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State Police Retirement System of New Jersey

Actuarial Valuation Report as of July 1, 2024

Produced by Cheiron

February 2025

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Letter of Transmittal

February 5, 2025

Board of Trustees
State Police Retirement System of New Jersey
State of New Jersey
Department of the Treasury
Division of Pension and Benefits, CN 295
Trenton, NJ 08625-0295

Dear Board Members:

We have performed the July 1, 2024 Actuarial Valuation of the State Police Retirement System of New Jersey (SPRS or System).

In preparing our report, we relied on information (some oral and some written) supplied by the Division of Pensions and Benefits (DPB). This information includes, but is not limited to, plan provisions, employee data, and financial information. We performed an informal examination of the obvious characteristics of the data for reasonableness and consistency in accordance with Actuarial Standard of Practice No. 23, Data Quality.

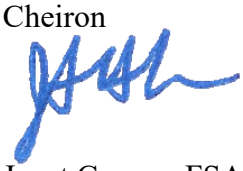
The results of this report are only applicable to the System's contribution for Fiscal Year Ending 2026. Future results may differ significantly from the current results presented in this report due to such factors as the following: plan experience differing from that anticipated by the assumptions; changes in assumptions; and changes in plan provisions or applicable law.

The demographic and economic (other than the investment rate of return) actuarial assumptions are based on the recommended assumptions from the July 1, 2018 – June 30, 2021 Experience Study, approved by the Board of Trustees on November 22, 2022. The investment rate of return assumption of 7.00% is based on the recommendation of the State Treasurer.

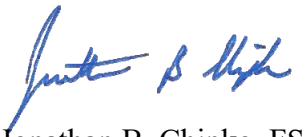
This report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices and our understanding of the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board as well as applicable laws and regulations. Furthermore, as credentialed actuaries we meet the Qualification Standards of the American Academy of Actuaries to render the opinion contained in this report. This report does not address any contractual or legal issues. We are not attorneys, and our firm does not provide any legal services or advice.

This actuarial valuation report was prepared exclusively for SPRS, the DPB and the System auditors for the purposes described herein and in preparing financial reports in accordance with applicable law and annual report requirements. Other users of this report are not intended users as defined in the Actuarial Standards of Practice, and Cheiron assumes no duty or liability to such other users.

Sincerely,
Cheiron



Janet Cranna, FSA, FCA, MAAA, EA
Principal Consulting Actuary



Jonathan B. Chipko, FSA, MAAA, EA
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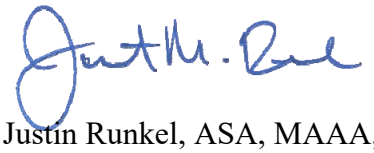


Justin Runkel, ASA, MAAA, EA
Consulting Actuary

SECTION I – BOARD SUMMARY

The primary purpose of the actuarial valuation and this report is to disclose the following as of the valuation date:

- The financial condition of the State Police Retirement System of New Jersey,
- Past and expected future trends and risks to the System's financial condition, and
- The State's Pension Contribution for the Fiscal Year Ending (FYE) 2026.

In this Section we present a summary of the principal valuation results. This includes the basis upon which the July 1, 2024 valuation was completed and an examination of the current financial condition of the System. In addition, we present a review of the key historical trends as well as the System's projected financial outlook. The stress testing in accordance with the requirements set out in Chapter 277, P. L. 2017 follows in Section II.

This report does not include reporting requirements under GASB Statements No. 67 and 68 which were provided in separate reports.

Results shown in this report for years prior to July 1, 2018 are based on the prior actuary's valuation reports.

SECTION I – BOARD SUMMARY

Valuation Basis

The July 1, 2024 valuation results are based on the same actuarial methods and assumptions as used in the July 1, 2023 valuation. The demographic and economic assumptions, aside from the valuation interest rate, are based on the July 1, 2018 – June 30, 2021 Experience Study, which was approved by the Board of Trustees on November 22, 2022. The valuation is based on a 7.00% interest rate as recommended by the State Treasurer.

This report is prepared using census data, plan provisions, and financial information as of July 1, 2024 provided by the Division of Pensions and Benefits, and does not reflect any changes in the membership, plan provisions, or assets that occur after the valuation date. Events following that date are not reflected in this report. Actual experience, both demographic and economic, will be reflected in subsequent valuations as experience emerges.

The Appropriations Act of 2024 set the State pension contribution equal to the Statutory amount of $220,326,450 rounded to the nearest thousand, or $220,326,000 (100.00% of the Statutory contribution).

Chapter 83, P.L. 2016 calls for the State to make the required pension contributions on a quarterly basis in each fiscal year according to the following schedule: at least 25% by September 30, at least 50% by December 31, at least 75% by March 31, and at least 100% by June 30. As such, contributions are assumed to be made on a quarterly basis with the first contribution 15 months after the associated valuation date.

The valuation excludes assets and liabilities under the Non-Contributory Group Insurance Premium Fund. The Non-Contributory Group Insurance premiums are separately funded on a pay-as-you-go basis.

SECTION I – BOARD SUMMARY

Key Results

The following Table I-1 summarizes the key results of the valuation with respect to the System's membership, assets and liabilities, and contributions. The results are presented and compared for both the current and prior year.

Table I-1
Summary of Key Valuation Results

Valuation Date Fiscal Year Ending (FYE)	July 1, 2024 2026	July 1, 2023 2025	% Change
Member Data			
Contributing Actives	3,185	3,147	1.2%
Non-Contributing Actives	78	71	9.9%
Deferred Vested Members	0	0	N/A
Retirees and Beneficiaries[1]	3,720	3,671	1.3%
Total Members	6,983	6,889	1.4%
Appropriation Payroll[2]	$ 388,027,317	$ 366,982,156	5.7%
Annual Retirement Allowances	263,021,839	255,683,589	2.9%
Assets and Liabilities			
Actuarial Liability	$ 4,461,205,210	$ 4,299,450,412	3.8%
Actuarial Value of Assets (AVA)[3]	2,536,561,144	2,388,132,876	6.2%
Unfunded Actuarial Liability/(Surplus)	$ 1,924,644,066	$ 1,911,317,536	0.7%
Funded Ratio (AVA)	56.9%	55.5%	1.4%
Market Value of Assets (MVA)[3]	$ 2,537,848,295	$ 2,319,895,327	9.4%
Unfunded Actuarial Liability/(Surplus)	$ 1,923,356,915	$ 1,979,555,085	-2.8%
Funded Ratio (MVA)	56.9%	54.0%	2.9%
Contribution Amounts			
State Normal Cost at End of Year	$ 70,773,269	$ 66,643,070	6.2%
Amortization Payment of UAL	165,154,703	161,622,975	2.2%
Total Statutory Contribution for FYE	$ 235,927,972	$ 228,266,045	3.4%
Expected Percent Appropriated	100.00%	100.00%	0.0%
Net State Contribution	$ 235,927,972	$ 228,266,045	3.4%

[1] Retiree and Beneficiary counts do not include QDROs
[2] Annual compensation for contributing actives only
[3] Includes discounted State appropriations receivable

SECTION I – BOARD SUMMARY

The key results of the July 1, 2024 actuarial valuation are as follows:

- The Statutory contributions increased from $228.3 million for FYE 2025 to $235.9 million for FYE 2026 prior to any State appropriation adjustments.
- The funded ratio, the ratio of actuarial asset value to liabilities, increased from 55.5% as of July 1, 2023 to 56.9% as of July 1, 2024. Using the market value of assets, the funded ratio increased from 54.0% to 56.9%.
- The unfunded actuarial liability used in determining the Statutory contribution (excess of actuarial liability over the actuarial value of assets) increased from $1,911.3 million as of July 1, 2023 to $1,924.6 million as of July 1, 2024.
- During the year there was a total actuarial experience loss of $35.3 million, consisting of an asset loss of $1.4 million and a liability loss of $33.9 million. The rate of return on the actuarial value of assets was 7.01% compared to the expected return of 7.00%. The asset loss occurred because this small investment gain was offset by the administrative expense loss.

SECTION I – BOARD SUMMARY

Recent Trends

Although most of the attention given to the valuation reflects the most recently computed unfunded actuarial liability, funded ratio, and contribution amounts, each valuation is merely a snapshot of the long-term progress of a pension fund. It is important to take a step back from these latest results and view them in the context of the System's recent history. Below, we present a series of graphs which display key factors in the valuations of the last ten years. Additionally, in Appendix D we provide the numerical values of the historical unfunded actuarial liability, funded ratio, and contribution amounts.

In reviewing the historic trends over the first half of the ten-year period, the System's declining funded status coupled with significant negative net cash flow highlights the potential risk of running out of assets to pay benefits unless the State consistently contributes the full amount of the Statutory required contributions.

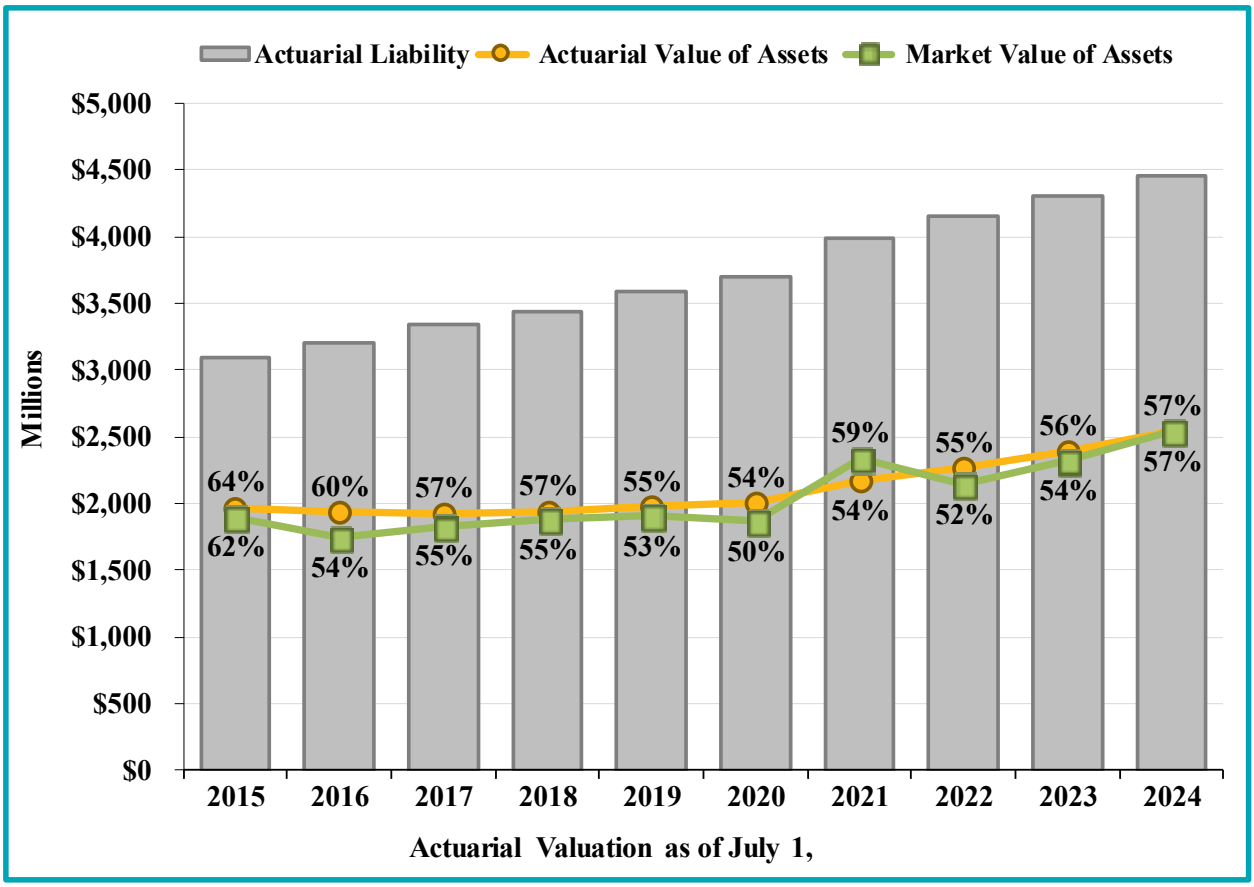
SECTION I – BOARD SUMMARY

Assets and Liabilities

In the following graph, the gray bars represent the Actuarial Liability (AL). The green line is the Market Value of Assets (MVA) and the gold line is the Actuarial Value of Assets (AVA). The System's funded ratio (ratio of assets to actuarial liability), on both a MVA basis and an AVA basis, is shown next to the respective assets lines.

The liability has been increasing over time in part due to additional benefit accruals but also due to decreases in the discount rate and other assumption changes. The large liability increase in 2021 was due to the reduction in the assumed rate of investment return from 7.30% to 7.00% as well as larger than expected salary increases.

Until 2021, the funded ratio had been decreasing over time due to decreases in the discount rate and because the State had not been making the full Statutory contribution. The funded ratio reversed that trend in 2021 and increased due to higher-than-expected asset returns and State contributions in excess of the Statutory contribution amount. Since 2021, the funded ratio on an actuarial basis increased each year as the State continued to contribute the full Statutory contribution amount.



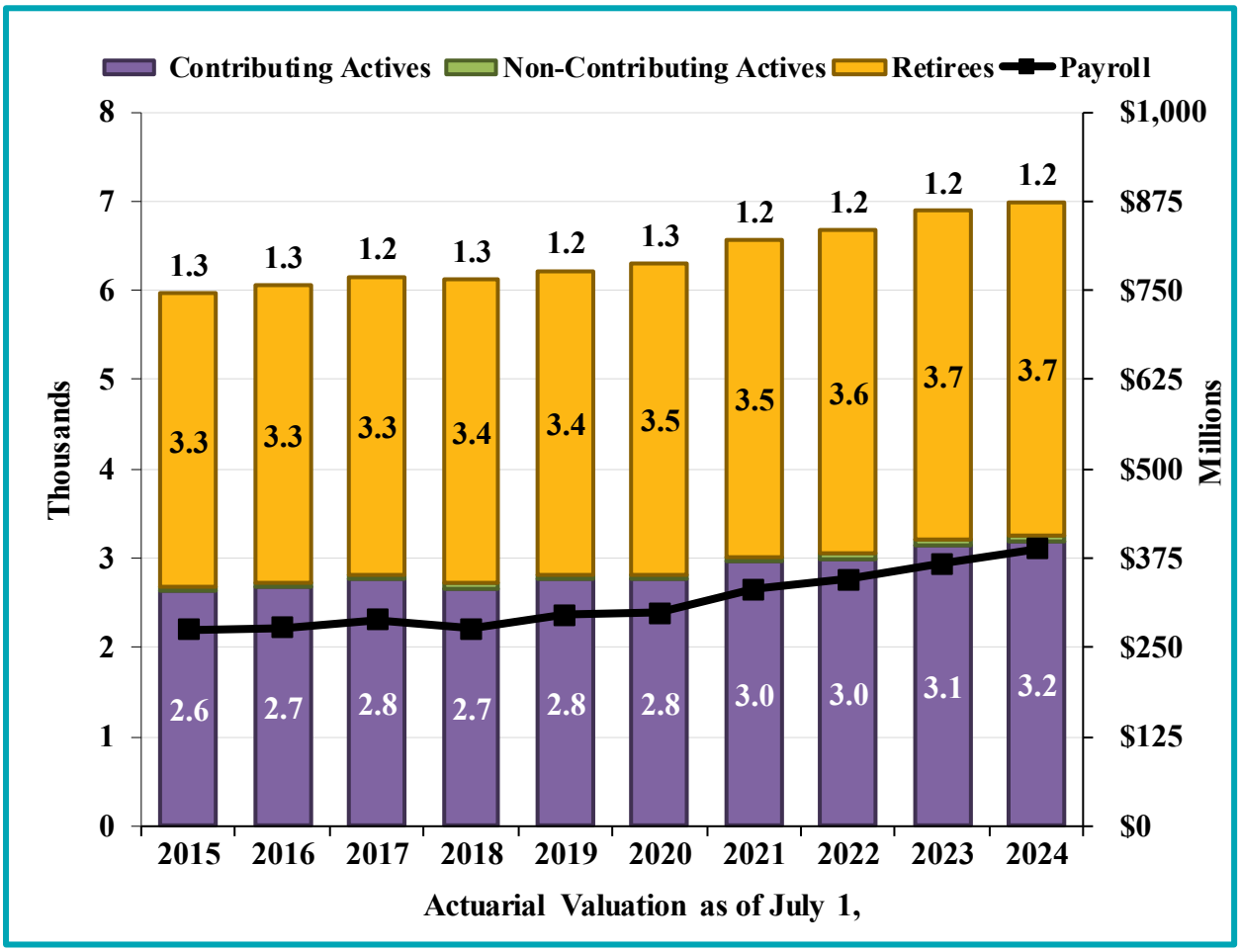
The information above is based on the final actuarial valuation reports for the given years. The amounts do not reflect differences between the discounted State appropriations receivable and the actual State contribution amounts that became known after the issuance of the reports.

SECTION I – BOARD SUMMARY

Membership Trends

The graph below shows the membership counts of the System for the last ten valuations. The numbers which appear above each bar represent the ratio of the number of inactive members to active members at each valuation date and provide a measure of the maturity of the System. We refer to this ratio as the *support ratio.* The support ratio has remained relatively level during this period. As more of the liability moves from actives to inactives, the System will experience more volatility in contribution rates when actuarial gains and losses are recognized.

The numbers that are shown in the middle of the bars represent the number of actives or inactive members in thousands. The black line represents the appropriation payroll over the period and corresponds with the scale on the right. For valuation years prior to 2018, appropriation payroll includes payroll for non-contributing actives and the appropriation payroll beginning in 2018 excludes the payroll for non-contributing actives.

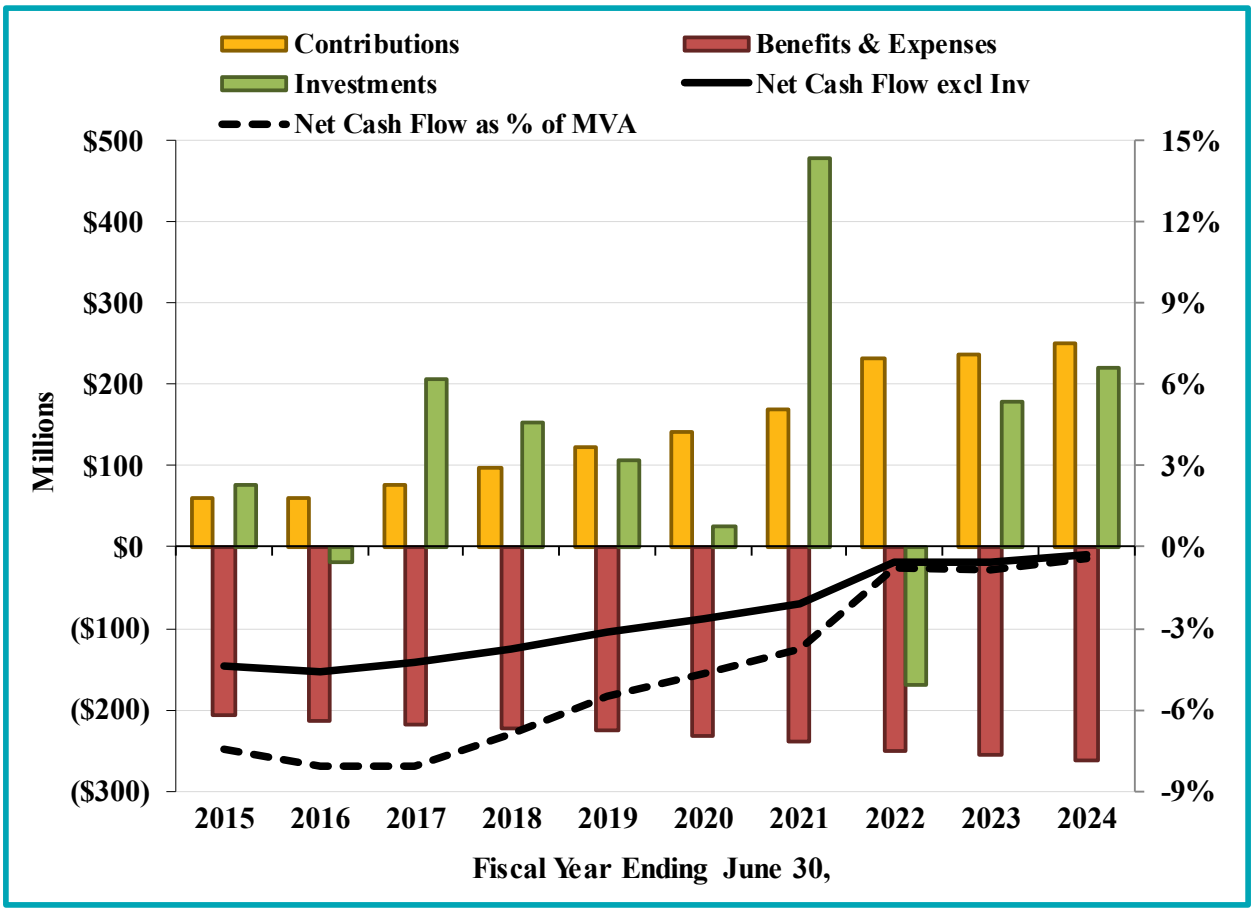


SECTION I – BOARD SUMMARY

Cash Flows

The following graph shows the System net cash flow (contributions less benefit payments and expenses) at the end of each fiscal year. For the entire period shown, the net cash flow, which excludes investment return, has been negative. This illustrates that contributions have not been sufficient to cover benefits and expenses in any years over the past decade. A major implication of negative cash flow is that the difference each year must be met first from cash generated by investments and then be paid out of the principal assets, representing additional risk for the System if investments need to be sold in a down market to cover benefit payments.

The black dotted line shows the net cash flow as a percent of the market assets and goes with the right-hand axis. As seen in the graph below, the negative net cash flow has been gradually improving from -8.1% for FYE 2017 to -0.4% for FYE 2024. The significant improvement in the negative cash flow is the result of the increase in the State appropriation percentage.



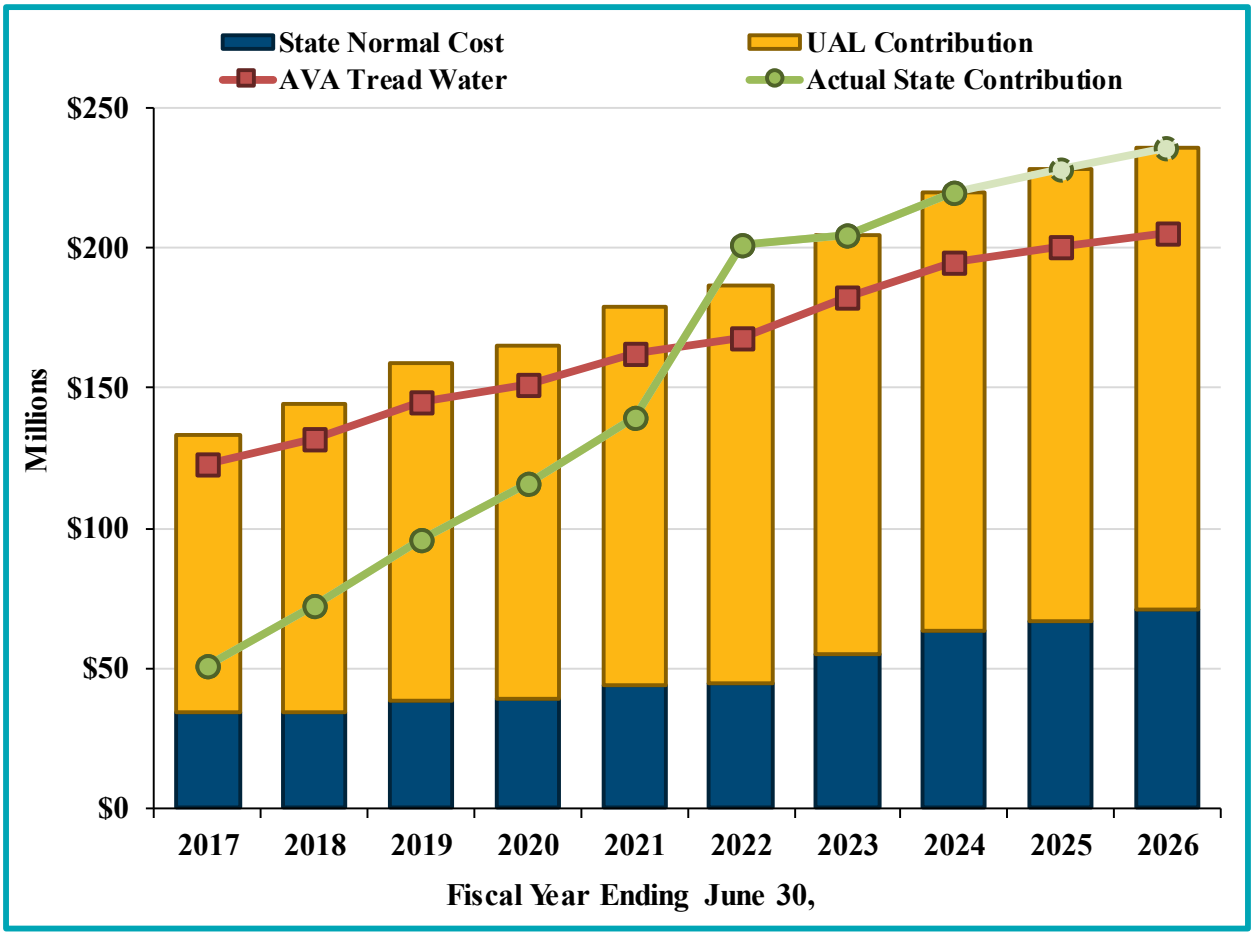
SECTION I – BOARD SUMMARY

Contributions

This graph shows the historical trends for the State contributions. The Statutory contributions are comprised of the State normal cost (blue bars) and the amortization of the UAL (gold bars). The green line shows the actual State contributions over the period. For FYE 2025 and 2026, the green line has a lighter shade to indicate that these are expected, rather than actual, contributions. The expected contributions are based on the anticipated appropriations shown in Table I-1.

The red line is the **tread water line**, which is the State normal cost plus the interest on the UAL. The tread water line shows the minimum contributions needed to avoid an increase in the UAL.

The graph shows that prior to 2022 not only had the State been making contributions less than required by Statute, but that the State contributions had been significantly below the tread water line. When contributions are lower than the normal cost plus interest on the UAL, the UAL is expected to grow from one year to the next. In 2022, actual State contributions were greater than the tread water amount for the first time during the period. State contributions are expected to be greater than the tread water amount going forward as the State continues to contribute 100% of the Statutory contribution.



SECTION I – BOARD SUMMARY

Projected Future Outlook

The analysis of projected financial trends is perhaps the most important component of the valuation. This has been recognized by the State Legislature in its adoption of Chapter 277, P.L. 2017 requiring the System to have stress testing performed annually. The graphs presented in this section show the expected progress of the System's funded status over the next 30 years, measured in terms of the expected funded ratios and State contributions assuming that the System is ongoing.

While experience will not conform exactly to the assumptions every year, the trends reflect reasonable expectations. As a result, in addition to the baseline projection in this section, we provide additional **stress testing** in Section II based on varying investment returns in the future. It is our opinion that the stress testing analyses shown in Section II meet the requirements of Chapter 277, P. L. 2017.

The projections assume a constant active population. As members retire, terminate and die based on the current valuation assumptions, it is assumed that new members will replace them based on characteristics (age/gender/salary) similar to recent new members.

Additional assumptions used for these projections, including the investment rate of return for each subsequent valuation as recommended by the State Treasurer, as well as the anticipated appropriation percentages, are shown in Appendix B.

Baseline Scenario

The baseline projection shows the outcome if all actuarial assumptions, including the long-term rate of return assumption of 7.00%, as recommended by the State Treasurer, are exactly met. For each scenario we show two graphs.

The top graph compares the Market Value of Assets (green line) and the Actuarial or smoothed Value of Assets (gold line) to the System's Actuarial Liabilities (gray bars). In addition, at the top of the graph, we show the System's funded ratio on an Actuarial Value of Assets basis (ratio of Actuarial Value of Assets to Actuarial Liabilities). The years shown in the graph signify the valuation date as of July 1 of the labeled year.

The System's funded ratio on an Actuarial Value of Assets basis is projected to steadily increase to 100% by 2054. The estimated period to fully amortize the UAL is longer than the Statutory amortization period due to the timing of contributions during the fiscal year and the lack of a dedicated administrative expense contribution.

The bottom graph shows the contributions by fiscal year. The member contributions are in purple and the State contributions are in gold.

The projection assumes the State appropriates 100% of the Statutory contribution in FYE 2026 and each year thereafter. Both the appropriated State contributions and the member contributions are shown in dollar amounts.

SECTION I – BOARD SUMMARY

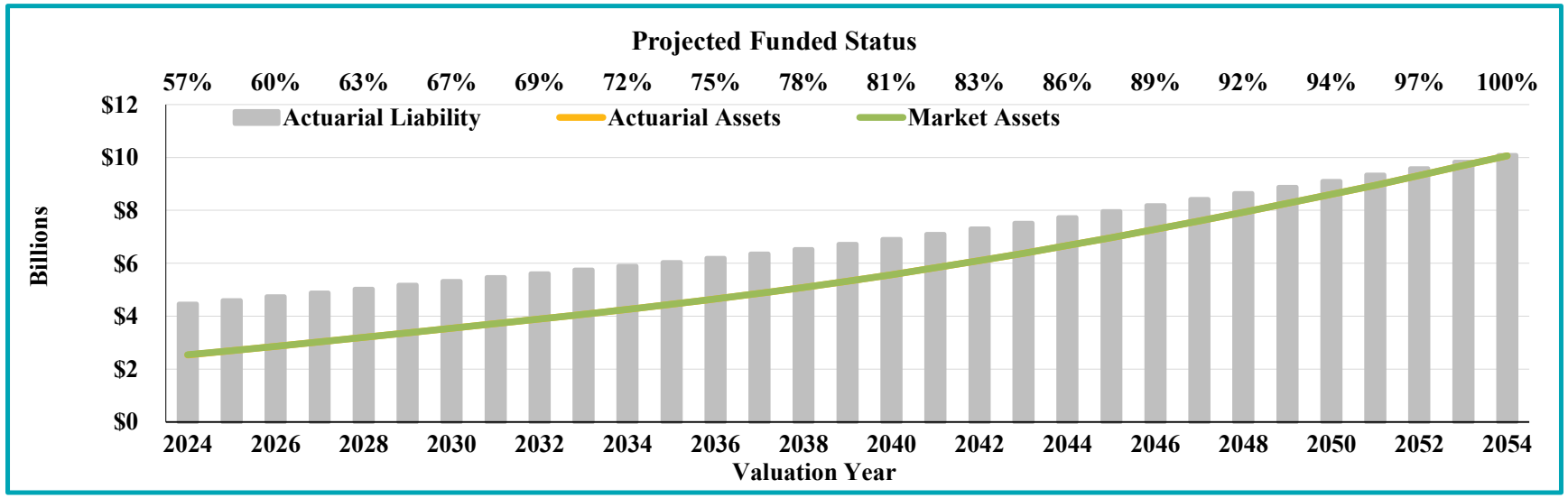
The dashed black line in the bottom graph shows the gross normal cost. The difference between the dashed black line and the purple bar is the State portion of the normal cost.

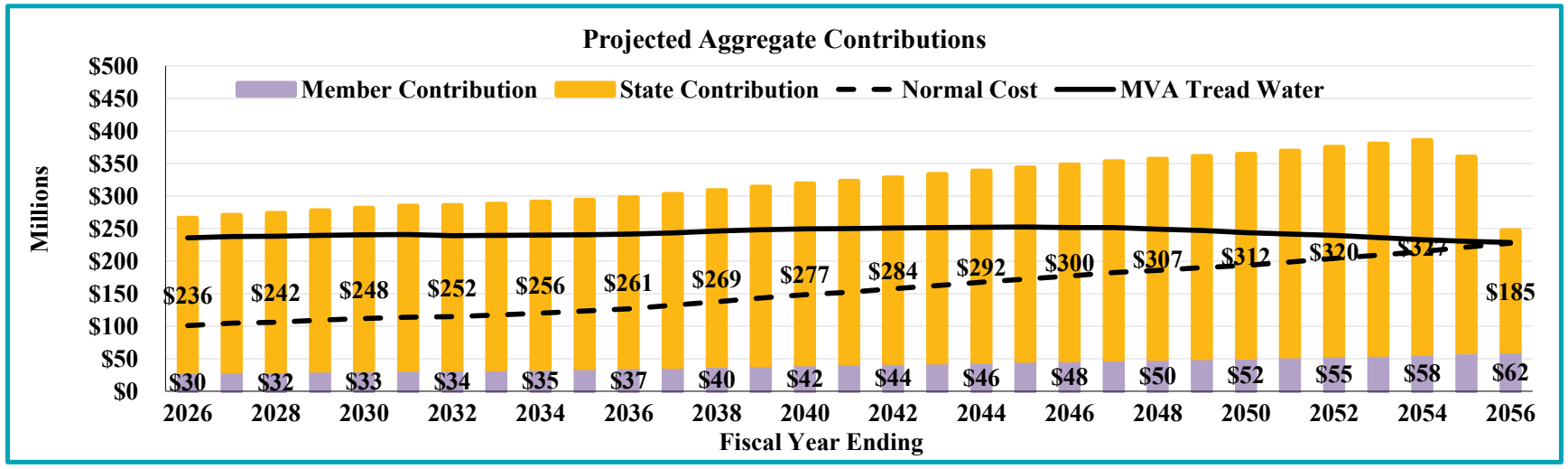
The solid black line is the tread water line based on the Actuarial Value of Assets. Because the tread water metric equals the normal cost plus interest on the UAL, the difference between the solid black line and the dashed black line is the interest on the UAL. When contributions fall below the solid black line, the UAL grows and the funded ratio falls. When the contributions exceed the solid line, as is the case throughout the projection period, the UAL is expected to decrease and the funded ratio is expected to increase.

The Statutory contribution gradually increases over the projection period until the plan approaches 100% in the final years of the projection. Because the appropriated amount equals the Statutory contribution for all projection years, the contributions pay down the UAL and the tread water line decreases relative to the Statutory contribution.

SECTION I – BOARD SUMMARY

Baseline: 7.0% return for all years





SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

Actuarial valuations are based on a set of assumptions about future economic and demographic experience. These assumptions represent a reasonable estimate of future experience, but actual future experience will undoubtedly be different and may be significantly different. This section of the report is intended to identify the primary risks to the System, provide some background information about those risks, and provide an assessment of those risks.

Identification of Risks

The fundamental risk to the System is that the contributions needed to pay the benefits become unaffordable. While there are a number of factors that could lead to contribution amounts becoming unaffordable, we believe the primary risks are:

- Investment risk,
- Assumption change risk, and
- Contribution risk.

Other risks that we have not identified may also turn out to be important.

Investment risk is the potential for investment returns to be different than expected. Lower investment returns than anticipated will increase the unfunded actuarial liability necessitating higher contributions in the future unless there are other gains that offset these investment losses. The potential volatility of future investment returns is determined by the System's asset allocation, and the affordability of the investment risk is determined by the amount of assets invested relative to the size of the plan sponsor or other contribution base.

Assumption change risk is the potential for the environment to change such that future valuation assumptions are different than the current assumptions. For example, declines in interest rates over the last three decades resulted in higher investment returns for fixed income investments, but lower expected future returns necessitating either a change in investment policy, a reduction in discount rate, or some combination of the two. Assumption change risk is an extension of the other risks identified, but rather than capturing the risk as it is experienced, it captures the cost of recognizing a change in environment when the current assumption is no longer reasonable.

Contribution risk is the potential for actual future contributions to deviate from expected future contributions. There are different sources of contribution risk ranging from the sponsor choosing to not make contributions in accordance with the funding policy to material changes in the contribution base (e.g., covered employees, covered payroll, sponsor revenue) that affect the amount of contributions the System can collect.

The chart below shows the components of changes in the Unfunded Actuarial Liability (UAL) for the System over the last ten years, including investment gains and losses on the Actuarial Value of Assets, liability gains and losses, assumption and plan changes, and contributions compared to the tread water level of contributions (normal cost plus interest on the UAL.) The net UAL change is shown by the dark blue line. Table II-1 below the chart summarizes the changes in the UAL over the last ten years.

These total changes in UAL support our identification of investment returns, assumption changes, and contributions as the primary risks to the System.

SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

Historical Changes in UAL 2015-2024

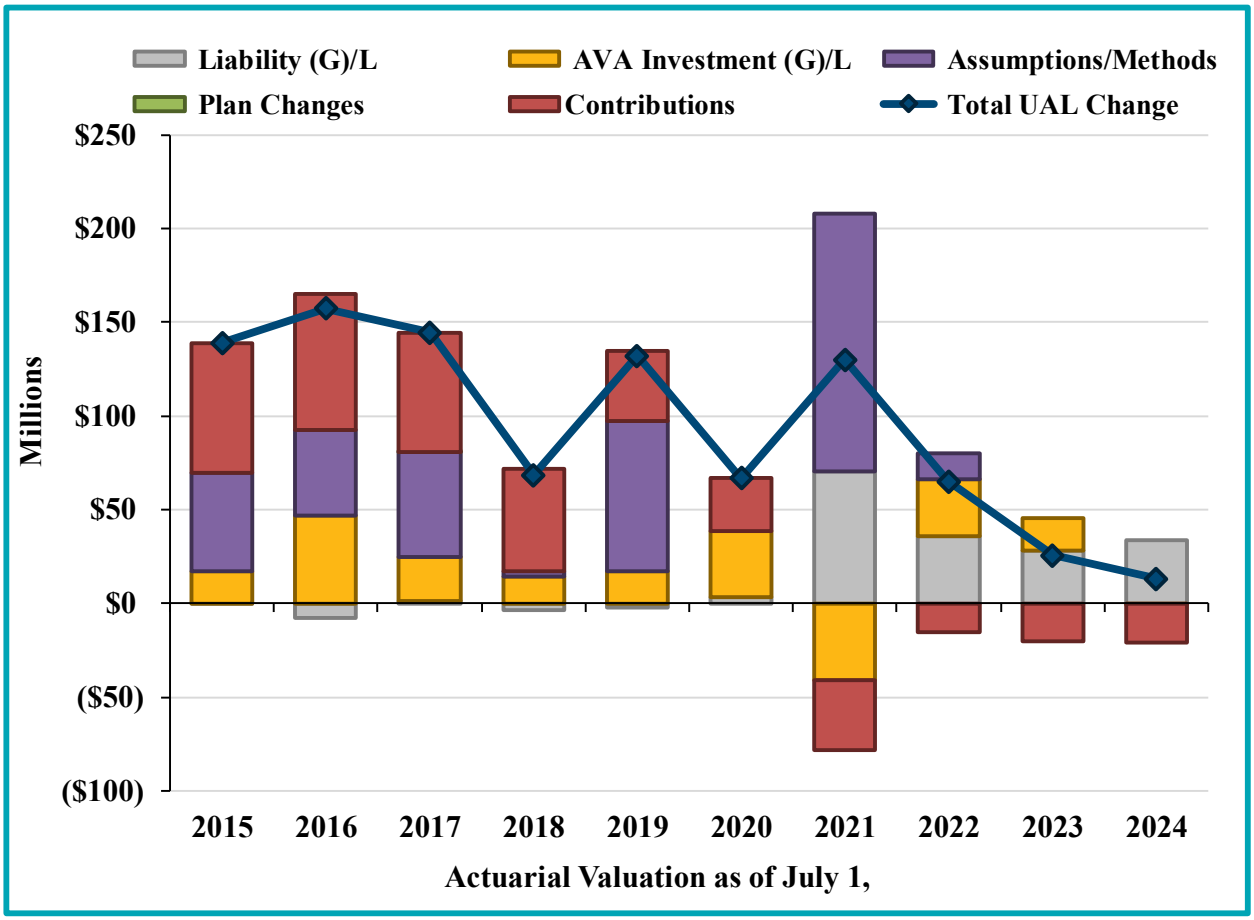


Table II-1
Changes in Unfunded Actuarial Liability
(Dollar amounts in millions)

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
Discount Rate	**7.90%**	**7.65%**	**7.50%**	**7.50%**	**7.30%**	**7.30%**	**7.00%**	**7.00%**	**7.00%**	**7.00%**	
Source											
AVA Investment (G)/L	$ 17.1	$ 46.7	$ 23.2	$ 14.5	$ 17.2	$ 35.2	$ (40.9)	$ 30.3	$ 17.1	$ (0.3)	$ 160.1
Liability (G)/L	0.1	(8.0)	1.5	(3.3)	(2.4)	3.4	70.2	35.9	28.4	33.9	159.6
Assumptions/Methods	52.4	45.7	55.9	2.8	79.8	0.0	137.9	14.1	0.0	0.0	388.6
Plan Changes	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Contributions[1]	69.6	72.9	63.8	54.6	37.5	28.3	(37.1)	(15.2)	(19.8)	(20.3)	234.3
Net UAL Change	**$ 139.2**	**$ 157.3**	**$ 144.7**	**$ 68.6**	**$ 132.2**	**$ 66.9**	**$ 130.0**	**$ 65.1**	**$ 25.7**	**$ 13.3**	**$ 942.8**

[1] *UAL change due to contributions (greater)/less than normal cost plus interest on the UAL.*

SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

On a smoothed asset basis, the investment gains and losses (gold bars) from 2015 to 2024 largely reflect investment losses, with the exception of the investment gains during FYE 2021 and FYE 2024. In aggregate, over the ten-year period, investment losses have added approximately $160.1 million to the UAL.

On the liability side (gray bars), the System has experienced a combination of gains and losses. Higher-than-expected salary increases resulted in relatively large liability losses over the past four years. Overall, liability gains and losses increased the UAL by approximately $159.6 million over the ten-year period. Triennial experience studies are performed in an effort to identify emerging trends and avoid consistent liability gains or losses.

Assumption and method changes (purple bars) over the last ten years have increased the UAL by approximately $388.6 million. The significant assumption changes have included reductions in the discount rate from 7.90% to 7.00% as well as decreases in mortality rates, projected mortality improvement and adjustments to salary increases. It is important to note that the discount rate changes simply reflect a downward revision to the estimate of future investment earnings and ultimately costs will be determined by actual investment earnings.

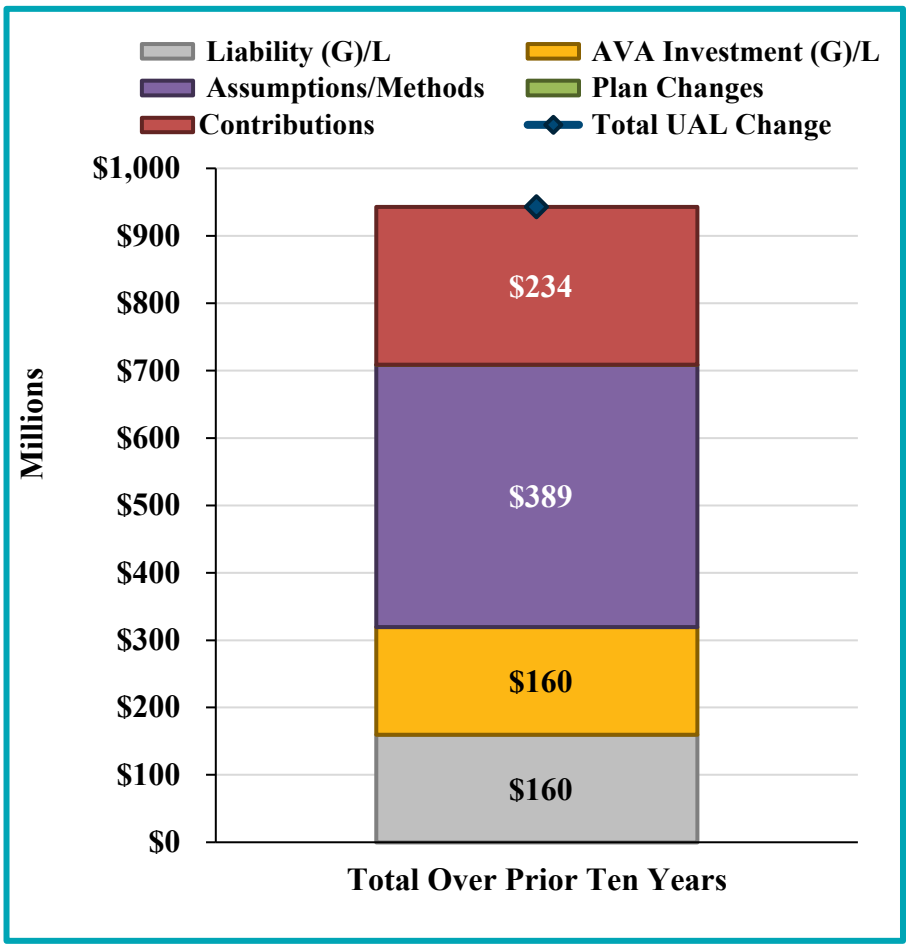
Plan changes (green bars) over the last ten years have increased the UAL by approximately $0.2 million.

Each year the UAL is expected to increase for benefit accruals attributable to the current year (the normal cost) and interest on the UAL. This expected increase is referred to as the tread water level. If contributions are greater than the tread water level, the UAL is expected to decrease. Conversely, if contributions are less than the tread water level, the UAL is expected to increase. Changes due to contributions greater or less than the tread water level (red bars) have increased the UAL by approximately $234.3 million over the last ten years.

In general, the amortization methods used to determine the Statutory contributions are designed to collect more than the tread water level. However, contributions may be less than this threshold because of the State appropriating less than the Statutory contributions. Notably, the trend of contributions less than the tread water level reversed in FYE 2021, and therefore the Statutory contributions are now paying down the UAL.

It also is important to consider the relative sizes of the assets and the liabilities when evaluating the changes to the UAL. Investment losses and liability losses have been similar in terms of dollar amounts over the last ten years, but the investment losses were generated by relatively small assets. Going forward, the assets are expected to grow relative to the liabilities, as illustrated in the baseline projections shown in the Summary section. In that case, investment outcomes similar to those of the last ten years could produce relatively larger investment losses.

The following chart shows the total changes to the UAL over the ten-year period by source.



Plan Maturity Measures

The future financial condition of a mature pension plan is more sensitive to each of the risks identified above than a less mature plan. Before assessing each of these risks, it is important to understand the maturity of the plan compared to other plans and how the maturity has changed over time.

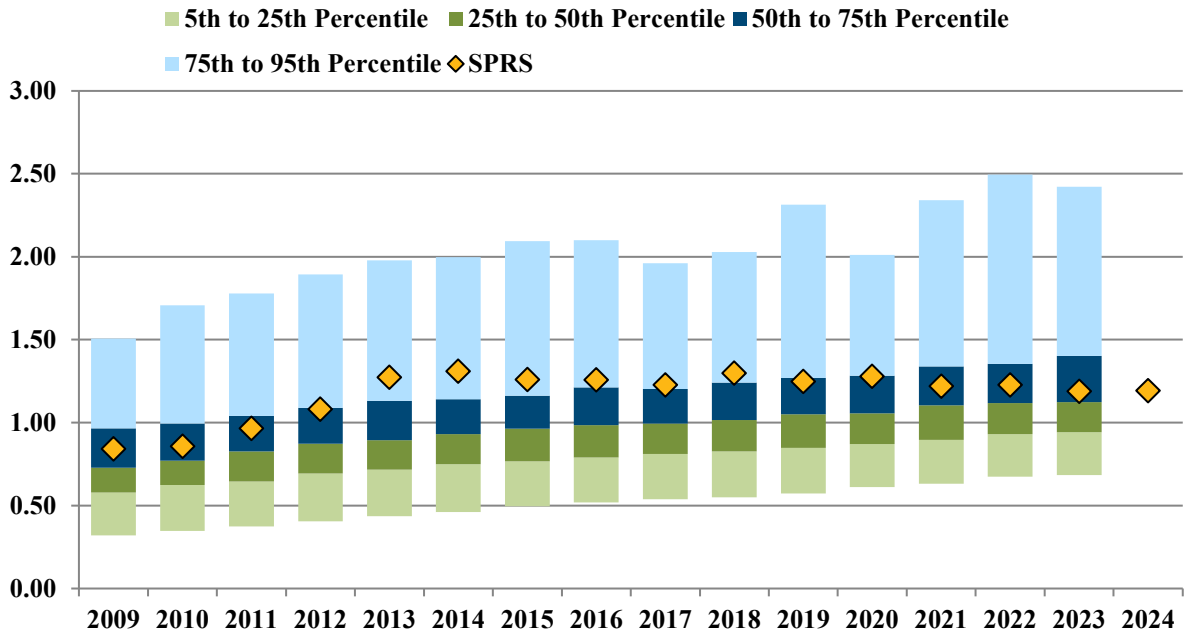
Plan maturity can be measured in a variety of ways, but they all get at one basic dynamic – the larger the plan is compared to the contribution or revenue base that supports it, the more sensitive the plan will be to risk. The measures below have been selected as the most important in understanding the primary risks identified for the System.

SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

Inactives per Active (Support Ratio)

One simple measure of plan maturity is the ratio of the number of inactive members (those receiving benefits or entitled to a deferred benefit) to the number of active members. We refer to this ratio as the *support ratio.* The revenue base supporting the plan is usually proportional to the number of active members, so a relatively high number of inactives compared to actives indicates a larger plan relative to its revenue base as well. We also discussed this risk metric in Section I.

Support Ratio



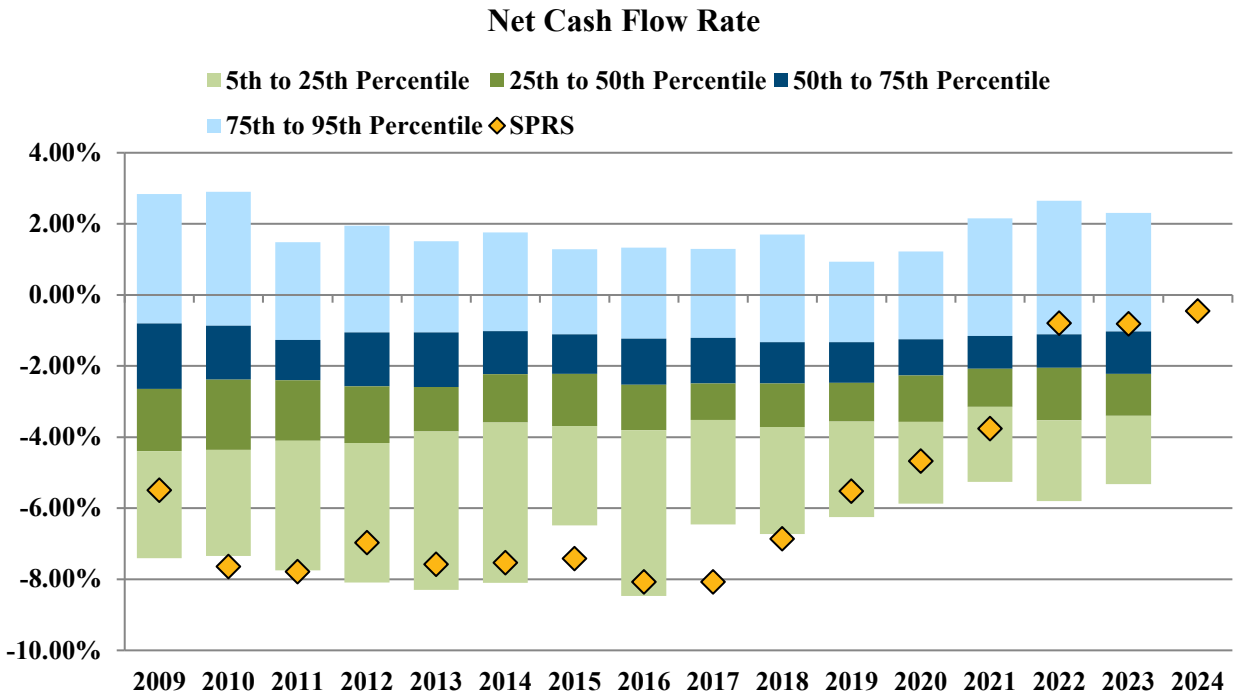
Survey Data from Public Plans Data as of 12/10/2024

The chart above shows the distribution from the 5th to 95th percentile of support ratios for the plans in the Public Plans Database. The gold diamond shows how SPRS compares dating back to 2009. Through 2010, SPRS was slightly more mature than the median plan. The support ratio increased following the Great Recession and stabilized at about the 75th percentile. Since 2021, the support ratio has decreased relative to the other public plans, returning the System to slightly more mature than the median plan.

Net Cash Flow

The net cash flow of the plan as a percentage of the beginning of year assets indicates the sensitivity of the plan to short-term investment returns. Net cash flow is equal to contributions less benefit payments and administrative expenses. Mature plans can have large amounts of benefit payments compared to contributions, particularly if they are well funded. Investment losses in the short-term are compounded by the net withdrawal from the plan leaving a smaller asset base to try to recover from the investment losses. Large negative cash flows can also create liquidity issues. We also discussed this metric in Section I.

SECTION II – ASSESSMENT AND DISCLOSURE OF RISK



Survey Data from Public Plans Data as of 12/10/2024

The chart above shows the distribution from the 5th to 95th percentile of net cash flow for the plans in the Public Plans Database. The gold diamond shows how SPRS compares. Since the Great Recession, SPRS had generally been at or below the 5th percentile compared to the database of other public plans in terms of negative cash flow as a percentage of assets. With the State's increased appropriation percentage, SPRS's net cash flow has improved considerably in recent years. The System's net cash flow rate was above the 75th percentile in FYE 2023 and is expected to be positioned similarly in FYE 2024.

Assessing Costs and Risks

The fundamental risk to the System is that the contributions needed to fund the benefits become unaffordable. Assessing this risk, however, is complex because there is no bright line of what is unaffordable and the contribution amounts themselves are affected not just by the experience of the System, but also by the interaction of that experience and decisions by the State and the Board related to the amount of contributions appropriated, assumptions, asset smoothing methods, and amortization periods.

Investment Risk – Stress Testing

This section illustrates stress testing of the investment return assumption and is an extension of the baseline projections provided in the Summary section. Under the baseline results, we assumed a 7.00% investment return assumption each year.

SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

For stress testing purposes, we developed six hypothetical scenarios to illustrate the impact actual investment returns may have on future funded status and contribution amounts. The scenarios are balanced between positive and negative scenarios and are based on a lognormal distribution of one and five year expected returns as shown in the following table using the capital market assumptions from the New Jersey Division of Investments (geometric return of 8.09%, standard deviation of 11.89%).

Distribution of Expected Average Annual Returns		
Percentile	**1 Year**	**5 Year**
5%	-9.6%	-0.2%
25%	0.5%	4.6%
50%	8.1%	8.1%
75%	16.4%	11.8%
95%	29.4%	17.2%

The scenarios include: a one-year shock using the 5th and 95th percentile returns for one year; a 5-year moderate scenario using the 25th and 75th percentile returns for five years; and a 5-year significant scenario using the 5th and 95th percentile returns for five years. The table below summarizes the theoretical scenarios.

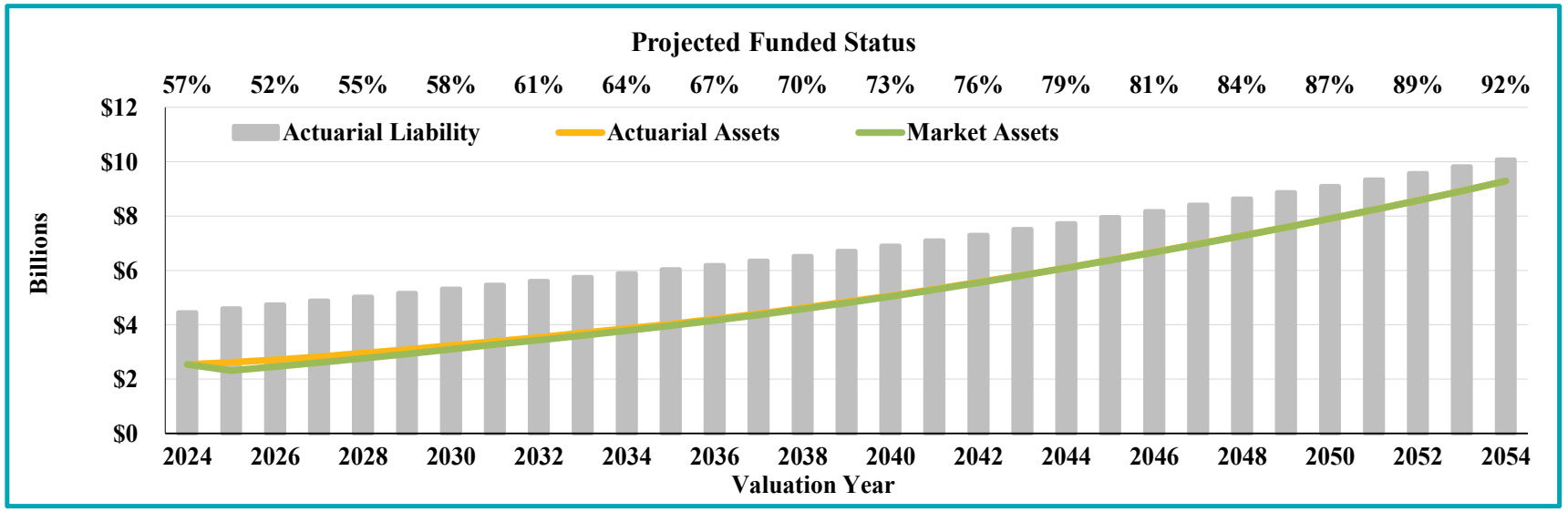
Theoretical Scenarios						
	1-Yr Shock		5-Yr Moderate		5-Yr Significant	
FYE	**Neg**	**Pos**	**Neg**	**Pos**	**Neg**	**Pos**
2025	-9.6%	29.4%	4.6%	11.8%	-0.2%	17.2%
2026	7.0%	7.0%	4.6%	11.8%	-0.2%	17.2%
2027	7.0%	7.0%	4.6%	11.8%	-0.2%	17.2%
2028	7.0%	7.0%	4.6%	11.8%	-0.2%	17.2%
2029	7.0%	7.0%	4.6%	11.8%	-0.2%	17.2%
2030+	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%

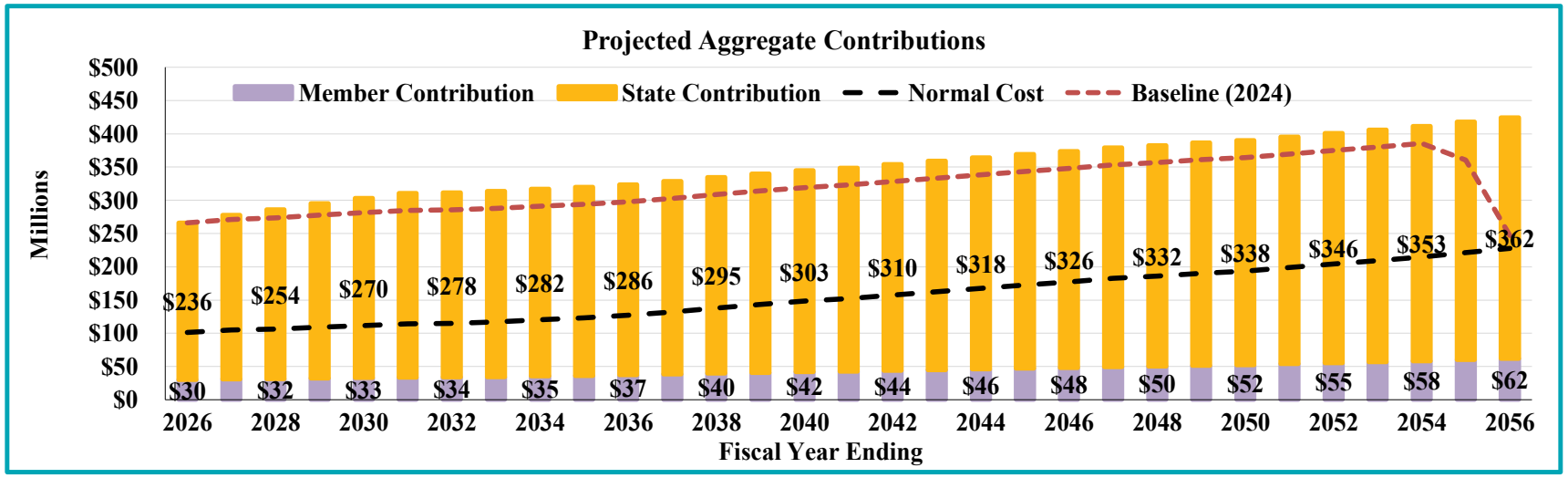
In reviewing each of these projections, it is the future trends, not necessarily the actual values, that are important to observe in consideration of the risks of the System and the potential volatility of future funded ratios and Statutory contribution levels.

The graphs on the following pages show the projections under each of these theoretical scenarios. Instead of the tread water line shown for the baseline projection, the contribution graphs include a dashed red line representing the expected contributions under the baseline projections shown in the Summary section to facilitate the comparison between the particular scenario and the baseline projections assuming all assumptions are met.

SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

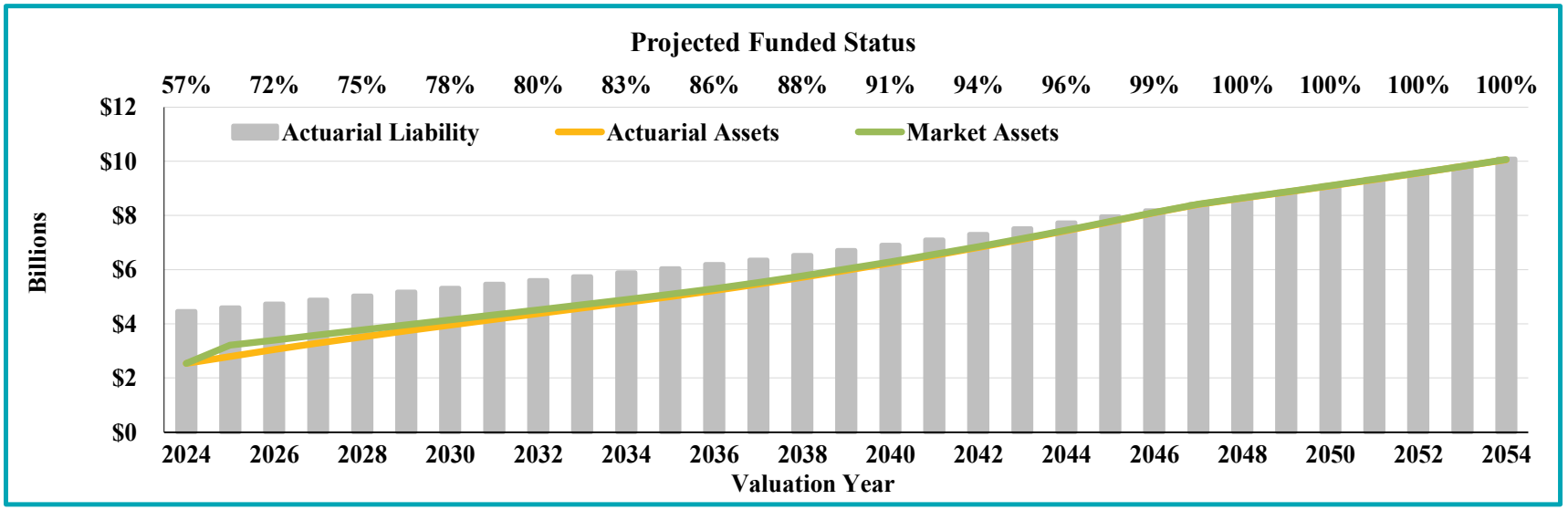
One-Year Negative Shock Scenario: -9.6% return FYE 2025, 7.0% after

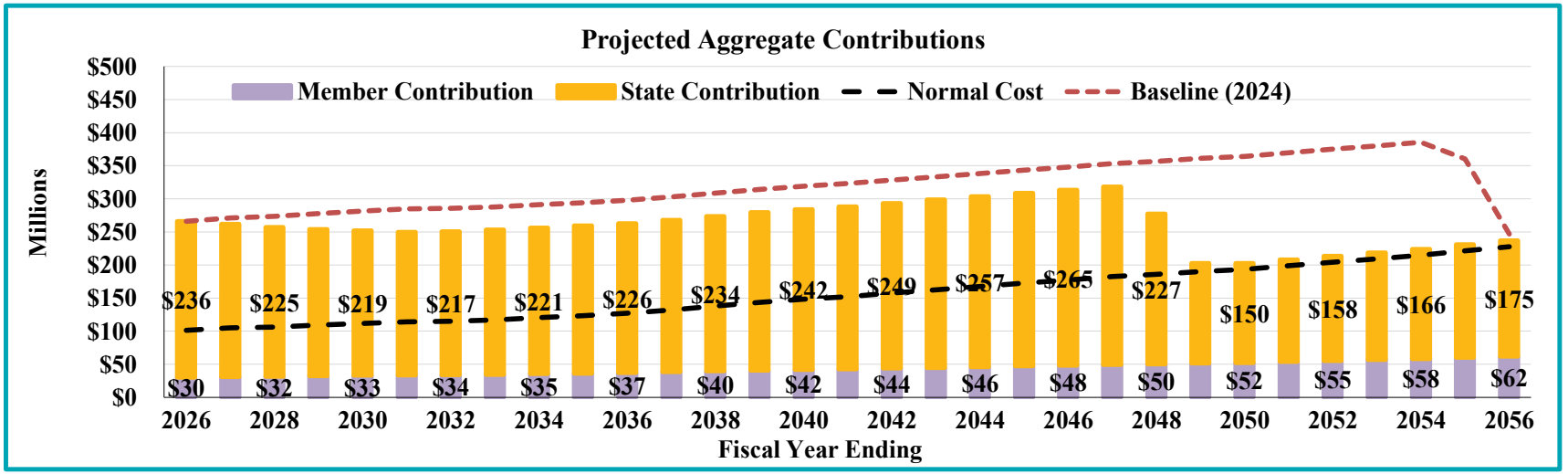




SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

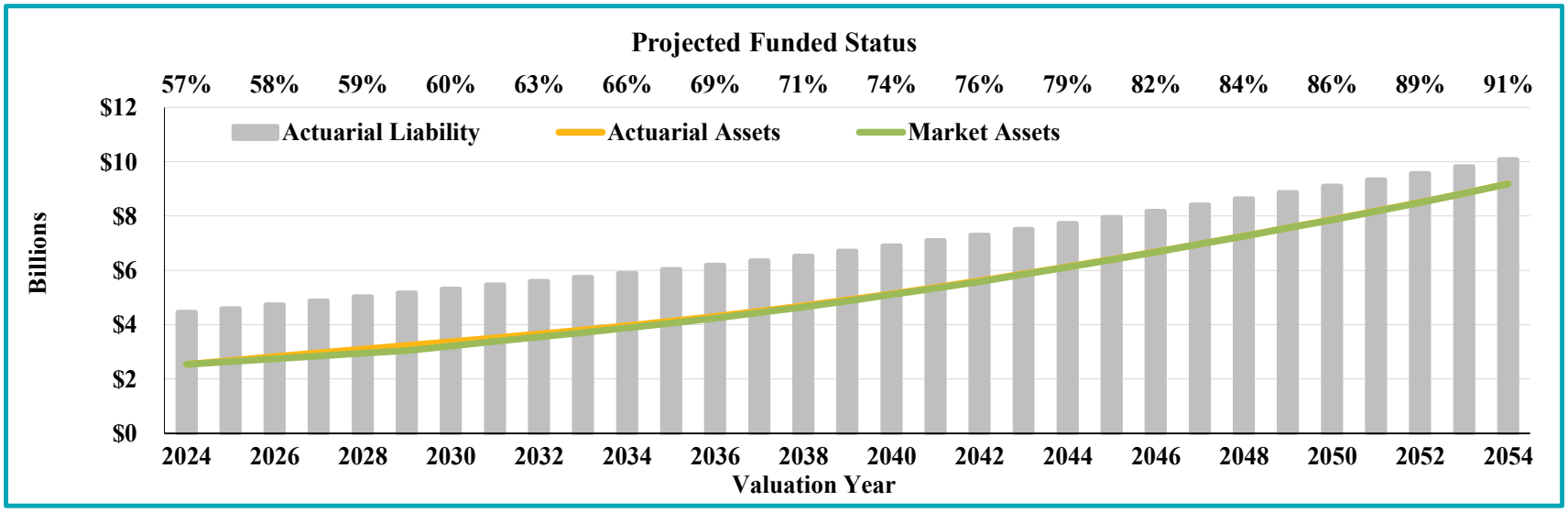
One-Year Positive Shock Scenario: 29.4% return FYE 2025, 7.0% after

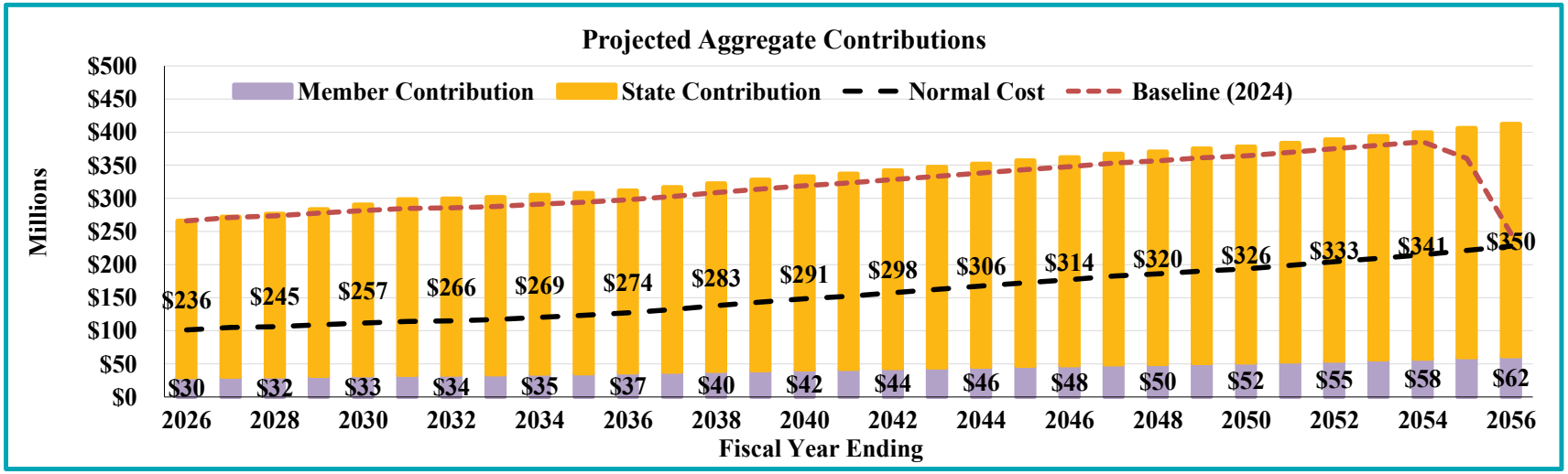




SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

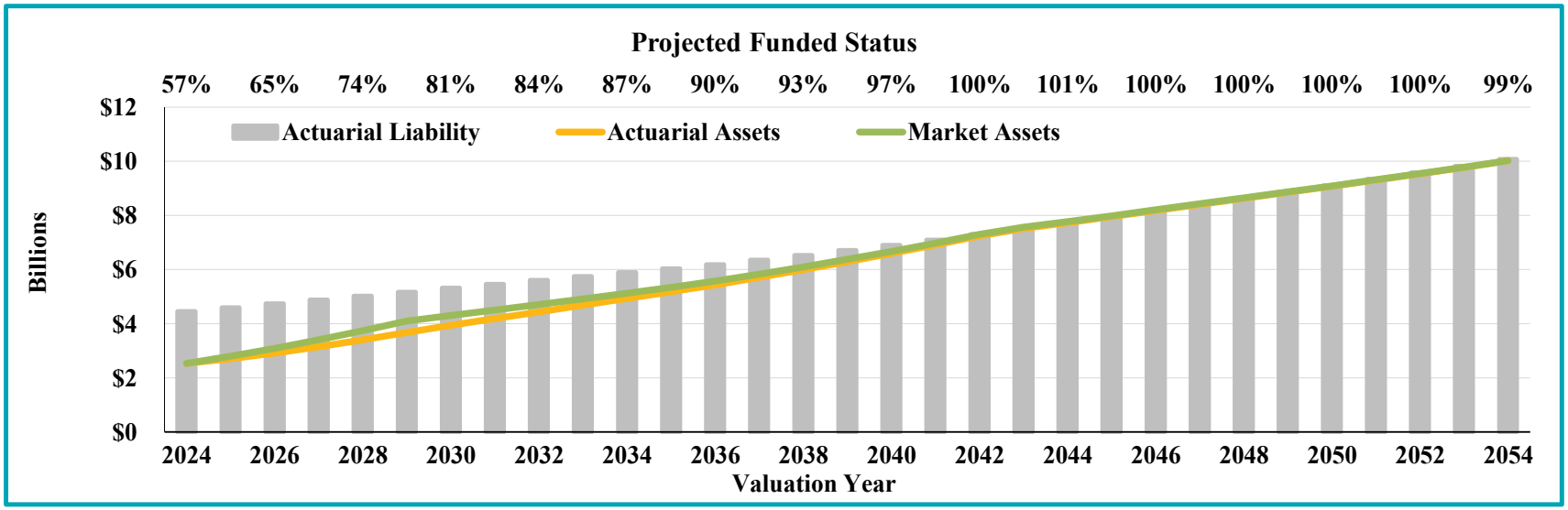
Five-Year Moderate Negative Scenario: 4.6% return FYE 2025-2029, 7.0% after

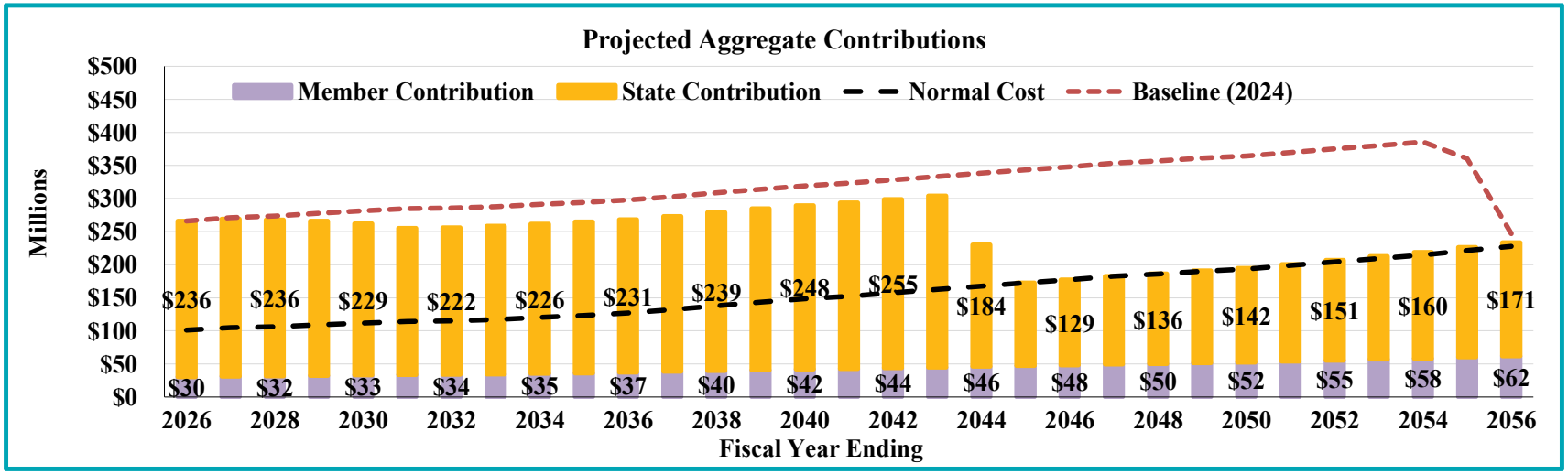




SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

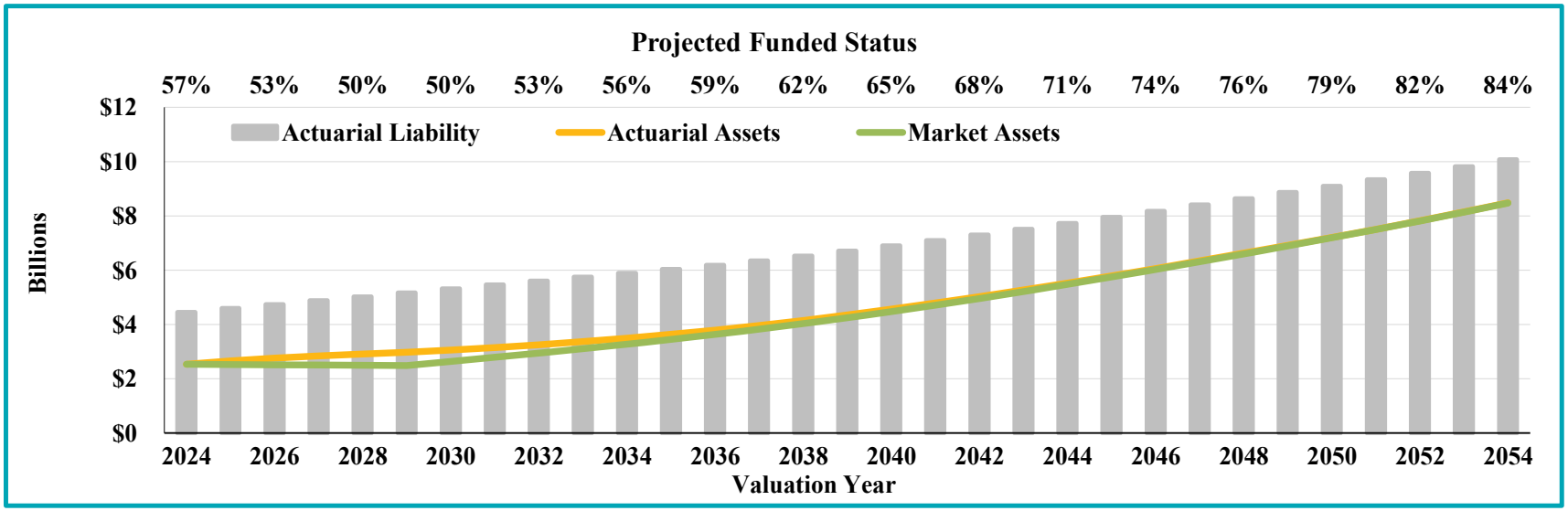
Five-Year Moderate Positive Scenario: 11.8% return FYE 2025-2029, 7.0% after

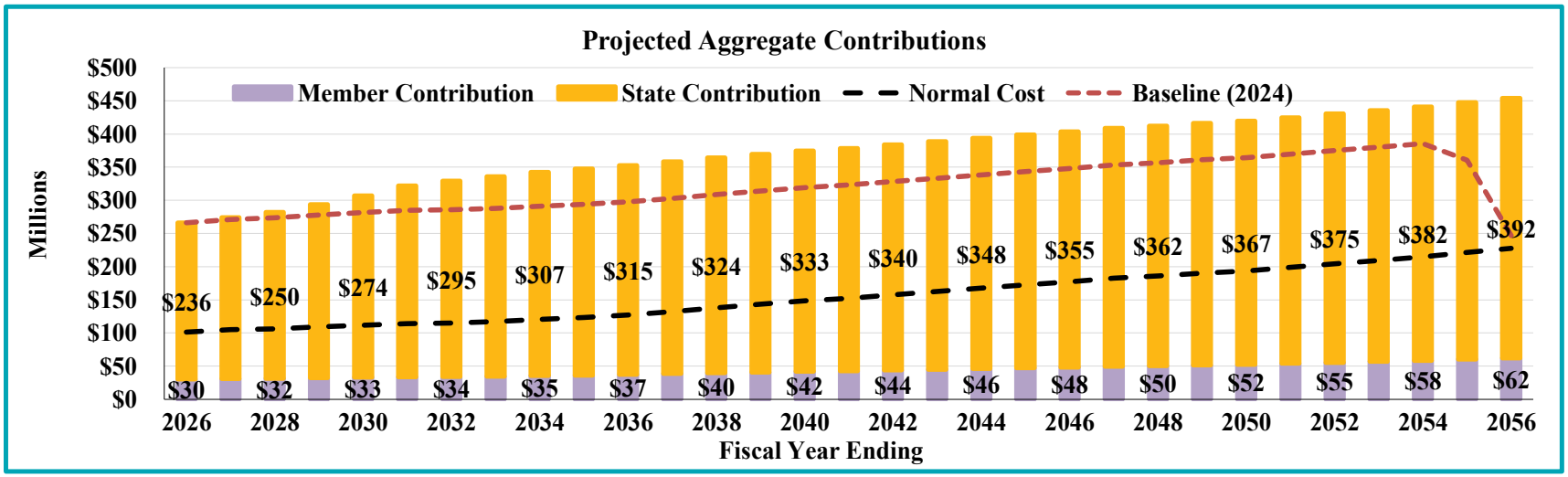




SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

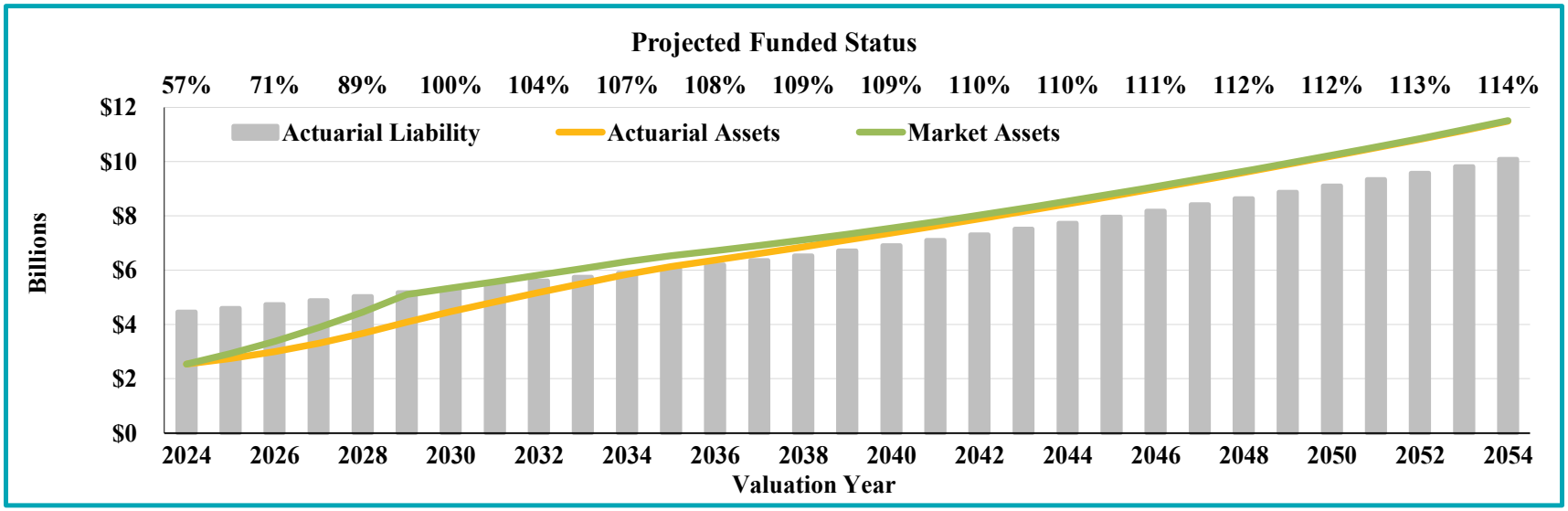
Five-Year Significant Negative Scenario: -0.2% return FYE 2025-2029, 7.0% after

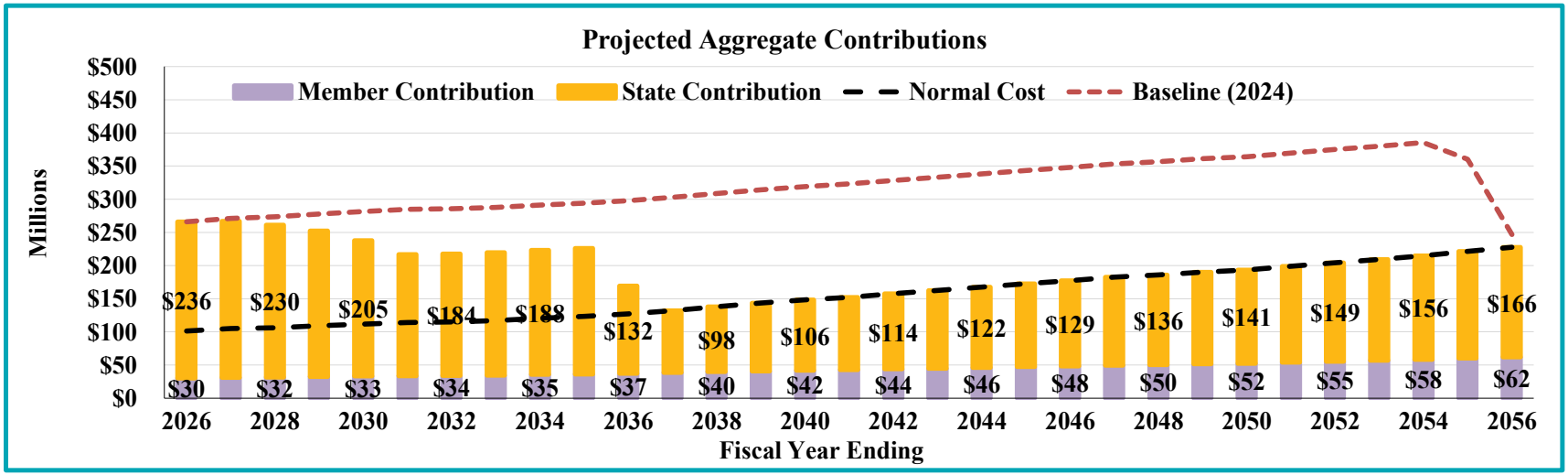




SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

Five-Year Significant Positive Scenario: 17.2% return FYE 2025-2029, 7.0% after





SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

These scenarios show that actual future investment returns have a significant impact on future State contribution amounts. The following table summarizes the impact on the State contributions in FYE 2038 for each of the investment return scenarios.

Table II-2
Impact on Contributions for FYE 2038
(dollar amounts in millions)

	1-Yr Shock		5-Yr Moderate		5-Yr Significant	
	Neg	Pos	Neg	Pos	Neg	Pos
Amount	$26	($35)	$14	($30)	$55	($171)
Percent	10%	-13%	5%	-11%	20%	-64%

The positive scenarios show the System achieving a 100% funded status earlier in the 30-year projection period than the baseline projection, which results in the State contribution decreasing to equal the employer normal cost.

The investment returns used in the projections above were selected solely to illustrate the impact of investment volatility on the pattern of future funded status and contribution amounts. They are not intended to be predictive of actual future contributions or funded status or even to represent a realistic pattern of investment returns.

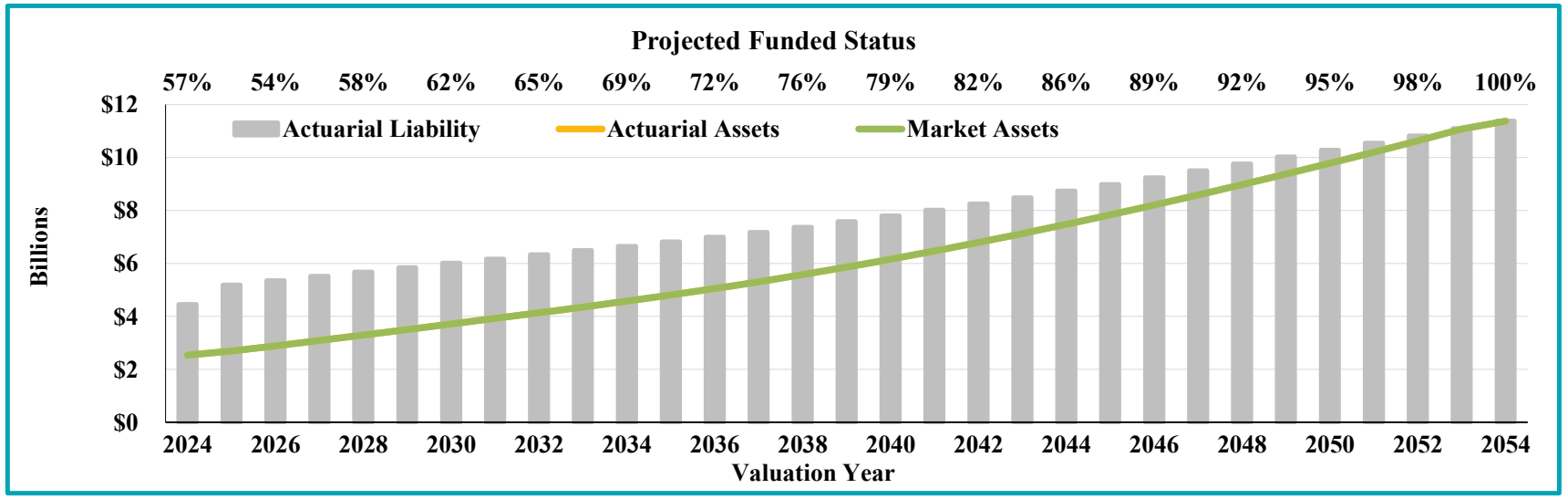
Assumption Change Risk – Sensitivity Testing

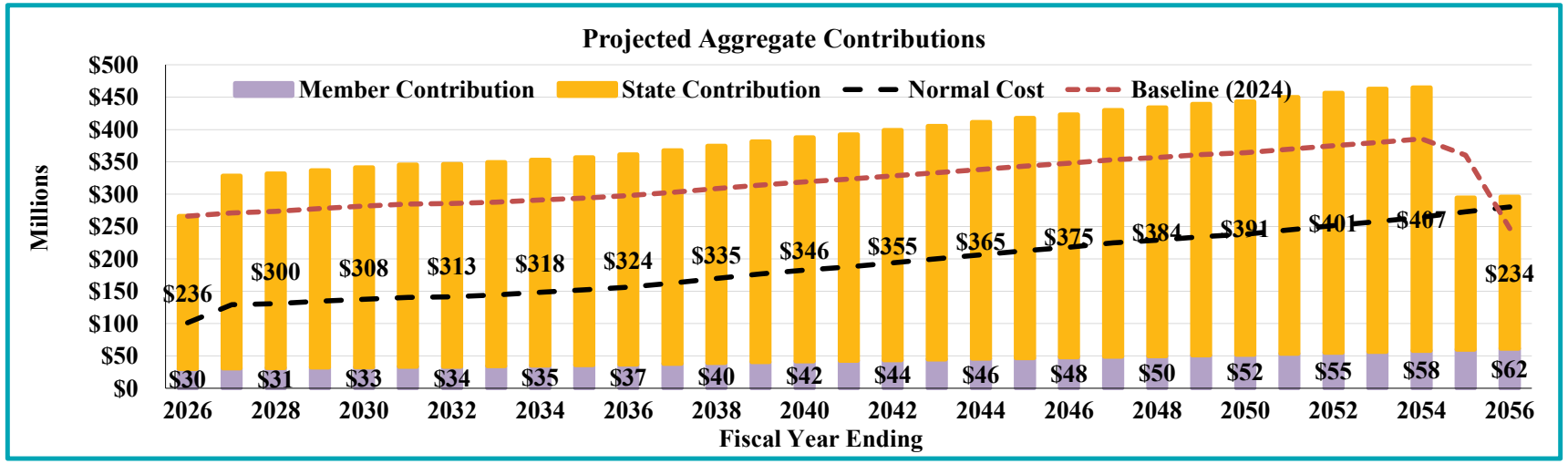
As shown in Table II-1, assumption changes over the last decade have increased the UAL by approximately $388.6 million. The most significant changes were reductions in the discount rate and projections of mortality improvement. While interest rates have increased over the past few years, the reductions in discount rates over the last ten years have been largely driven by declines in interest rates that affect expectations of future investment returns. If there are declines in interest rates or if there is a desire or need to reduce investment risk that reduces expected returns, the discount rate and expected returns may need to be reduced further. The graphs on the following page show the impact on projected future funded status and contribution amounts if the discount rate and expected returns were reduced by 100 basis points to 6.00% beginning with the July 1, 2025 valuation.

This scenario results in Statutory contribution amounts in FYE 2038 that are about 25% more than the baseline.

SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

6.00% Discount Rate and Investment Return Assumption Effective July 1, 2025





SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

Low-Default-Risk Obligation Measure (LDROM)

The System invests in a diversified portfolio to achieve the best possible return at an acceptable level of risk. The lowest investment risk portfolio for a pension plan would be composed entirely of low-default-risk fixed income securities whose cash flows approximately match the cash flow needs of the System. However, such a portfolio would have a lower expected rate of return (5.35% as of June 30, 2024) than the diversified portfolio (7.00%). Low-Default-Risk Obligation Measure (LDROM) represents what the Actuarial Liability would be if the System's assets were invested in such a portfolio. As of June 30, 2024 the LDROM is $5.5 billion[1] compared to the Actuarial Liability of $4.5 billion for the System. The $1.0 billion difference can be viewed as the expected savings from taking on the investment risk of the diversified portfolio. Alternatively, it can be viewed as the potential cost of eliminating the investment risk of the non-fixed income allocations of the diversified portfolio.

If the System were to invest in the LDROM portfolio, the funded ratios would decrease, and the State's contribution requirements would increase. The security of the System's pension benefits relies on the current assets, future investment earnings, and the ability and willingness of the State to make future contributions. If the System were to invest in the LDROM portfolio, it would not change the current assets, but it would reduce future investment earnings and increase future State contributions. However, the range of future investment earnings and future contributions would narrow significantly.

[1] Based on a discount rate equal to the June 30, 2024 FTSE Pension Liability Index of 5.35% and all other assumptions and methods as used to calculate the Actuarial Liability

SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

Contribution Risk – Sensitivity Testing

The amortization method used to determine the Statutory contributions is designed to collect more than the tread water level and, therefore, gradually pay down the UAL. However, prior to FYE 2022, the appropriated contributions had consistently been less than the Statutory contributions and the tread water level, causing an increase in the UAL of about $234.3 million over the last ten years. Since FYE 2022, the appropriated contributions have been greater than or equal to the Statutory contribution. The baseline projections in this report assume the State appropriates 100% of the Statutory contribution each year.

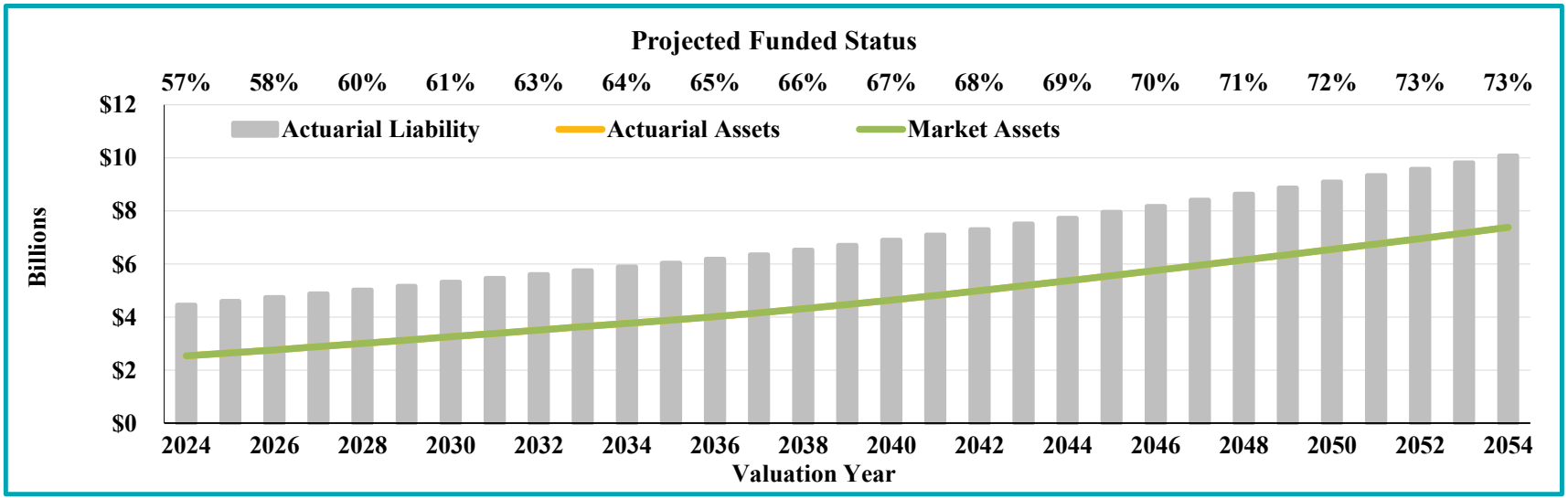
Contribution risk is the potential for actual future contributions to deviate from expected future contributions. The graphs on the following page illustrate the impact on projected future funded status and contribution amounts if the State changes its appropriation to 80% of the Statutory contribution for each year in the future, rather than continuing at 100% of the Statutory contribution.

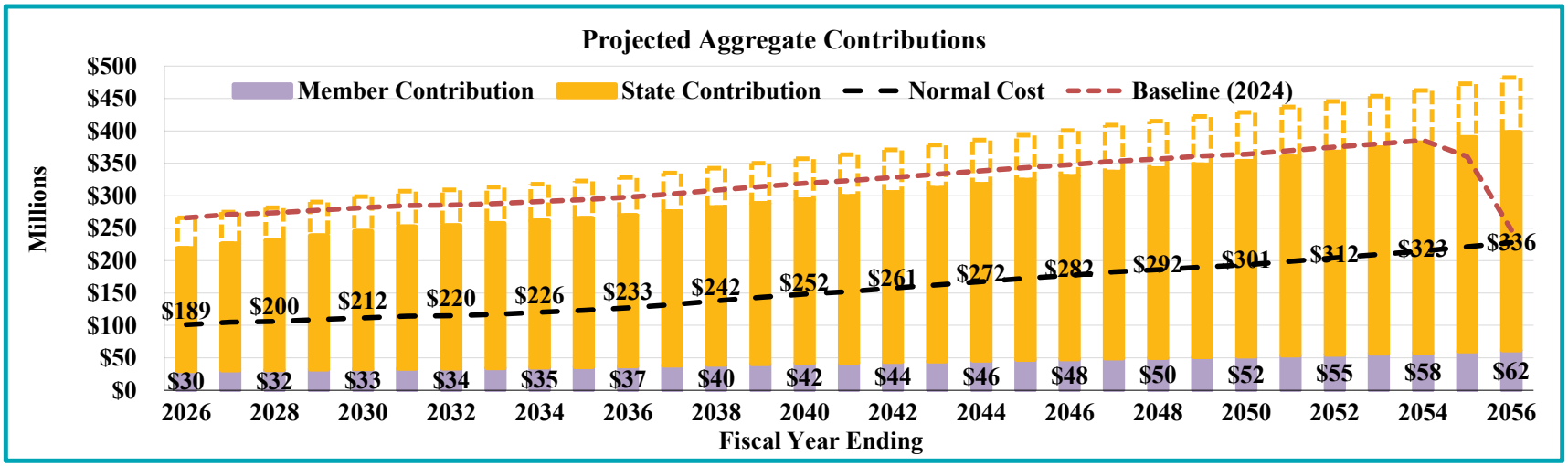
The gold outline in the bottom graph shows the State's full Statutory contributions with the shaded portion showing the anticipated appropriated amount.

This scenario shows both the Statutory and appropriated contributions gradually increasing over time. The Statutory contributions quickly exceed the baseline. The appropriated contributions are below the baseline initially but eventually grow to reach to the same level, with a much lower funded ratio. The funded ratio at the end of the projection period is 73% compared to 100% under the baseline projections.

SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

State Appropriates 80% of Statutory Contribution for Fiscal Year Ending June 30, 2026 and Thereafter





SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

More Detailed Assessment

While a more detailed assessment is always valuable to enhance the understanding of the risks identified above, we believe the scenarios illustrated above cover the primary risks facing the System at this time. We would be happy to provide the Board with a more in-depth analysis at their request.

SECTION III – ASSETS

The System uses and discloses two different asset measurements for funding, which are presented in this section of the report: market value and actuarial value of assets. The market value represents the value of the assets if they were liquidated on the valuation date. The actuarial value of assets is a value that smooths annual investment returns to reduce annual investment volatility and is used in determining contribution levels. In compliance with New Jersey Statute, the method used to calculate the actuarial value of assets recognizes 20% of the difference between the market value of assets and the expected actuarial value of assets each year.

Actuarial Standards of Practice (ASOP) No. 44 states that the asset valuation method should produce an actuarial value of assets that falls within a reasonable range of market value, recognizes the difference between the market value and actuarial value of assets within a reasonably short period of time, and is likely to produce actuarial values that are sometimes greater than and sometimes less than the corresponding market values. The asset method required under N. J. Statute does not meet the requirements of ASOP No. 44 because this method has produced actuarial asset values which have consistently been greater than the market asset values and recognizes investment losses slowly over time. Additionally, the method may produce an actuarial value of assets that falls outside of a reasonable range of the market value.

On the following pages, we present detailed information on the System's assets:

- Disclosure of assets at July 1, 2023 and July 1, 2024,
- Statement of cash flows during the year,
- Development of the actuarial value of assets, and
- Disclosure of investment performance for the year.

Disclosure

The market value of assets represents a "snap-shot" value as of the last day of the fiscal year that provides the principal basis for measuring financial performance from one year to the next. Market values, however, can fluctuate widely with corresponding swings in the value of the investments. Because these fluctuations would cause volatility in employer contributions, an actuarial value of assets is developed. Table III-1 on the following page presents the market value as of June 30, 2023 and June 30, 2024. Table III-2 presents the System's net cash flows from June 30, 2023 to June 30, 2024. Table III-3 presents the development of the Actuarial Value of Assets as of July 1, 2024. Tables III-4 and III-5 show the market and actuarial value of assets historical investment returns compared to the assumed return for each year, as well as the cumulative returns over various periods and durations of time.

SECTION III – ASSETS

Table III-1
Statement of Assets at Market Value

	June 30, 2024	June 30, 2023
Assets		
Cash	$ 469,653	$ 21,134,589
Securities Lending Collateral	20,386,106	40,313,400
Investment Holdings	2,333,316,077	2,102,293,713
Accrued Interest on Investments	25,627	17,538
Interest Receivable on Loans	280,661	224,556
Employer Contributions Receivable		
State	0	0
State NCGI	0	0
Members' Contributions Receivable	1,342,103	1,289,970
Loans Receivable	8,839,023	9,329,214
Accounts Receivable	98,965	56,410
Total Assets	$ 2,364,758,215	$ 2,174,659,390
Liabilities		
Pension Payroll Payable	$ (17,156,633)	$ (16,611,591)
Pension Adjustment Payroll Payable	(1,425,979)	(1,469,319)
Death Benefits Payable	(1,059,690)	(2,921,331)
Withholdings Payable	(3,451,154)	(3,297,057)
Securities Lending Collateral and Rebate Payable	(20,375,935)	(40,298,629)
Administrative Expense Payable	(2,188,806)	(1,295,569)
Accounts Payable - Other	(105,532)	(112,159)
Total Liabilities	$ (45,763,729)	$ (66,005,655)
Preliminary Market Value of Assets	**$ 2,318,994,486**	**$ 2,108,653,735**
Discounted State Appropriations Receivable	218,853,809	211,241,592
Market Value of Assets	**$ 2,537,848,295**	**$ 2,319,895,327**

SECTION III – ASSETS

System Cash Flows as of June 30, 2024

Table III-2
Changes in Market Values for FYE June 30, 2024

Additions		
Pension Contributions		
Members' Contributions	$	31,192,573
Transfers from Other Systems		330,036
Employers' Contributions		
State Appropriations		220,326,000
Non-Contributory Group Insurance		31,798
Transfers from Other Systems		485,741
Administrative Fee Loans		4,155
Income		
Per Statement		220,016,992
Total Additions	$	472,387,295
Deductions		
Benefits Provided by Members		
Withdrawal of Members' Contributions - Regular & Death	$	310,322
Withdrawal of Members' Contributions - Transfer		17,451
Adjustment - Member Account Loans - State		2,000
Benefits Provided by Employers and Members		
Retirement Allowances		242,723,377
Benefits Provided by Employers		
Benefit Expense - Pension Adjustment		17,297,684
Administrative Expense		1,628,191
Withdrawals - Employer Transfers		36,337
Administrative Expense Loans		4,245
Adjustment - Member Accounts Expense - State		(4,861)
NCGI Premium Expense		31,798
Miscellaneous Expense		0
Total Deductions	$	262,046,544
Net Increase/(Decrease)	**$**	**210,340,751**
Preliminary Market Value of Assets Beginning of Year	$	2,108,653,735
Preliminary Market Value of Assets End of Year	**$**	**2,318,994,486**
Discounted State Appropriations Receivable		218,853,809
Market Value of Assets	**$**	**2,537,848,295**
Approximate Return		**10.59%**

SECTION III – ASSETS

Actuarial Value of Assets

To determine on-going funding requirements, most pension systems utilize an actuarial value of assets that differs from the market value of assets. The actuarial value of assets represents an asset value based on averaging or smoothing year-to-year market value returns for purposes of reducing contribution volatility. Each year, 20% of the difference between the market value of assets and the expected actuarial value of assets is added to the expected actuarial value of assets.

Table III-3
Development of Actuarial Value of Assets for July 1, 2024

1. Preliminary Actuarial Value of Assets as of 7/1/2023[1]	$	2,176,891,284
2. Net Cash Flow excluding Investment Income	$	(9,676,241)
3. Expected Investment Income[2]	$	150,170,504
4. Expected Actuarial Value of Assets as of 7/1/2024 [1 + 2 + 3]	$	2,317,385,547
5. Preliminary Market Value as of 6/30/2024	$	2,318,994,486
6. 20% of Difference from MVA [20% * (5 - 4)]	$	321,788
7. Preliminary Actuarial Value of Assets as of 7/1/2024 [4 + 6]	$	2,317,707,335
8. Discounted State Appropriations Receivable	$	218,853,809
9. Actuarial Value of Assets as of 7/1/2024 [7 + 8]	$	2,536,561,144
10. Rate of Return on Actuarial Value of Assets		7.01%
11. Ratio of Actuarial Value of Assets to Market Value of Assets		99.95%

[1] Excludes discounted State appropriations receivable

[2] Refer to Appendix B, Actuarial Methods, for details on the assumed timing of contributions

SECTION III – ASSETS

Investment Performance

The market value of assets rate of return was 10.59% for the year ending June 30, 2024. This is compared to an assumed return of 7.00% for the same period. On an actuarial value of assets basis, the return for FYE 2024 was 7.01%. In the table below, we show historical asset returns compared to the investment return assumption. We show returns beginning with the year ending in 2000.

Table III-4
Annual Rates of Return

Year Ended June 30	Investment Return Assumption	Market Value[1]	Actuarial Value[2]
2000	8.75%	11.86%	12.83%
2001	8.75%	-9.80%	7.77%
2002	8.75%	-8.61%	4.74%
2003	8.75%	3.31%	4.36%
2004	8.75%	14.16%	5.87%
2005	8.25%	8.77%	5.85%
2006	8.25%	9.79%	6.55%
2007	8.25%	17.14%	8.30%
2008	8.25%	-2.61%	6.29%
2009	8.25%	-15.49%	2.18%
2010	8.25%	13.34%	3.72%
2011	8.25%	17.97%	5.75%
2012	7.95%	2.47%	4.83%
2013	7.90%	11.72%	5.77%
2014	7.90%	16.79%	7.64%
2015	7.90%	4.08%	6.91%
2016	7.90%	-1.15%	5.32%
2017	7.65%	12.77%	6.26%
2018	7.50%	9.11%	6.69%
2019	7.50%	6.12%	6.54%
2020	7.30%	1.43%	5.35%
2021	7.30%	28.44%	9.55%
2022	7.00%	-7.66%	5.53%
2023	7.00%	9.32%	6.16%
2024	7.00%	10.59%	7.01%

[1] Beginning in 2017, the returns are from the System's Actuarial Valuation Report. Since the prior actuary did not calculate a market value return prior 2017, earlier returns are from other sources. Returns for 2014 through 2016 are money-weighted returns for the Pension Funds from the DPB's Comprehensive Annual Financial Reports. Returns for 2000 through 2013 are returns for the Pension Funds from the New Jersey State Investment Council Annual Reports.
[2] The prior actuary did not report an actuarial value return in 2000. The return shown was calculated based on available information.

SECTION III – ASSETS

Additionally, we show the compound annualized rates of return for various periods in the following table. On a cumulative basis, there are periods where the market value return significantly exceeds the actuarial value return. This is due to the recognition of market value losses from earlier years in the actuarial value. We present compound annualized rates of return over consecutive five-year periods to help illustrate this point.

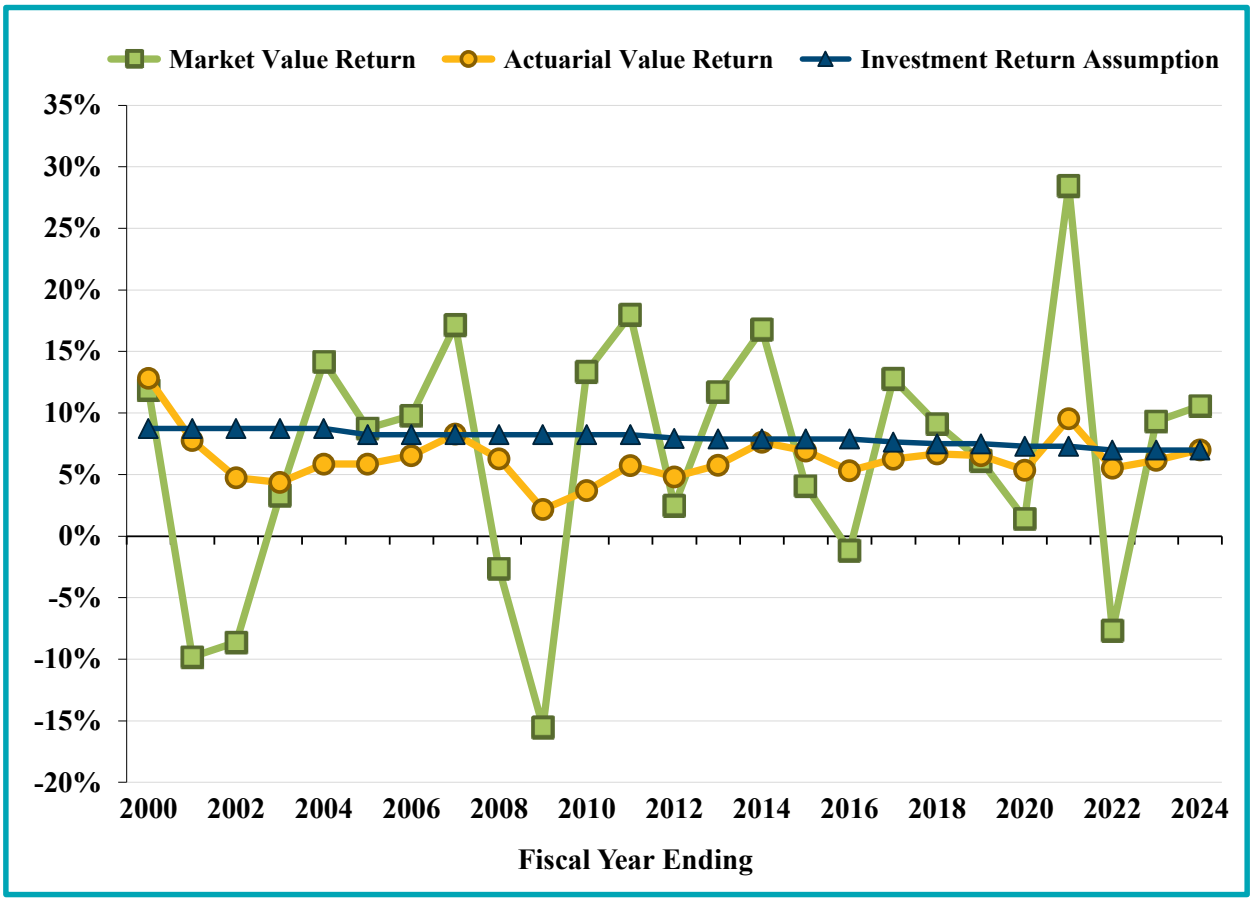
Table III-5
Compound Annualized Rates of Returns

Period	Investment Return Assumption	Market Value	Actuarial Value
Since July 1, 1999	7.97%	6.08%	6.29%
20-Year	7.78%	7.21%	6.10%
15-Year	7.62%	8.70%	6.19%
10-Year	7.40%	6.93%	6.53%
5-Year	7.12%	7.78%	6.71%
Consecutive Five-Year Periods			
2000 to 2004	8.75%	1.69%	7.07%
2005 to 2009	8.25%	2.86%	5.81%
2010 to 2014	8.05%	12.32%	5.53%
2015 to 2019	7.69%	6.08%	6.34%
2020 to 2024	7.12%	7.78%	6.71%

SECTION III – ASSETS

The annual rates of return from Table III-4 are presented in the following graph. The market value return (green) shows significant volatility with years above and below the investment return assumption (blue). The largest deviations from expectations are losses in 2001 and 2002 and again in 2008 and 2009, as well as the mostly offsetting gain and loss in 2021 and 2022, respectively. The actuarial value returns (yellow) follow the direction of market value returns, but much more gradually as gains and losses are recognized over time.

For nearly the entire period, the actuarial value returns fall short of the investment return assumption and result in AVA losses and UAL increases. When the actuarial return approaches the assumption, the MVA closes in on the AVA with the possibility of AVA gains in the near future. However, two such instances (2007 and 2014) are followed by market value losses (large, sharp losses in 2008-2009 and small cumulative losses in 2015-2020). In contrast, the 2021 market return of 28.44% was sufficiently large so that the market value of assets exceeded the actuarial value of assets and the actuarial value return was slightly greater than the investment return assumption, resulting in an actuarial asset gain for the July 1, 2021 valuation. However, the significant negative market return in 2022 again resulted in actuarial asset losses in 2022 and 2023 as the investment loss was gradually recognized in the actuarial returns. The actuarial return was about equal to expectations in 2024.



SECTION IV – LIABILITIES

In this section, we present detailed information on the liabilities of the System, including:

- Disclosure of liabilities at July 1, 2023 and July 1, 2024,
- Active liabilities broken down by Tier, and
- The development of the actuarial gain and loss.

Disclosure

The Actuarial Liability is used for determining employer contributions. For SPRS, the funding method employed is the Projected Unit Credit (PUC) Actuarial Cost Method. Under this funding method, the actuarial liability is calculated as the actuarial present value of the projected benefits allocated to periods prior to the valuation year based on service.

This liability is determined for funding purposes and is not appropriate for measuring the cost of settling plan liabilities by purchasing annuities or paying lump sums.

Table IV-1 shows the actuarial liability, unfunded actuarial liability and funded ratio as of July 1, 2024 and July 1, 2023 for the System.

Table IV-1
Actuarial Liability

	July 1, 2024	July 1, 2023
Actuarial Liability		
Contributing Actives	$ 1,413,836,153	$ 1,326,075,025
Non-Contributing Actives	18,408,636	15,549,489
Deferred Vested	0	0
Retirees	2,650,986,811	2,580,356,529
Disabled	194,568,181	195,294,607
Beneficiaries	183,405,429	182,174,762
Total	**$ 4,461,205,210**	**$ 4,299,450,412**
Actuarial Value of Assets	$ 2,536,561,144	$ 2,388,132,876
Unfunded Actuarial Liability/(Surplus)	$ 1,924,644,066	$ 1,911,317,536
Funded Ratio	56.9%	55.5%

SECTION IV – LIABILITIES

Tables IV-2 and IV-3 show the Actuarial Liability of active members by Tier as of July 1, 2024.

Table IV-2
Contributing Active Liabilities by Tier

	Number of Members	Appropriation Payroll	Actuarial Liability	Gross Normal Cost
Tier 1	1,301	$ 193,936,624	$ 1,113,770,740	$ 51,216,558
Tier 2	1,884	194,090,693	300,065,413	43,293,929
Total	3,185	$ 388,027,317	$ 1,413,836,153	$ 94,510,487

Table IV-3
Non-Contributing Active Liabilities by Tier

	Number of Members	Last Reported Payroll	Actuarial Liability	Gross Normal Cost
Tier 1	34	$ 3,687,434	$ 14,851,724	$ 0
Tier 2	44	3,837,013	3,556,912	0
Total	78	$ 7,524,447	$ 18,408,636	$ 0

SECTION IV – LIABILITIES

Table IV-4 presents the change in the actuarial liabilities, actuarial assets, and unfunded actuarial liability during the plan year. In general, the unfunded actuarial liability (UAL) of any retirement system is expected to change at each subsequent valuation for a variety of reasons. In each valuation, we report on those elements of change in the UAL which are of particular significance, potentially affecting the long-term financial outlook of the System.

Table IV-4
Development of 2024 Experience (Gain)/Loss

	Actuarial Liability	Actuarial Value of Assets	Unfunded Actuarial Liability
1. Value as of July 1, 2023	$ 4,299,450,412	$ (2,388,132,876)	$ 1,911,317,536
2. Additions			
Normal Cost	$ 89,147,002	$ 0	$ 89,147,002
Statutory State Contributions	0	(228,266,045)	(228,266,045)
Expected Member Contributions	0	(27,788,088)	(27,788,088)
Total Additions	$ 89,147,002	$ (256,054,133)	$ (166,907,131)
3. Deductions			
Benefit Payments	$ (260,333,383)	$ 260,333,383	$ 0
Expected Administrative Expenses	0	0	0
Total Deductions	$ (260,333,383)	$ 260,333,383	$ 0
4. Net Transfers from Other Systems			
State Contributions	$ 449,404	$ (449,404)	$ 0
Member Contributions	312,585	(312,585)	0
Total Net Transfers	$ 761,989	$ (761,989)	$ 0
5. Expected Interest	$ 298,270,475	$ (159,194,091)	$ 139,076,384
6. Expected Value as of July 1, 2024 [1 + 2 + 3 + 4 + 5]	$ 4,427,296,495	$ (2,543,809,706)	$ 1,883,486,789
7. Other Changes			
Appropriation Adjustment	$ 0	$ 462	$ 462
Contribution Timing	0	9,412,236	9,412,236
Actual Member Contributions	0	(3,521,627)	(3,521,627)
Assumption Changes	0	0	0
Change in Benefits	0	0	0
Total Other Changes	$ 0	$ 5,891,071	$ 5,891,071
8. Expected Value after Changes [6 + 7]	$ 4,427,296,495	$ (2,537,918,635)	$ 1,889,377,860
9. Actual Value as of July 1, 2024	$ 4,461,205,210	$ (2,536,561,144)	$ 1,924,644,066
10. Actuarial (Gain)/Loss [9 - 8]	$ 33,908,715	$ 1,357,491	$ 35,266,206

SECTION IV – LIABILITIES

Table IV-5 shows the components of the Actuarial (Gain)/Loss for the System as of July 1, 2024 and July 1, 2023.

Table IV-5
Actuarial (Gain)/Loss Analysis

Components	July 1, 2024	July 1, 2023
Actuarial Value of Assets		
Investment Return	$ (321,788)	$ 17,059,387
Administrative Expenses	1,679,279	891,300
Total	$ 1,357,491	$ 17,950,687
Actuarial Liability		
Salary Increases	$ 30,680,658	$ 14,085,092
New Entrants	3,849,228	5,096,057
Demographic Experience		
Contributing Actives	5,151,091	13,394,629
Non-Contributing Actives	(1,453,386)	(843,639)
Inactives	(3,530,668)	(2,918,149)
Sub-Total	$ 34,696,923	$ 28,813,990
Impact of Net Transfers from Other Systems	(788,208)	(377,030)
Total	$ 33,908,715	$ 28,436,960
Actuarial (Gain)/Loss	**$ 35,266,206**	**$ 46,387,647**

SECTION V – CONTRIBUTIONS

In the process of evaluating the financial condition of any pension plan, the actuary analyzes the assets and liabilities to determine what level (if any) of contributions is needed to properly maintain the funded status of the System. Typically, the actuarial process will use a funding technique that will result in a pattern of contributions that are both stable and predictable.

Under the current funding policy, the State funding requirement contains two components: the employer normal cost and an amortization of the unfunded actuarial liability (UAL). The funding methodology prescribed by NJ State Statute does not include a cost component for administrative expenses, and therefore administrative expenses are implicitly covered by the investment rate of return assumption.

For SPRS, the funding method employed is the Projected Unit Credit (PUC) Actuarial Cost Method. Under this funding method, the actuarial liability is calculated as the actuarial present value of the projected benefits allocated to periods prior to the valuation year based on service. The unfunded actuarial liability is the actuarial liability on the valuation date less the actuarial value of assets.

In accordance with Chapter 78, P. L. 2011, the unfunded actuarial liability for the July 1, 2019 valuation was amortized over a closed 30-year period as a level dollar amount. For the July 1, 2024 valuation, the amortization period has decreased to 25 years.

SECTION V – CONTRIBUTIONS

Table V-1 shows the development of the Statutory Pension Contribution for the current and prior year. Table V-2 summarizes the contributions as a percentage of appropriation payroll.

Table V-1
Development of Statutory Pension Contribution

Valuation Date Fiscal Year Ending	July 1, 2024 2026	July 1 2023 2025
1. Unfunded Actuarial Liability (UAL) Contribution		
a. Actuarial Liability	$ 4,461,205,210	$ 4,299,450,412
b. Actuarial Value of Assets	2,536,561,144	2,388,132,876
c. Unfunded Actuarial Liability [1a. - 1b.]	$ 1,924,644,066	$ 1,911,317,536
d. Amortization Period (years)	25	26
e. Amortization of UAL Payable at Valuation Date (Level Dollar)	$ 154,350,190	$ 151,049,509
f. UAL Contribution Payable Beginning of Fiscal Year [1e. with one year of interest]	$ 165,154,703	$ 161,622,975
2. Normal Cost Contribution		
a. Gross Normal Cost	$ 94,510,487	$ 89,147,002
b. Expected Member Contributions	28,367,245	26,863,759
c. State Normal Cost [2a. - 2b.]	$ 66,143,242	$ 62,283,243
d. State Normal Cost Payable Beginning of Fiscal Year [2c. with one year of interest]	$ 70,773,269	$ 66,643,070
3. Total Statutory Pension Contribution as of Beginning of Fiscal Year [1f. + 2d.]	**$ 235,927,972**	**$ 228,266,045**

Table V-2
Statutory Contributions as a Percent of Appropriation Payroll

Valuation Date Fiscal Year Ending	July 1, 2024 2026	July 1, 2023 2025
Statutory Contribution		
State Normal Cost	18.24%	18.16%
UAL Contribution	42.56%	44.04%
Total Statutory Pension Contribution	60.80%	62.20%

Rates are based only on contributing active compensation

APPENDIX A – MEMBERSHIP INFORMATION

The data for this valuation was provided by the New Jersey Division of Pensions and Benefits as of July 1, 2024. Cheiron did not audit any of the data. However, we did perform an informal examination of the obvious characteristics of the data for reasonableness and consistency in accordance with Actuarial Standard of Practice No. 23, Data Quality. The following is a list of data charts contained in this section:

- A-1: Contributing Active Member Data by Tier
- A-2: Non-Contributing Active Member Data by Tier
- A-3: Inactive Member Data, Total Annual and Average Retirement Allowances by Status
- A-4: Reconciliation of Plan Membership
- A-5 through A-6: Contributing Active Member Data by Age and Service
- A-7 through A-8: Inactive Member Data by Age and Status

Table A-1
Contributing Active Member Data by Tier

	July 1, 2024	July 1, 2023	% Change
Tier 1			
Count	1,301	1,400	-7.1%
Average Age	46.2	45.7	1.2%
Average Service	20.3	19.6	3.5%
Average Appropriation Pay	$ 149,067	$ 141,667	5.2%
Total Appropriation Payroll	$ 193,936,624	$ 198,334,031	-2.2%
Tier 2			
Count	1,884	1,747	7.8%
Average Age	32.9	32.4	1.7%
Average Service	6.4	5.8	11.2%
Average Appropriation Pay	$ 103,021	$ 96,536	6.7%
Total Appropriation Payroll	$ 194,090,693	$ 168,648,125	15.1%
Total			
Count	3,185	3,147	1.2%
Average Age	38.3	38.3	0.2%
Average Service	12.1	11.9	1.3%
Average Appropriation Pay	$ 121,830	$ 116,613	4.5%
Total Appropriation Payroll	$ 388,027,317	$ 366,982,156	5.7%

APPENDIX A – MEMBERSHIP INFORMATION

Table A-2
Non-Contributing Active Member Data by Tier

	July 1, 2024	July 1, 2023	% Change
Tier 1			
Count	34	32	6.3%
Average Age	50.6	50.3	0.5%
Average Service	13.6	13.2	3.3%
Average Last Reported Pay	$ 108,454	$ 103,904	4.4%
Total Last Reported Pay	$ 3,687,434	$ 3,324,931	10.9%
Tier 2			
Count	44	39	12.8%
Average Age	35.0	34.1	2.5%
Average Service	3.6	3.2	13.6%
Average Last Reported Pay	$ 87,205	$ 83,102	4.9%
Total Last Reported Pay	$ 3,837,013	$ 3,240,968	18.4%
Total			
Count	78	71	9.9%
Average Age	41.8	41.4	0.9%
Average Service	8.0	7.7	3.7%
Average Last Reported Pay	$ 96,467	$ 92,477	4.3%
Total Last Reported Pay	$ 7,524,447	$ 6,565,899	14.6%

APPENDIX A – MEMBERSHIP INFORMATION

Table A-3
Inactive Member Data by Status

	July 1, 2024	July 1, 2023	% Change
Retirees			
Count	2,907	2,858	1.7%
Annual Retirement Allowances	$ 225,757,336	$ 218,858,687	3.2%
Average Retirement Allowance	$ 77,660	$ 76,578	1.4%
Beneficiaries			
Count	525	524	0.2%
Annual Retirement Allowances	$ 21,657,662	$ 21,262,137	1.9%
Average Retirement Allowance	$ 41,253	$ 40,577	1.7%
Ordinary Disability			
Count	119	120	-0.8%
Annual Retirement Allowances	$ 4,940,937	$ 4,918,313	0.5%
Average Retirement Allowance	$ 41,520	$ 40,986	1.3%
Accidental Disability			
Count	169	169	0.0%
Annual Retirement Allowances	$ 10,665,904	$ 10,644,452	0.2%
Average Retirement Allowance	$ 63,112	$ 62,985	0.2%
In-Pay Total			
Count	**3,720**	**3,671**	**1.3%**
Annual Retirement Allowances	**$ 263,021,839**	**$ 255,683,589**	**2.9%**
Average Retirement Allowance	**$ 70,705**	**$ 69,650**	**1.5%**
Deferred Vested Members			
Count	0	0	N/A
Annual Retirement Allowances	$ 0	$ 0	N/A
Average Retirement Allowance	$ 0	$ 0	N/A

QDRO benefits included with member records for valuation purposes.

APPENDIX A – MEMBERSHIP INFORMATION

Table A-4
Reconciliation of Plan Membership from July 1, 2023 to July 1, 2024

	Contributing Actives	Non-Contrib. Actives	Deferred Vested	Retired	Disabled	Beneficiaries	Total
1. July 1, 2023	**3,147**	**71**	**0**	**2,858**	**289**	**524**	**6,889**
2. Additions							
a. New entrants	149						149
b. New beneficiaries						7	7
c. Data correction							0
d. Total	149	0	0	0	0	7	156
3. Reductions							
a. Withdrawal	(3)	(5)					(8)
b. Died without beneficiary				(25)	(3)	(24)	(52)
c. Payments ceased						(2)	(2)
d. Total	(3)	(5)	0	(25)	(3)	(26)	(62)
4. Changes in Status							
a. Contributing Active	2	(2)					0
b. Non-Contributing Active	(14)	14					0
c. Deferred Vested							0
d. Retired	(94)			94			0
e. Disabled	(2)			(2)	4		0
f. Died with beneficiary				(18)	(2)	20	0
g. Total	(108)	12	0	74	2	20	0
5. July 1, 2024	**3,185**	**78**	**0**	**2,907**	**288**	**525**	**6,983**

QDRO benefits included with member records for valuation purposes.

APPENDIX A – MEMBERSHIP INFORMATION

Table A-5
Counts by Age and Service of Contributing Active Members

Attained Age	Years of Service								
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & up	Total
Under 30	104	438	69	0	0	0	0	0	611
30 to 34	27	215	298	46	1	0	0	0	587
35 to 39	1	52	233	256	70	2	0	0	614
40 to 44	0	0	39	64	435	70	1	0	609
45 to 49	0	0	0	5	189	295	23	0	512
50 to 54	0	0	0	0	41	112	95	2	250
55 & up	0	0	0	0	0	0	2	0	2
Total	132	705	639	371	736	479	121	2	3,185

Table A-6
Average Appropriation Pay by Age and Service of Contributing Active Members

Attained Age	Years of Service								
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & up	Total
Under 30	$ 84,747	$ 91,346	$ 95,658	$ 0	$ 0	$ 0	$ 0	$ 0	$ 90,710
30 to 34	84,747	93,123	103,763	116,386	101,033	0	0	0	99,976
35 to 39	84,747	93,593	112,283	122,113	134,218	131,531	0	0	117,317
40 to 44	0	0	116,025	124,813	141,327	150,552	141,958	0	139,033
45 to 49	0	0	0	131,069	143,969	155,245	160,374	0	151,077
50 to 54	0	0	0	0	145,287	155,910	165,012	153,077	157,604
55 & up	0	0	0	0	0	0	230,894	0	230,894
Total	$ 84,747	$ 92,054	$ 106,743	$ 121,989	$ 141,495	$ 154,616	$ 165,029	$ 153,077	$ 121,830

APPENDIX A – MEMBERSHIP INFORMATION

Table A-7
Counts by Age and Status of Inactive Members

Attained Age	Status				
	Retiree	Beneficiary	Ordinary Disability	Accidental Disability	Total
Under 45	3	16	6	13	38
45 to 49	31	5	8	19	63
50 to 54	236	9	6	28	279
55 to 59	573	16	23	38	650
60 to 64	650	34	29	36	749
65 to 69	422	43	19	16	500
70 to 74	273	61	8	8	350
75 to 79	331	98	8	3	440
80 to 84	252	115	8	5	380
85 & up	136	128	4	3	271
Total	2,907	525	119	169	3,720

Table A-8
Average Retirement Allowances by Age and Status of Inactive Members

Attained Age	Status				
	Retiree	Beneficiary	Ordinary Disability	Accidental Disability	Total
Under 45	$ 66,315	$ 37,599	$ 42,976	$ 57,656	$ 47,577
45 to 49	94,018	60,683	42,311	70,520	77,719
50 to 54	101,625	67,888	40,222	67,571	95,799
55 to 59	88,144	59,569	40,831	68,864	84,639
60 to 64	82,681	52,970	42,724	63,992	78,887
65 to 69	78,164	49,017	50,594	58,380	73,976
70 to 74	72,813	45,771	45,663	54,411	67,059
75 to 79	64,709	39,875	32,851	39,118	58,424
80 to 84	54,592	38,525	30,150	30,148	48,893
85 & up	46,853	32,420	23,642	42,172	39,641
Total	$ 77,660	$ 41,253	$ 41,520	$ 63,112	$ 70,705

QDRO benefits included with member records for valuation purposes.

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

A. Actuarial Assumptions

1. Investment Rate of Return

7.00% per annum, compounded annually.

2. Administrative Expenses

No explicit assumption is made for administrative expenses for funding purposes per the funding methodology prescribed by NJ State Statute.

3. Cost-of-Living Adjustments (COLAs)

No future COLAs are assumed. Previously granted COLAs are included in the data.

4. Salary Increases

Salaries are assumed to increase annually as follows:

Service	Rates
0 – 11	6.75%
12 – 25	3.75
26 +	2.75

Salary increases are assumed to occur on January 1.

5. 401(a)(17) Pay Limit

$345,000 in 2024 increasing 2.75% per annum, compounded annually.

6. Social Security Wage Base

$168,600 in 2024 increasing 3.25% per annum, compounded annually.

7. Termination

Termination rates are as follows:

Service	Rates
0 – 3	0.450%
4	0.300
5	0.225
6	0.200
7	0.175
8	0.150
9	0.125
10	0.100
11-19	0.075
20	0.000

No termination is assumed after attainment of retirement eligibility.

All members with ten or more years of service at termination are assumed to elect a deferred retirement benefit.

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

8. Disability

Representative disability rates are as follows:

Age	Ordinary Disability	Accidental Disability
20	0.009%	0.015%
25	0.015	0.025
30	0.032	0.053
35	0.116	0.194
40	0.125	0.208
45	0.128	0.214
50	0.132	0.220
54	0.177	0.295

No ordinary disability is assumed prior to attainment of ordinary disability retirement eligibility at four years of service or after attainment of special retirement eligibility at 25 years of service.

Accidental disability rates apply at all ages until the mandatory retirement age of 55.

Members retiring under the ordinary disability decrement with 20 or more years of service are assumed to receive the involuntary disability retirement benefit.

Members are assumed to receive the greater of the applicable disability benefit or the service or special retirement benefit, depending on eligibility.

9. Mortality

Pre-Retirement (Non-Annuitant): The Pub-2010 Public Safety Above-Median Income Employee mortality table [*PubS-2010(A) Employee*] as published by the Society of Actuaries (SOA), unadjusted, and with future improvement from the base year of 2010 on a generational basis using SOA's Scale MP-2021.

35% of the deaths are assumed to be accidental.

For purposes of pre-retirement accidental death benefits based on Adjusted Final Compensation, the benefit is assumed to increase at 3.75% per year, consistent with the assumed salary increases for members with 12 to 25 years of service.

Healthy Retirees (Healthy Annuitants): The Pub-2010 Public Safety Above-Median Income Healthy Retiree mortality table [*PubS-2010(A) Healthy Retiree*] as published by the Society of Actuaries, unadjusted, and with future improvement from the base year of 2010 on a generational basis using SOA's Scale MP-2021.

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

Beneficiaries (Contingent Annuitants): The Pub-2010 General Above-Median Income Healthy Retiree mortality table [*PubG-2010(A) Healthy Retiree*] as published by the Society of Actuaries, unadjusted, and with future improvement from the base year of 2010 on a generational basis using SOA's Scale MP-2021.

Disabled Retirees (Disabled Annuitants): The Pub-2010 Public Safety Disabled Retiree mortality table [*PubS-2010 Disabled Retiree*] as published by the Society of Actuaries, unadjusted, and with future improvement from the base year of 2010 on a generational basis using SOA's Scale MP-2021.

10. Retirement

For those with 24 years of service or less: 0.50%

For those with 25 years of service:

Age	Rates
48 or younger	25.00%
49-54	50.00

For those with 26 or more years of service: 35.00%

Mandatory retirement at age 55.

11. Family Composition Assumptions

For members not currently in receipt, 83.3% of members are assumed married to spouses of the opposite sex. Males are assumed to be two years older than females.

For purposes of the post-retirement death benefit for members currently in receipt, beneficiary status is based on the beneficiary allowance reported. If no beneficiary date of birth is provided, the beneficiary is assumed to be the member's spouse of the opposite sex with males assumed to be two years older than females.

No additional dependent children or parents are assumed.

For current dependents receiving a pre-retirement accidental death benefit, those under age 24 are assumed to receive a benefit until age 24 while those over age 24 are assumed to receive a benefit for the remainder of their lifetime.

For current dependents receiving a benefit other than a pre-retirement accidental death benefit, those under age 18 are assumed to receive a benefit until age 18 while those over age 18 are assumed to receive a benefit for the remainder of their lifetime.

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

12. Data

Information provided by the prior actuary was relied upon for the purposes of setting the status of and valuing non-contributing active records.

For current beneficiaries with missing data, reasonable assumptions were made based on the information available in prior years.

Inactives receiving benefits according to the 2023 data but omitted from the 2024 data are assumed to have died without a beneficiary.

The maintenance amount reported in the 2023 active data was unchanged since 2021. For the 2023 valuation data, we increased the reported maintenance amount by 11.2% in accordance with the contract between the State and State Troopers Fraternal Associations covering Fiscal Years 2020-2023. For the 2024 valuation, no adjustments to the reported maintenance amounts were required since this field was updated for 2024.

13. Rationale for Assumptions

The demographic and economic assumptions used in this report, except for the investment return assumption, reflect the results of the July 1, 2018 – June 30, 2021 Experience Study, which was approved by the Board of Trustees on November 22, 2022.

The investment return assumption was recommended by the State Treasurer. We find the investment return assumption to be reasonable based on the System's current asset allocation and the capital market outlook of the New Jersey Division of Investment.

The combined effect of the assumptions in aggregate is expected to have no significant bias.

14. Changes in Assumptions since Last Valuation

None.

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

B. Projection Assumptions

1. Investment Rate of Return

7.00% per annum, compounded annually.

2. Appropriation Percentages

The State is assumed to appropriate 100% of the Statutory contribution in FYE 2026 and each year thereafter.

3. Administrative Expenses

The actual administrative expenses paid in FYE 2024 are assumed to increase by 2.75% per annum, compounded annually.

4. New Entrants

- Contributing active population assumed to remain at 2024 levels.
- Assumed to join mid-year.
- Age/sex distributions based on the last three years of new hires.
- Salary based on salary for most recent hires reported on 2024 data.
- New entrant salary assumed to increase with the salary increase rates applicable for members with 26 or more years of service.

5. Demographic Assumptions

Same as those used for valuation purposes.

6. Projection Basis

This report includes projections of future assets, liabilities, funded status and contributions for the purpose of assisting the Board of Trustees with the management of the System.

The projections are based on the same census data and financial information as of July 1, 2024 which has been used for the actuarial valuation. The projections assume continuation of the plan provisions and actuarial assumptions in effect as of July 1, 2024 and do not reflect the impact of any changes in benefits or actuarial assumptions that may be adopted after July 1, 2024 unless otherwise indicated. While the assumptions individually are reasonable for the underlying valuation that supports the projections, specifically for projection purposes, they are also considered reasonable in the aggregate.

The projections are based on our proprietary model *PScan* developed by our firm that utilizes the results shown in this valuation report. The projections assume that all future assumptions are met except where indicated with respect to future investment returns and demographic assumptions. The future outcomes become increasingly uncertain over time, and therefore the general trends and not the absolute values should be considered in the review of these projections.

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

C. Actuarial Methods

The actuarial methods used for determining State contributions are described as follows.

1. Actuarial Cost Method

The actuarial cost method for funding calculations is the Projected Unit Credit Cost Method.

The actuarial liability is calculated as the actuarial present value of the projected benefits linearly allocated to periods prior to the valuation year based on service. The unfunded actuarial liability is the actuarial liability on the valuation date less the actuarial value of assets.

In accordance with Chapter 78, P.L. 2011:

- Beginning with the July 1, 2010 actuarial valuation, the accrued liability contribution shall be computed so that if the contribution is paid annually in level dollars, it will amortize the unfunded accrued liability over an open 30 year period.
- Beginning with the July 1, 2019 actuarial valuation, the accrued liability contribution shall be computed so that if the contribution is paid annually in level dollars, it will amortize the unfunded accrued liability over a closed 30 year period (i.e., for each subsequent actuarial valuation the amortization period shall decrease by one year).
- Beginning with the July 1, 2029 actuarial valuation, when the remaining amortization period reaches 20 years, any increase or decrease in the unfunded accrued liability as a result of actuarial losses or gains for subsequent valuation years shall serve to increase or decrease, respectively, the amortization period for the unfunded accrued liability, unless an increase in the amortization period will cause it to exceed 20 years. If an increase in the amortization period as a result of actuarial losses for a valuation year would exceed 20 years, the accrued liability contribution shall be computed for the valuation year using a 20-year amortization period.

To the extent that the amortization period remains an open period in future years and depending upon the specific circumstances, it should be noted that in the absence of emerging actuarial gains or contributions made in excess of the actuarially determined contribution, any existing unfunded accrued liability may not be fully amortized in the future.

2. Asset Valuation Method

For the purposes of determining contribution rates, an actuarial value of assets is used that dampens the volatility in the market value of assets, resulting in a smoother pattern of contributions.

The actuarial value of assets is adjusted to reflect actual contributions, benefit payments and administrative expenses and an assumed return on the previous year's assets and the current year's cash flow at the prior year's actuarial valuation interest rate, with a further adjustment to reflect 20% of the difference between the resulting value and the actual market value of Plan assets.

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

3. State Contribution Payable Dates

Chapter 83, P.L. 2016 requires the State to make the required pension contributions on a quarterly basis in each fiscal year according to the following schedule: at least 25% by September 30, at least 50% by December 31, at least 75% by March 31, and at least 100% by June 30. As such, contributions are assumed to be made on a quarterly basis, with the first contribution 15 months after the associated valuation date.

4. ASOP No. 4 Disclosure

ASOP No. 4 requires the disclosure of a reasonable actuarially determined contribution (ADC), which includes the use of an asset valuation method that complies with ASOP No. 44. For purposes of this disclosure requirement only, we have calculated an ADC based on the market value of assets instead of the actuarial value of assets. Using the market value of assets would result in more volatile contribution requirements but would avoid deferral of contribution increases due to unrecognized asset losses. This reasonable ADC is $0.1 million, or 0.05%, less than the FYE 2026 Statutory contribution shown in Table I-1. For purposes of this reasonable ADC calculation, we use an investment rate of return assumption of 7.00%, net of administrative expenses.

The actuarial methods used to determine the reasonable ADC described above have been selected to balance benefit security, intergenerational equity and stability of contributions. The selection of the actuarial methods has taken into account the demographics of plan members, the funding goals and objectives of the State (as expressed through the Statutory contribution), and the need to accumulate assets to make benefit payments when due. The methods used are not the only methods that would result in a reasonable ADC. There are a range of methods that would result in reasonable ADCs. For example, a reasonable ADC could be based on a different asset smoothing method that complies with ASOP No. 44.

5. Valuation Software

Cheiron utilizes ProVal, an actuarial valuation software leased from Winklevoss Technologies (WinTech) to calculate liabilities and project benefit payments. We have relied on WinTech as the developer of ProVal. We have reviewed ProVal and have used ProVal in accordance with its original intended purpose. We have not identified any material inconsistencies in Proval assumptions or output that would affect this actuarial valuation.

6. Changes in Methods since Last Valuation

None.

APPENDIX C – SUMMARY OF PLAN PROVISIONS

This summary of Plan provisions provides an overview of the major provisions of the SPRS used in the actuarial valuation. It is not intended to replace the more precise language of the NJ State Statutes, Title 53, Chapter 5A, and if there is any difference between the description of the plan herein and the actual language in the NJ State Statutes, the NJ State Statutes will govern. This valuation is prepared based on plan provisions in effect as of July 1, 2024, and does not reflect the impact of any changes in benefits that may have been approved after the valuation date.

1. Eligibility of Membership

All members of the former State Police and Benevolent Fund and full-time commissioned officers, non-commissioned officers or troopers of the Division of State Police. Membership is a condition of employment.

a) Tier 1 Member: Any member hired on or before May 21, 2010.

b) Tier 2 Member: Any member hired after May 21, 2010.

2. Plan Year

The 12-month period beginning on July 1 and ending on June 30.

3. Service Credit

Service rendered while a member as described above. Chapter 399, P.L. 2021 permits members to purchase service credit earned from public employment in another state or with the United States Government.

4. Credited Service

A year is credited for each year of service as an officer or trooper in the State Police.

5. Compensation

Base salary in accordance with established salary policies of the state for all employees in the same position. Compensation does not include individual salary adjustments granted primarily in anticipation of the retirement or for temporary or extracurricular duties beyond the regular work day or shift. Effective June 30, 1996, Chapter 113, P. L. 1997 provided that the amount of compensation used for employer and member contributions and benefits under the program cannot exceed the compensation limitation of Section 401(a)(17) of the Internal Revenue Code. Chapter 1, P. L. 2010 provides that for members hired on or after May 22, 2010, the amount of compensation used for employer and member contributions and benefits under the System cannot exceed the annual maximum wage contribution base for Social Security, pursuant to the Federal Insurance Contributions Act.

APPENDIX C – SUMMARY OF PLAN PROVISIONS

6. Final Compensation

Average compensation received by the member in the last 12 months of credited service preceding retirement or death. Such term includes the value of the member's maintenance allowance for the same period. Chapter 1, P. L. 2010 provides that for members hired on or after May 22, 2010, Final Compensation means the average annual compensation for service for which contributions are made during any three fiscal years of membership providing the largest possible benefit to the member or the member's beneficiary.

7. Aggregate Contributions

The sum of all amounts deducted from the compensation of a member or contributed by him or on his behalf.

8. Member Contributions

Each member contributes 9.0% of base salary. For contribution purposes, compensation does not include overtime, bonuses, maintenance or any adjustments before retirement.

9. Adjusted Final Compensation

For purposes of the pre-retirement accidental death benefit, the amount of compensation or compensation as adjusted, as the case may be, increased by the same percentage increase which is applied in any adjustments of the compensation schedule of active members after the member's death and before the date on which the deceased member of the retirement system would have accrued 25 years of service under an assumption of continuous service, at which time that amount will become fixed. Adjustments to compensation or adjusted compensation shall take effect at the same time as any adjustments in the compensation schedule of active members.

10. Benefits

a) Service and Special Retirement

Mandatory retirement at age 55. Voluntary retirement prior to age 55.

(1) Service Retirement: 20 years of service credit, or members as of August 29, 1985 who would not have 20 years of service credit at age 55.

Benefit is an annual retirement allowance equal to 50% of final compensation.

(2) Special Retirement: 25 years of service credit.

Benefit is an annual retirement allowance equal to 65% of final compensation, plus 1% for each year of service credit in excess of 25 years, to a maximum of 70% of final compensation.

(3) Members as of August 29, 1985 who would have 20 years of service credit but not 25 years at age 55.

Benefit is an annual retirement allowance equal to 50% of final compensation, plus 3% for each year of service credit in excess of 20 years.

b) Deferred Retirement

Termination of service prior to age 55 with ten years of service credit.

Benefit is either a refund of aggregate contributions, or a deferred life annuity beginning at age 55 equal to 2% of final compensation for each year of service credit up to 25 years.

For members who die during the deferral period, the benefit is a return of aggregate contributions.

c) Non-Vested Termination

Termination of service prior to age 55 and less than ten years of service credit.

Benefit is a return of aggregate contributions.

d) Death Benefits

(1) Ordinary Death Before Retirement: Death of an active member of the plan. Benefit is equal to:

a. Lump sum payment equal to 350% of final compensation, also known as the noncontributory group life insurance benefit, plus

b. Spousal life annuity of 50% of final compensation payable until spouse's death or remarriage. If there is no surviving spouse, or upon death or remarriage, 50% of final compensation payable to surviving children in equal shares. If there is no surviving spouse or dependent child(ren), 25% (40%) of final compensation to one (two) dependent parent(s). If there is no surviving spouse, dependent child(ren) or parent(s), the benefit is a refund of accumulated contributions.

(2) Accidental Death Before Retirement: Death of an active member of the plan resulting during performance of duties. Benefit is equal to:

a. Lump sum payment equal to 350% of final compensation, also known as the noncontributory group life insurance benefit, plus

b. Spousal life annuity of 70% of final compensation or adjusted final compensation (if appropriate) payable until spouse's death. If there is no surviving spouse, or upon death of the surviving spouse, 70% of final compensation or adjusted final compensation (if appropriate) payable to surviving children in equal shares. If there is no surviving spouse or dependent children, 25% (40%) of final compensation or adjusted final compensation (if appropriate) to one (two) dependent parents. If there is no surviving spouse, dependent child(ren) or parent(s), the benefit is a refund of accumulated contributions.

(3) Death After Retirement: Death of a retired member of the plan. Accidental death benefits in certain circumstances are provided to surviving spouses and children of SPRS retirees who participated in the World Trade Center rescue, recovery or cleanup operations and died prior to July 8, 2019.

Benefit is equal to:

a. Lump sum payment equal to 50% of final compensation for a member retired under service, special or deferred retirement. For a member receiving a disability benefit, lump sum payment of 350% of final compensation if death occurs prior to age 55 and 50% of final compensation if death occurs after age 55. This benefit is also known as the noncontributory group life insurance benefit, plus

b. Spousal life annuity of 50% of final compensation payable until spouse's death or remarriage. If there is no surviving spouse, or upon death or remarriage, a total of 20% (35%, 50%) of final compensation payable to one (two, three or more) dependent child(ren). Previously granted COLAs also apply.

e) Disability Retirement

(1) Ordinary Disability Retirement: Four years of service credit and mentally or physically incapacitated for the performance of his usual duty and of any other available duty in the Division of State Police and such incapacity is likely to be permanent.

Benefit is an immediate life annuity equal to the greater of:

a. 40% of final compensation, or

b. 1.5% of final compensation for each year of service credit.

(2) Involuntary Ordinary Disability Retirement: Ordinary Disability Retirement applied for by the employer.

Benefit is an immediate life annuity equal to:

a. For members with 20 years of service credit but less than 25 years, 50% of final compensation plus 3% of final compensation for each year of service credit in excess of 20 years, to a maximum of 65% of final compensation.

b. For all other members, the Ordinary Disability benefit.

(3) Accidental Disability Retirement: Totally and permanently disabled as a direct result of a traumatic event occurring during and as a result of his regular or assigned duties and such member is mentally or physically incapacitated for the performance of his usual duties in the Division of State Police. A member may also be eligible if the member becomes totally and permanently disabled because of a preexisting and asymptomatic condition that is later rendered symptomatic as a direct result of a traumatic event occurring during and as a result of the performance of regular or assigned duties. Under certain conditions, regular or assigned duties may include the World Trade Center (WTC) rescue, recovery, or cleanup operations between September 11, 2001 and October 11, 2011. For such members who participated in the WTC rescue, recovery, or cleanup operations, the total and permanent disability may occur after retirement on a service retirement or an ordinary disability retirement.

Benefit is an immediate life annuity equal to 2/3 of annual rate of compensation, including the maintenance allowance, at the time of the traumatic event or retirement, whichever is greater.

11. Forms of Payment

No optional forms of payment available.

12. Changes in Plan Provisions since Last Valuation

None.

APPENDIX D – HISTORICAL DATA AND REQUIRED EXHIBITS

Table D-1
Historical Summary of Assets and Liabilities

Valuation Date July 1,	Market Value of Assets	Actuarial Value of Assets	Actuarial Liability	Funded Ratio Market Value	Funded Ratio Actuarial Value
2024	$ 2,537,848,295	$ 2,536,561,144	$ 4,461,205,210	56.9%	56.9%
2023	2,319,895,327	2,388,132,876	4,299,450,412	54.0%	55.5%
2022	2,143,761,852	2,265,019,950	4,150,668,450	51.6%	54.6%
2021	2,337,244,908	2,173,817,051	3,994,414,280	58.5%	54.4%
2020	1,861,270,733	2,001,925,624	3,692,501,511	50.4%	54.2%
2019	1,902,721,169	1,971,653,600	3,595,361,713	52.9%	54.8%
2018	1,881,340,538	1,939,304,839	3,430,821,762	54.8%	56.5%
2017	1,830,429,239	1,923,127,122	3,346,082,274	54.7%	57.5%
2016	1,744,462,405	1,931,131,875	3,209,386,033	54.4%	60.2%
2015	1,900,695,725	1,969,239,472	3,090,220,484	61.5%	63.7%

Table D-2
Historical Summary of State Appropriations

Fiscal Year Ending June 30,	Actuarially Determined Contribution	Actual Pension Contributions	Contribution Deficiency (Excess)	Percentage of Contribution Covered
2025	$ 228,266,045	$ 228,266,045	$ 0	100.00%
2024	220,326,450	220,326,000	450	100.00%
2023	204,873,732	204,874,000	(268)	100.00%
2022	186,571,217	201,321,000	(14,749,783)	107.91%
2021	178,836,912	139,493,000	39,343,912	78.00%
2020	165,576,179	115,920,000	49,656,179	70.01%
2019	159,162,729	96,000,000	63,162,729	60.32%
2018	144,208,823	72,104,000	72,104,823	50.00%
2017	133,217,662	51,038,000	82,179,662	38.31%
2016	118,600,705	35,580,000	83,020,705	30.00%

FYE 2025 actual contribution is based on the State's anticipated appropriation equal to the Statutory Contribution.

The information above is based on the final actuarial valuation reports for the given years. The amounts do not reflect differences between the discounted State appropriations receivable and the actual State contribution amounts that became known after the issuance of the reports.

APPENDIX D – HISTORICAL DATA AND REQUIRED EXHIBITS

In accordance with the Government Finance Officers Association (GFOA) and their recommended checklist for Annual Comprehensive Financial Reports, we prepared the following schedules for the System. The GFOA checklist uses the term Actuarial Accrued Liability, which is the same as the Actuarial Liability used elsewhere in this report.

Table D-3
Schedule Retirees and Beneficiaries Added to and Removed from Rolls

Valuation Date July 1,	Added to Rolls		Removed from Rolls		Rolls at End of Year		Average Annual Allowance[1]	% Increase in Average Annual Allowance[1]
	Number	Annual Allowance	Number[1]	Annual Allowance	Number[1]	Annual Allowance		
2024	123	$ 10,849,612	74	$ 3,541,266	3,720	$ 263,021,839	$ 70,705	1.52%
2023	140	11,843,040	81	3,886,255	3,671	255,683,589	69,650	1.62%
2022	153	11,561,892	85	3,902,361	3,612	247,559,564	68,538	1.76%
2021	142	10,977,530	77	3,625,235	3,544	238,690,959	67,351	1.30%
2020	161	11,682,136	82	3,767,812	3,479	231,316,330	66,489	1.19%
2019	79	5,012,378	83	3,855,314	3,400	223,394,278	65,704	0.66%
2018	127	9,003,637	64	2,802,076	3,404	222,196,734	65,275	8.54%
2017	101	5,551,153	79	3,074,257	3,588	215,773,680	60,138	0.54%
2016	137	8,351,556	82	3,165,408	3,566	213,292,784	59,813	0.91%
2015	160	10,330,374	58	2,732,284	3,511	208,106,636	59,273	0.77%

[1] Beginning with the 2018 valuation, QDRO records excluded from headcounts and QDRO benefits included with member records. This change resulted in 247 fewer records on the rolls as of July 1, 2018.

Table D-4
Schedule of Active Member Valuation Data

Valuation Date July 1,	Number of Contributing Active Members[1]	Annual Compensation[1]	Average Annual Compensation[1]	% Increase/ (Decrease) in Average Annual Compensation[1]
2024	3,185	$ 388,027,317	$ 121,830	4.47%
2023	3,147	366,982,156	116,613	1.14%
2022	2,994	345,191,396	115,294	2.68%
2021	2,957	332,022,798	112,284	3.98%
2020	2,762	298,254,514	107,985	0.84%
2019	2,766	296,189,926	107,082	3.32%
2018	2,661	275,790,087	103,642	0.84%
2017	2,812	289,022,222	102,782	0.83%
2016	2,725	277,771,135	101,934	(0.98%)
2015	2,676	275,477,457	102,944	(1.09%)

[1] Prior to July 1, 2018, includes non-contributing active members

APPENDIX D – HISTORICAL DATA AND REQUIRED EXHIBITS

Table D-5
Schedule of Funding Progress

Valuation Date July 1,	Actuarial Value of Assets[1] (a)	Actuarial Accrued Liability (b)	(Surplus)/Unfunded Actuarial Accrued Liability (c) = (b) - (a)	Funded Ratio (a) / (b)	Covered Payroll[2] (d)	(Surplus)/Unfunded Actuarial Accrued Liability as % of Covered Payroll (c) / (d)
2024	$ 2,536,561,144	$ 4,461,205,210	$ 1,924,644,066	56.86%	$ 388,027,317	496.01%
2023	2,388,132,876	4,299,450,412	1,911,317,536	55.55%	366,982,156	520.82%
2022	2,265,019,950	4,150,668,450	1,885,648,500	54.57%	345,191,396	546.26%
2021	2,173,817,051	3,994,414,280	1,820,597,229	54.42%	332,022,798	548.34%
2020	2,001,925,624	3,692,501,511	1,690,575,887	54.22%	298,254,514	566.82%
2019	1,971,653,600	3,595,361,713	1,623,708,113	54.84%	296,189,926	548.20%
2018	1,939,304,839	3,430,821,762	1,491,516,923	56.53%	275,790,087	540.82%
2017	1,923,127,122	3,346,082,274	1,422,955,152	57.47%	289,022,222	492.33%
2016	1,931,131,875	3,209,386,033	1,278,254,158	60.17%	277,771,135	460.18%
2015	1,969,239,472	3,090,220,484	1,120,981,012	63.72%	275,477,457	406.92%

[1] Includes receivable amounts
[2] Prior to July 1, 2018, includes non-contributing active members

Table D-6
Schedule of Funded Liabilities by Type (Solvency Test)

Valuation Date July 1,	Actuarial Accrued Liability for: Contributing & Non-Contributing Active Member Contributions (1)	Retirees, Beneficiaries & Deferred Vesteds (2)	Contributing & Non-Contributing Active Member Benefits Financed by Employer (3)	Actuarial Value of Assets[1]	Portion of Actuarial Accrued Liabilities Covered by Actuarial Value of Assets (1)	(2)	(3)
2024	$ 280,708,162	$ 3,028,960,421	$ 1,151,536,627	$ 2,536,561,144	100.00%	74.48%	0.00%
2023	267,637,314	2,957,825,898	1,073,987,200	2,388,132,876	100.00%	71.69%	0.00%
2022	255,374,601	2,877,652,250	1,017,641,599	2,265,019,950	100.00%	69.84%	0.00%
2021	244,835,739	2,799,992,676	949,585,865	2,173,817,051	100.00%	68.89%	0.00%
2020	237,863,129	2,647,423,561	807,214,821	2,001,925,624	100.00%	66.63%	0.00%
2019	232,360,668	2,562,244,073	800,756,972	1,971,653,600	100.00%	67.88%	0.00%
2018	215,026,809	2,512,523,540	703,271,413	1,939,304,839	100.00%	68.63%	0.00%
2017	206,680,622	2,445,366,686	694,034,966	1,923,127,122	100.00%	70.19%	0.00%
2016	190,955,019	2,401,980,284	616,450,730	1,931,131,875	100.00%	72.45%	0.00%
2015	181,536,046	2,289,865,821	618,818,617	1,969,239,472	100.00%	78.07%	0.00%

[1] Includes receivable amounts

APPENDIX D – HISTORICAL DATA AND REQUIRED EXHIBITS

Table D-7
Analysis of Financial Experience
Change in Unfunded Actuarial Accrued Liability

Valuation Date July 1,	Actuarial Value of Asset Investment (Gain)/Loss	Actuarial Accrued Liability (Gain)/Loss	Assumption & Method Changes	Plan Changes	Contributions[1]	Change in Unfunded Actuarial Accrued Liability
2024	$ (321,788)	$ 33,908,715	$ 0	$ 0	$ (20,260,397)	$ 13,326,530
2023	17,059,387	28,436,960	0	0	(19,827,311)	25,669,036
2022	30,314,524	35,857,942	14,109,636	0	(15,230,831)	65,051,271
2021	(40,856,964)	70,169,382	137,855,533	0	(37,146,609)	130,021,342
2020	35,163,723	3,355,504	0	0	28,348,547	66,867,774
2019	17,233,108	(2,412,105)	79,849,779	0	37,520,408	132,191,190
2018	14,491,075	(3,282,548)	2,791,271	0	54,561,973	68,561,771
2017	23,174,471	1,508,647	55,934,385	239,606	63,843,885	144,700,994
2016	46,667,367	(8,038,512)	45,696,315	0	72,947,976	157,273,146
2015	17,135,937	71,841	52,383,620	0	69,583,989	139,175,387

[1] Change due to contributions (greater)/less than normal cost plus interest on the Unfunded Actuarial Accured Liability.

APPENDIX E – GLOSSARY OF TERMS

1. Actuarial Assumptions

Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disability, and retirement; changes in compensation; inflation; rates of investment earnings, and asset appreciation or depreciation; and other relevant items.

2. Actuarial Cost Method

A procedure for determining the Actuarial Present Value of pension plan benefits and expenses and for developing an allocation of such value to each year of service, usually in the form of a Normal Cost and an Actuarial Liability.

3. Actuarial Gain/(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, as determined in accordance with a particular Actuarial Cost Method.

4. Actuarial Liability

The portion of the Actuarial Present Value of Projected Benefits which will not be paid by future Normal Costs. It represents the value of the past Normal Costs with interest to the valuation date.

5. Actuarial Present Value (Present Value)

The value as of a given date of a future amount or series of payments. The Actuarial Present Value discounts the payments to the given date at the assumed investment return and includes the probability of the payment being made. As a simple example: assume you owe $100 to a friend one year from now. Also, assume there is a 1% probability of your friend dying over the next year, in which case you won't be obligated to pay him. If the assumed investment return is 10%, the actuarial present value is:

Amount		Probability of Payment		1/(1+Investment Return)		
$100	x	(1 - .01)	x	1/(1+.1)	=	$90

6. Actuarial Valuation

The determination, as of a specified date, of the Normal Cost, Actuarial Liability, Actuarial Value of Assets, and related Actuarial Present Values for a pension plan.

APPENDIX E – GLOSSARY OF TERMS

7. Actuarial Value of Assets

The value of cash, investments and other property belonging to a pension plan as used by the actuary for the purpose of an Actuarial Valuation. The purpose of an Actuarial Value of Assets is to smooth out fluctuations in market values. This way long-term costs are not distorted by short-term fluctuations in the market.

8. Actuarially Equivalent

Of equal Actuarial Present Value, determined as of a given date with each value based on the same set of Actuarial Assumptions.

9. Amortization Payment

The portion of the pension plan contribution which is designed to pay interest and principal on the Unfunded Actuarial Liability in order to pay for that liability in a given number of years.

10. Funded Ratio

The ratio of the Actuarial Value of Assets to the Actuarial Liabilities.

11. Investment Return Assumption

The assumed interest rate used for projecting dollar related values in the future.

12. Mortality Table

A set of percentages which estimate the probability of death at a particular point in time. Typically, the rates are annual and based on age and sex.

13. Normal Cost

That portion of the Actuarial Present Value of pension plan benefits and expenses, which is allocated to a valuation year by the Actuarial Cost Method.

14. Projected Benefits

Those pension plan benefit amounts which are expected to be paid in the future under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age and increases in future compensation and service credits.

APPENDIX E – GLOSSARY OF TERMS

15. Projected Unit Credit Cost Method

A method under which the Actuarial Liability is calculated as the Actuarial Present Value of the Projected Benefits allocated to periods prior to the valuation year based on service.

16. Unfunded Actuarial Liability

The excess of the Actuarial Liability over the Actuarial Value of Assets.