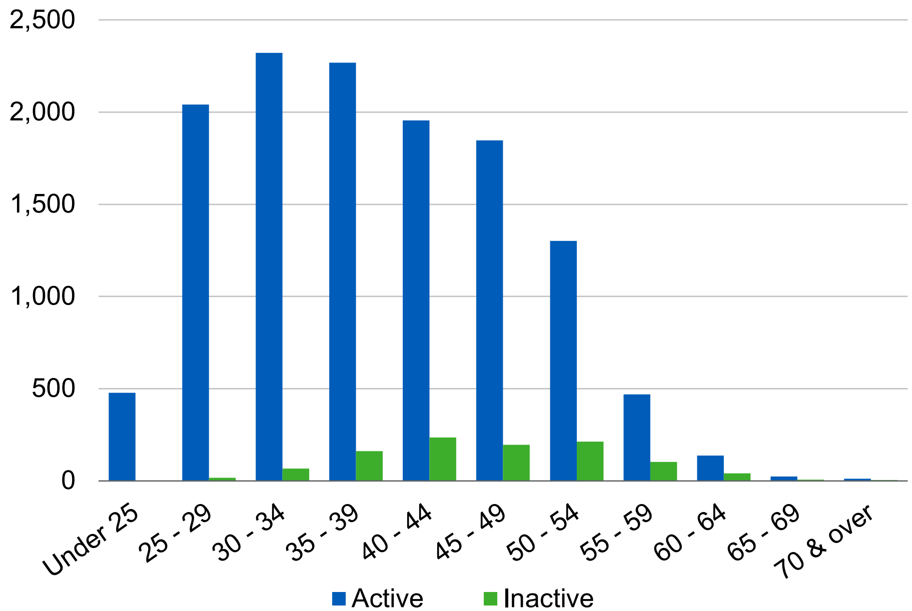
Plan costs are affected by the age, years of service and salaries of active members. In this year's valuation, there were 12,850 active members with an average age of 39.3, average years of service of 10.8 years and an average salary of $83,489. The 13,134 active members in the prior valuation had an average age of 39.3, average service of 10.8 years and average salary of $81,303.

### Inactive Members

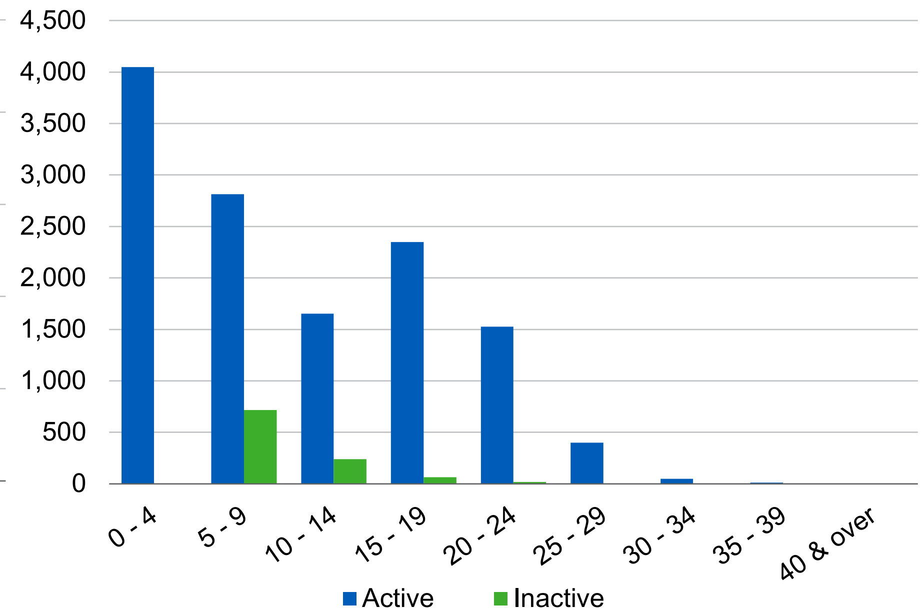
In this year’s valuation, there were 1,040 members with a vested right to a deferred or immediate vested benefit versus 967 members in the prior valuation. The average age and service of these members is 46.3 and 8.9 years, as compared to 46.5 and 8.9 as of last year's valuation date.

Distribution of Active and Inactive Police/Fire Members as of June 30, 2022

Active and Inactive Members By Age




Active and Inactive Members By Service



## Police/Fire Members (continued)

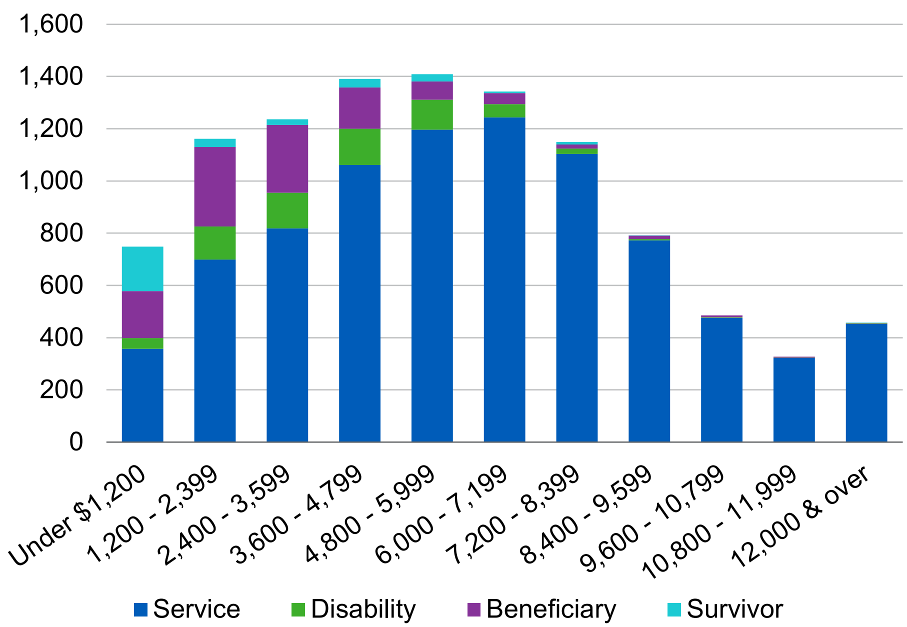
### Retired Members and Beneficiaries

As of June 30, 2022, 9,142 retired members and 1,357 beneficiaries and survivors were receiving total monthly benefits of $59,797,517. Of these, 2,072 retired members and 28 beneficiaries and survivors were receiving annual benefits of at least $100,000, which represents 20.0% of all retirees, beneficiaries and survivors.

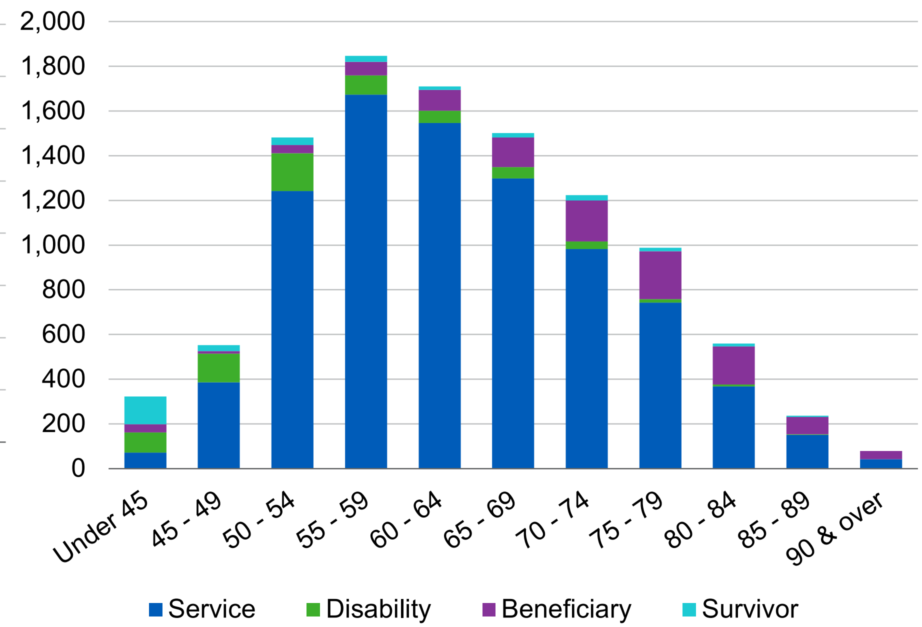
For comparison, in the previous valuation there were 8,686 retired members and 1,281 beneficiaries and survivors receiving monthly benefits of $54,756,795, with 18.3% of those receiving annual benefits of at least $100,000.

Distribution of Police/Fire Retired Members and Beneficiaries as of June 30, 2022

Retired Members and Beneficiaries by Type and Monthly Amount




Retired Members and Beneficiaries by Type and Age

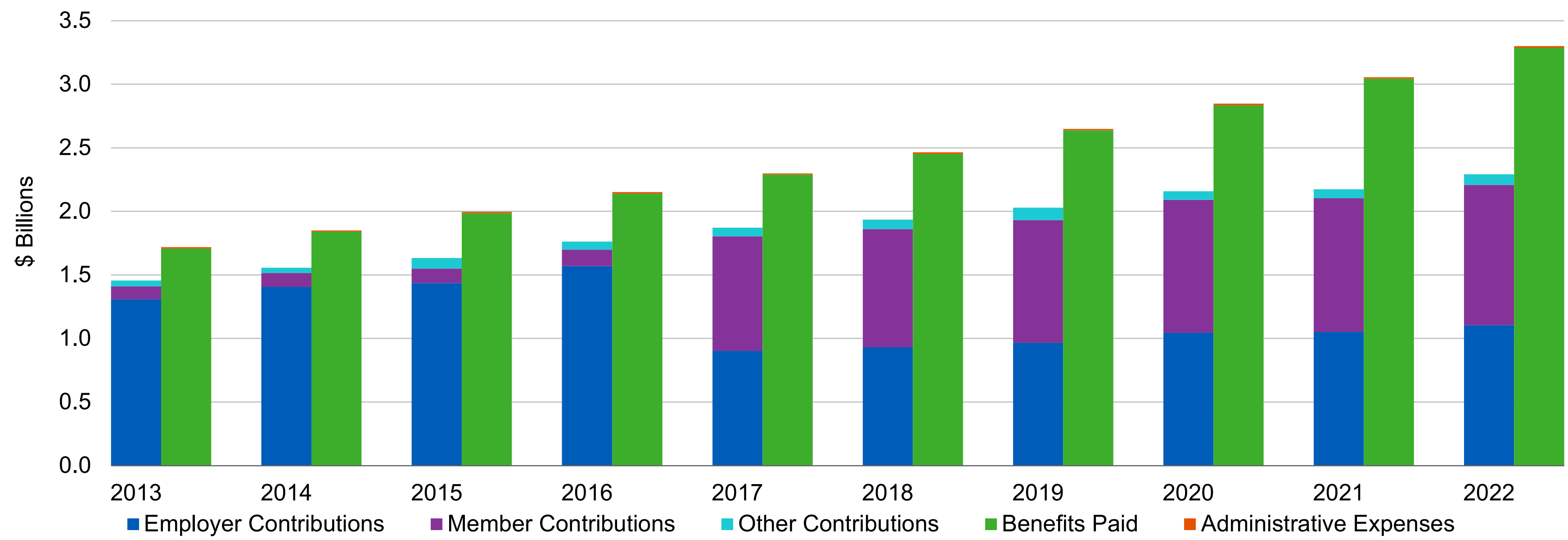


## B. Financial Information

Retirement plan funding anticipates that, over the long term, both net contributions (less administrative expenses) and net investment earnings (less investment fees) will be needed to cover benefit payments.

Retirement plan assets change as a result of the net impact of these income and expense components. Additional financial information, including a summary of these transactions for the valuation year, is presented in *Section 3, Exhibits D, E, and F*.

### Comparison of Contributions with Benefits and Expenses for Years Ended June 30, 2013 – 2022[1]




[1] Starting in the year ended June 30, 2017, pursuant to GASB Statement No. 82, the financial statements recognize half of the employer contributions made on behalf of Employer-Pay members as member contributions.

## Determination of Actuarial Value of Assets for Year Ended June 30, 2022

It is desirable to have level and predictable plan costs from one year to the next. For this reason, the Board has approved an asset valuation method that gradually adjusts to market value. Under this valuation method, the full value of market fluctuations is not recognized in a single year and, as a result, the asset value and the plan costs are more stable.

The amount of the adjustment to recognize market value is treated as income, which may be positive or negative. Realized and unrealized gains and losses are treated equally and, therefore, the sale of assets has no immediate effect on the actuarial value.

| | | Regular | | Police/Fire | |
|---|---|---|---|---|---|
| **1** | **Market Value of Assets** | | **$41,942,108,337** | | **$12,571,903,671** |
| **2** | Calculation of unrecognized return | **Original Amount[1]** | **Unrecognized Return** | **Original Amount[1]** | **Unrecognized Return** |
| a. | Year ended June 30, 2022[2] | $(5,073,922,259) | $(4,059,137,807) | $(1,517,027,149) | $(1,213,621,719) |
| b. | Year ended June 30, 2021[2] | 7,074,416,935 | 4,244,650,161 | 2,101,133,203 | 1,260,679,922 |
| c. | Year ended June 30, 2020[2] | (80,728,453) | (32,291,381) | (23,535,176) | (9,414,070) |
| d. | Year ended June 30, 2019[2] | 313,413,248 | 62,682,650 | 91,717,871 | 18,343,574 |
| e. | Year ended June 30, 2018[2] | 295,081,911 | 0 | 85,392,866 | 0 |
| f. | Total unrecognized return[3] | $2,528,261,382 | $215,903,623 | $737,681,615 | $55,987,707 |
| **3** | Preliminary Actuarial Value of Assets: **1 – 2f** | | $41,726,204,714 | | $12,515,915,964 |
| **4** | Additional write up/(down) due to 70%/130% corridor | | $0 | | $0 |
| **5** | **Actuarial Value of Assets 3 + 4** | | **$41,726,204,714** | | **$12,515,915,964** |
| **6** | Actuarial Value of Assets as a percentage of Market Value of Assets: **5 ÷ 1**[4] | | 99.49% | | 99.55% |

[1] Difference between the actual return on the market value of assets and the expected return on the actuarial value of assets.
[2] Recognition at 20% per year over 5 years.
[3] Deferred return as of June 30, 2022 recognized in each of the next four years:

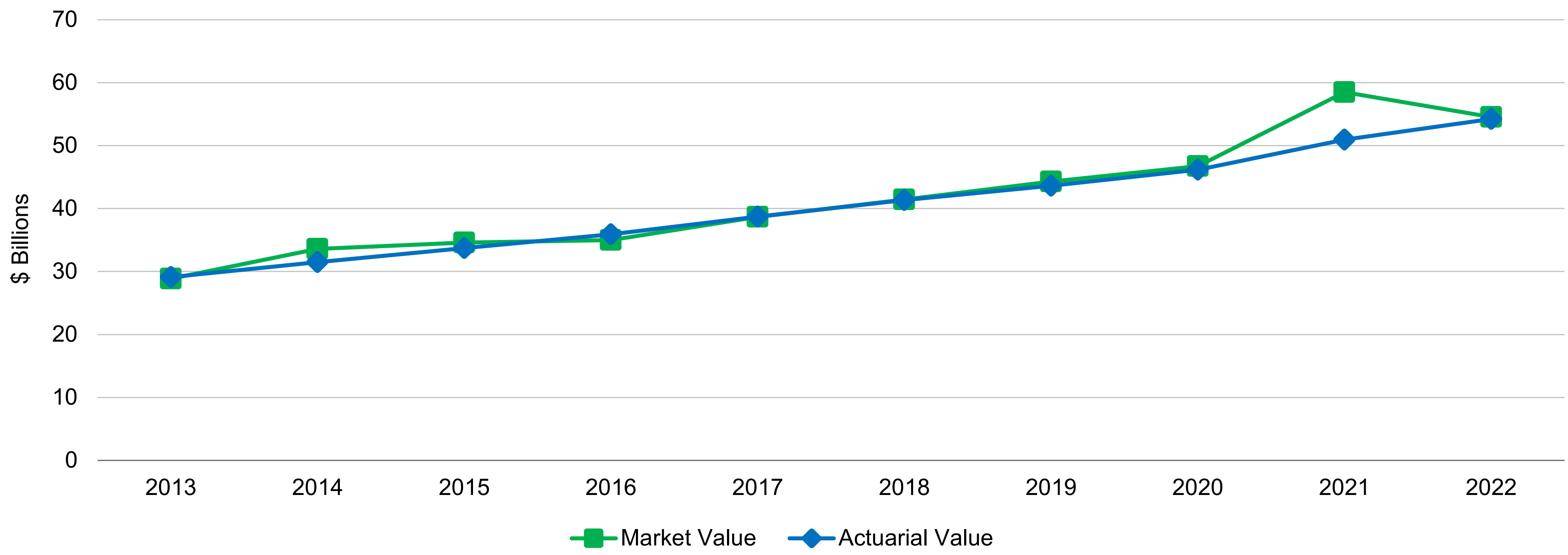
| | Regular | Police/Fire | Total |
|---|---|---|---|
| a. Amount recognized during 2022/2023 | $446,635,895 | $130,457,750 | $577,093,645 |
| b. Amount recognized during 2023/2024 | 383,953,245 | 112,114,176 | 496,067,421 |
| c. Amount recognized during 2024/2025 | 400,098,935 | 116,821,211 | 516,920,146 |
| d. Amount recognized during 2025/2026 | (1,014,784,452) | (303,405,430) | (1,318,189,882) |
| | $215,903,623 | $55,987,707 | $271,891,330 |

[4] Total actuarial value as a percentage of total market value is 99.50% for Regular and Police/Fire.

# Section 2: Actuarial Valuation Results

Both the actuarial value and market value of assets are representations of PERS's financial status. As investment gains and losses are gradually taken into account, the actuarial value of assets tracks the market value of assets. The actuarial asset value is significant because PERS's liabilities are compared to these assets to determine what portion, if any, remains unfunded. Amortization of the unfunded actuarial accrued liability is an important element in determining the contribution requirement.

## Market Value and Actuarial Value of Assets as of June 30, 2013 – 2022



## C. Actuarial Experience

To calculate the required contribution, assumptions are made about future events that affect the amount and timing of benefits to be paid and assets to be accumulated. Each year actual experience is measured against the assumptions. If overall experience is more favorable than anticipated (an actuarial gain), the contribution requirement will decrease from the previous year. On the other hand, the contribution requirement will increase if overall actuarial experience is less favorable than expected (an actuarial loss).

Taking account of experience gains or losses in one year without making a change in assumptions reflects the belief that the single year's experience was a short-term development and that, over the long term, experience will return to the original assumptions. For contribution requirements to remain stable, assumptions should approximate experience.

If assumptions are changed, the contribution requirement is adjusted to take into account a change in experience anticipated for all future years.

The components of the total loss of $1,963 million are shown below. The net experience loss from sources other than investments was 3.61% of the actuarial accrued liability. A discussion of the major components of the actuarial experience is on the following pages.

### Actuarial Experience for Year Ended June 30, 2022

| | | Regular | Police/Fire | Total |
|---|---|---|---|---|
| 1 | Net gain/(loss) from investments[1] | $505,652,275 | $147,536,321 | $653,188,596 |
| 2 | Net gain/(loss) from post-retirement benefit increases other than expected[2] | (1,163,033,202) | (375,664,975) | (1,538,698,177) |
| 3 | Net gain/(loss) from individual salary and service increases other than expected[2] | (46,599,020) | (45,666,918) | (92,265,938) |
| 4 | Net gain/(loss) from contributions greater/(less) than expected[3] | (563,950,176) | (217,522,290) | (781,472,466) |
| 5 | Net gain/(loss) from administrative expenses other than expected | (450,125) | 1,255,582 | 805,457 |
| 6 | Net gain/(loss) from other experience[2] | (149,835,519) | (55,136,399) | (204,971,918) |
| **7** | **Net experience gain/(loss): 1 + 2 + 3 + 4 + 5 + 6** | **$(1,418,215,767)** | **$(545,198,679)** | **$(1,963,414,446)** |

[1] Details on page 27.
[2] Details on page 30. Does not include the effect of plan or assumption changes, if any.
[3] Includes a contribution loss due to the actuarially determined contributions being lowered by the four-year phase-in of the cost impact of the 2021 assumption changes.

## Investment Experience

A major component of projected asset growth is the assumed rate of return. The assumed return should represent the expected long-term rate of return, based on the PERS investment policy. For valuation purposes, the assumed rate of return on the actuarial value of assets for the 2021-2022 plan year is 7.25%. The actual rates of return on an actuarial basis for the 2021-2022 plan year were 8.55% for Regular and 8.52% for Police/Fire.

Because the actual return for the year was greater than the assumed return, PERS experienced an actuarial gain during the year ended June 30, 2022 with regard to its investments.

### Investment Experience for Year Ended June 30, 2022

| | | Regular | Police/Fire | Total |
|---|---|---|---|---|
| 1 | Actual return | $3,320,457,851 | $989,437,894 | $4,309,895,745 |
| 2 | Average value of assets | 38,824,904,491 | 11,612,435,487 | 50,437,339,978 |
| 3 | Actual rate of return: 1 ÷ 2 | 8.55% | 8.52% | 8.55% |
| 4 | Assumed rate of return | 7.25% | 7.25% | 7.25% |
| 5 | Expected return: 2 × 4 | 2,814,805,576 | 841,901,573 | 3,656,707,149 |
| 6 | **Actuarial gain/(loss): 1 – 5** | **$505,652,275** | **$147,536,321** | **$653,188,596** |

Because actuarial planning is long term, it is useful to see how the assumed investment rate of return has followed actual experience over time. The chart below shows the rate of return on an actuarial basis compared to the market value investment return for the last ten years, including five-year and ten-year averages.

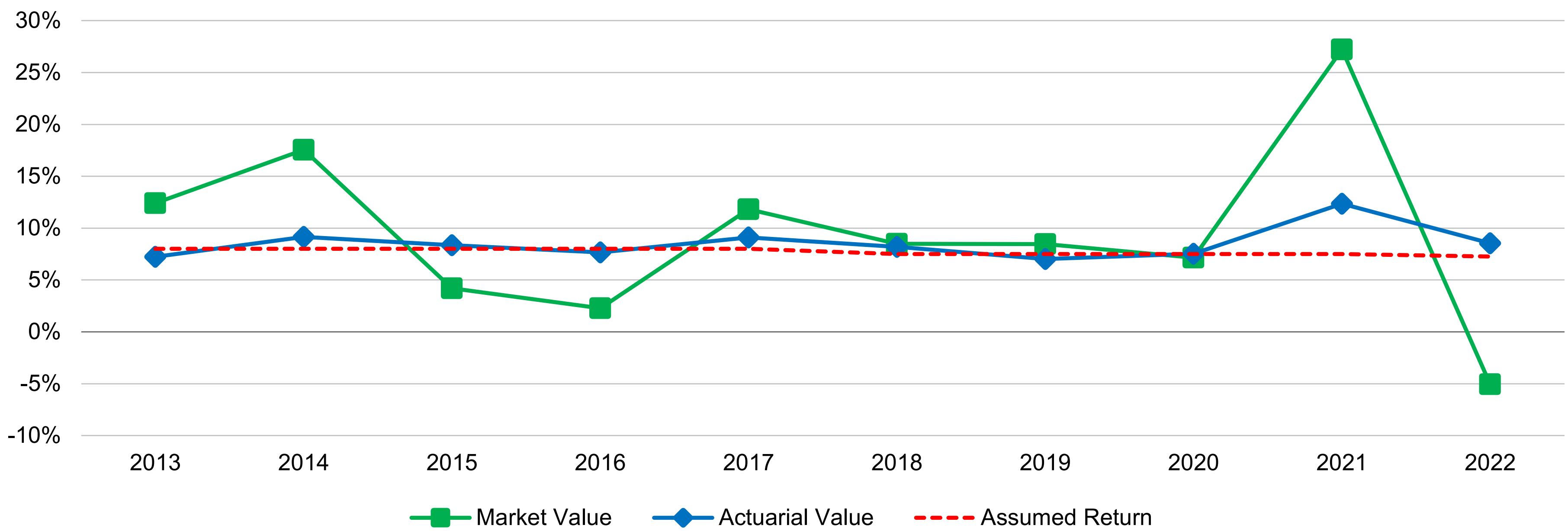
### Investment Return – Actuarial Value vs. Market Value: 2013 – 2022

| Year Ended June 30 | Regular | | | | Police/Fire | | | | Total | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Market Value Investment Return | | Actuarial Value Investment Return | | Market Value Investment Return | | Actuarial Value Investment Return | | Market Value Investment Return | | Actuarial Value Investment Return | |
| | Amount | Percent | Amount | Percent | Amount | Percent | Amount | Percent | Amount | Percent | Amount | Percent |
| 2013 | $2,511,331,333 | 12.41% | $1,541,374,010 | 7.19% | $685,094,279 | 12.40% | $429,796,701 | 7.39% | $3,196,425,612 | 12.40% | $1,971,170,711 | 7.23% |
| 2014 | 3,941,218,147 | 17.55% | 2,066,313,021 | 9.10% | 1,092,158,512 | 17.54% | 583,651,095 | 9.32% | 5,033,376,659 | 17.55% | 2,649,964,116 | 9.15% |
| 2015 | 1,091,598,827 | 4.19% | 2,032,338,690 | 8.32% | 306,479,335 | 4.18% | 582,473,284 | 8.50% | 1,398,078,162 | 4.19% | 2,614,811,974 | 8.36% |
| 2016 | 607,842,576 | 2.27% | 1,998,441,567 | 7.66% | 172,798,662 | 2.27% | 569,208,453 | 7.67% | 780,641,238 | 2.27% | 2,567,650,020 | 7.66% |
| 2017 | 3,195,254,603 | 11.82% | 2,529,012,783 | 9.12% | 917,155,134 | 11.82% | 722,225,866 | 9.08% | 4,112,409,737 | 11.82% | 3,251,238,649 | 9.11% |
| 2018 | 2,531,944,593 | 8.50% | 2,447,884,797 | 8.21% | 732,574,827 | 8.50% | 705,926,799 | 8.18% | 3,264,519,420 | 8.50% | 3,153,811,596 | 8.20% |
| 2019 | 2,695,615,596 | 8.47% | 2,230,820,715 | 7.02% | 787,003,317 | 8.47% | 654,177,997 | 7.06% | 3,482,618,913 | 8.47% | 2,884,998,712 | 7.03% |
| 2020 | 2,425,618,631 | 7.15% | 2,511,373,011 | 7.52% | 714,927,575 | 7.15% | 741,028,781 | 7.53% | 3,140,546,206 | 7.15% | 3,252,401,792 | 7.52% |
| 2021 | 9,718,611,414 | 27.23% | 4,360,096,632 | 12.37% | 2,886,741,179 | 27.23% | 1,292,651,780 | 12.34% | 12,605,352,593 | 27.23% | 5,652,748,412 | 12.36% |
| 2022 | (2,259,116,683) | -5.06% | 3,320,457,851 | 8.55% | (675,125,576) | -5.06% | 989,437,894 | 8.52% | (2,934,242,259) | -5.06% | 4,309,895,745 | 8.55% |
| Total | $26,459,919,037 | | $25,038,113,077 | | $7,619,807,244 | | $7,270,578,650 | | $34,079,726,281 | | $32,308,691,727 | |
| **Five-year average return** | | **8.78%** | | **8.72%** | | **8.78%** | | **8.71%** | | **8.78%** | | **8.72%** |
| **Ten-year average return** | | **9.14%** | | **8.50%** | | **9.14%** | | **8.55%** | | **9.14%** | | **8.51%** |

Note: The five-year and ten-year average returns are geometric averages of the returns over each time period.

In the preceding *Subsection B* we described the actuarial asset valuation method that gradually takes into account fluctuations in the market value rate of return. The effect of this method is to stabilize the actuarial rate of return, which contributes to leveling pension plan costs. This effect is clear in the chart below, where the year-to-year returns on actuarial value are less volatile than the returns on market value.

### Market and Actuarial Rates of Return for Years Ended June 30, 2013 – 2022



## Other Experience

There are other differences between the expected and the actual experience that appear when the new valuation is compared with the projections from the previous valuation. These include the extent of turnover among the participants, retirement experience (earlier or later than projected), mortality (more or fewer deaths than projected), the number of disability retirements, and salary increases different than assumed, and post-retirement benefit increases (PRBIs) different than expected.

The net gain/(loss) from this other experience for the year ended June 30, 2022 amounted to a loss of $1,359 million for Regular and a loss of $476 million for Police/Fire, which are 2.44% and 2.84% of the actuarial accrued liability, respectively. A brief summary of the demographic gain/(loss) experience (excluding contribution and administrative expense experience) of PERS for the year ended June 30, 2022 is shown in the chart below.

### Experience Due to Sources Other Than Investment Return for Year Ended June 30, 2022

| | Regular | % of AAL | Police/Fire | % of AAL | Total | % of AAL |
|---|---|---|---|---|---|---|
| Age and Service Retirements | $(136,129,596) | (0.24%) | $(45,814,162) | (0.27%) | $(181,943,758) | (0.25%) |
| Disability Retirements | (7,925,501) | (0.01%) | (5,002,489) | (0.03%) | (12,927,990) | (0.02%) |
| Pre and Post-Retirement Mortality | (301,572) | (0.00%) | (29,974,436) [1] | (0.18%) | (30,276,008) | (0.04%) |
| Post-Retirement Benefit Increases (PRBIs)[2] | (1,163,033,202) | (2.08%) | (375,664,975) | (2.24%) | (1,538,698,177) | (2.12%) |
| Withdrawal From Employment | 67,813,140 | 0.12% | 6,576,123 | 0.04% | 74,389,263 | 0.10% |
| Individual Pay and Service Increases[3] | (46,599,020) | (0.08%) | (45,666,918) | (0.27%) | (92,265,938) | (0.13%) |
| Active New Entrants | (13,606,209) | (0.02%) | 15,577,350 | 0.09% | 1,971,141 | 0.00% |
| Active Rehires | (57,470,823) | (0.10%) | (4,910,921) | (0.03%) | (62,381,744) | (0.09%) |
| Inactive and Retiree Showups | (23,181,782) | (0.04%) | (4,682,073) | (0.03%) | (27,863,855) | (0.04%) |
| Other[4] | 20,966,825 | 0.04% | 13,094,207 | 0.08% | 34,061,032 | 0.05% |
| **Total Liability Experience Gain/(Loss) During Year** | **$(1,359,467,741)** | **(2.44%)** | **$(476,468,292)** | **(2.84%)** | **$(1,835,936,033)** | **(2.53%)** |

Note: The total gain/(loss) dollar amounts and percentages may not exactly match the sum of the components due to rounding.

[1] Reflects Police/Fire mortality experience and also the assumption that existing "employer-pay" Police/Fire retirees with an unmodified option who retired after June 30, 1981 and before July 1, 2011 will have no surviving spouse.
[2] Includes the effect of benefit adjustments due to the PRBI audit performed by System staff for some members. We understand that the PRBI audit has been completed and is no longer in process.
[3] Also includes other data changes for continuing actives.
[4] The actual contributions toward purchase of service ($59.7 million for Regular and $22.7 million for Police/Fire) offset the gain/(loss) for Age and Service Retirements for new retirees, and Individual Pay and Service Increases for continuing actives. The contributions toward purchase of service for other members are allocated to Other.

## D. Calculated Contribution Rates

The amount of annual contribution required to fund the Plan is comprised of a normal cost payment and a payment on the unfunded actuarial accrued liability. This total amount is then divided by the projected payroll for active members to determine the actuarially determined contribution rate.

The statutory contribution rates are adjusted at the beginning of each odd-numbered fiscal year, based on the actuarially determined rates indicated in the actuarial valuation report for the immediately preceding year. See *Section 4, Exhibit 3* for details about this adjustment.

### Calculated Contribution Rates for Year Beginning July 1

| | 2022 | | 2021 | |
|---|---|---|---|---|
| | Regular | Police/Fire | Regular | Police/Fire |
| **Employer-Pay, Current Statutory Rate[1]** | **29.75%** | **44.00%** | **29.75%** | **44.00%** |
| Normal cost | 18.79% | 32.30% | 18.90% | 32.17% |
| Amortization percentage | 18.58% | 24.99% | 18.62% | 27.03% |
| Administrative expenses | 0.20% | 0.20% | 0.20% | 0.20% |
| Phase-in adjustment | (3.96%) | (7.54%) | (5.94%) | (11.31%) |
| **Employer-Pay, Total Rate[2]** | **33.61%** | **49.95%** | **31.78%** | **48.09%** |
| **Employer-Pay, New Statutory Rate[1]** | **33.50%** | **50.00%** | **N/A** | **N/A** |
| **Employee/Employer-Pay, Current Statutory Rate[3]** | **31.00%** | **45.50%** | **31.00%** | **45.50%** |
| Normal cost | 20.18% | 33.57% | 20.28% | 33.44% |
| Amortization percentage | 18.58% | 24.99% | 18.62% | 27.03% |
| Administrative expenses | 0.20% | 0.20% | 0.20% | 0.20% |
| Phase-in adjustment | (3.94%) | (7.38%) | (5.91%) | (11.07%) |
| **Employee/Employer-Pay, Total Rate[2]** | **35.02%** | **51.38%** | **33.19%** | **49.60%** |
| **Employee/Employer-Pay, New Statutory Rate[3]** | **35.00%** | **51.50%** | **N/A** | **N/A** |

[1] See cost-sharing mechanism in NRS 286.421.
[2] The required contribution rates were lowered by the four-year phase-in of the cost impact of the 2021 assumption changes. The actuarially determined contribution rates without any adjustment for the phase-in are 37.57% for Regular Employer-Pay, 38.96% for Regular Employee/Employer-Pay, 57.49% for Police/Fire Employer-Pay, and 58.76% for Police/Fire Employee/Employer-Pay.
[3] See cost-sharing mechanism in NRS 286.410.

# Reconciliation of Calculated Contribution Rate

The actuarially determined contribution rates as of June 30, 2022 are based on all of the data described in the previous sections, the actuarial assumptions described in *Section 4*, and the Plan provisions adopted at the time of preparation of the Actuarial Valuation. They include all changes affecting future costs, adopted benefit changes, actuarial gains and losses and changes in the actuarial assumptions.

The chart below details the changes in the calculated contribution rate from the prior rate-setting year to the current year's valuation. As of June 30, 2022, this rate was lowered by the four-year phase-in of the cost impact of the 2021 assumption changes.

## Reconciliation of Calculated Contribution Rate from June 30, 2020 to June 30, 2022[1]

| | Regular | Estimated Annual Dollar Cost[2] | Police/Fire | Estimated Annual Dollar Cost[2] |
|---|---|---|---|---|
| **Calculated Contribution Rate as of June 30, 2020** | **30.10%** | **$1,770,718,135** | **44.07%** | **$518,581,503** |
| • Effect of investment (gain)/loss | (2.36%) | (136,671,330) | (3.25%) | (37,795,698) |
| • Effect of (gains)/losses on individual salary and service experience | (0.27%) | (15,188,777) | 0.03% | 297,088 |
| • Effect on existing amortization of payroll growth (greater)/less than expected | 1.04% | 82,279,201[3] | 2.18% | 24,700,676[3] |
| • Effect of changes in normal cost[4] | (0.27%) | 6,183,087[5] | (0.00%) | (1,449,562)[5] |
| • Effect of contributions (greater)/less than expected[6] | 0.88% | 51,756,149 | 1.56% | 18,164,508 |
| • Effect of (gain)/loss on post-retirement benefit increases | 1.98% | 116,270,906 | 3.07% | 35,845,276 |
| • Effect of other (gains)/losses[7] | 0.35% | 22,579,852 | 0.91% | 10,842,232 |
| • Effect of changes in assumptions | 7.92% | 447,692,081 | 15.04% | 174,464,358 |
| • Effect of four-year phase-in of the cost impact of the changes in assumptions | (3.96%) | (235,932,244) | (7.53%) | (88,031,557) |
| • Effect of changes in funding policy | (1.54%) | (91,751,428) | (6.03%) | (70,495,391) |
| **Total change** | **3.77%** | **$247,217,497** | **5.98%** | **$66,541,930** |
| **Calculated Contribution Rate as of June 30, 2022** | **33.87%** | **$2,017,935,632** | **50.05%** | **$585,123,433** |

[1] Average rate for the Employer-pay and Employee/Employer-pay plans.
[2] Based on rate payroll for each valuation date shown.
[3] Actual dollar increase in existing amortization bases.
[4] Excludes effects of assumption changes.
[5] Actual dollar increase/(decrease) in normal cost.
[6] Includes a contribution loss due to the actuarially determined contributions being lowered by the four-year phase-in of the cost impact of the 2021 assumption changes.
[7] Estimated annual dollar cost also reflects change in payroll from the June 30, 2020 valuation.

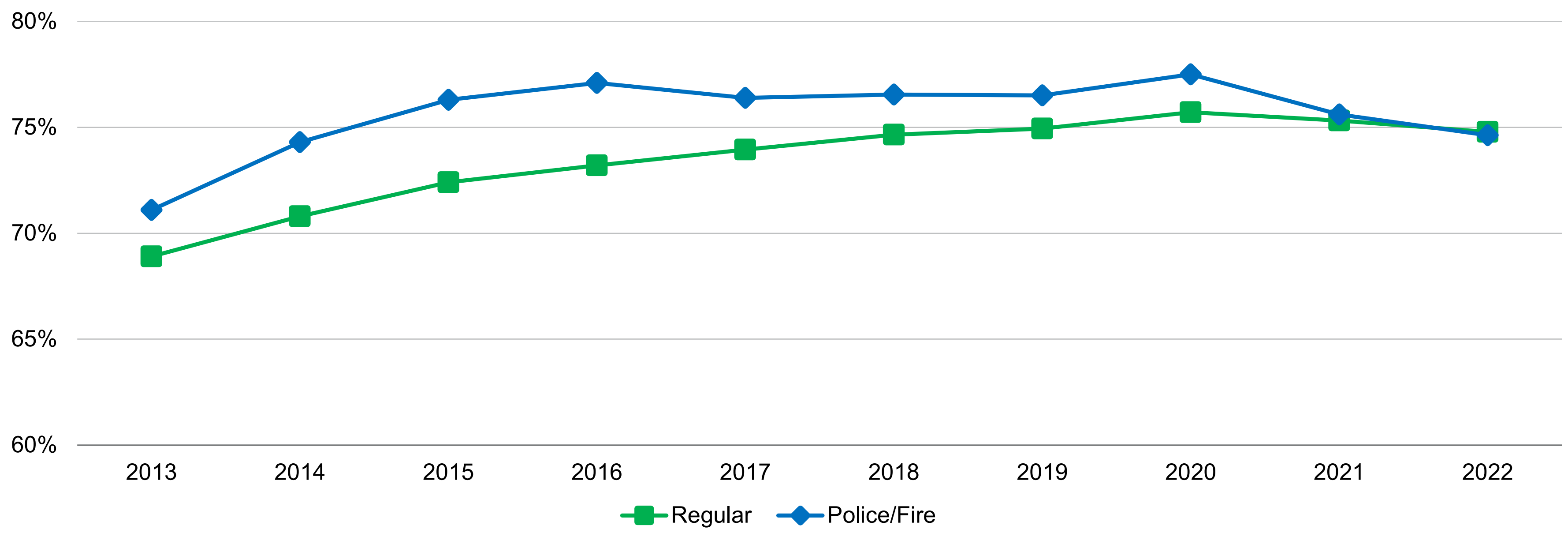
## E. Funded Ratio

One critical piece of information regarding the Plan's financial status is the funded ratio. This ratio compares the actuarial value of assets to the actuarial accrued liabilities of the plan.

The funded status measures shown in this valuation are appropriate for assessing the need for or amount of future contributions. However, they are not necessarily appropriate for assessing the sufficiency of Plan assets to cover the estimated cost of settling the Plan's benefit obligations.

Higher ratios indicate a well-funded plan with assets sufficient to cover the plan's liabilities. Lower ratios may indicate recent changes to actuarial assumptions, benefit structures, funding of the plan below actuarial requirements, poor asset performance, or a variety of other factors.

### Funded Ratio for Years Ending June 30, 2013 – 2022



# F. Risk Assessment

Because the actuarial valuation results are dependent on a fixed set of assumptions and data as of a specific date, there is risk that emerging results may differ, perhaps significantly, as actual experience is fluid and will not exactly track current assumptions. This potential divergence may have a significant impact on the future financial condition of the plan.

This section does not contain a detailed analysis of the potential range of future measurements, but does include a concise discussion of some of the primary risks that may affect the Plan's future financial condition. We recommend a more detailed assessment of the risks to provide the Board with a better understanding of the risks inherent in the Plan that can inform both financial preparation and future decision making. This assessment would enable us to work with the Board to highlight and illustrate particular risks or potential future outcomes that the Board may be interested in discussing and could include tailored scenario testing, sensitivity testing, stress testing and stochastic modeling.

This section provides descriptions and basic assessments of the primary risks that are likely to have an ongoing influence on the Plan's financial health, as well as a discussion of historical trends and maturity measures:

## Risk Assessments

- Asset/Liability Mismatch Risk (the potential that future plan experience does not affect asset and liability values in the same way, causing them to diverge)

  The most significant asset/liability mismatch risk to the Plan is investment risk, as discussed below. In fact, investment risk has the potential to impact asset/liability mismatch in two ways. The first mismatch is evident in annual valuations: when asset values deviate from assumptions they are typically independent from liability changes. The second mismatch can be caused when systemic asset deviations from assumptions may signal the need for an assumption change, which causes liability values and contribution rates to move in the opposite direction from any change in the expected experience of asset growth rates.

  Asset/liability mismatch can also be caused by demographic assumption risks such as longevity, which affect liabilities but have no impact on asset levels. This risk is also discussed below.

- Investment Risk (the risk that investment returns will be different than expected)

  The investment return assumption is a long-term, static assumption for valuation purposes even though in reality market experience can be quite volatile in any given year. That volatility can cause significant changes in the financial condition of the Plan, affecting both funded status and contribution rates. The inherent year-to-year volatility is reduced by smoothing through the Actuarial Value of Assets; however, investment experience can still have a sizable impact.

The market value rate of return over the last 10 years has ranged from a low of -5.06% to a high of 27.23%.

- Longevity Risk (the risk that mortality experience will be different than expected)

  The actuarial valuation includes current life expectancy assumptions and an expectation of future improvement in life expectancy, which are significant assumptions given the relatively long duration of liabilities for pension plans. Emerging plan experience that does not match these expectations will result in increases or decreases in the actuarially determined contribution over time. This risk can be reduced by using tables appropriate for the Plan (public experience tables) that are weighted by benefit levels, and by using generational mortality projections. Effective with the July 1, 2021 valuation, the Board has adopted amount-weighted mortality tables with generational mortality projections.

- Other Risks

  In addition to longevity, the valuation includes a variety of other assumptions that are unlikely to match future experience exactly. One example is projected salary scales over time. As salary is central to the determination of benefits paid in retirement, deviations from the projected salary scales could have a material impact on the benefits anticipated for each member. Examples of demographic assumptions include retirement, termination and disability assumptions, and will likely vary in significance for different cost groups.

Some plans also carry significant contribution risk, defined as the potential for actual future contributions deviating from expected future contributions. However, the employers have a proven track record of contributing at the statutory contributions that are closely related to the Actuarially Determined Contributions based on the Board’s Actuarial Funding Policy, so contribution risk is minimal.

Based on the Plan’s amortization policy, any new UAAL from actuarial gains, losses or assumption changes is amortized over a “closed” amortization period of 20 years as a level percentage of payroll. The assumed total payroll growth rates used to compute the UAAL amortization payment are set by the Board. The assumed total payroll growth rates are 3.50% for both Regular and Police/Fire. In years when the actual total payroll growth is less than the assumption, the System will receive less UAAL contributions than expected. This “contribution loss” could lead to future contribution rate increases.

## Evaluation of Historical Trends

Past experience can help demonstrate the sensitivity of key results to the Plan’s actual experience. Over the past 10 years:

- The funded percentage on the actuarial value of assets basis has increased from 68.9% to 74.8% for Regular and 71.1% to 74.6% for Police/Fire. This is primarily due to contributions made to amortize the UAAL using a 20-year amortization period (as compared to a 30-year amortization period used before 2012) and favorable investment experience over these 10 years, partially offset by the strengthening of actuarial assumptions through multiple Experience Studies. For a more detailed history see *Section 2, Subsection E, Funded Ratio* on page 33.

- The geometric average investment return on the actuarial value of assets over the last 10 years was 8.51%. This includes a high of a 12.36% return and a low of 7.03%. The average over the last 5 years was 8.72%. For more details see the Investment Return table in *Section 2, Subsection C* on page 28.
- A major source of new UAAL was the strengthening of assumptions through multiple assumption changes. For example, the assumption changes in 2013 updated mortality tables and other assumptions, adding $1,460 million in unfunded liability. The assumption changes in 2017 changed the discount rate from 8.00% to 7.50% and updated mortality tables and other assumptions, adding $1,046 million in unfunded liability. The assumption changes in 2021 changed the discount rate from 7.50% to 7.25% and updated mortality tables and other assumptions, adding $3,345 million in unfunded liability. It is important to note that assumptions reflect anticipated plan costs in the future, and changes in those assumptions reflect changes in anticipated plan costs. Ultimately plan costs will only be known as experience unfolds. For more details on the unfunded liability changes see *Section 3, Exhibit H, Table of Amortization Bases* starting on page 48.

## Maturity Measures

Over the last 10 years the ratio of non-active members to active members has increased from 0.67 to 0.91 for Regular and 0.62 to 0.90 for Police/Fire. An increased ratio indicates that the plan has grown in maturity over time. This is to be expected, but is also informative for understanding plan sensitivity to particular risks. For more details see *Section 2, Subsection A, Member Data* on pages 17 and 20.

As pension plans mature, the cash needed to fulfill benefit obligations will increase over time. Therefore, cash flow projections and analysis should be performed to assure that the Plan's asset allocation is aligned to meet emerging pension liabilities. For the prior year, benefits and expenses paid were $1,010 million more than contributions received. This outflow is 1.9% of the market value of assets. Plans with higher levels of negative cash flows have a need for a larger allocation to income generating assets, which can create a drag on investment return. For more details on historical cash flows see the Comparison of Contributions with Benefits and Expenses in *Section 2, Subsection B, Financial Information* on page 23.

# Section 3: Supplemental Information

## Exhibit A: Table of Plan Coverage

| Regular | Year Ended June 30 2022 | 2021 | Change From Prior Year |
|---|---|---|---|
| **Active members in valuation:** | | | |
| • Number | 95,785 | 93,796 | 2.1% |
| Employer-Pay | 75,217 | 73,618 | 2.2% |
| Employee/Employer-Pay | 20,568 | 20,178 | 1.9% |
| • Average age | 45.7 | 45.8 | (0.1) |
| • Average service | 9.8 | 10.0 | (0.2) |
| • Total annual salary | $5,267,320,827 | $5,118,606,683 | 2.9% |
| • Average annual salary | $54,991 | $54,572 | 0.8% |
| • Account balances | $1,094,086,963 | $1,052,660,621 | 3.9% |
| • Total active vested members | 63,624 | 62,893 | 1.2% |
| **Inactive vested members** | 18,471 | 17,904 | 3.2% |
| **Retired members:** | | | |
| • Number in pay status | 58,870 | 56,647 | 3.9% |
| • Average age | 70.8 | 70.6 | 0.2 |
| • Average monthly benefit | $3,325 | $3,217 | 3.4% |
| **Disabled members:** | | | |
| • Number in pay status | 2,398 | 2,422 | (1.0%) |
| • Average age | 61.1 | 60.7 | 0.4 |
| • Average monthly benefit | $2,500 | $2,378 | 5.1% |
| **Beneficiaries:** | | | |
| • Number in pay status | 4,994 | 4,697 | 6.3% |
| • Average age | 72.3 | 72.0 | 0.3 |
| • Average monthly benefit | $2,307 | $2,208 | 4.5% |
| **Survivors:** | | | |
| • Number in pay status | 2,288 | 2,222 | 3.0% |
| • Average age | 55.6 | 55.6 | 0.0 |
| • Average monthly benefit | $1,571 | $1,528 | 2.8% |
| **Total pay status:** | | | |
| • Number in pay status | 68,550 | 65,988 | 3.9% |
| • Average age | 70.1 | 69.8 | 0.3 |
| • Average monthly benefit | $3,163 | $3,058 | 3.4% |

# Exhibit A: Table of Plan Coverage (continued)

## Police/Fire

| | Year Ended June 30 2022 | Year Ended June 30 2021 | Change From Prior Year |
|---|---|---|---|
| **Active members in valuation:** | | | |
| • Number | 12,850 | 13,134 | (2.2%) |
| Employer-Pay | 11,500 | 11,612 | (1.0%) |
| Employee/Employer-Pay | 1,350 | 1,522 | (11.3%) |
| • Average age | 39.3 | 39.3 | 0.0 |
| • Average service | 10.8 | 10.8 | 0.0 |
| • Total annual salary | $1,072,835,909 | $1,067,830,741 | 0.5% |
| • Average annual salary | $83,489 | $81,303 | 2.7% |
| • Account balances | $163,668,463 | $164,162,372 | (0.3%) |
| • Total active vested members | 9,187 | 9,072 | 1.3% |
| **Inactive vested members** | 1,040 | 967 | 7.5% |
| **Retired members:** | | | |
| • Number in pay status | 8,503 | 8,066 | 5.4% |
| • Average age | 63.9 | 63.9 | 0.0 |
| • Average monthly benefit | $6,299 | $6,088 | 3.5% |
| **Disabled members:** | | | |
| • Number in pay status | 639 | 620 | 3.1% |
| • Average age | 54.7 | 54.5 | 0.2 |
| • Average monthly benefit | $3,850 | $3,669 | 4.9% |
| **Beneficiaries:** | | | |
| • Number in pay status | 1,055 | 1,005 | 5.0% |
| • Average age | 72.1 | 71.7 | 0.4 |
| • Average monthly benefit | $2,975 | $2,792 | 6.6% |
| **Survivors:** | | | |
| • Number in pay status | 302 | 276 | 9.4% |
| • Average age | 45.8 | 46.4 | (0.6) |
| • Average monthly benefit | $2,123 | $2,071 | 2.5% |
| **Total pay status:** | | | |
| • Number in pay status | 10,499 | 9,967 | 5.3% |
| • Average age | 63.6 | 63.6 | 0.0 |
| • Average monthly benefit | $5,696 | $5,494 | 3.7% |

# Exhibit A: Table of Plan Coverage (continued)

## Total

| Total | Year Ended June 30 2022 | Year Ended June 30 2021 | Change From Prior Year |
|---|---|---|---|
| **Active members in valuation:** | | | |
| • Number | 108,635 | 106,930 | 1.6% |
| Employer-Pay | 86,717 | 85,230 | 1.7% |
| Employee/Employer-Pay | 21,918 | 21,700 | 1.0% |
| • Average age | 44.9 | 45.0 | (0.1) |
| • Average service | 9.9 | 10.1 | (0.2) |
| • Total annual salary | $6,340,156,736 | $6,186,437,424 | 2.5% |
| • Average annual salary | $58,362 | $57,855 | 0.9% |
| • Account balances | $1,257,755,426 | $1,216,822,993 | 3.4% |
| • Total active vested members | 72,811 | 71,965 | 1.2% |
| **Inactive vested members** | 19,511 | 18,871 | 3.4% |
| **Retired members:** | | | |
| • Number in pay status | 67,373 | 64,713 | 4.1% |
| • Average age | 69.9 | 69.8 | 0.1 |
| • Average monthly benefit | $3,700 | $3,575 | 3.5% |
| **Disabled members:** | | | |
| • Number in pay status | 3,037 | 3,042 | (0.2%) |
| • Average age | 59.7 | 59.4 | 0.3 |
| • Average monthly benefit | $2,784 | $2,641 | 5.4% |
| **Beneficiaries:** | | | |
| • Number in pay status | 6,049 | 5,702 | 6.1% |
| • Average age | 72.2 | 71.9 | 0.3 |
| • Average monthly benefit | $2,423 | $2,311 | 4.8% |
| **Survivors:** | | | |
| • Number in pay status | 2,590 | 2,498 | 3.7% |
| • Average age | 54.4 | 54.6 | (0.2) |
| • Average monthly benefit | $1,635 | $1,588 | 3.0% |
| **Total pay status:** | | | |
| • Number in pay status | 79,049 | 75,955 | 4.1% |
| • Average age | 69.2 | 69.0 | 0.2 |
| • Average monthly benefit | $3,499 | $3,377 | 3.6% |

# Exhibit B: Members in Active Service as of June 30, 2022 by Age, Years of Service, and Average Annual Salary

## Regular

| | | Years of Service[1] | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Age | Total | 0 – 4 | 5 – 9 | 10 – 14 | 15 – 19 | 20 – 24 | 25 – 29 | 30 – 34 | 35 – 39 | 40 & over |
| Under 25 | 3,243 | 3,214 | 29 | — | — | — | — | — | — | — |
| | $22,822 | $22,652 | $41,656 | — | — | — | — | — | — | — |
| 25 – 29 | 7,665 | 6,507 | 1,150 | 8 | — | — | — | — | — | — |
| | 37,455 | 35,778 | 46,767 | $62,920 | — | — | — | — | — | — |
| 30 – 34 | 10,071 | 5,829 | 3,595 | 589 | 55 | 3 | — | — | — | — |
| | 45,241 | 38,852 | 53,433 | 56,004 | $69,431 | * | — | — | — | — |
| 35 – 39 | 11,628 | 4,973 | 3,524 | 2,098 | 958 | 70 | 5 | — | — | — |
| | 52,212 | 39,585 | 57,760 | 64,407 | 68,579 | $78,478 | $78,764 | — | — | — |
| 40 – 44 | 12,808 | 4,202 | 2,999 | 2,127 | 2,716 | 691 | 72 | 1 | — | — |
| | 58,353 | 40,719 | 57,896 | 67,151 | 72,840 | 80,459 | 86,734 | * | — | — |
| 45 – 49 | 13,222 | 3,524 | 2,673 | 1,843 | 2,542 | 1,873 | 756 | 11 | — | — |
| | 61,689 | 39,803 | 56,422 | 64,689 | 73,649 | 81,766 | 84,652 | $89,945 | — | — |
| 50 – 54 | 13,967 | 3,124 | 2,512 | 1,934 | 2,571 | 1,955 | 1,749 | 119 | 3 | — |
| | 63,930 | 41,457 | 57,264 | 61,785 | 70,839 | 79,890 | 86,193 | 90,255 | * | — |
| 55 – 59 | 11,348 | 2,421 | 1,980 | 1,661 | 2,221 | 1,633 | 1,180 | 228 | 22 | 2 |
| | 61,546 | 40,700 | 54,277 | 58,265 | 67,983 | 76,623 | 83,058 | 85,395 | $85,941 | * |
| 60 – 64 | 7,485 | 1,550 | 1,400 | 1,156 | 1,599 | 994 | 580 | 161 | 35 | 10 |
| | 59,419 | 40,015 | 54,329 | 57,101 | 65,417 | 73,429 | 79,719 | 80,724 | 88,476 | $73,991 |
| 65 – 69 | 3,041 | 700 | 609 | 455 | 587 | 320 | 252 | 87 | 17 | 14 |
| | 58,047 | 40,621 | 54,877 | 54,762 | 64,148 | 69,908 | 77,959 | 76,016 | 116,693 | 105,904 |
| 70 & over | 1,307 | 320 | 232 | 211 | 248 | 137 | 94 | 42 | 17 | 6 |
| | 51,900 | 30,566 | 47,769 | 53,881 | 61,611 | 60,889 | 76,130 | 78,426 | 60,802 | 82,614 |
| **Total** | **95,785** | **36,364** | **20,703** | **12,082** | **13,497** | **7,676** | **4,688** | **649** | **94** | **32** |
| | **$54,991** | **$37,636** | **$55,400** | **$62,012** | **$70,032** | **$78,102** | **$83,711** | **$83,590** | **$87,816** | **$89,886** |

* Not shown for groups with fewer than five members.

[1] Includes purchased service.

# Exhibit B: Members in Active Service as of June 30, 2022 by Age, Years of Service, and Average Annual Salary (continued)

## Police/Fire

| | | Years of Service[1] | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Age | Total | 0 – 4 | 5 – 9 | 10 – 14 | 15 – 19 | 20 – 24 | 25 – 29 | 30 – 34 | 35 – 39 | 40 & over |
| Under 25 | 477 | 474 | 3 | — | — | — | — | — | — | — |
| | $46,157 | $46,013 | * | — | — | — | — | — | — | — |
| 25 – 29 | 2,041 | 1,576 | 458 | 7 | — | — | — | — | — | — |
| | 61,590 | 57,495 | $75,283 | $87,652 | — | — | — | — | — | — |
| 30 – 34 | 2,322 | 1,041 | 1,070 | 187 | 23 | 1 | — | — | — | — |
| | 69,657 | 57,257 | 77,582 | 89,529 | $98,602 | * | — | — | — | — |
| 35 – 39 | 2,268 | 526 | 691 | 566 | 439 | 45 | 1 | — | — | — |
| | 84,412 | 57,658 | 76,670 | 96,135 | 110,066 | $116,422 | * | — | — | — |
| 40 – 44 | 1,956 | 214 | 299 | 418 | 740 | 276 | 9 | — | — | — |
| | 95,093 | 57,696 | 76,440 | 95,573 | 104,680 | 116,994 | $121,797 | — | — | — |
| 45 – 49 | 1,847 | 110 | 162 | 245 | 594 | 632 | 103 | 1 | — | — |
| | 102,677 | 57,848 | 71,513 | 92,862 | 105,084 | 115,271 | 131,297 | * | — | — |
| 50 – 54 | 1,301 | 79 | 85 | 147 | 379 | 415 | 183 | 12 | 1 | — |
| | 102,845 | 51,280 | 67,863 | 85,000 | 100,689 | 115,832 | 127,606 | $147,280 | * | — |
| 55 – 59 | 468 | 20 | 26 | 59 | 128 | 122 | 83 | 25 | 5 | — |
| | 100,163 | 48,578 | 71,950 | 78,546 | 92,665 | 109,575 | 119,500 | 142,056 | $140,147 | — |
| 60 – 64 | 136 | 6 | 11 | 19 | 37 | 30 | 17 | 9 | 6 | 1 |
| | 95,569 | 44,680 | 89,597 | 82,460 | 87,055 | 94,098 | 114,831 | 130,979 | 144,099 | * |
| 65 – 69 | 23 | 2 | 6 | 4 | 4 | 5 | 1 | 1 | — | — |
| | 78,159 | * | 62,091 | * | * | 102,989 | * | * | — | — |
| 70 & over | 11 | 1 | 2 | — | 5 | 1 | 2 | — | — | — |
| | 72,933 | * | * | — | 78,330 | * | * | — | — | — |
| **Total** | **12,850** | **4,049** | **2,813** | **1,652** | **2,349** | **1,527** | **399** | **48** | **12** | **1** |
| | **$83,489** | **$55,933** | **$76,151** | **$92,871** | **$104,063** | **$114,838** | **$126,262** | **$139,697** | **$141,852** | ***** |

* Not shown for groups with fewer than five members.

[1] Includes purchased service.

# Exhibit B: Members in Active Service as of June 30, 2022 by Age, Years of Service, and Average Annual Salary (continued)

## Total

| | | Years of Service[1] | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Age** | **Total** | **0 – 4** | **5 – 9** | **10 – 14** | **15 – 19** | **20 – 24** | **25 – 29** | **30 – 34** | **35 – 39** | **40 & over** |
| Under 25 | 3,720 | 3,688 | 32 | — | — | — | — | — | — | — |
| | $25,814 | $25,654 | $44,209 | — | — | — | — | — | — | — |
| 25 – 29 | 9,706 | 8,083 | 1,608 | 15 | — | — | — | — | — | — |
| | 42,530 | 40,012 | 54,889 | $74,462 | — | — | — | — | — | — |
| 30 – 34 | 12,393 | 6,870 | 4,665 | 776 | 78 | 4 | — | — | — | — |
| | 49,816 | 41,641 | 58,972 | 64,083 | $78,033 | * | — | — | — | — |
| 35 – 39 | 13,896 | 5,499 | 4,215 | 2,664 | 1,397 | 115 | 6 | — | — | — |
| | 57,467 | 41,314 | 60,860 | 71,148 | 81,616 | $93,326 | $93,966 | — | — | — |
| 40 – 44 | 14,764 | 4,416 | 3,298 | 2,545 | 3,456 | 967 | 81 | 1 | — | — |
| | 63,220 | 41,542 | 59,577 | 71,819 | 79,657 | 90,887 | 90,629 | * | — | — |
| 45 – 49 | 15,069 | 3,634 | 2,835 | 2,088 | 3,136 | 2,505 | 859 | 12 | — | — |
| | 66,713 | 40,349 | 57,284 | 67,995 | 79,603 | 90,219 | 90,245 | $95,025 | — | — |
| 50 – 54 | 15,268 | 3,203 | 2,597 | 2,081 | 2,950 | 2,370 | 1,932 | 131 | 4 | — |
| | 67,246 | 41,700 | 57,611 | 63,425 | 74,674 | 86,183 | 90,116 | 95,478 | * | — |
| 55 – 59 | 11,816 | 2,441 | 2,006 | 1,720 | 2,349 | 1,755 | 1,263 | 253 | 27 | 2 |
| | 63,076 | 40,765 | 54,506 | 58,961 | 69,328 | 78,914 | 85,453 | 90,994 | $95,979 | * |
| 60 – 64 | 7,621 | 1,556 | 1,411 | 1,175 | 1,636 | 1,024 | 597 | 170 | 41 | 11 |
| | 60,064 | 40,033 | 54,604 | 57,512 | 65,906 | 74,034 | 80,719 | 83,385 | 96,616 | $79,764 |
| 65 – 69 | 3,064 | 702 | 615 | 459 | 591 | 325 | 253 | 88 | 17 | 14 |
| | 58,198 | 40,668 | 54,947 | 54,848 | 64,289 | 70,417 | 78,206 | 75,799 | 116,693 | 105,904 |
| 70 & over | 1,318 | 321 | 234 | 211 | 253 | 138 | 96 | 42 | 17 | 6 |
| | 52,075 | 30,478 | 47,782 | 53,881 | 61,942 | 61,055 | 76,897 | 78,426 | 60,802 | 82,614 |
| **Total** | **108,635** | **40,413** | **23,516** | **13,734** | **15,846** | **9,203** | **5,087** | **697** | **106** | **33** |
| | **$58,362** | **$39,469** | **$57,883** | **$65,724** | **$75,077** | **$84,197** | **$87,048** | **$87,453** | **$93,933** | **$91,329** |

* Not shown for groups with fewer than five members.

[1] Includes purchased service.

## Exhibit C: Reconciliation of Member Data

| | Active Members | Inactive Vested Members | Retired Members | Disabled Members | Beneficiaries and Survivors | Total |
|---|---|---|---|---|---|---|
| **Number as of June 30, 2021** | **106,930** | **18,871** | **64,713** | **3,042** | **8,200** | **201,756** |
| • New members | 13,058 | 0 | 0 | 0 | 858 | 13,916 |
| • Terminations – with vested rights | (2,652) | 2,652 | 0 | 0 | 0 | 0 |
| • Terminations – without vested rights | (5,959) | (148) | N/A | N/A | N/A | (6,107) |
| • Retirements | (2,985) | (1,314) | 4,354 | (55) | N/A | 0 |
| • New disabilities | (137) | (13) | 0 | 150 | N/A | 0 |
| • Return to work | 572 | (569) | (1) | (2) | N/A | 0 |
| • Died with or without beneficiary | (116) | (45) | (1,705) | (96) | (341) | (2,303) |
| • Certain period expired | N/A | N/A | 0 | 0 | (73) | (73) |
| • Data adjustments | (76) | 77 | 12 | (2) | (5) | 6 |
| **Number as of June 30, 2022** | **108,635** | **19,511** | **67,373** | **3,037** | **8,639** | **207,195** |

# Exhibit D: Summary Statement of Income and Expenses on an Actuarial Value Basis (Based On Unaudited Financial Statements)

| | Year Ended June 30, 2022 | | | Year Ended June 30, 2021 |
|---|---|---|---|---|
| | **Regular** | **Police/Fire** | **Total** | **Total** |
| Net assets at actuarial value at the beginning of the year | $39,244,062,118 | $11,698,392,903 | $50,942,455,021 | $46,171,692,203 |
| **Contribution income:**[1] | | | | |
| • Employer contributions[2] | $851,036,184 | $252,953,824 | $1,103,990,008 | $1,051,938,035 |
| • Member contributions | 851,036,184 | 252,953,824 | 1,103,990,008 | 1,051,938,035 |
| • Repayment and purchase of service | 59,713,064 | 22,698,416 | 82,411,480 | 69,958,026 |
| Contribution income | $1,761,785,432 | $528,606,064 | $2,290,391,496 | $2,173,834,096 |
| **Investment income:** | | | | |
| • Interest | $161,256,553 | $0 | $161,256,553 | $177,842,092 |
| • Dividends | 713,766,500 | 0 | 713,766,500 | 645,827,624 |
| • Net appreciation | (3,940,090,118) | 0 | (3,940,090,118) | 11,671,590,894 |
| • Other | 147,800,484 | 0 | 147,800,484 | 126,075,176 |
| • Transfer of annual investment income | 676,021,316 | (676,021,316) | 0 | 0 |
| • Securities lending income | 6,193,380 | 0 | 6,193,380 | 3,183,489 |
| • Change in fair value of securities lending | 0 | 0 | 0 | 0 |
| • Other income | 2,807,749 | 895,740 | 3,703,489 | 3,262,309 |
| • Change in unrecognized return | 5,579,574,534 | 1,664,563,470 | 7,244,138,004 | (6,952,604,181) |
| • Less investment fees | (26,872,547) | 0 | (26,872,547) | (22,428,991) |
| Net investment income | $3,320,457,851 | $989,437,894 | $4,309,895,745 | $5,652,748,412 |
| **Total income available for benefits** | **$5,082,243,283** | **$1,518,043,958** | **$6,600,287,241** | **$7,826,582,508** |
| **Less operating expenses:** | | | | |
| • Retirement and survivor benefits | $(2,449,303,320) | $(658,020,848) | $(3,107,324,168) | $(2,889,309,044) |
| • Disability benefits | (92,261,146) | (32,355,992) | (124,617,138) | (119,257,987) |
| • Refunds to members | (42,732,082) | (10,805,843) | (53,537,925) | (30,272,862) |
| • Administrative expenses | (12,259,055) | (1,194,207) | (13,453,262) | (12,530,326) |
| • Transfer to JRS | (1,689,041) | 0 | (1,689,041) | (4,424,263) |
| • Other expenses | (50) | 0 | (50) | (25,208) |
| Net operating expenses | $(2,598,244,694) | $(702,376,890) | $(3,300,621,584) | $(3,055,819,690) |
| **Interfund transfer** | $(1,855,993) | $1,855,993 | $0 | $0 |
| **Change in reserve for future benefits** | **$2,482,142,596** | **$817,523,061** | **$3,299,665,657** | **$4,770,762,818** |
| **Net assets at actuarial value at the end of the year** | **$41,726,204,714** | **$12,515,915,964** | **$54,242,120,678** | **$50,942,455,021** |

[1] Pursuant to GASB Statement No. 82, the financial statements recognize half of the employer contributions made on behalf of Employer-Pay members as member contributions.

[2] See cost-sharing mechanisms in NRS 286.410 and NRS 286.421.

# Exhibit E: Summary Statement of Plan Assets (Based on Unaudited Financial Statements)

| | Year Ended June 30, 2022 | | Year Ended June 30, 2021 | |
|---|---|---|---|---|
| Cash and cash equivalents | | $511,020,040 | | $705,534,396 |
| **Receivables:** | | | | |
| • Contributions receivable | $213,753,422 | | $190,228,841 | |
| • Pending trades receivable | 45,076,880 | | 719,321,011 | |
| • Accrued investment income | 171,044,397 | | 156,089,782 | |
| Total accounts receivable | | 429,874,699 | | 1,065,639,634 |
| **Investments:** | | | | |
| • Fixed income securities | $14,521,166,462 | | $14,584,320,841 | |
| • Marketable equity securities | 21,073,996,031 | | 24,876,074,298 | |
| • International securities | 9,678,799,992 | | 11,150,135,417 | |
| • Real estate | 3,471,506,085 | | 2,626,656,113 | |
| • Private equity | 4,955,746,744 | | 4,231,478,443 | |
| Total investments at market value | | 53,701,215,314 | | 57,468,665,112 |
| Collateral on loaned securities | | 248,941,553 | | 174,487,304 |
| Property and equipment | | 8,081,697 | | 5,148,672 |
| Other assets | | 5,107,407 | | 4,769,353 |
| Total assets | | $54,904,240,710 | | $59,424,244,471 |
| **Liabilities:** | | | | |
| • Accounts payable | $(33,781,903) | | $(39,503,999) | |
| • Pending trades payable | (107,505,246) | | (751,768,813) | |
| • Obligations under securities lending activities | (248,941,553) | | (174,487,304) | |
| Total liabilities | | $(390,228,702) | | $(965,760,116) |
| **Net assets at market value** | | **$54,514,012,008** | | **$58,458,484,355** |
| **Net assets at actuarial value** | | **$54,242,120,678** | | **$50,942,455,021** |

# Exhibit F: Development of the Fund Through June 30, 2022

| Year Ended June 30 | Employer Contributions[1] | Member Contributions[1] | Other Contributions | Net Investment Return[2] | Administrative Expenses | Benefit Payments[3] | Actuarial Value of Assets at End of Year |
|---|---|---|---|---|---|---|---|
| 2012 | | | | | | | $27,398,984,856 |
| 2013 | $1,310,082,859 | $99,230,935 | $46,467,628 | $1,971,170,711 | $9,560,240 | $1,707,835,385 | 29,108,541,364 |
| 2014 | 1,405,006,553 | 109,656,492 | 42,752,491 | 2,649,964,116 | 9,592,570 | 1,840,771,509 | 31,465,556,937 |
| 2015 | 1,436,652,815 | 114,302,545 | 82,485,688 | 2,614,811,974 | 9,648,626 | 1,986,231,557 | 33,717,929,776 |
| 2016 | 1,569,709,596 | 129,788,195 | 61,736,428 | 2,567,650,020 | 11,950,720 | 2,138,616,015 | 35,896,247,280 |
| 2017 | 901,744,209 | 901,744,209 | 67,230,428 | 3,251,238,649 | 9,872,019 | 2,289,032,062 | 38,719,300,694 |
| 2018 | 930,269,428 | 930,269,427 | 73,557,803 | 3,153,811,596 | 12,945,720 | 2,451,895,189 | 41,342,368,039 |
| 2019 | 965,518,968 | 965,518,968 | 98,357,134 | 2,884,998,712 | 11,812,306 | 2,635,977,671 | 43,608,971,844 |
| 2020 | 1,045,108,804 | 1,045,108,804 | 67,038,909 | 3,252,401,792 | 12,398,452 | 2,834,539,498 | 46,171,692,203 |
| 2021 | 1,051,938,035 | 1,051,938,035 | 69,958,026 | 5,652,748,412 | 12,555,534 | 3,043,264,156 | 50,942,455,021 |
| 2022 | 1,103,990,008 | 1,103,990,008 | 82,411,480 | 4,309,895,745 | 13,453,312 | 3,287,168,272 | 54,242,120,678 |

1 Starting in the year ended June 30, 2017, pursuant to GASB Statement No. 82, the financial statements recognize half of the employer contributions made on behalf of Employer-Pay members as member contributions.
2 Net of investment fees.
3 Includes transfers in/out of the System (e.g. to the Judicial Retirement System) that correspond to transfers of liability.

# Exhibit G: Development of Unfunded Actuarial Accrued Liability For Year Ended June 30, 2022

| | | Regular | Police/Fire | Total |
|---|---|---|---|---|
| 1 | **Unfunded actuarial accrued liability at beginning of year** | **$12,861,465,358** | **$3,773,861,078** | **$16,635,326,436** |
| 2 | Normal cost at beginning of year | 1,095,026,805 | 375,117,052 | 1,470,143,857 |
| 3 | Expected total contributions at beginning of year[1] | (2,170,370,784) | (691,626,194) | (2,861,996,978) |
| 4 | Expected administrative expenses at beginning of year | 11,425,056 | 2,324,549 | 13,749,605 |
| 5 | Interest for whole year on **1 + 2 + 3 + 4** | 855,322,115 | 250,826,548 | 1,106,148,663 |
| 6 | Expected unfunded actuarial accrued liability at end of year | $12,652,868,550 | $3,710,503,033 | $16,363,371,583 |
| 7 | Changes due to | | | |
| | a. Investment gain | $(505,652,275) | $(147,536,321) | $(653,188,596) |
| | b. Post-retirement benefit increases greater than expected | 1,163,033,202 | 375,664,975 | 1,538,698,177 |
| | c. Individual salary and service increases greater than expected | 46,599,020 | 45,666,918 | 92,265,938 |
| | d. Contributions less than expected[2] | 563,950,176 | 217,522,290 | 781,472,466 |
| | e. Administrative expenses greater/(less) than expected | 450,125 | (1,255,582) | (805,457) |
| | f. Other experience[3] | 149,835,519 | 55,136,399 | 204,971,918 |
| | Total changes | $1,418,215,767 | $545,198,679 | $1,963,414,446 |
| 8 | **Unfunded actuarial accrued liability at end of year** | **$14,071,084,317** | **$4,255,701,712** | **$18,326,786,029** |

1 The expected total contributions are based on the actuarially determined contribution rates without any adjustment due to the four-year phase-in of the cost impact of the 2021 assumption changes.

2 The contribution loss is due to the net effect of a) lower than expected payroll growth (for Police/Fire only), b) statutory contribution rates lower than the actuarially determined contribution rates, c) actuarially determined contribution rates being lowered by the four-year phase-in of the cost impact of the 2021 assumption changes, and d) timing effect of actuarially determined contributions payable at the beginning of the year vs. actual contributions payable throughout the two years beginning one year after the rate-setting year.

3 Details on page 30.

# Exhibit H: Table of Amortization Bases

## Regular

| Date Established | Initial Years | Initial Amount | Outstanding Balance | Years Remaining | Current Annual Payment[1] |
|---|---|---|---|---|---|
| June 30, 2004 | 30 | $3,306,492,730 | $4,415,201,174 | 12 | $444,129,521 |
| June 30, 2022[2] | 20 | 9,655,883,143 | 9,655,883,143 | 20 | 662,972,595 |
| **Subtotal** | | | **$14,071,084,317** | **16.5[3]** | **$1,107,102,116** |

[1] Level percentage of payroll with payroll expected to increase 3.50% per year for Regular and Police/Fire. Payments shown as of beginning of year.
[2] The funding policy adopted by the Board was updated effective June 30, 2022. The outstanding balance of all Regular amortization bases established between June 30, 2005 and June 30, 2022 were combined and re-amortized over a closed 20-year period as of June 30, 2022.
[3] Effective average amortization period. Combined Regular and Police/Fire average amortization period is 17.3.

# Exhibit H: Table of Amortization Bases (continued)

## Police/Fire

| Date Established | Initial Years | Initial Amount | Outstanding Balance | Years Remaining | Current Annual Payment[1] |
|---|---|---|---|---|---|
| June 30, 2022[2] | 20 | $4,255,701,712 | $4,255,701,712 | 20 | $292,196,330 |
| **Subtotal** | | | **$4,255,701,712** | **20.0[3]** | **$292,196,330** |
| **Total** | | | **$18,326,786,029** | | **$1,399,298,446** |

[1] Level percentage of payroll with payroll expected to increase 3.50% per year for Regular and Police/Fire. Payments shown as of beginning of year.
[2] The funding policy adopted by the Board was updated effective June 30, 2022. The outstanding balance of all Police/Fire amortization bases established between June 30, 2004 and June 30, 2022 were combined and re-amortized over a closed 20-year period as of June 30, 2022.
[3] Effective average amortization period. Combined Regular and Police/Fire average amortization period is 17.3.

# Exhibit I: Definition of Pension Terms

The following list defines certain technical terms for the convenience of the reader:

| | |
|---|---|
| **Actuarial Accrued Liability for Actives:** | The equivalent of the accumulated normal costs allocated to the years before the valuation date. |
| **Actuarial Accrued Liability for Pensioners and Beneficiaries:** | The single-sum value of lifetime benefits to existing pensioners and beneficiaries. This sum takes account of life expectancies appropriate to the ages of the annuitants and the interest that the sum is expected to earn before it is entirely paid out in benefits. |
| **Actuarial Cost Method:** | A procedure allocating the Actuarial Present Value of Future Benefits to various time periods; a method used to determine the Normal Cost and the Actuarial Accrued Liability that are used to determine the actuarially determined contribution. |
| **Actuarial Gain or Loss:** | A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions, during the period between two Actuarial Valuation dates. Through the actuarial assumptions, rates of decrements, rates of salary increases, and rates of fund earnings have been forecasted. To the extent that actual experience differs from that assumed, Actuarial Accrued Liabilities emerge which may be the same as forecasted, or may be larger or smaller than projected. Actuarial gains are due to favorable experience, e.g., assets earn more than projected, salary increases are less than assumed, members retire later than assumed, etc. Favorable experience means actual results produce actuarial liabilities not as large as projected by the actuarial assumptions. On the other hand, actuarial losses are the result of unfavorable experience, i.e., actual results yield in actuarial liabilities that are larger than projected. Actuarial gains will shorten the time required for funding of the actuarial balance sheet deficiency while actuarial losses will lengthen the funding period. |
| **Actuarially Equivalent:** | Of equal actuarial present value, determined as of a given date and based on a given set of Actuarial Assumptions. |
| **Actuarial Present Value (APV):** | The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions. Each such amount or series of amounts is:<br>Adjusted for the probable financial effect of certain intervening events (such as changes in compensation levels, marital status, etc.)<br>Multiplied by the probability of the occurrence of an event (such as survival, death, disability, withdrawal, etc.) on which the payment is conditioned, and<br>Discounted according to an assumed rate (or rates) of return to reflect the time value of money. |

| | |
|---|---|
| **Actuarial Present Value of Future Plan Benefits:** | The Actuarial Present Value of benefit amounts expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age, anticipated future compensation, and future service credits. The Actuarial Present Value of Future Plan Benefits includes the liabilities for active members, retired members, beneficiaries receiving benefits, and inactive members entitled to either a refund or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would provide sufficient assets to pay all projected benefits when due. |
| **Actuarial Valuation:** | The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a plan. An Actuarial Valuation for a governmental retirement system typically also includes calculations of items needed for compliance with GASB, such as the Actuarially Determined Contribution (ADC) and the Net Pension Liability (NPL). |
| **Actuarial Value of Assets (AVA):** | The value of the Fund's assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets, but commonly plans use a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the ADC. |
| **Actuarially Determined:** | Values that have been determined utilizing the principles of actuarial science. An actuarially determined value is derived by application of the appropriate actuarial assumptions to specified values determined by provisions of the law. |
| **Actuarially Determined Contribution (ADC):** | The employer's periodic required contributions, expressed as a dollar amount or a percentage of covered plan compensation, determined under the Plan's funding policy. The ADC consists of the Employer Normal Cost and the Amortization Payment. |
| **Amortization Method:** | A method for determining the Amortization Payment. The most common methods used are level dollar and level percentage of payroll. Under the Level Dollar method, the Amortization Payment is one of a stream of payments, all equal, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the Amortization Payment is one of a stream of increasing payments, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the stream of payments increases at the assumed rate at which total covered payroll of all active members will increase. |
| **Amortization Payment:** | The portion of the pension plan contribution, or ADC, that is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability. |

| | |
|---|---|
| **Assumptions or Actuarial Assumptions:** | The estimates upon which the cost of the Fund is calculated, including:<br>Investment return - the rate of investment yield that the Fund will earn over the long-term future;<br>Mortality rates - the death rates of employees and pensioners; life expectancy is based on these rates;<br>Retirement rates - the rate or probability of retirement at a given age or service;<br>Disability rates – the probability of disability retirement at a given age;<br>Termination rates - the rates at which employees of various ages are expected to leave employment for reasons other than death, disability, or retirement;<br>Salary increase rates - the rates of salary increase due to inflation and productivity growth. |
| **Closed Amortization Period:** | A specific number of years that is counted down by one each year, and therefore declines to zero with the passage of time. For example, if the amortization period is initially set at 30 years, it is 29 years at the end of one year, 28 years at the end of two years, etc. See Open Amortization Period. |
| **Decrements:** | Those causes/events due to which a member's status (active-inactive-retiree-beneficiary) changes, that is: death, retirement, disability, or termination. |
| **Defined Benefit Plan:** | A retirement plan in which benefits are defined by a formula applied to the member's compensation and/or years of service. |
| **Defined Contribution Plan:** | A retirement plan, such as a 401(k) plan, a 403(b) plan, or a 457 plan, in which the contributions to the plan are assigned to an account for each member, the plan's earnings are allocated to each account, and each member's benefits are a direct function of the account balance. |
| **Employer Normal Cost:** | The portion of the Normal Cost to be paid by the employer. This is equal to the Normal Cost less expected member contributions. |
| **Experience Study:** | A periodic review and analysis of the actual experience of the Fund that may lead to a revision of one or more actuarial assumptions. Actual rates of decrement and salary increases are compared to the actuarially assumed values and modified as deemed appropriate by the Actuary. |
| **Funded Ratio:** | The ratio of the Actuarial Value of Assets (AVA) to the actuarial accrued liability (AAL). Plans sometimes calculate a market funded ratio, using the Market Value of Assets (MVA), rather than the AVA. |
| **Investment Return:** | The rate of earnings of the Fund from its investments, including interest, dividends and capital gain and loss adjustments, computed as a percentage of the average value of the fund. For actuarial purposes, the investment return often reflects a smoothing of the capital gains and losses to avoid significant swings in the value of assets from one year to the next. |

# Section 3: Supplemental Information

| | |
|---|---|
| **Normal Cost:** | That portion of the Actuarial Present Value of pension plan benefits and expenses allocated to a valuation year by the Actuarial Cost Method. Any payment in respect of an Unfunded Actuarial Accrued Liability is not part of Normal Cost (see Amortization Payment). For pension plan benefits that are provided in part by employee contributions, Normal Cost refers to the total of employee contributions and employer Normal Cost unless otherwise specifically stated. |
| **Open Amortization Period:** | An open amortization period is one which is used to determine the Amortization Payment but which does not change over time. If the initial period is set as 30 years, the same 30-year period is used in determining the Amortization Period each year. In theory, if an Open Amortization Period with level percentage of payroll is used to amortize the Unfunded Actuarial Accrued Liability, the UAAL will never decrease, but will become smaller each year, in relation to covered payroll, if the actuarial assumptions are realized. |
| **Unfunded Actuarial Accrued Liability:** | The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. This value may be negative, in which case it may be expressed as a negative Unfunded Actuarial Accrued Liability, also called the Funding Surplus. |
| **Valuation Date or Actuarial Valuation Date:** | The date as of which the value of assets is determined and as of which the Actuarial Present Value of Future Plan Benefits is determined. The expected benefits to be paid in the future are discounted to this date. |

# Section 4: Actuarial Valuation Basis

## Exhibit 1: Summary of Actuarial Valuation Results

The valuation was made with respect to the following data supplied to us:

| | | |
|---|---|---|
| 1 | Retired members as of the valuation date (including 8,639 beneficiaries and survivors in pay status) | 79,049 |
| 2 | Members inactive during year ended June 30, 2022 with vested rights | 19,511 |
| 3 | Members active during the year ended June 30, 2022 | 108,635 |
| 4 | Total members | 207,195 |

The actuarial factors as of the valuation date are as follows:

| | | | |
|---|---|---|---|
| 1 | Normal cost[1] | | |
| | Regular members | $1,135,427,591 | |
| | Police/Fire members | 378,728,869 | |
| | Total normal cost | | $1,514,156,460 |
| 2 | Actuarial accrued liability | | |
| | Retired members and beneficiaries | $43,704,872,960 | |
| | Inactive members with vested rights | 2,027,094,205 | |
| | Active members | 26,836,939,542 | |
| | Total actuarial accrued liability | | $72,568,906,707 |
| 3 | Actuarial value of assets ($54,514,012,008 at market value as reported by System staff) | | 54,242,120,678 |
| 4 | Unfunded actuarial accrued liability: **2 - 3** | | $18,326,786,029 |
| 5 | Total rate payroll | | 7,126,962,737 |

[1] Does not include administrative expenses.

# Exhibit 2: Actuarial Assumptions and Methods

| | |
|---|---|
| **Rationale for Assumptions:** | The information and analysis used in selecting each assumption that has a significant effect on this actuarial valuation is shown in the Actuarial Experience Study dated September 10, 2021. These assumptions were adopted by the Board. |
| **<u>Economic Assumptions</u>** | |
| **Net Investment Return:** | 7.25% (including 2.50% for inflation), net of investment expenses<br>Based on the actuarial experience study referenced above, expected investment expenses represent about 0.13% of the actuarial value of assets. |
| **Consumer Price Index:** | Increase of 2.50% per year |
| **Annual Administrative Expenses:** | 0.20% of payroll added to normal cost |

**Salary Increases:**

*Inflation:* 2.50% plus
*Productivity pay increases:* 0.50% plus
*Merit and promotion salary increases:*

| | Rate (%) | |
|---|---|---|
| **Years of Service** | **Regular** | **Police/Fire** |
| 0 – 1 | 6.10 | 11.50 |
| 1 – 2 | 5.00 | 8.20 |
| 2 – 3 | 4.40 | 5.80 |
| 3 – 4 | 4.00 | 5.20 |
| 4 – 5 | 3.70 | 4.90 |
| 5 – 6 | 3.40 | 4.70 |
| 6 – 7 | 3.30 | 4.40 |
| 7 – 8 | 3.20 | 4.20 |
| 8 – 9 | 3.00 | 4.00 |
| 9 – 10 | 2.80 | 3.90 |
| 10 – 11 | 2.60 | 3.50 |
| 11 – 12 | 2.30 | 2.80 |
| 12 – 13 | 2.10 | 2.20 |
| 13 – 14 | 1.90 | 2.00 |
| 14 – 15 | 1.80 | 1.90 |
| 15 – 16 | 1.70 | 1.70 |
| 16 – 17 | 1.60 | 1.70 |
| 17 – 18 | 1.50 | 1.70 |
| 18 – 19 | 1.40 | 1.70 |
| 19 – 20 | 1.30 | 1.70 |
| 20 & Over | 1.20 | 1.60 |

Future salary increases are assumed to occur at the beginning of the year.

**Total Payroll Growth:**

Assumed payroll growth rates are used to compute the unfunded actuarial accrued liability amortization payments as a level percentage of projected payroll. For this valuation, the payroll for the coming year is based on actual annualized payroll for the actives as of the valuation date and projected by the salary scale. However, for members with less than one year of service as of the valuation date, no salary increase assumption is applied to their annualized compensation. For the purpose of calculating the actuarially determined contribution rate, the total payroll growth assumption for future years is 3.50% per year for both Regular and Police/Fire.

# Section 4: Actuarial Valuation Basis

| | |
|---|---|
| **Post-Retirement Benefit Increases:** | For current retirees and beneficiaries, future Post-Retirement Benefit Increases reflect actual changes in historical CPI and are assumed to follow the formulas described in Exhibit 3 of this section.<br>For future retirees, those hired prior to January 1, 2010 are assumed to reach the cap after 14 years of retirement. Those hired between January 1, 2010 and July 1, 2015 are also assumed to reach the cap after 14 years of retirement. Those hired after July 1, 2015 are assumed to never receive an annual increase that exceeds 2.50%. Underlying all of these assumptions is that CPI will grow over time at a rate of 2.50% per year. |
| **Demographic Assumptions:** | |
| **Post-Retirement Mortality Rates:** | *Healthy*<br>• **Regular Members:** Pub-2010 General Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates increased by 30% for males and 15% for females, projected generationally with the two-dimensional mortality improvement scale MP-2020.<br>The above listed mortality tables only provide rates for ages 50 and older. To develop mortality rates for ages 40 through 50, we have smoothed the difference between the rates at age 40 from the Pub-2010 General Employee Amount-Weighted Above-Median Mortality Tables and the rates at age 50 from the Pub-2010 General Healthy Retiree Amount-Weighted Above-Median Mortality Tables. To develop the mortality rates before age 40, we have used the Pub-2010 General Employee Amount-Weighted Above-Median Mortality Tables rates. This methodology for developing an extended annuitant mortality table is similar to the method used by the IRS to develop the base mortality table for determining minimum funding standards for single-employer defined benefit pension plans under Internal Revenue Code Section 430. While Section 430 is not applicable to NVPERS, we believe this is a reasonable method for developing annuitant mortality rates at earlier ages.<br>• **Police/Fire Members:** Pub-2010 Safety Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates increased by 30% for males and 5% for females, projected generationally with the two-dimensional mortality improvement scale MP-2020.<br>The above listed mortality tables only provide rates for ages 45 and older. To develop mortality rates for ages 35 through 45, we have smoothed the difference between the rates at age 35 from the Pub-2010 Safety Employee Amount-Weighted Above-Median Mortality Tables and the rates at age 45 from the Pub-2010 Safety Healthy Retiree Amount-Weighted Above-Median Mortality Tables. To develop the mortality rates before age 35, we have used the Pub-2010 Safety Employee Amount-Weighted Above-Median Mortality Tables rates. This methodology for developing an extended annuitant mortality table is similar to the method used by the IRS to develop the base mortality table for determining minimum funding standards for single-employer defined benefit pension plans under Internal Revenue Code Section 430. While Section 430 is not applicable to NVPERS, we believe this is a reasonable method for developing annuitant mortality rates at earlier ages. |

| | |
|---|---|
| **Post-Retirement Mortality Rates (continued):** | *Disabled*<br>• **Regular Members:** Pub-2010 Non-Safety Disabled Retiree Amount-Weighted Mortality Table (separate tables for males and females) with rates increased by 20% for males and 15% for females, projected generationally with the two-dimensional mortality improvement scale MP-2020.<br>• **Police/Fire Members:** Pub-2010 Safety Disabled Retiree Amount-Weighted Mortality Table (separate tables for males and females) with rates increased by 30% for males and 10% for females, projected generationally with the two-dimensional mortality improvement scale MP-2020.<br>*Beneficiaries*<br>• **Regular and Police/Fire Current Beneficiaries in Pay Status:** Pub-2010 Contingent Survivor Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates increased by 15% for males and 30% for females, projected generationally with the two-dimensional mortality improvement scale MP-2020.<br>The above listed mortality table only provides rates for ages 45 and older. To develop mortality rates for ages 35 through 45, we have smoothed the difference between the rates at age 35 from the Pub-2010 General Employee Amount-Weighted Above-Median Mortality Tables and the rates at age 45 from the Pub-2010 Contingent Survivor Amount-Weighted Above-Median Mortality Tables. To develop the mortality rates before age 35, we have used the Pub-2010 General Employee Amount-Weighted Above-Median Mortality Tables rates. This methodology for developing an extended annuitant mortality table is similar to the method used by the IRS to develop the base mortality table for determining minimum funding standards for single-employer defined benefit pension plans under Internal Revenue Code Section 430. While Section 430 is not applicable to NVPERS, we believe this is a reasonable method for developing annuitant mortality rates at earlier ages.<br>• **Regular and Police/Fire Contingent Beneficiaries:** Pub-2010 General Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates increased by 30% for males and 15% for females, projected generationally with the two-dimensional mortality improvement scale MP-2020.<br>The above listed mortality tables only provide rates for ages 50 and older. To develop mortality rates for ages 40 through 50, we have smoothed the difference between the rates at age 40 from the Pub-2010 General Employee Amount-Weighted Above-Median Mortality Tables and the rates at age 50 from the Pub-2010 General Healthy Retiree Amount-Weighted Above-Median Mortality Tables. To develop the mortality rates before age 40, we have used the Pub-2010 General Employee Amount-Weighted Above-Median Mortality Tables rates. This methodology for developing an extended annuitant mortality table is similar to the method used by the IRS to develop the base mortality table for determining minimum funding standards for single-employer defined benefit pension plans under Internal Revenue Code Section 430. While Section 430 is not applicable to NVPERS, we believe this is a reasonable method for developing annuitant mortality rates at earlier ages. |

**Post-Retirement Mortality Rates (continued):**

For the mortality table applicable to contingent beneficiaries, "Approach 1" from the Society of Actuaries "Pub-2010 Public Retirement Plans Mortality Tables Report" (as noted on page 61 of that report) was utilized. In particular, the mortality basis for contingent beneficiaries has been assumed to be the same mortality basis as the Healthy Regular retiree table listed above (except using rates applicable to the beneficiary's gender) for both when the primary retiree is alive and is no longer alive.

The Pub-2010 Amount-Weighted Mortality Tables and adjustments as shown above reasonably reflect the mortality experience of the Plan as of the measurement date. These mortality tables were adjusted to future years using a generational projection to reflect future mortality improvement between the measurement date and those years.

**Pre-Retirement Mortality Rates:**

- **Regular Members:** Pub-2010 General Employee Amount-Weighted Above-Median Mortality Table (separate tables for males and females), projected generationally with the two-dimensional mortality improvement scale MP-2020.
- **Police/Fire Members:** Pub-2010 Safety Employee Amount-Weighted Above-Median Mortality Table (separate tables for males and females), projected generationally with the two-dimensional mortality improvement scale MP-2020.

The Pub-2010 Amount-Weighted Mortality Tables reasonably reflect the projected mortality experience of the Plan as of the measurement date. The generational projection is a provision made for future mortality improvement.

**Pre-Retirement Mortality Rates (%)**

| | Regular | | Police/Fire | |
|---|---|---|---|---|
| **Age** | **Male** | **Female** | **Male** | **Female** |
| 20 | 0.04 | 0.01 | 0.04 | 0.02 |
| 25 | 0.02 | 0.01 | 0.03 | 0.02 |
| 30 | 0.03 | 0.01 | 0.04 | 0.02 |
| 35 | 0.04 | 0.02 | 0.04 | 0.03 |
| 40 | 0.06 | 0.03 | 0.05 | 0.04 |
| 45 | 0.09 | 0.05 | 0.07 | 0.06 |
| 50 | 0.13 | 0.08 | 0.10 | 0.08 |
| 55 | 0.19 | 0.11 | 0.15 | 0.11 |
| 60 | 0.28 | 0.17 | 0.23 | 0.15 |
| 65 | 0.41 | 0.27 | 0.35 | 0.20 |
| 70 | 0.61 | 0.45 | 0.66 | 0.39 |

Note that generational projections beyond the base year (2010) are not reflected in the above mortality rates.

Deaths that occur during the first two years of employment are assumed to be non-duty related.

**Disability Rates:**

| Age | Disability Rates (%) Regular | Police/Fire |
|---|---|---|
| 22 | 0.01 | 0.00 |
| 27 | 0.03 | 0.06 |
| 32 | 0.04 | 0.16 |
| 37 | 0.10 | 0.32 |
| 42 | 0.20 | 0.50 |
| 47 | 0.30 | 0.80 |
| 52 | 0.55 | 0.70 |
| 57 | 0.70 | 0.50 |
| 62 | 0.30 | 0.30 |
| 65 & Over | 0.00 | 0.00 |

Disability rates are applied only for members with more than 5 years of service and less than 30 years of service for Regular members with an effective date of membership before July 1, 2015, less than 33 1/3 years of service for Regular members with an effective date of membership on or after July 1, 2015, less than 25 years of service for Police/Fire members with an effective date of membership before January 1, 2010, or less than 30 years of service for Police/Fire members with an effective date of membership on or after January 1, 2010.

**Termination Rates:**

| Years of Service | Termination Rates (%) Regular | Termination Rates (%) Police/Fire |
|---|---|---|
| 0 – 1 | 15.75 | 14.50 |
| 1 – 2 | 12.75 | 8.25 |
| 2 – 3 | 10.25 | 6.50 |
| 3 – 4 | 8.25 | 5.50 |
| 4 – 5 | 7.50 | 4.50 |
| 5 – 6 | 6.50 | 4.25 |
| 6 – 7 | 5.75 | 3.25 |
| 7 – 8 | 5.25 | 2.50 |
| 8 – 9 | 4.75 | 2.50 |
| 9 – 10 | 4.50 | 1.90 |
| 10 – 11 | 4.25 | 1.40 |
| 11 – 12 | 3.25 | 1.25 |
| 12 – 13 | 3.00 | 1.00 |
| 13 – 14 | 2.75 | 0.90 |
| 14 – 15 | 2.25 | 0.80 |
| 15 – 16 | 2.25 | 0.70 |
| 16 – 17 | 2.25 | 0.60 |
| 17 – 18 | 2.00 | 0.50 |
| 18 – 19 | 1.75 | 0.40 |
| 19 – 20 | 1.75 | 0.30 |
| 20 – 21 | 1.75 | 0.30 |
| 21 – 22 | 1.75 | 0.30 |
| 22 – 23 | 1.75 | 0.30 |
| 23 – 24 | 1.75 | 0.30 |
| 24 – 25 | 1.50 | 0.30 |
| 25 & Over | 1.50 | 0.30 |

No termination is assumed after a member reaches earliest unreduced retirement age.

The termination liability is based on the greater actuarial value of a refund of member contributions and a deferred vested retirement benefit.

**Retirement Rates:**

*Regular members with an effective date of membership before January 1, 2010:*

| | Retirement Rates (%) | | | | | |
|---|---|---|---|---|---|---|
| | Years of Service | | | | | |
| **Age** | **5 – 9** | **10 – 19** | **20 – 24** | **25 – 27** | **28 – 29** | **30 & Over** |
| 45 | 0.00 | 0.10 | 0.10 | 0.50 | 20.00 | 20.00 |
| 46 | 0.00 | 0.20 | 0.20 | 1.00 | 20.00 | 20.00 |
| 47 | 0.00 | 0.30 | 0.30 | 1.50 | 20.00 | 20.00 |
| 48 | 0.00 | 0.40 | 0.40 | 2.00 | 20.00 | 20.00 |
| 49 | 0.00 | 0.50 | 0.50 | 2.00 | 20.00 | 20.00 |
| 50 | 0.20 | 0.60 | 0.70 | 2.00 | 20.00 | 20.00 |
| 51 | 0.30 | 0.70 | 1.00 | 2.00 | 20.00 | 20.00 |
| 52 | 0.40 | 0.80 | 1.20 | 3.00 | 20.00 | 20.00 |
| 53 | 0.50 | 1.00 | 1.50 | 3.00 | 20.00 | 20.00 |
| 54 | 0.60 | 1.20 | 2.00 | 3.00 | 20.00 | 20.00 |
| 55 | 0.80 | 1.50 | 3.00 | 3.00 | 20.00 | 20.00 |
| 56 | 1.00 | 2.00 | 3.50 | 4.00 | 20.00 | 20.00 |
| 57 | 1.50 | 2.50 | 4.00 | 7.00 | 20.00 | 20.00 |
| 58 | 2.00 | 3.00 | 5.00 | 7.00 | 20.00 | 20.00 |
| 59 | 2.50 | 4.00 | 7.00 | 11.00 | 20.00 | 20.00 |
| 60 | 5.00 | 11.00 | 18.00 | 25.00 | 21.00 | 21.00 |
| 61 | 6.00 | 10.00 | 15.00 | 20.00 | 21.00 | 21.00 |
| 62 | 7.00 | 11.00 | 16.00 | 20.00 | 20.00 | 20.00 |
| 63 | 8.00 | 11.00 | 16.00 | 20.00 | 20.00 | 20.00 |
| 64 | 9.00 | 11.00 | 16.00 | 20.00 | 20.00 | 20.00 |
| 65 | 18.00 | 19.00 | 22.00 | 22.00 | 25.00 | 25.00 |
| 66 | 18.00 | 19.00 | 22.00 | 22.00 | 25.00 | 25.00 |
| 67 | 18.00 | 19.00 | 22.00 | 22.00 | 25.00 | 25.00 |
| 68 | 18.00 | 19.00 | 22.00 | 22.00 | 25.00 | 25.00 |
| 69 | 18.00 | 19.00 | 22.00 | 22.00 | 25.00 | 25.00 |
| 70 | 20.00 | 20.00 | 25.00 | 30.00 | 30.00 | 30.00 |
| 71 | 20.00 | 20.00 | 25.00 | 30.00 | 30.00 | 30.00 |
| 72 | 20.00 | 20.00 | 25.00 | 30.00 | 30.00 | 30.00 |
| 73 | 20.00 | 20.00 | 25.00 | 30.00 | 30.00 | 30.00 |
| 74 | 20.00 | 20.00 | 25.00 | 30.00 | 30.00 | 30.00 |
| 75 & Over | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

**Retirement Rates (continued):**

*Regular members with an effective date of membership on or after January 1, 2010 and before July 1, 2015:*

| | Retirement Rates (%) | | | | | |
|---|---|---|---|---|---|---|
| | Years of Service | | | | | |
| **Age** | **5 – 9** | **10 – 19** | **20 – 24** | **25 – 27** | **28 – 29** | **30 & Over** |
| 45 | 0.00 | 0.00 | 0.00 | 0.00 | 20.00 | 20.00 |
| 46 | 0.00 | 0.00 | 0.00 | 0.00 | 20.00 | 20.00 |
| 47 | 0.00 | 0.00 | 0.00 | 0.00 | 20.00 | 20.00 |
| 48 | 0.00 | 0.00 | 0.00 | 0.00 | 20.00 | 20.00 |
| 49 | 0.00 | 0.00 | 0.00 | 0.00 | 20.00 | 20.00 |
| 50 | 0.00 | 0.00 | 0.00 | 0.00 | 20.00 | 20.00 |
| 51 | 0.00 | 0.00 | 0.00 | 0.00 | 20.00 | 20.00 |
| 52 | 0.00 | 0.40 | 0.70 | 1.70 | 20.00 | 20.00 |
| 53 | 0.00 | 0.60 | 0.90 | 1.80 | 20.00 | 20.00 |
| 54 | 0.00 | 0.80 | 1.30 | 1.90 | 20.00 | 20.00 |
| 55 | 0.20 | 1.00 | 2.00 | 2.00 | 20.00 | 20.00 |
| 56 | 0.40 | 1.40 | 2.50 | 2.90 | 20.00 | 20.00 |
| 57 | 0.60 | 1.90 | 3.00 | 5.20 | 20.00 | 20.00 |
| 58 | 0.80 | 2.30 | 3.90 | 5.40 | 20.00 | 20.00 |
| 59 | 1.00 | 3.20 | 5.60 | 8.80 | 20.00 | 20.00 |
| 60 | 2.00 | 4.00 | 6.00 | 10.00 | 21.00 | 21.00 |
| 61 | 3.50 | 6.00 | 10.00 | 15.00 | 21.00 | 21.00 |
| 62 | 4.00 | 10.30 | 15.00 | 18.70 | 20.00 | 20.00 |
| 63 | 5.00 | 10.30 | 15.00 | 18.70 | 20.00 | 20.00 |
| 64 | 7.00 | 10.30 | 15.00 | 18.70 | 20.00 | 20.00 |
| 65 | 17.00 | 17.80 | 20.60 | 20.60 | 25.00 | 25.00 |
| 66 | 17.00 | 17.80 | 20.60 | 20.60 | 25.00 | 25.00 |
| 67 | 17.00 | 17.80 | 20.60 | 20.60 | 25.00 | 25.00 |
| 68 | 17.00 | 17.80 | 20.60 | 20.60 | 25.00 | 25.00 |
| 69 | 17.00 | 17.80 | 20.60 | 20.60 | 25.00 | 25.00 |
| 70 | 19.00 | 18.70 | 23.40 | 28.10 | 30.00 | 30.00 |
| 71 | 19.00 | 18.70 | 23.40 | 28.10 | 30.00 | 30.00 |
| 72 | 19.00 | 18.70 | 23.40 | 28.10 | 30.00 | 30.00 |
| 73 | 19.00 | 18.70 | 23.40 | 28.10 | 30.00 | 30.00 |
| 74 | 19.00 | 18.70 | 23.40 | 28.10 | 30.00 | 30.00 |
| 75 & Over | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

**Retirement Rates (continued):**

*Regular members with an effective date of membership on or after July 1, 2015:*

| | Retirement Rates (%) | | | | | |
|---|---|---|---|---|---|---|
| | Years of Service | | | | | |
| **Age** | **5 – 9** | **10 – 19** | **20 – 24** | **25 – 29** | **30 – 33.3** | **33.3 & Over** |
| 45 | 0.00 | 0.00 | 0.00 | 0.00 | 7.20 | 20.00 |
| 46 | 0.00 | 0.00 | 0.00 | 0.00 | 8.30 | 20.00 |
| 47 | 0.00 | 0.00 | 0.00 | 0.00 | 9.40 | 20.00 |
| 48 | 0.00 | 0.00 | 0.00 | 0.00 | 10.40 | 20.00 |
| 49 | 0.00 | 0.00 | 0.00 | 0.00 | 11.50 | 20.00 |
| 50 | 0.00 | 0.00 | 0.00 | 0.00 | 12.60 | 20.00 |
| 51 | 0.00 | 0.00 | 0.00 | 0.00 | 13.70 | 20.00 |
| 52 | 0.00 | 0.40 | 0.60 | 1.50 | 14.80 | 20.00 |
| 53 | 0.00 | 0.50 | 0.80 | 1.60 | 15.80 | 20.00 |
| 54 | 0.00 | 0.70 | 1.20 | 1.70 | 16.90 | 20.00 |
| 55 | 0.20 | 0.90 | 1.80 | 1.80 | 18.00 | 20.00 |
| 56 | 0.40 | 1.30 | 2.30 | 2.60 | 18.00 | 20.00 |
| 57 | 0.50 | 1.70 | 2.70 | 4.70 | 18.00 | 20.00 |
| 58 | 0.70 | 2.10 | 3.50 | 4.90 | 18.00 | 20.00 |
| 59 | 0.90 | 2.90 | 5.00 | 7.90 | 18.00 | 20.00 |
| 60 | 1.80 | 3.60 | 5.40 | 9.00 | 18.90 | 21.00 |
| 61 | 3.20 | 5.40 | 9.00 | 13.50 | 18.90 | 21.00 |
| 62 | 3.60 | 9.30 | 13.50 | 16.80 | 18.00 | 20.00 |
| 63 | 4.50 | 9.30 | 13.50 | 16.80 | 18.00 | 20.00 |
| 64 | 6.30 | 9.30 | 13.50 | 16.80 | 18.00 | 20.00 |
| 65 | 15.30 | 16.00 | 18.50 | 18.50 | 22.50 | 25.00 |
| 66 | 15.30 | 16.00 | 18.50 | 18.50 | 22.50 | 25.00 |
| 67 | 15.30 | 16.00 | 18.50 | 18.50 | 22.50 | 25.00 |
| 68 | 15.30 | 16.00 | 18.50 | 18.50 | 22.50 | 25.00 |
| 69 | 15.30 | 16.00 | 18.50 | 18.50 | 22.50 | 25.00 |
| 70 | 17.10 | 16.80 | 21.10 | 25.30 | 27.00 | 30.00 |
| 71 | 17.10 | 16.80 | 21.10 | 25.30 | 27.00 | 30.00 |
| 72 | 17.10 | 16.80 | 21.10 | 25.30 | 27.00 | 30.00 |
| 73 | 17.10 | 16.80 | 21.10 | 25.30 | 27.00 | 30.00 |
| 74 | 17.10 | 16.80 | 21.10 | 25.30 | 27.00 | 30.00 |
| 75 & Over | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

**Retirement Rates (continued):**

*Police/Fire members with an effective date of membership before January 1, 2010:*

| | Retirement Rates (%) | | | | | |
|---|---|---|---|---|---|---|
| | Years of Service | | | | | |
| Age | 5 – 9 | 10 – 19 | 20 – 22 | 23 – 24 | 25 – 29 | 30 & Over |
| 40 | 0.00 | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 |
| 41 | 0.00 | 0.20 | 0.00 | 20.00 | 20.00 | 0.00 |
| 42 | 0.00 | 0.30 | 1.00 | 20.00 | 20.00 | 0.00 |
| 43 | 0.00 | 0.40 | 2.00 | 20.00 | 20.00 | 0.00 |
| 44 | 0.00 | 0.50 | 3.00 | 20.00 | 20.00 | 0.00 |
| 45 | 0.00 | 0.70 | 3.50 | 20.00 | 20.00 | 20.00 |
| 46 | 0.00 | 0.90 | 4.00 | 20.00 | 20.00 | 20.00 |
| 47 | 0.00 | 1.10 | 4.50 | 20.00 | 20.00 | 20.00 |
| 48 | 0.00 | 1.30 | 5.00 | 20.00 | 20.00 | 20.00 |
| 49 | 0.00 | 1.50 | 6.50 | 20.00 | 20.00 | 20.00 |
| 50 | 1.50 | 4.50 | 16.00 | 23.00 | 23.00 | 23.00 |
| 51 | 1.50 | 4.50 | 13.00 | 23.00 | 23.00 | 23.00 |
| 52 | 1.50 | 5.00 | 13.00 | 23.00 | 23.00 | 23.00 |
| 53 | 1.50 | 6.00 | 13.00 | 23.00 | 23.00 | 23.00 |
| 54 | 1.50 | 7.00 | 13.00 | 23.00 | 23.00 | 23.00 |
| 55 | 4.50 | 11.00 | 18.00 | 25.00 | 25.00 | 25.00 |
| 56 | 4.50 | 11.00 | 18.00 | 25.00 | 25.00 | 25.00 |
| 57 | 4.50 | 11.00 | 18.00 | 25.00 | 25.00 | 25.00 |
| 58 | 4.50 | 11.00 | 18.00 | 25.00 | 25.00 | 25.00 |
| 59 | 4.50 | 11.00 | 18.00 | 25.00 | 25.00 | 25.00 |
| 60 | 5.00 | 18.00 | 26.00 | 35.00 | 35.00 | 35.00 |
| 61 | 6.00 | 18.00 | 26.00 | 35.00 | 35.00 | 35.00 |
| 62 | 7.00 | 18.00 | 26.00 | 35.00 | 35.00 | 35.00 |
| 63 | 8.00 | 18.00 | 26.00 | 35.00 | 35.00 | 35.00 |
| 64 | 9.00 | 18.00 | 26.00 | 35.00 | 35.00 | 35.00 |
| 65 | 20.00 | 25.00 | 40.00 | 50.00 | 50.00 | 50.00 |
| 66 | 20.00 | 25.00 | 40.00 | 50.00 | 50.00 | 50.00 |
| 67 | 20.00 | 25.00 | 40.00 | 50.00 | 50.00 | 50.00 |
| 68 | 20.00 | 25.00 | 40.00 | 50.00 | 50.00 | 50.00 |
| 69 | 20.00 | 25.00 | 40.00 | 50.00 | 50.00 | 50.00 |
| 70 & Over | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

**Retirement Rates (continued):**

*Police/Fire members with an effective date of membership on or after January 1, 2010 and before July 1, 2015:*

| | Retirement Rates (%) | | | | | |
|---|---|---|---|---|---|---|
| | Years of Service | | | | | |
| Age | 5 – 9 | 10 – 19 | 20 – 24 | 25 – 27 | 28 – 29 | 30 & Over |
| 40 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 41 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 42 | 0.00 | 0.00 | 0.70 | 0.00 | 0.00 | 0.00 |
| 43 | 0.00 | 0.00 | 1.50 | 10.90 | 20.00 | 0.00 |
| 44 | 0.00 | 0.00 | 2.40 | 12.00 | 20.00 | 0.00 |
| 45 | 0.00 | 0.00 | 2.90 | 13.10 | 20.00 | 20.00 |
| 46 | 0.00 | 0.00 | 3.40 | 14.20 | 20.00 | 20.00 |
| 47 | 0.00 | 0.00 | 3.90 | 15.40 | 20.00 | 20.00 |
| 48 | 0.00 | 0.00 | 4.50 | 16.50 | 20.00 | 20.00 |
| 49 | 0.00 | 0.00 | 6.00 | 17.60 | 20.00 | 20.00 |
| 50 | 0.00 | 2.10 | 15.00 | 21.50 | 23.00 | 23.00 |
| 51 | 0.00 | 2.30 | 12.20 | 21.50 | 23.00 | 23.00 |
| 52 | 0.00 | 2.80 | 12.20 | 21.50 | 23.00 | 23.00 |
| 53 | 0.00 | 3.50 | 12.20 | 21.50 | 23.00 | 23.00 |
| 54 | 0.00 | 4.40 | 12.20 | 21.50 | 23.00 | 23.00 |
| 55 | 2.80 | 7.20 | 16.90 | 23.40 | 25.00 | 25.00 |
| 56 | 3.00 | 7.80 | 16.90 | 23.40 | 25.00 | 25.00 |
| 57 | 3.20 | 8.40 | 16.90 | 23.40 | 25.00 | 25.00 |
| 58 | 3.40 | 9.10 | 16.90 | 23.40 | 25.00 | 25.00 |
| 59 | 3.50 | 9.70 | 16.90 | 23.40 | 25.00 | 25.00 |
| 60 | 4.10 | 16.90 | 24.30 | 32.80 | 35.00 | 35.00 |
| 61 | 5.10 | 16.90 | 24.30 | 32.80 | 35.00 | 35.00 |
| 62 | 6.10 | 16.90 | 24.30 | 32.80 | 35.00 | 35.00 |
| 63 | 7.20 | 16.90 | 24.30 | 32.80 | 35.00 | 35.00 |
| 64 | 8.30 | 16.90 | 24.30 | 32.80 | 35.00 | 35.00 |
| 65 | 18.70 | 23.40 | 37.50 | 46.80 | 50.00 | 50.00 |
| 66 | 18.70 | 23.40 | 37.50 | 46.80 | 50.00 | 50.00 |
| 67 | 18.70 | 23.40 | 37.50 | 46.80 | 50.00 | 50.00 |
| 68 | 18.70 | 23.40 | 37.50 | 46.80 | 50.00 | 50.00 |
| 69 | 18.70 | 23.40 | 37.50 | 46.80 | 50.00 | 50.00 |
| 70 & Over | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

**Retirement Rates (continued):**

*Police/Fire members with an effective date of membership on or after July 1, 2015:*

| | Retirement Rates (%) | | | | |
|---|---|---|---|---|---|
| | Years of Service | | | | |
| Age | 5 – 9 | 10 – 19 | 20 – 24 | 25 – 29 | 30 & Over |
| 40 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 41 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 42 | 0.00 | 0.00 | 0.70 | 0.00 | 0.00 |
| 43 | 0.00 | 0.00 | 1.50 | 10.90 | 0.00 |
| 44 | 0.00 | 0.00 | 2.40 | 12.00 | 0.00 |
| 45 | 0.00 | 0.00 | 2.90 | 13.10 | 20.00 |
| 46 | 0.00 | 0.00 | 3.40 | 14.20 | 20.00 |
| 47 | 0.00 | 0.00 | 3.90 | 15.40 | 20.00 |
| 48 | 0.00 | 0.00 | 4.50 | 16.50 | 20.00 |
| 49 | 0.00 | 0.00 | 6.00 | 17.60 | 20.00 |
| 50 | 0.00 | 2.10 | 15.00 | 21.50 | 23.00 |
| 51 | 0.00 | 2.30 | 12.20 | 21.50 | 23.00 |
| 52 | 0.00 | 2.80 | 12.20 | 21.50 | 23.00 |
| 53 | 0.00 | 3.50 | 12.20 | 21.50 | 23.00 |
| 54 | 0.00 | 4.40 | 12.20 | 21.50 | 23.00 |
| 55 | 2.80 | 7.20 | 16.90 | 23.40 | 25.00 |
| 56 | 3.00 | 7.80 | 16.90 | 23.40 | 25.00 |
| 57 | 3.20 | 8.40 | 16.90 | 23.40 | 25.00 |
| 58 | 3.40 | 9.10 | 16.90 | 23.40 | 25.00 |
| 59 | 3.50 | 9.70 | 16.90 | 23.40 | 25.00 |
| 60 | 4.10 | 16.90 | 24.30 | 32.80 | 35.00 |
| 61 | 5.10 | 16.90 | 24.30 | 32.80 | 35.00 |
| 62 | 6.10 | 16.90 | 24.30 | 32.80 | 35.00 |
| 63 | 7.20 | 16.90 | 24.30 | 32.80 | 35.00 |
| 64 | 8.30 | 16.90 | 24.30 | 32.80 | 35.00 |
| 65 | 18.70 | 23.40 | 37.50 | 46.80 | 50.00 |
| 66 | 18.70 | 23.40 | 37.50 | 46.80 | 50.00 |
| 67 | 18.70 | 23.40 | 37.50 | 46.80 | 50.00 |
| 68 | 18.70 | 23.40 | 37.50 | 46.80 | 50.00 |
| 69 | 18.70 | 23.40 | 37.50 | 46.80 | 50.00 |
| 70 & Over | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

| | |
|---|---|
| **Retirement Rates (continued):** | The following categories of active members are assumed to receive an unreduced benefit when they retire: |

| Group (Active Members) | Years of Service |
|---|---|
| Regular members with an effective date of membership before January 1, 2010 | 28 – 29 years of service |
| Regular members with an effective date of membership on or after January 1, 2010 and before July 1, 2015 | 28 – 29 years of service |
| Police/Fire members with an effective date of membership before January 1, 2010 | 23 – 24 years of service |
| Police/Fire members with an effective date of membership on or after January 1, 2010 and before July 1, 2015 | 28 – 29 years of service |

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| **Retirement Age for Inactive Vested Members:** | Inactive vested members are generally assumed to retire at the earliest unreduced retirement age. The following categories of inactive vested members are assumed to retire immediately with an unreduced benefit: |

| Group (Inactive Vested Members) | Years of Service |
|---|---|
| Regular members with an effective date of membership before January 1, 2010 | 28 – 29 years of service |
| Regular members with an effective date of membership on or after January 1, 2010 and before July 1, 2015 | 28 – 29 years of service |
| Police/Fire members with an effective date of membership before January 1, 2010 | 23 – 24 years of service |
| Police/Fire members with an effective date of membership on or after January 1, 2010 and before July 1, 2015 | 28 – 29 years of service |

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| **Unknown Data for Members:** | Same as those exhibited by members with similar known characteristics. If not specified, Regular members are assumed to be female, and Police/Fire members are assumed to be male. |
| **Future Benefit Accruals:** | 1.0 year of service per year |
| **Definition of Active Member:** | All active members of NVPERS as of the valuation date |
| **Form of Payment:** | All active and inactive members are assumed to elect the unmodified option at retirement (Option 1). |

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| **Percent Married:** | Because pre-retirement death benefits are payable to a surviving beneficiary of an unmarried member, all members are assumed to have a beneficiary upon pre-retirement death.<br>The unmodified option is a straight life annuity except for “employer-pay” Police/Fire retirees, for whom it is a 50% joint and survivor annuity. Existing “employer-pay” Police/Fire retirees with an unmodified option who retired after June 30, 1981 and before July 1, 2011 have been valued assuming no surviving spouse, pending the results of an analysis and verification of spousal information.<br>75% of “employer-pay” Police/Fire male members and 65% of “employer-pay” Police/Fire female members are assumed to be married at retirement. |
| **Age of Spouse:** | Male members 2 years older than their spouses, female members 2 years younger than their spouses. Spouses are assumed to be of the opposite sex of the member. |
| **Dependent Children:** | The assumption for dependent children in the actuarial valuation is one dependent child who is 28 years younger than the member. |
| **<u>Actuarial Methods</u>** | |
| **Actuarial Cost Method:** | Entry Age Actuarial Cost Method. Entry Age is the age at the time the participant commenced employment. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are based on costs allocated as a level percentage of salary, with Normal Cost determined based on the plan provisions and benefit accrual rate applicable to that individual. |
| **Actuarial Value of Assets:** | Market value of assets less unrecognized returns in each of the last five years. Unrecognized return is equal to the difference between the actual market return and the expected return on the actuarial value, and is recognized over a five-year period. The actuarial value of assets is further limited to not less than 70% or greater than 130% of the market value of assets. |

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| **Amortization Policy:** | Effective June 30, 2022 the outstanding balance of all Regular amortization bases, except for the initial base dated June 30, 2004, were combined and re-amortized over a closed 20-year period, and the outstanding balance of all Police/Fire amortization bases, including the initial base dated June 30, 2004, were combined and re-amortized over a closed 20-year period.<br><br>Any new UAAL as a result of actuarial gains or losses or a change in actuarial assumptions or methods will be amortized over 20 years.<br><br>Unless an alternative amortization period is recommended by the Actuary and accepted by the Board based on the results of an actuarial analysis:<br>a) with the exception noted in b., below, the increase in UAAL as a result of any plan amendments will be amortized over a period of 15 years;<br>b) the increase in UAAL that would result from a temporary retirement incentive will be pre-funded by the participating employer(s).<br><br>UAAL layers shall be amortized over “closed” amortization periods so that the amortization period for each layer decreases by one year with each actuarial valuation.<br><br>UAAL layers shall be amortized as a level percentage of payroll so that the amortization amount in each year during the amortization period shall be expected to be a level percentage of covered payroll, taking into consideration the current assumption for general payroll increase.<br><br>If an overfunding exists (i.e., the total of all UAAL becomes negative so that there is a surplus), the contribution rate will be the greater of:<br>a) the rate resulting from a 30-year amortization of the surplus, and<br>b) the previous year’s rate, reduced by 25% of the difference between the previous rate and the rate resulting from a 30-year amortization of the surplus.<br><br>These amortization policy components will apply separately to each of the Regular and Police/Fire UAAL cost groups. |
| **Projected Compensation:** | Projected compensation for the year following the valuation date is calculated by increasing the compensation provided by System staff with the assumed rate of salary increase. For members with less than one year of service as of the valuation date, no salary increase assumption is applied to their annualized compensation. |
| **Phase-In:** | On October 21, 2021, the Board adopted a four-year phase-in of the cost impact of the assumption changes being made pursuant to the Experience Study dated September 10, 2021. One fourth of the cost impact attributable to the assumption changes, measured as of June 30, 2021 separately for each cost group, will be recognized in each of the valuations as of June 30, 2021, 2022, 2023, and 2024. |
| **Changes in Actuarial Assumptions:** | There have been no changes in actuarial assumptions since the last valuation.<br><br>The amortization policy was updated as described above. |

## Exhibit 3: Summary of Plan Provisions

This exhibit summarizes the major provisions of the Nevada Public Employees' Retirement Act included in the valuation. It is not intended to be, nor should it be interpreted as, a complete statement of all plan provisions.

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| **Plan Year:** | July 1 through June 30 |
| **Service Retirement:** | |
| | **For members with an effective date of membership before January 1, 2010:** |
| *Requirement for Regular Members* | Age 65 with five years of service, or age 60 with ten years of service, or at any age with 30 years of service. |
| *Requirement for Police/Fire Members* | Age 65 with five years of service, or age 55 with ten years of Police/Fire service, or age 50 with 20 years of Police/Fire service, or at any age with 25 years of Police/Fire service. |
| *Benefit Amount* | 2.67% of final average compensation (average of 36 highest consecutive months) per year of service earned on or after July 1, 2001 plus 2.50% of final average compensation per year of service before July 1, 2001. Maximum benefits are 90% of average compensation for individuals who became members before July 1, 1985 and 75% of average compensation for individuals who became members after June 30, 1985. |
| | **For members with an effective date of membership on or after January 1, 2010:** |
| *Requirement for Regular Members* | Age 65 with five years of service, or age 62 with ten years of service, or at any age with 30 years of service. |
| *Requirement for Police/Fire Members* | Age 65 with five years of service, or age 60 with ten years of Police/Fire service, or age 50 with 20 years of Police/Fire service, or at any age with 30 years of Police/Fire service. For Police/Fire members with an effective date of membership on or after July 1, 2015, purchased service generally may not be counted toward years needed to attain eligibility. |
| *Benefit Amount* | 2.50% of final average compensation (average of 36 highest consecutive months) per year of service. Maximum benefits are 75% of average compensation. |
| | **For Regular members with an effective date of membership on or after July 1, 2015:** |
| *Requirement* | Age 65 with five years of service, or age 62 with ten years of service, or age 55 with 30 years of service, or any age with 33 1/3 years of service. Purchased service generally may not be counted toward years needed to attain eligibility. |
| *Benefit Amount* | 2.25% of final average compensation (average of 36 highest consecutive months) per year of service. Maximum benefits are 75% of average compensation. |
| **Limitation on Compensation Used in Determining Retirement Benefits:** | For any member with an effective date of membership on or after July 1, 2015, compensation used in determining retirement benefits is limited to $200,000. This limit shall be adjusted annually based on CPI. |

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| **Early Retirement:** | |
| *Requirement* | Any age with five years of service. |
| *Benefit Amount* | **For members with an effective date of membership before January 1, 2010:**<br>Accrued retirement benefit reduced 4% per year for each year that the member is under the age required for service retirement.<br>**For members with an effective date of membership on or after January 1, 2010:**<br>Accrued retirement benefit reduced 6% per year for each year that the member is under the age required for service retirement. |
| **Disability:** | |
| *Requirement* | Five years of service and totally unable to perform current job or any comparable job for which the member is qualified by training and experience, because of injury or illness of a permanent nature, provided the member is in the employ of a participating employer at the time of application for disability retirement. |
| *Benefit Amount* | Accrued service retirement benefit without reduction for age. (System disability benefit is reduced for other benefits received on account of same disability, if such other benefits are financed by a Nevada public employer, to the extent that total disability benefits would otherwise exceed 100% of final average compensation.) |
| **Vesting:** | |
| *Requirement* | Any age with five years of service, provided the member has not received a refund of member contributions. |
| *Benefit Amount* | Accrued service retirement benefit payable upon attainment of age 65 if member has between five and ten years of service at termination, or upon attainment of the age required for service retirement if member has ten or more years of service at termination. |

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| **Spouse's Pre-Retirement Death Benefit:** | |
| *Requirement* | Eligible survivors of an active member who dies receive survivor benefits if: (a) the deceased member had two years of service in the 2½ years immediately preceding death; or (b) the deceased member had ten years of service; or (c) death was caused by occupational disease or a service-connected accident regardless of the deceased member's length of service; or (d) death occurred within 18 months after termination of employment where mental or physical condition required the termination; or (e) death occurred while member was on leave of absence for training and member met requirements of (a) at time such leave began. |
| *Benefit Amount* | a) Unmarried children under age 18, or age 18 to 23 and attending an accredited school on a full-time basis: $400 per month per child. Payments cease upon attaining age 18 or age 23 if full-time student, unless child is incapacitated; or upon marriage, adoption, or death.<br>b) Spouse, or survivor beneficiary of an unmarried member, of deceased member with fewer than ten years of service (and at least two years of service in the last 2½ years): $450 per month. Payments cease upon death.<br>c) Spouse, or survivor beneficiary of an unmarried member, of deceased member with ten but fewer than 15 years of service: greater of $450 per month or Option 3 benefit that would have been payable if deceased member had retired on date of death without reduction for early payment. Payments cease upon death.<br>d) Spouse, or survivor beneficiary of an unmarried member, of deceased member with 15 or more years of service: greater of $450 per month or Option 2 benefit that would have been payable if deceased member had retired on date of death without reduction for early payment. Payments cease upon death.<br>e) Spouse, or survivor beneficiary of an unmarried member, of deceased member eligible to retire with respect to both age and service: greater of $450 per month, Option 2 or Option 3 benefit that would have been payable if deceased member had retired on death, without reduction for early payment. Payments cease upon death.<br>f) Dependent parents: $400 per month each, provided there are no other eligible survivors. Payments cease upon death.<br>g) Lump sum payment option: a spouse, or survivor beneficiary of an unmarried member, may waive right to monthly survivor benefits and instead receive a lump sum refund of deceased member's contributions plus half the contributions made under the Employer-Pay provisions, provided no other person is eligible for survivor benefits. |
| *Benefit Limitations* | Total survivor benefits, including any other survivor benefit received from any other source, shall not exceed final average compensation (a) if the other benefit was provided or purchased by a public employer, except for lump sum payments under a group insurance program; and (b) to the extent that the total of the allowance and the other benefit would otherwise exceed the deceased member's final average compensation. |

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| **Spouse's Pre-Retirement Death Benefit (continued):** | |
| *Benefit for Certain Spouses* | A member who begins receiving service or disability retirement benefits from the Police/Fire members retirement fund after June 30, 1981, is eligible to receive an unreduced service retirement allowance. Upon the death of such a retired member, a spouse who was the retired member's spouse at the time of retirement is entitled to receive 50% of the unreduced allowance; this benefit is payable to the surviving spouse beginning at age 50. A surviving spouse is not eligible to receive this 50% spouse's benefit if the retired member elects an optional benefit form at the time of retirement. Service performed after July 1, 1981, in positions other than as a Police/Fire member, except military service, is not credited toward this 50% spouse's benefit. Existing "employer-pay" Police/Fire retirees who retired after June 30, 1981 and before July 1, 2011 have been valued assuming no surviving spouse, pending the results of an analysis and verification of spousal information. |
| **Benefit for Spouses of Members Killed in the Line of Duty:** | The spouse of a member who is a police officer or firefighter killed in the line of duty on or after July 1, 2013, or the spouse of any other member killed in the course of employment on or after July 1, 2013, is entitled to receive a monthly allowance equal to the greater of:<br>a) 50% of the salary of the member on the date of the member's death; or<br>b) 100% of the retirement allowance that the member was eligible to receive based on the member's years of service obtained before the member's death without any reduction for age for the deceased member.<br>The spouse may elect to receive this benefit in lieu of any other available death benefit.<br>This benefit is also available to a survivor beneficiary of an unmarried member. |

# Section 4: Actuarial Valuation Basis

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| **Post-Retirement Benefit Increases:** | |
| *Benefit Amount* | **For members with an effective date of membership before January 1, 2010:**<br>The lesser of<br>a) 2% per year following the third anniversary of the commencement of benefits, 3% per year following the sixth anniversary, 3 ½% per year following the ninth anniversary, 4% per year following the twelfth anniversary and 5% per year following the fourteenth anniversary, or<br>b) The annual benefit increase is equal to the average percentage increase in the Consumer Price Index (or other Board approved index) for the three preceding years.<br>In any event, a member's benefit must be increased by the percentages in paragraph (a) if their benefit has not been increased at a rate greater than or equal to the average of the Consumer Price Index (All Items) (or other Board approved index) for the period between retirement and the date of increase.<br>**For members with an effective date of membership on or after January 1, 2010 and before July 1, 2015:**<br>Same as above, except the increases do not exceed 4% per year.<br>**For members with an effective date of membership on or after July 1, 2015:**<br>2% per year following the third through fifth anniversaries of the commencement of benefits;<br>2 ½% per year following the sixth through eighth anniversaries.<br>On succeeding anniversaries the annual increase shall be the lesser of 3% or the CPI for the preceding calendar year. |
| **Optional Benefit Forms** | Retirees may elect one of the following forms of payment:<br>• Option 1 (unmodified) – Single life annuity except for:<br>Police/Fire members who contribute under the "employer pay" contribution plan, Option 1 is a 50% joint and survivor annuity<br>• Option 2 – 100% joint and survivor<br>• Option 3 – 50% joint and survivor<br>• Option 4 – 100% joint and survivor, with payments to beneficiary commencing at age 60<br>• Option 5 – 50% joint and survivor, with payments to beneficiary commencing at age 60<br>• Option 6 – Specific sum option up to 100% of allowance paid to retiree<br>• Option 7 – Specific sum option up to 100% of allowance paid to retiree, with payments to beneficiary commencing at age 60<br>If the beneficiary predeceases the retired member, the optional allowance reverts to the unmodified allowance. |

# Section 4: Actuarial Valuation Basis

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|---|---|
| **Contribution Rates:** | For the fiscal years July 1, 2021 through June 30, 2023, statutory contribution rates as a percentage of compensation are as follows: |

| | Regular | Police/Fire |
|---|---|---|
| Employer-Pay | 29.75% | 44.00% |
| Employee/Employer-Pay | 15.50% / 15.50% | 22.75% / 22.75% |

Total contribution rates are adjusted at the beginning of each odd-numbered fiscal year, based on the actuarially determined rates indicated in the actuarial valuation report for the immediately preceding year. Rates are only adjusted upward if the new rates are more than 0.50% higher than the existing rate for Employer-Pay and if the new rates (for each the employee and the employer) are more than 0.25% higher for Employee/Employer. Rates are only adjusted downward if the new rates are more than 2.00% lower than the existing rate for Employer-Pay (and adjusted only by the amount in excess of 2.00%) and if the new rates (for each the employee and the employer) are more than 1.00% lower than the existing rate for Employee/Employer (and adjusted only by the amount in excess of 1.00%). Rates for each the employee and the employer are rounded to the nearest 0.25% of payroll.

For the valuations as of June 30, 2021, 2022, and 2023, the required contribution rates used in this determination were lowered by the four-year phase-in of the cost impact of the 2021 assumption changes.

Under the Employer-Pay provisions, the contributions made by employers on behalf of members are not credited to member accounts and are not refunded upon termination. For members covered by the Employer-Pay provisions, final average compensation is increased by half the total contribution made by the public employer and may not be less than it would have been if contributions had been made by the member and the employer separately.

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| **Changes in Plan Provisions:** | There were no changes in plan provisions since the last actuarial valuation. |

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