



# **Police and Firemen's Retirement System of New Jersey**

## **Actuarial Valuation Report as of July 1, 2020**

**Produced by Cheiron**

**April 2021**

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***LETTER OF TRANSMITTAL***

April 1, 2021

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

Dear Board Members:

At your request, we have performed the July 1, 2020 Actuarial Valuation of the Police and Firemen's Retirement System of New Jersey (PFRS or System).

In preparing our report, we relied on information (some oral and some written) supplied by the Division of Pensions and Benefits. 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.

The results of this report are only applicable to the System's contribution for Fiscal Year Ending 2022. 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 actuarial assumptions are the same as those used in the July 1, 2019 valuation. The demographic and economic (other than the investment rate of return) actuarial assumptions are based on the recommended assumptions from the July 1, 2013 – June 30, 2018 Experience Study, which were approved by the Board of Trustees on January 13, 2020. The investment return assumption of 7.30% 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 the Police and Firemen's Retirement System of New Jersey for the purposes described herein and for the plan auditor in completing an audit related to the matters herein. 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



Anu Patel, FSA, MAAA, EA  
Principal Consulting Actuary



Jonathan Chipko, FSA, MAAA, EA  
Consulting Actuary

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
JULY 1, 2020 ACTUARIAL VALUATION**

**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 Police and Firemen's Retirement System of New Jersey,
- Past and expected future trends and risks to the System's financial condition, and
- The State's and Local employers' contributions for the Fiscal Year Ending (FYE) 2022.

In this section we present a summary of the principal valuation results. This includes the basis upon which the July 1, 2020 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 calculations under GASB Statements Nos. 67 and 68 which were provided in separate reports.

Results shown in this report for years prior to July 1, 2018 were provided by the prior actuary.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY**  
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**Valuation Basis**

The July 1, 2020 valuation results are based on the same actuarial methods and assumptions as used in the July 1, 2019 valuation. The demographic and economic assumptions, aside from the valuation interest rate, are based on the July 1, 2013 – June 30, 2018 Experience Study, which was approved by the Board of Trustees on January 13, 2020. The valuation is based on a 7.30% interest rate, which was recommended by the State Treasurer.

This report is prepared using census data, plan provisions, and financial information as of July 1, 2020 provided by the Divisions 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, and should not be, reflected in this report.

Whereas there remains a lot of uncertainty, we continue to monitor developments regarding the COVID-19 pandemic and the impact it may have on the System. Chapter 54, P.L. 2020, amends eligibility for accidental disability and accidental death benefits for PFRS members when related to the contraction of COVID-19 during the Public Health Emergency declared by the Governor in Executive Order 103 of 2020, as extended.

This valuation reflects two other changes to the plan provisions. Chapter 157, P.L. 2019 expanded the definition of regular or assigned duties for purposes of accidental disability retirement to include the World Trade Center (WTC) rescue, recovery, or cleanup operations between September 11, 2001 and October 11, 2011 under certain conditions. For such members who participated in the WTC rescue, recovery, or cleanup operations, total and permanent disability may occur after retirement on a service retirement or an ordinary disability retirement. After reviewing the members who have submitted eligibility registration forms and/or amended benefit request forms with the DPB, we do not expect this legislation to have a material impact on the benefits payable by the System. Therefore, we expect the impact of Chapter 157, P.L. 2019 will be recognized over time as part of the demographic experience as members are approved for such benefits.

Chapter 305, P.L. 2019 increased the benefit for a surviving child in the event of ordinary death while in active service. Previously, if there was no surviving spouse, or upon the surviving spouse's death or remarriage, a total of 20% (35%, 50%) of final compensation was payable to one (two, three or more) dependent child(ren). Under Chapter 305, P.L. 2019, if there is no surviving spouse, or upon the surviving spouse's death or remarriage, 50% of final compensation is payable to surviving children in equal shares. This legislation did not materially impact the actuarial liability for this valuation based on the covered population impacted by this change and the current demographic assumptions. Therefore, the impact of Chapter 305, P.L. 2019 will be recognized as part of the demographic experience as members are approved for such benefits.

The Appropriations Act of Fiscal Year 2020 reduced the State pension contribution from the Statutory amount of \$544,579,266 to \$380,309,000. This amount includes revenue of \$12,180,000 from the Lottery Enterprise Contribution Act.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY**  
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The potential impact of the Appropriations Act of 2021 reduces the State pension contribution for Fiscal Year 2021 from the Statutory amount of \$569,662,114 to \$444,361,046 (78% of the State Statutory contribution less the Lottery Enterprise Contribution Offset plus expected revenue from the Lottery Enterprise Contribution Act {78% x \$569,662,114 - \$13,012,258 + \$13,036,855}). The pension contribution amount of \$444,361,046 includes expected State-paid Local contributions of \$178,576,893. This valuation reflects the potential impact of the Appropriations Act of 2021. The 78% appropriation amount represents a decrease from the 80% appropriation assumed in the prior actuarial report.

Chapter 83, P.L. 2016 calls for the State to make the required pension contributions on a quarterly basis: 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, State contributions are assumed to be made on a quarterly basis.

Under Chapter 98, P.L. 2017, the Lottery Enterprise Contribution Act, the Police and Firemen's Retirement System receives 1.20% of the proceeds of the Lottery Enterprise, based on their members' past or present employment in schools and institutions in the State, for a term of 30 years. As of the July 1, 2020 valuation, 26 years remain. Revenues from Chapter 98, P.L. 2017, the Lottery Enterprise Contribution Act, are assumed to be contributed to the trust on a monthly basis. The special asset value is the present value of the projected future lottery contributions to the retirement systems. First effective with Fiscal Year 2018, the State's pension contribution shall be reduced by the product of the allocable percentage for such retirement system, the adjustment percentage for such retirement system and the special asset adjustment.

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. For Local employers, the Non-Contributory Group Insurance Contribution is calculated as the present value of expected benefit payments for the upcoming year based on valuation assumptions.

## **Key Results**

Following are Tables I-1 and I-2 which summarize the key results of the valuation with respect to the System's membership, assets and liabilities, and contributions for State and Local employers. The results are presented and compared for both the current and prior year.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
JULY 1, 2020 ACTUARIAL VALUATION**

**SECTION I – BOARD SUMMARY**

**Table I-1  
Summary of Key Valuation Results  
State**

Valuation Date Fiscal Year Ending (FYE)	July 1, 2020 2022	July 1, 2019 2021	% Change
<b><u>Member Data</u></b>			
Contributing Actives	6,688	6,875	-2.7%
Non-Contributing Actives	426	364	17.0%
Deferred Vesteds	13	13	0.0%
Retirees and Beneficiaries <sup>1</sup>	6,937	6,803	2.0%
Total Members	14,064	14,055	0.1%
Appropriation Payroll <sup>2</sup>	\$ 511,392,879	\$ 487,025,462	5.0%
Annual Retirement Allowances in Pay	\$ 330,805,742	\$ 321,147,218	3.0%
<b><u>Assets and Liabilities</u></b>			
Actuarial Liability	\$ 5,449,871,027	\$ 5,261,107,456	3.6%
Actuarial Value of Assets (AVA) <sup>3</sup>	1,935,340,424	1,896,362,754	2.1%
Unfunded Actuarial Liability/(Surplus)	\$ 3,514,530,603	\$ 3,364,744,702	4.5%
Funded Ratio (AVA)	35.5%	36.0%	-0.5%
Actuarial Value of Assets <sup>3</sup> including Special Asset Value (AVA + SAV)	\$ 2,086,162,539	\$ 2,047,752,683	1.9%
Unfunded Actuarial Liability/(Surplus)	\$ 3,363,708,488	\$ 3,213,354,773	4.7%
Funded Ratio (AVA + SAV)	38.3%	38.9%	-0.6%
Market Value of Assets (MVA) <sup>3</sup>	\$ 1,673,186,247	\$ 1,693,692,745	-1.2%
Unfunded Actuarial Liability/(Surplus)	\$ 3,776,684,780	\$ 3,567,414,711	5.9%
Funded Ratio (MVA)	30.7%	32.2%	-1.5%
<b><u>Contribution Amounts</u></b>			
State Normal Cost at End of Year <sup>4</sup>	\$ 126,788,951	\$ 123,396,056	2.7%
Amortization Payment of UAL <sup>4</sup>	467,477,652	446,266,058	4.8%
Total Statutory Contribution for FYE	\$ 594,266,603	\$ 569,662,114	4.3%
Expected Percent Appropriated	100.0%	78.0%	22.0%
State Appropriation for Pension	\$ 594,266,603	\$ 444,336,449	33.7%
Lottery Enterprise Contribution Offset	(13,150,454)	(13,012,258)	1.1%
Net State Contribution	\$ 581,116,149	\$ 431,324,191	34.7%

<sup>1</sup> QDRO recipients are excluded from member counts

<sup>2</sup> Limited annual compensation for contributing actives

<sup>3</sup> Includes discounted State receivable contributions and Lottery proceeds from the upcoming Fiscal Year

<sup>4</sup> Includes \$235,029,281 and \$228,944,734 for FYE 2022 and 2021, respectively, for Local obligations payable by the State in accordance with Chapter 109, P.L. 1979, Chapter 511, P.L. 1991, Chapter 247, P.L. 1993, Chapter 428, P.L. 1999, Chapter 86, P.L. 2001 and Chapter 318, P.L. 2001.



**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
JULY 1, 2020 ACTUARIAL VALUATION**

**SECTION I – BOARD SUMMARY**

**Table I-2  
Summary of Key Valuation Results  
Local Employers**

Valuation Date Fiscal Year Ending (FYE)	July 1, 2020 2022	July 1, 2019 2021	% Change
<b><u>Member Data</u></b>			
Contributing Actives	34,150	34,164	0.0%
Non-Contributing Actives	1,168	1,117	4.6%
Deferred Vesteds	54	52	3.8%
Retirees and Beneficiaries <sup>1</sup>	39,634	38,734	2.3%
Total Members	75,006	74,067	1.3%
Appropriation Payroll <sup>2</sup>	\$ 3,505,375,030	\$ 3,450,951,747	1.6%
Annual Retirement Allowances in Pay	\$ 2,374,772,652	\$ 2,269,658,558	4.6%
<b><u>Assets and Liabilities</u></b>			
Actuarial Liability	\$ 38,853,311,601	\$ 37,671,711,185	3.1%
Actuarial Value of Assets (AVA) <sup>3</sup>	27,723,057,451	27,023,458,408	2.6%
Unfunded Actuarial Liability/(Surplus)	\$ 11,130,254,150	\$ 10,648,252,777	4.5%
Funding Ratio (AVA)	71.4%	71.7%	-0.3%
Market Value of Assets (MVA) <sup>3</sup>	\$ 26,099,999,102	\$ 26,407,351,286	-1.2%
Unfunded Actuarial Liability/(Surplus)	\$ 12,753,312,499	\$ 11,264,359,899	13.2%
Funding Ratio (MVA)	67.2%	70.1%	-2.9%
<b><u>Contribution Amounts</u></b>			
Employer Normal Cost at End of Year <sup>4</sup>	\$ 352,637,446	\$ 351,092,694	0.4%
Amortization Payment of UAL <sup>4</sup>	774,507,570	729,215,100	6.2%
ERI Payments	1,120,317	2,528,630	-55.7%
Chapter 19, P.L. 2009 Payments	25,970,285	25,492,799	1.9%
Total Statutory Contribution for FYE	\$ 1,154,235,618	\$ 1,108,329,223	4.1%
Non-Contributory Group Insurance Contribution	\$ 38,420,336	\$ 36,964,099	3.9%

<sup>1</sup> QDRO recipients are excluded from member counts

<sup>2</sup> Limited annual compensation for contributing actives

<sup>3</sup> Includes discounted State receivable contributions

<sup>4</sup> Excludes \$235,029,281 and \$228,944,734 for FYE 2022 and 2021, respectively, for Local obligations payable by the State in accordance with Chapter 109, P.L. 1979, Chapter 511, P.L. 1991, Chapter 247, P.L. 1993, Chapter 428, P.L. 1999, Chapter 86, P.L. 2001 and Chapter 318, P.L. 2001.

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The key results of the July 1, 2020 actuarial valuation for the State are as follows:

- The total Statutory contribution, including Local obligations payable by the State, increased from \$569.7 million for FYE 2021 to \$594.3 million for FYE 2022 prior to any adjustments for the State phase-in of contributions or the Lottery Enterprise offset.
- The funded ratio, the ratio of actuarial asset value over liabilities, decreased from 36.0% to 35.5%. The funded ratio based on actuarial asset value plus special asset value decreased from 38.9% as of July 1, 2019 to 38.3% as of July 1, 2020. Using the market value of assets, the funded ratio also decreased from 32.2% to 30.7%.
- The unfunded actuarial liability based on the actuarial asset value plus special asset value increased from \$3.2 billion as of July 1, 2019 to \$3.4 billion as of July 1, 2020. The unfunded actuarial liability used in determining the Statutory contributions (excess of actuarial liability over the actuarial value of assets) increased from \$3.4 billion to \$3.5 billion.
- During the year there was a total actuarial experience loss of \$111.4 million, consisting of an asset loss of \$67.5 million and a liability loss of \$43.9 million.

The key results of the July 1, 2020 actuarial valuation for Local employers are as follows:

- The total Statutory contribution, excluding Local obligations payable by the State and including Early Retirement Incentive (ERI) and Chapter 19, P.L. 2009 payments, increased from \$1,108.3 million for FYE 2021 to \$1,154.2 million for FYE 2022.
- The funded ratio, the ratio of actuarial asset value over liabilities, decreased from 71.7% as of July 1, 2019 to 71.4% as of July 1, 2020. Using the market value of assets, the funded ratio also decreased from 70.1% to 67.2%.
- The unfunded actuarial liability increased from \$10.6 billion as of July 1, 2019 to \$11.1 billion as of July 1, 2020 on an actuarial asset value basis.
- During the year there was a total actuarial experience loss of \$512.6 million, consisting of an asset loss of \$417.1 million and a liability loss of \$95.5 million.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY**  
**JULY 1, 2020 ACTUARIAL VALUATION**

**SECTION I – BOARD SUMMARY**

**Recent Trends**

Although most of the attention given to the valuation reflects the current 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. Note that the contribution amounts in this section include State-paid Local obligations with Local employers' contribution amounts to illustrate their impact on the Local employers' portion of the unfunded actuarial liability. The historical amounts in Appendix D show the State-paid Local obligations with State contributions.

In reviewing the historic trends over the ten-year period, the State'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.

Assets and Liabilities

The gray bars represent the Actuarial Liability (AL). The green line is the Market Value of Assets (MVA), the gold line is the Actuarial Value of Assets (AVA) and the blue line (which starts in 2016) is the AVA plus the Special Asset Value (SAV). The System's funded ratio (ratio of assets to actuarial liability), on a MVA basis and an AVA or AVA+SAV basis, is shown next to the respective asset 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.

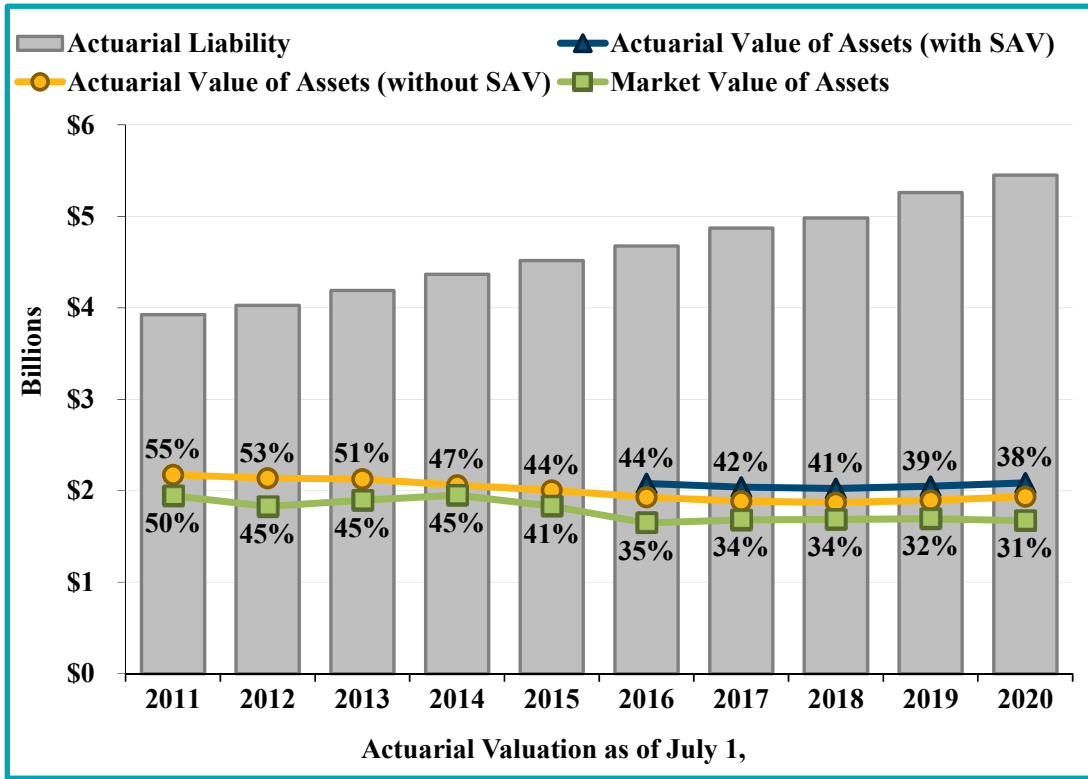
For the State, the funded ratios have been decreasing over time in part due to decreases in the discount rate, recognition of the 2008/2009 market losses and because the State has not been making the full Statutory contribution for the entire period shown.

For Local employers, the funded ratio based on the smoothed assets (AVA basis) has decreased over the period due to increases in liabilities resulting from decreases in the discount rate and the recognition of the 2008/2009 large market losses over time. In addition, while Local employers have been making the full Statutory contribution, the State has not been making the full State-paid Local Statutory contribution for the entire period shown.

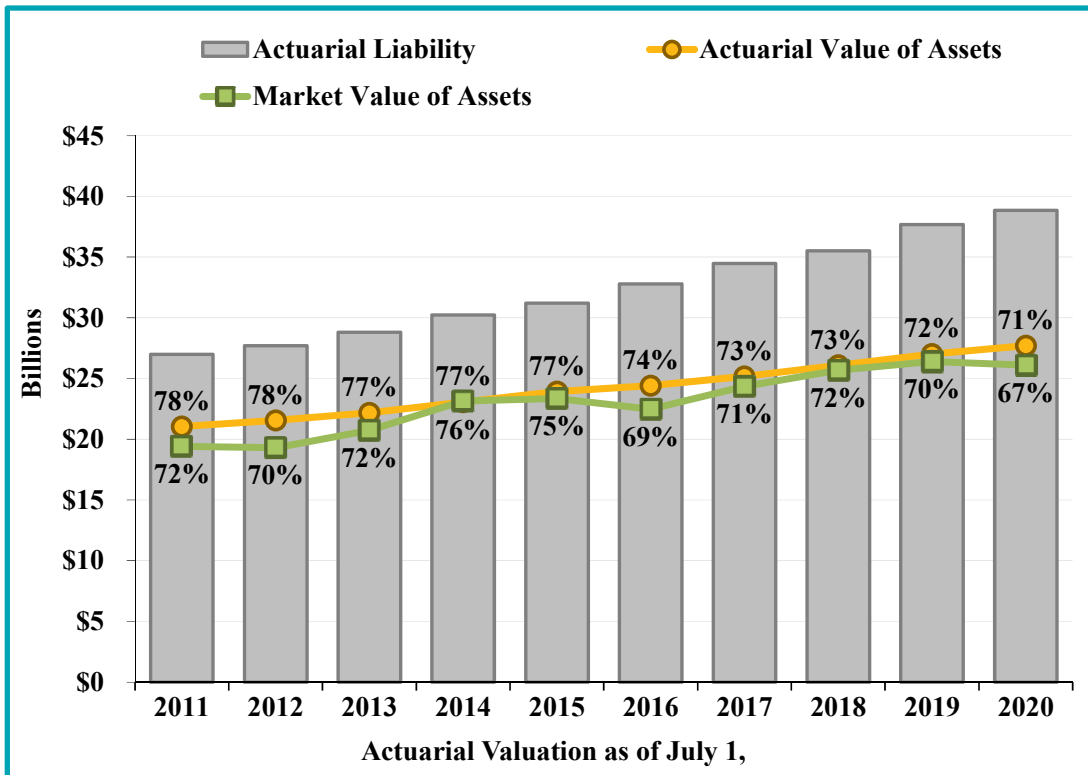
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SECTION I – BOARD SUMMARY

State



Local Employers



**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
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**SECTION I – BOARD SUMMARY**

Membership Trends

The following graphs show the membership counts of the System for the last ten valuations. The numbers that appear above each bar represent the ratio of the number of inactive and non-contributing active members to contributing 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 ratios for both State and Local employers have increased over the period shown. As more of the liability moves from actives to inactive, the System will experience more volatility in contribution rates when actuarial gains and losses are recognized.

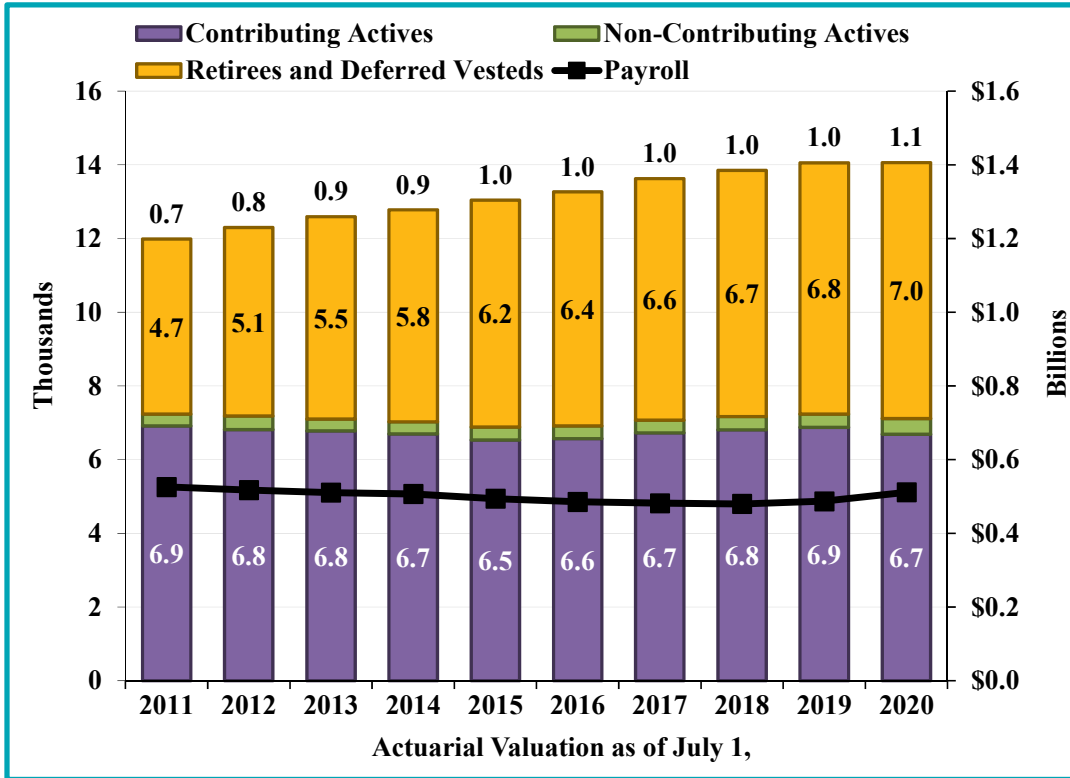
With the current inactive-to-active ratio of around 1.1 to 1.2, there are almost as many active members as inactive members implying that the risk factors for both the State and Local employers are not at a high level relative to other mature pension systems.

In the two graphs, 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 for contributing actives over the period and corresponds with the right-hand scale.

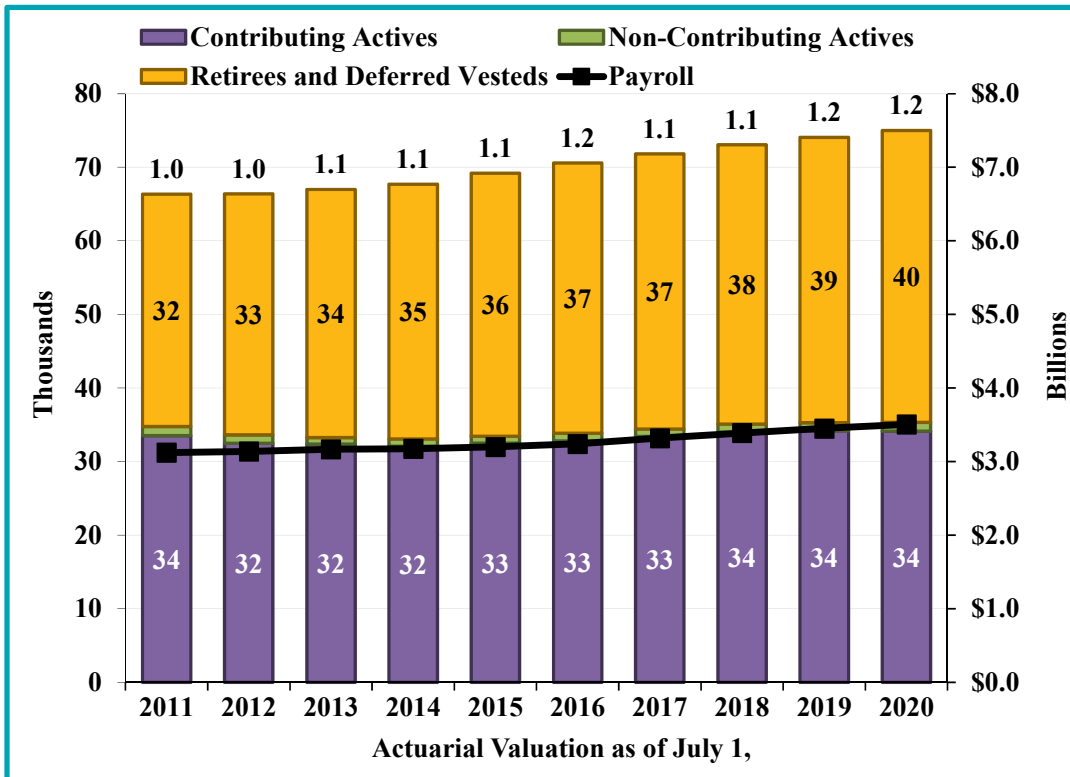
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**Local Employers**



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Cash Flows

The following graphs show 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 excluding 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 a 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.

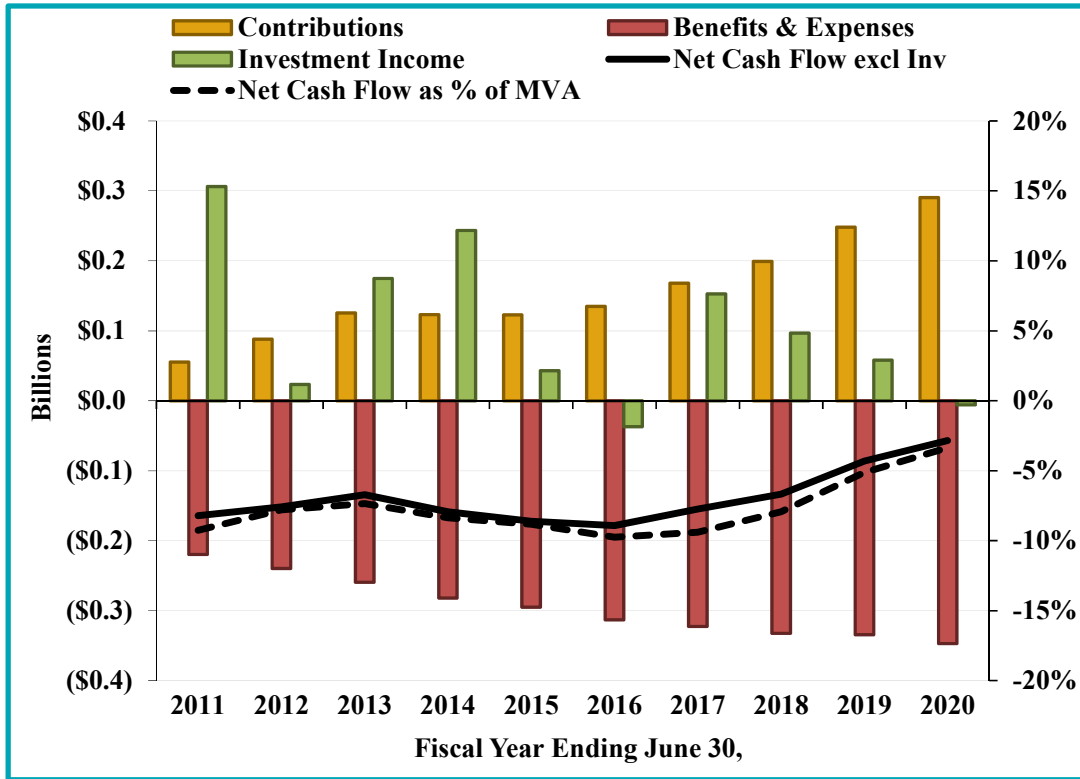
The black dotted line shows the net cash flow as a percent of the market assets and goes with the axis on the right.

The net cash flow for the State has been significantly more negative than the net cash flow for Local employers, and even more disconcerting is that, through 2018, the negative cash flow for the State was greater than the assumed long term return on investments. By itself this represents a plan that is expected to defund with the risk of insolvency if the contributions do not catch up to cover a higher portion of the benefit payments and expenses. In 2020, the negative cash flow continued to improve and with a net cash flow of -3.4% implies the assumed investment return if achieved at 7.30% will cover this difference. For Local employers, the negative cash flow has increased over the period shown due to an increase in the number of retirees and their corresponding benefit payments.

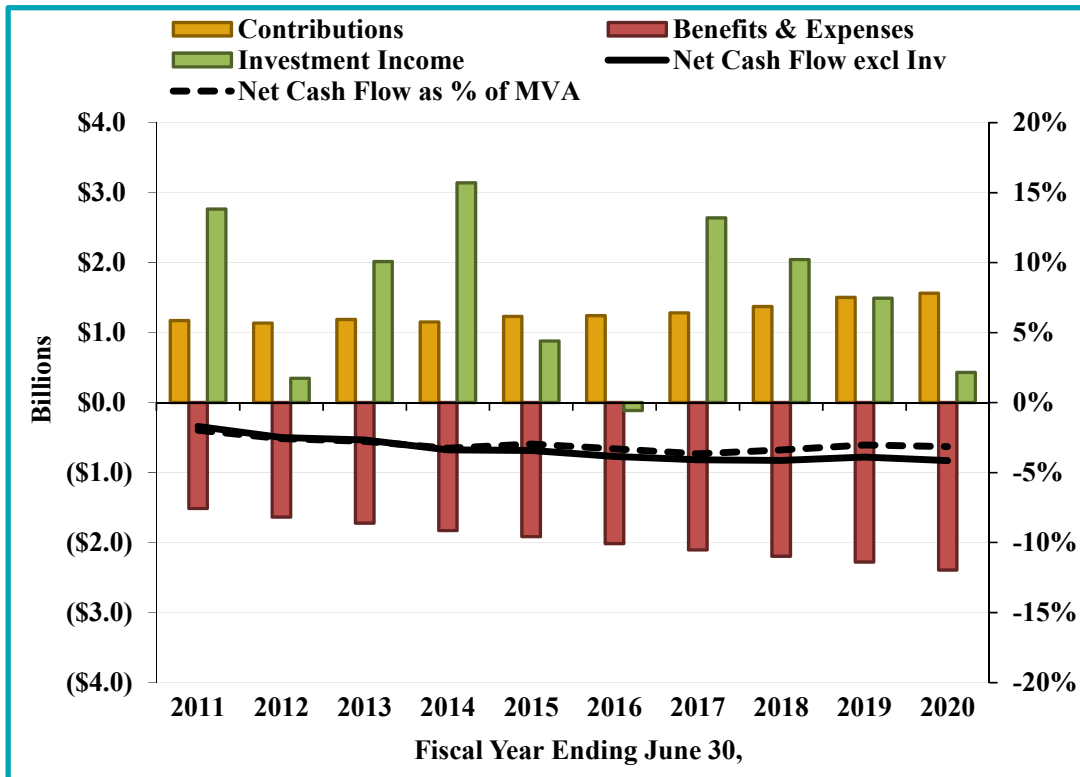
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**Local Employers**





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**JULY 1, 2020 ACTUARIAL VALUATION**

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Contributions

The following graphs show the historical trends for the State and Local employer contributions. The Local employer contributions include the State-paid Local obligations but not Early Retirement Incentive (ERI) or Chapter 19, P.L. 2009 payments. The Statutory contributions are comprised of the normal cost (blue bars) and the amortization of the UAL (gold bars). The green line shows the actual contributions over the period. For FYE 2021 and 2022, 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 and Table 1-2.

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

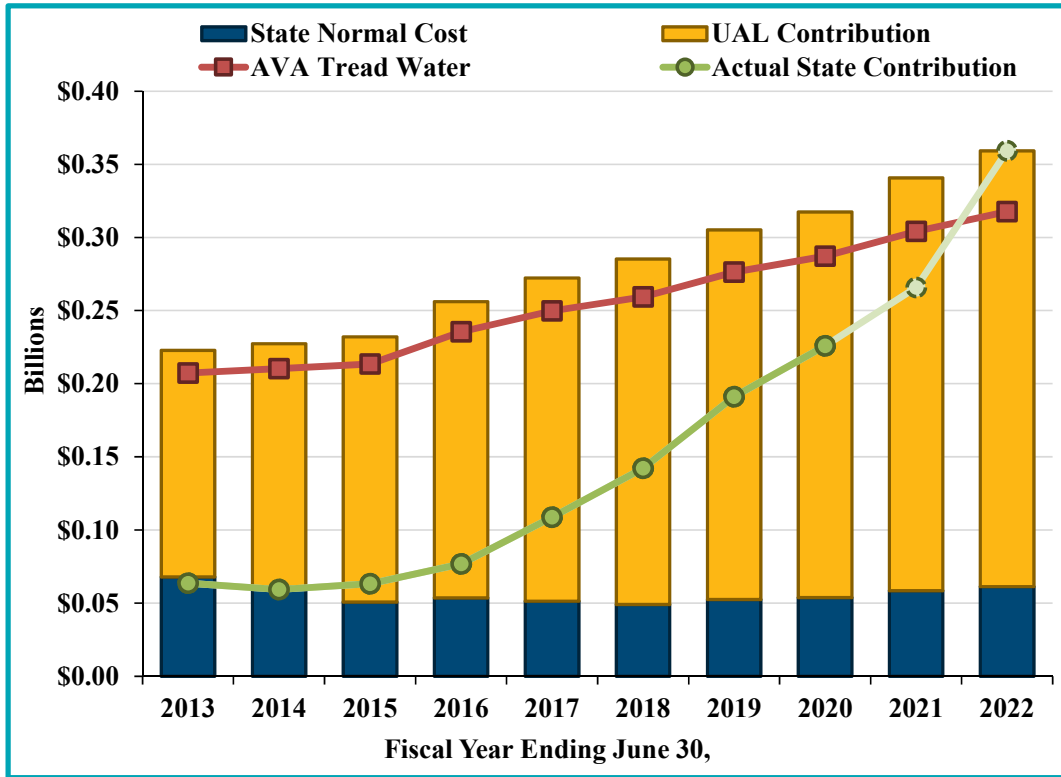
The graph for State shows that not only has the State been making contributions less than required by Statute, but that the State contributions have historically been significantly below the tread water line. When contributions are lower than the normal cost plus interest on the UAL, the unfunded actuarial liability is expected to grow from one year to the next. For FYE 2021 and 2022, the State is expected to appropriate 78% and 100% of the Statutory contribution, respectively. For FYE 2022, actual State contributions are expected to be greater than the tread water amount for the first time during the entire period shown.

The graph for Local employers shows that contributions have been lower than the tread water line for most of the period even though the Local employers have consistently made the Local portion of the Statutory contributions. This was caused by the State contributing less than the full State-paid Local obligations. For FYE 2021 and 2022, the actual contribution is expected to exceed the AVA tread water level.

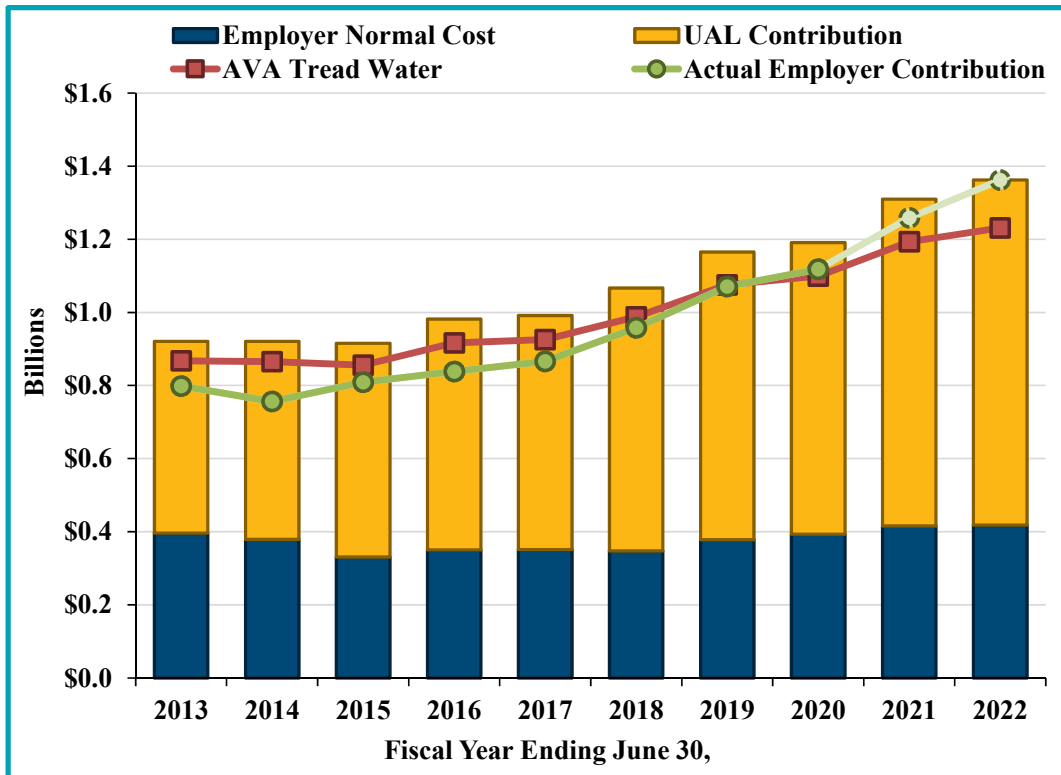
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**State**



**Local Employers**



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 their 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 and Local employer 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, we provided 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 ultimate 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). For the State, the graph also shows the Actuarial Value of Assets plus the Special Asset Value (blue line). 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 State's funded ratio on an Actuarial Value of Assets basis is projected to drop slightly next year as the valuation investment rate of return assumption decreases from 7.30% to 7.00%, before beginning a slow but steady increase to 100% by 2050.

The Local employers' funded ratio on an Actuarial Value of Assets basis is projected to drop slightly next year as the valuation investment rate of return assumption decreases from 7.30% to 7.00%, before beginning a slow but steady increase to 92% by 2050.

The funded ratio for the State increases faster than the Local employers' portion and reaches 100% compared to 92% for Local employers by the end of the projection period because of the

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expected lottery revenue that is contributed each year in excess of the Statutory contributions. This additional revenue helps pay down the UAL sooner for the State portion.

The bottom graph shows the contributions by fiscal year. The member contributions are in purple, the State contributions are in gold, the State-paid Local contributions are in light blue and Local employers' contributions are in green. We also show the contributions in dollar amounts.

The projected lottery revenue is provided by the DPB and is outlined in blue. Lottery revenue amounts shaded gold are offsets to Statutory contributions. Lottery revenue amounts shaded white are additional contributions in excess of the Statutory contributions that pay down the UAL. The lottery revenue through FYE 2022 largely offsets the Statutory contribution while lottery amounts after that are additional payments toward the UAL. The lottery offsets during the projection period are calculated based on the methodology as defined in Chapter 98, P.L. 2017.

The projection assumes the State appropriates 100% of the Statutory contribution in FYE 2022 and each year thereafter. The appropriated State and Local employer contributions and the member contributions are shown in dollar amounts. The contributions exclude amounts payable for the Non-Contributory Group Insurance.

The dashed black line in the bottom chart shows the gross normal cost. The difference between the dashed black line and the purple bar is the State and Local employers' 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 the contributions exceed the solid line, as is the case throughout the projection period for both State and Local employers, the UAL is expected to decrease and the funded ratio is expected to increase. If contributions fall below the solid black line, the UAL would be expected to increase and the funded ratio would be expected to decrease.

The State Statutory contribution increases for FYE 2023 as the valuation investment rate of return assumption decreases from 7.30% to 7.00%. Thereafter, the Statutory contributions continue to increase gradually. Once the appropriated amount equals the Statutory contribution, beginning in FYE 2022, the contributions reach the level necessary to pay down the UAL and the tread water line begins to decrease relative to the Statutory contribution.

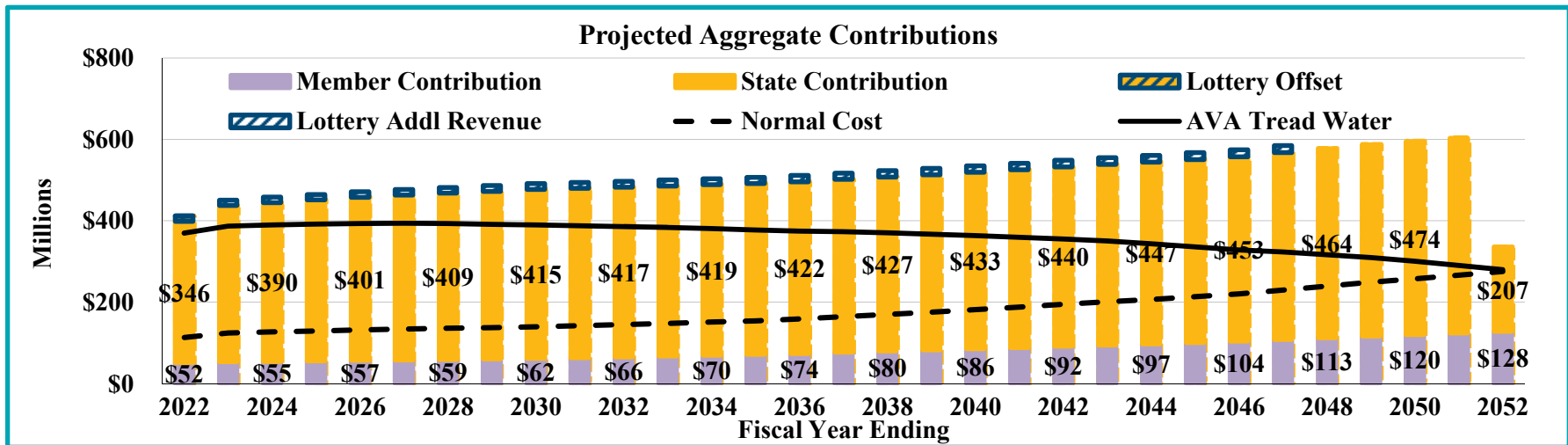
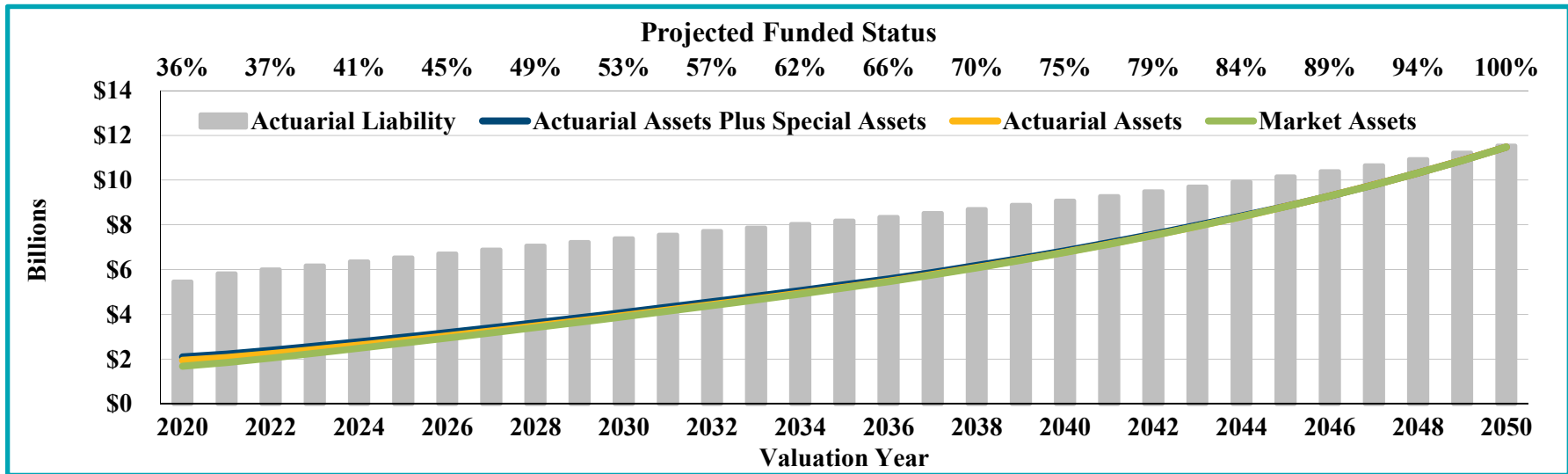
The Local employers' contribution increases for FYE 2023 as the valuation investment rate of return assumption decreases from 7.30% to 7.00%. Thereafter, the Local employers' and the State-paid Local contributions continue to increase gradually.

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SECTION I – BOARD SUMMARY

Baseline: 7.0% return for all years

State

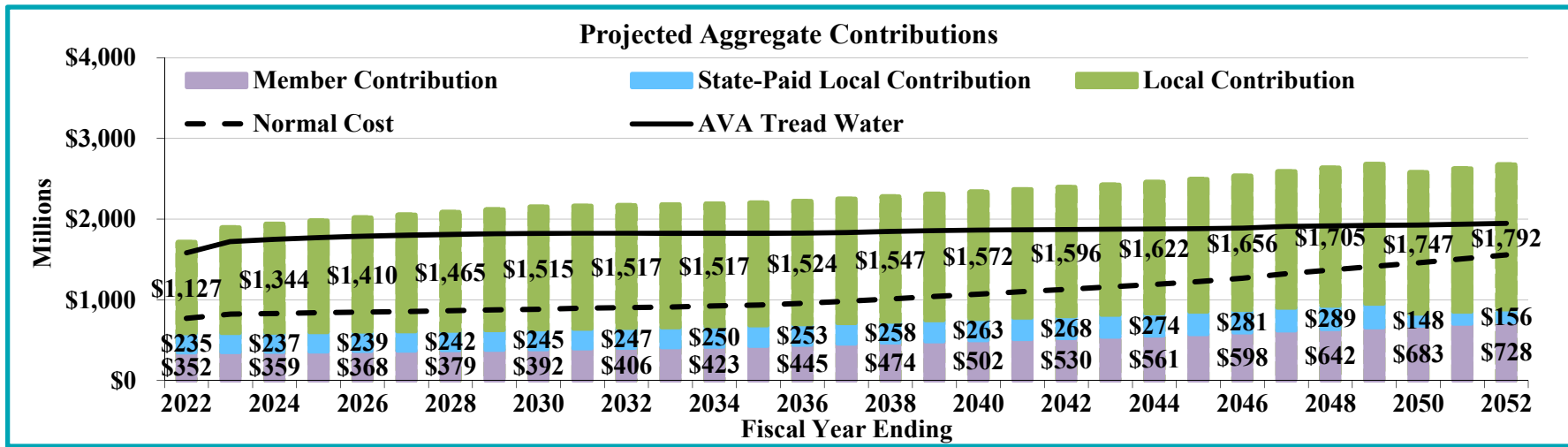
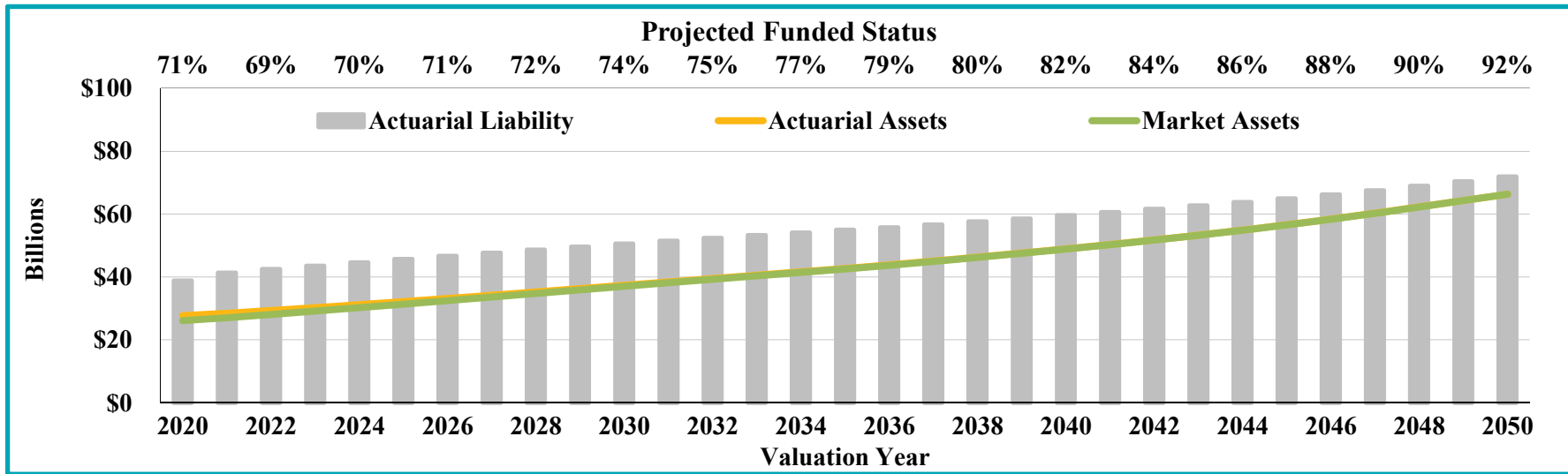


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Baseline: 7.0% return for all years

Local Employers



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**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 plan, 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.

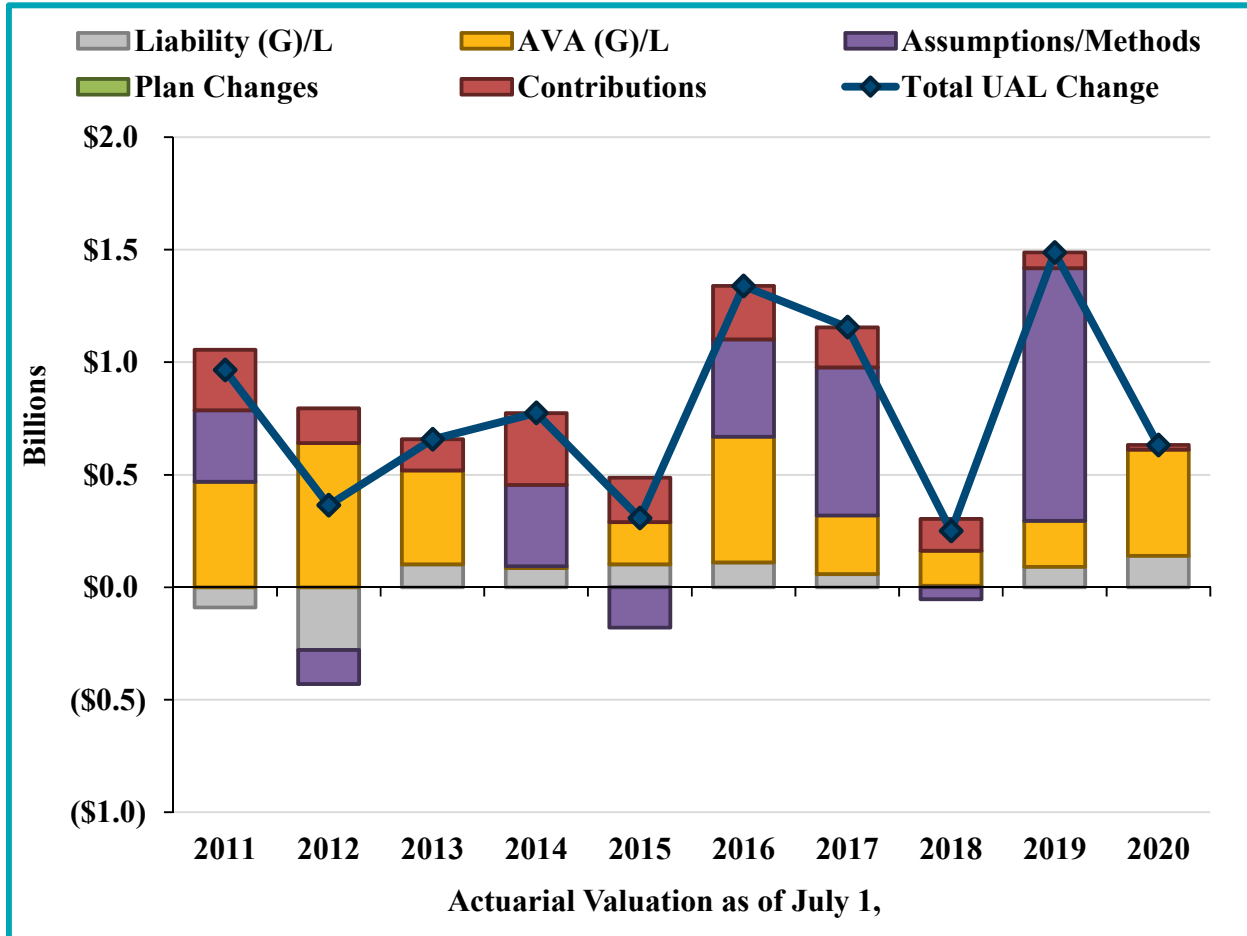
The chart below shows the components of changes in the Unfunded Actuarial Liability (UAL) for the total System (State and Local employers combined) over the last ten years, including investment gains and losses on the Actuarial Value of Assets, liability gains and losses, assumption and plan changes, 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.

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

**Historical Changes in UAL 2011-2020 for the Total System**



	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
<b>Discount Rate</b>	7.95%	7.90%	7.90%	7.90%	7.90%	7.65%	7.50%	7.50%	7.30%	7.30%	
<b>Source</b>											
AVA Investment (G)/L	\$ 468.7	\$ 640.4	\$ 416.7	\$ 8.6	\$ 187.1	\$ 558.2	\$ 259.9	\$ 154.3	\$ 204.7	\$ 471.3	\$ 3,369.9
Liability (G)/L	(90.1)	(279.1)	102.0	85.4	101.6	110.7	59.0	7.0	90.9	139.5	326.9
Assumptions/Methods	317.7	(150.6)	0.0	359.9	(179.5)	432.2	657.6	(53.9)	1,121.5	0.0	2,505.0
Plan Changes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Contributions <sup>1</sup>	268.0	154.3	138.8	319.8	197.3	237.6	177.9	142.5	69.9	21.0	1,727.2
<b>Net UAL Change</b>	<b>\$ 964.4</b>	<b>\$ 364.8</b>	<b>\$ 657.4</b>	<b>\$ 773.7</b>	<b>\$ 306.6</b>	<b>\$1,338.7</b>	<b>\$1,154.5</b>	<b>\$ 250.0</b>	<b>\$1,487.1</b>	<b>\$ 631.8</b>	<b>\$7,928.9</b>

<sup>1</sup> UAL change due to contributions (greater)/less than normal cost plus interest on the UAL.



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On a smoothed asset basis, the investment gains and losses (gold bars) from 2011 to 2020 reflect material investment losses driven by the market decline of 2008 and 2009, which was spread over the five successive years. In aggregate, over the 10-year period, investment losses have added approximately \$3.4 billion to the UAL.

On the liability side (gray bars), the System has experienced a combination of gains and losses, however much smaller in magnitude compared to the assets, increasing the UAL by approximately \$0.3 billion over the ten-year period.

Assumption and method changes (purple bars) over the last ten years have increased the UAL by approximately \$2.5 billion. The significant assumption changes have included reductions in the discount rate from 8.25% to 7.30% as well as decreases in mortality rates and projected mortality improvement. 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.

No significant plan changes occurred over the last ten years.

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 \$1.7 billion over the last ten years.

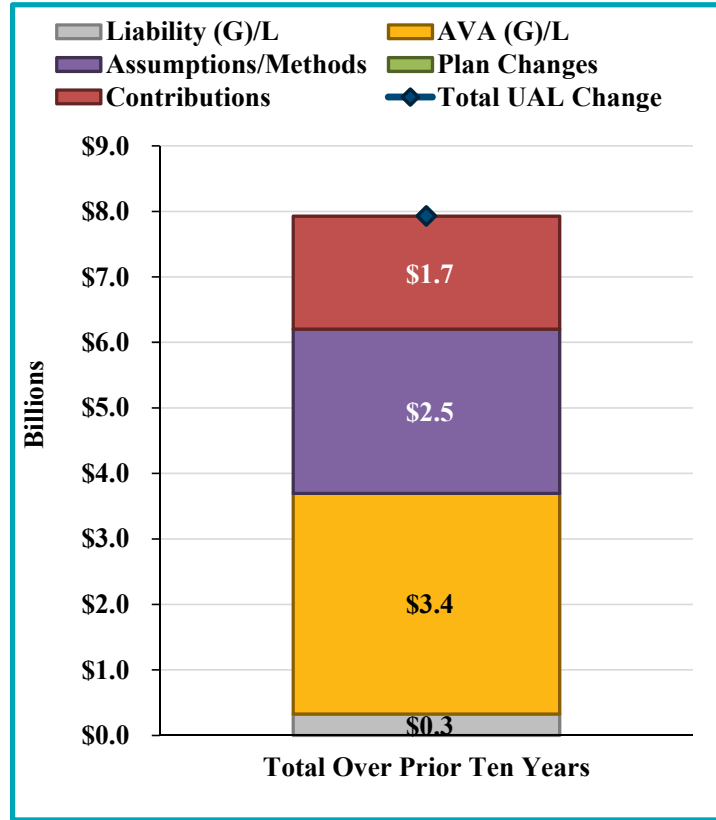
In general, the amortization methods used to determine the Statutory contributions are designed to collect more than the tread water level. However, contributions may be less than this threshold due to the State appropriating less than the Statutory contributions.

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

**Total Historical Change in UAL 2011-2020**



**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.

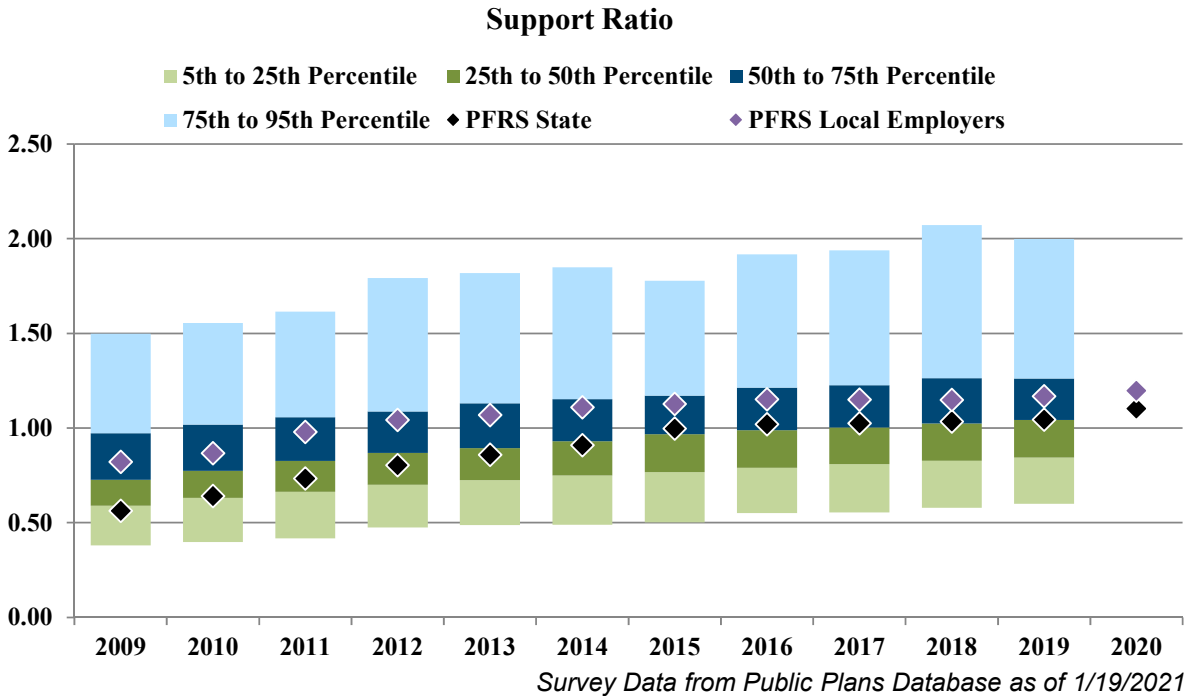
Plan maturity can be measured in a variety of ways, but they all get at one basic dynamic - the larger the plan is compared to the contribution or revenue base that supports it, the more sensitive the plan will be to risk. The measures below have been selected as the most important in understanding the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

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**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.



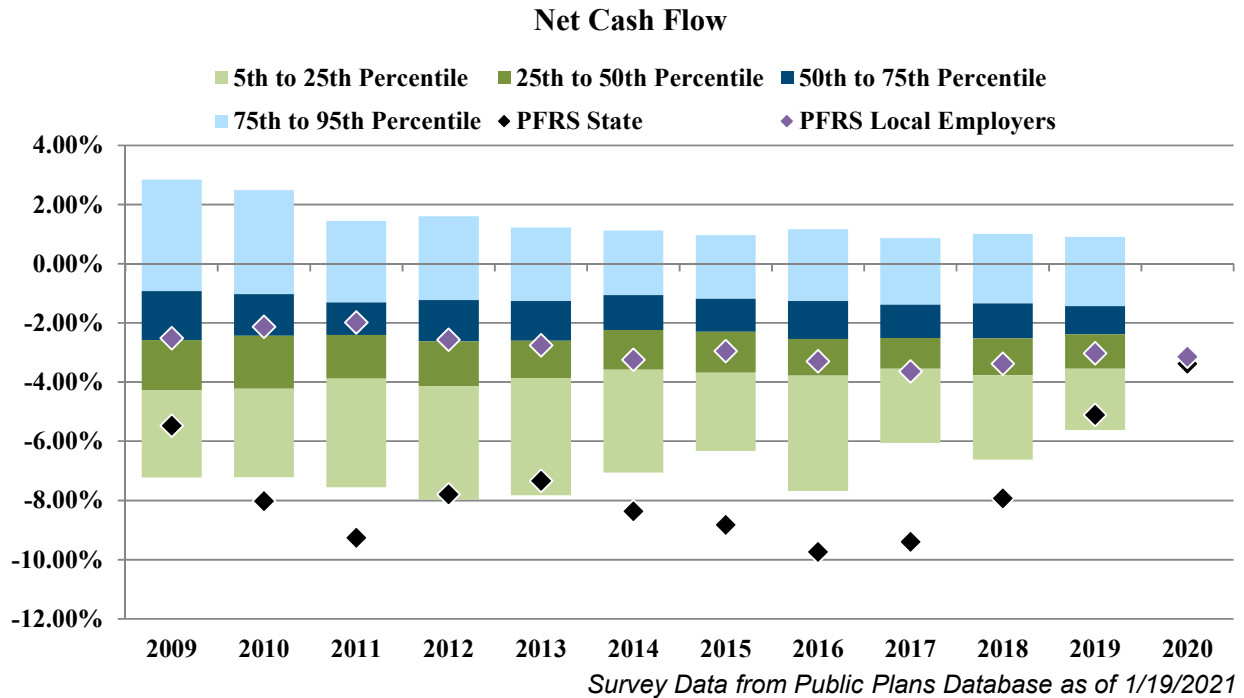
The chart above shows the distribution from the 5<sup>th</sup> to 95<sup>th</sup> percentile of support ratios for the plans in the Public Plans Database. The diamonds show how State (black) and Local employers (purple) compare dating back to 2009. The support ratio increased following the Great Recession, but has since stabilized at a level around the 50<sup>th</sup> percentile for State and the 75<sup>th</sup> percentile for Local employers.

**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 risk metric in Section I.

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The charts above show the distribution from the 5<sup>th</sup> to 95<sup>th</sup> percentile of net cash flow for the plans in the Public Plans Database. The diamonds show how the State (black) and Local employers (purple) compare. From the Great Recession through 2019, the State had been at or below the 5<sup>th</sup> percentile compared to the database of other public plans in terms of having significantly more negative cash flow as a percentage of assets causing a serious defunding risk for the System. However, since 2016, the net cash flow for the State has improved. Since 2012, the net cash flow for PFRS Local employers has declined from the 50<sup>th</sup> percentile of plans to the 25<sup>th</sup> percentile. The net cash flow for the State and Local employers was similar in 2020.

**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 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 the ultimate 7.00% investment return assumption each and every year beginning July 1, 2020.

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For stress testing purposes, we developed six hypothetical scenarios to illustrate the impact 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 table below using the capital market assumptions from the New Jersey Division of Investments (Geometric return of 6.94%, standard deviation of 11.05%).

<b>Distribution of Expected Average Annual Returns</b>		
<b>Percentile</b>	<b>1 Year</b>	<b>5 Year</b>
5%	-9.7%	-0.8%
25%	-0.2%	3.7%
50%	6.9%	6.9%
75%	14.6%	10.3%
95%	26.6%	15.3%

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.

<b>FYE</b>	<b>Theoretical Scenarios</b>					
	<b>1-Yr Shock</b>		<b>5-Yr Moderate</b>		<b>5-Yr Significant</b>	
	<b>Neg</b>	<b>Pos</b>	<b>Neg</b>	<b>Pos</b>	<b>Neg</b>	<b>Pos</b>
2021	-9.7%	26.6%	3.7%	10.3%	-0.8%	15.3%
2022	7.0%	7.0%	3.7%	10.3%	-0.8%	15.3%
2023	7.0%	7.0%	3.7%	10.3%	-0.8%	15.3%
2024	7.0%	7.0%	3.7%	10.3%	-0.8%	15.3%
2025	7.0%	7.0%	3.7%	10.3%	-0.8%	15.3%
2026+	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.

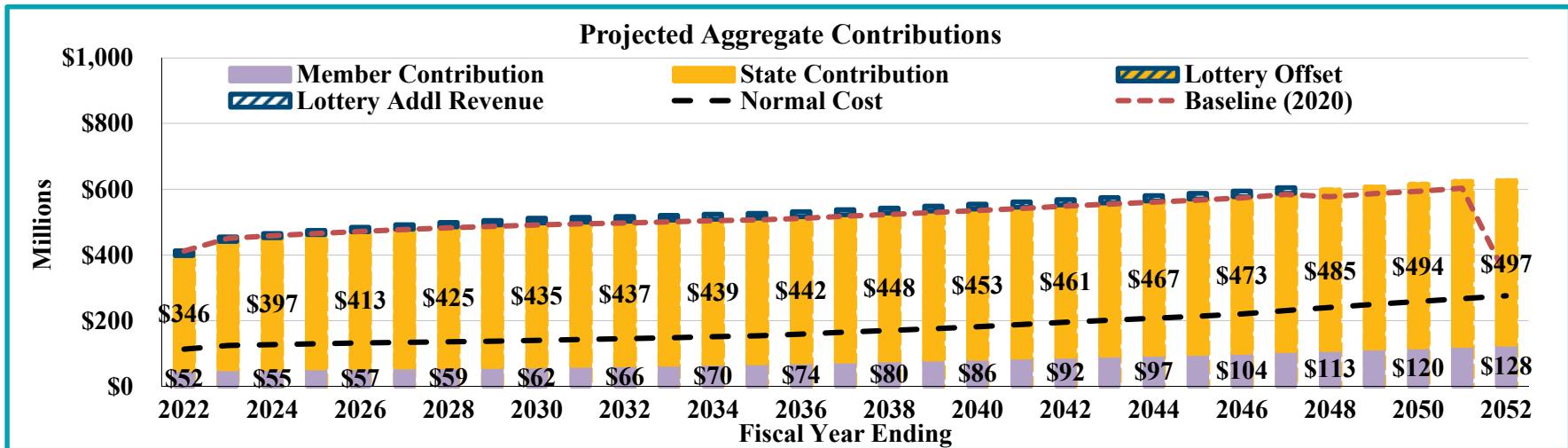
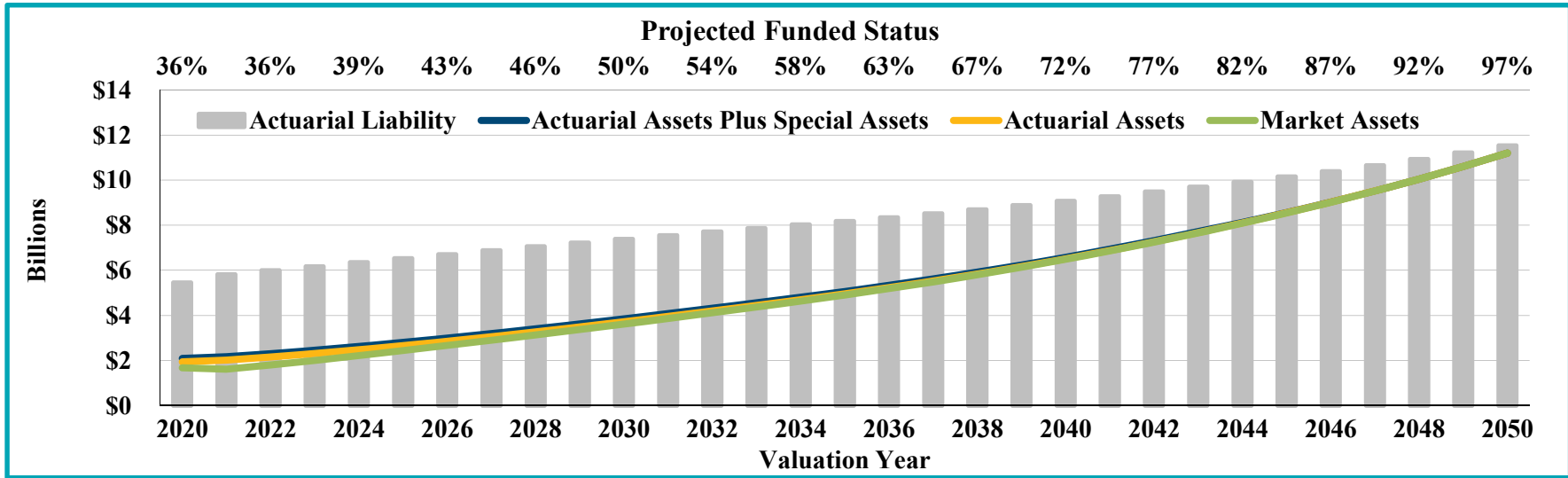
We note that when asset returns are high, excess assets may be used to offset employer costs. We have not shown the implications of a surplus and assume that the State and Local employers will always contribute the normal cost.

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.

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SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

One-Year Negative Shock Scenario: -9.7% return FYE 2021, 7.0% after  
 State

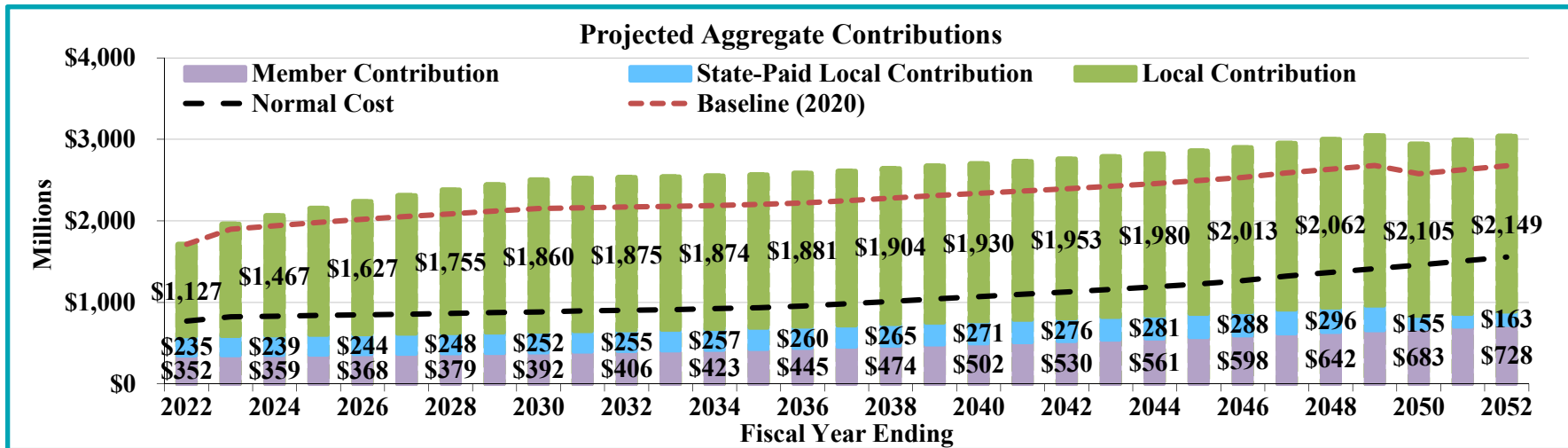
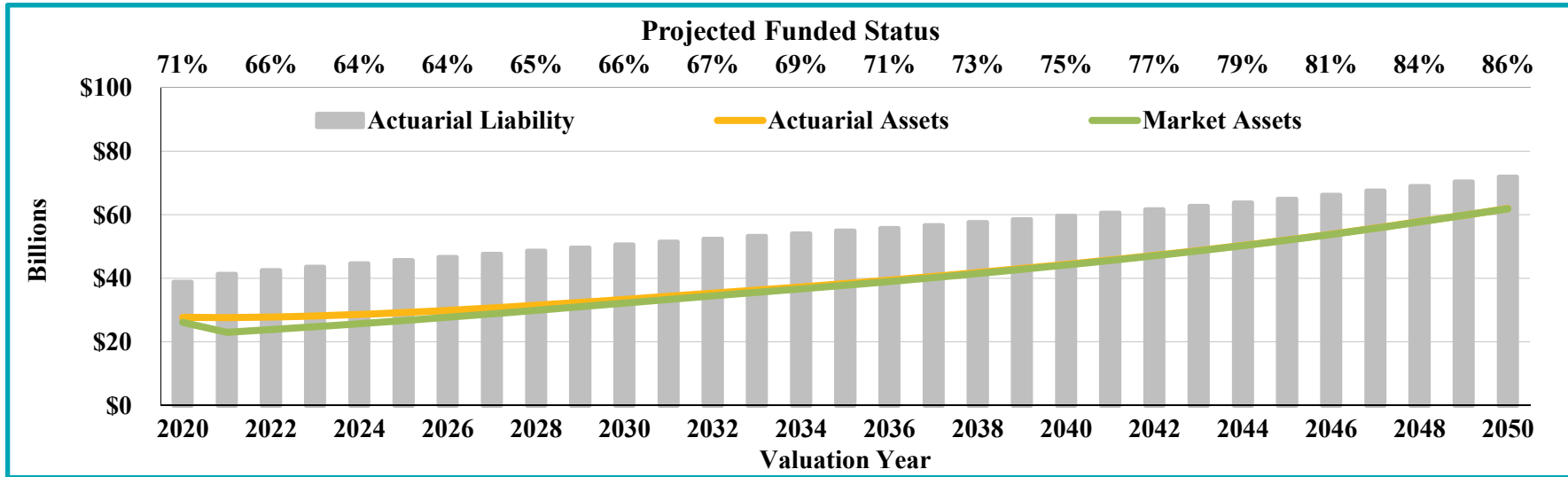


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One-Year Negative Shock Scenario: -9.7% return FYE 2021, 7.0% after

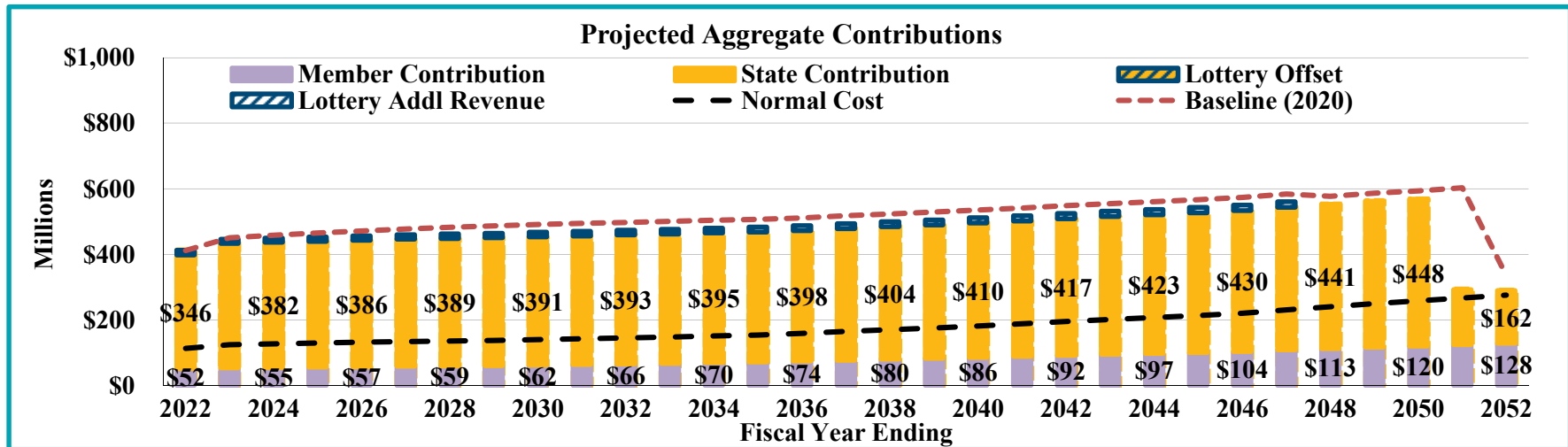
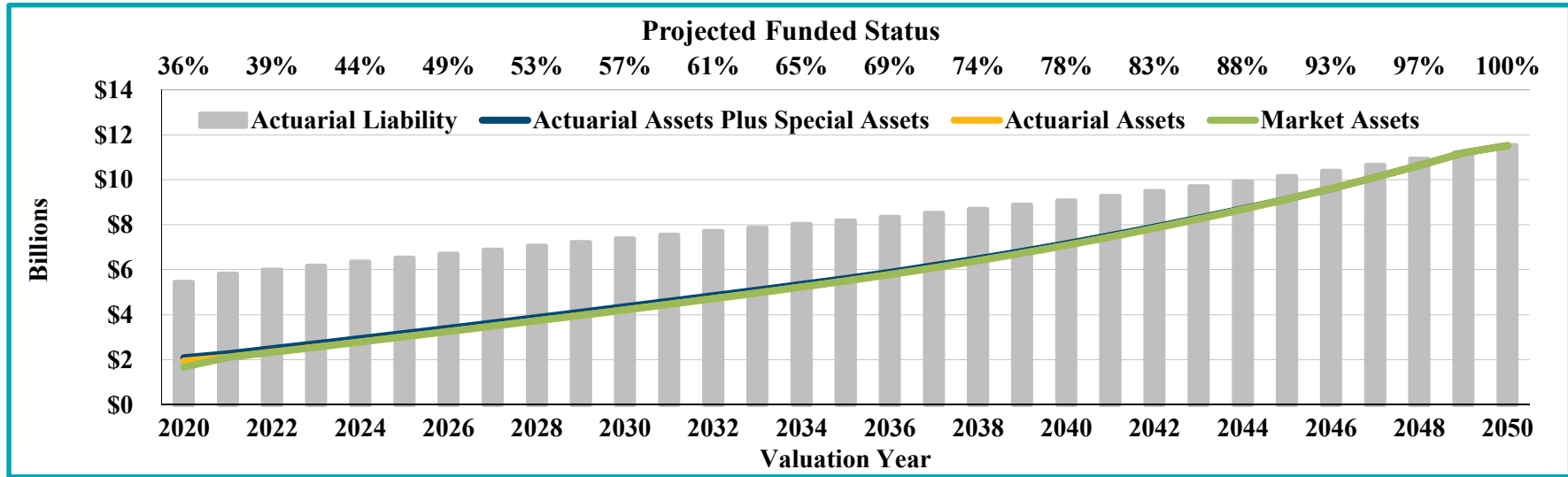
Local Employers



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SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

One-Year Positive Shock Scenario: 26.6% return FYE 2021, 7.0% after  
 State



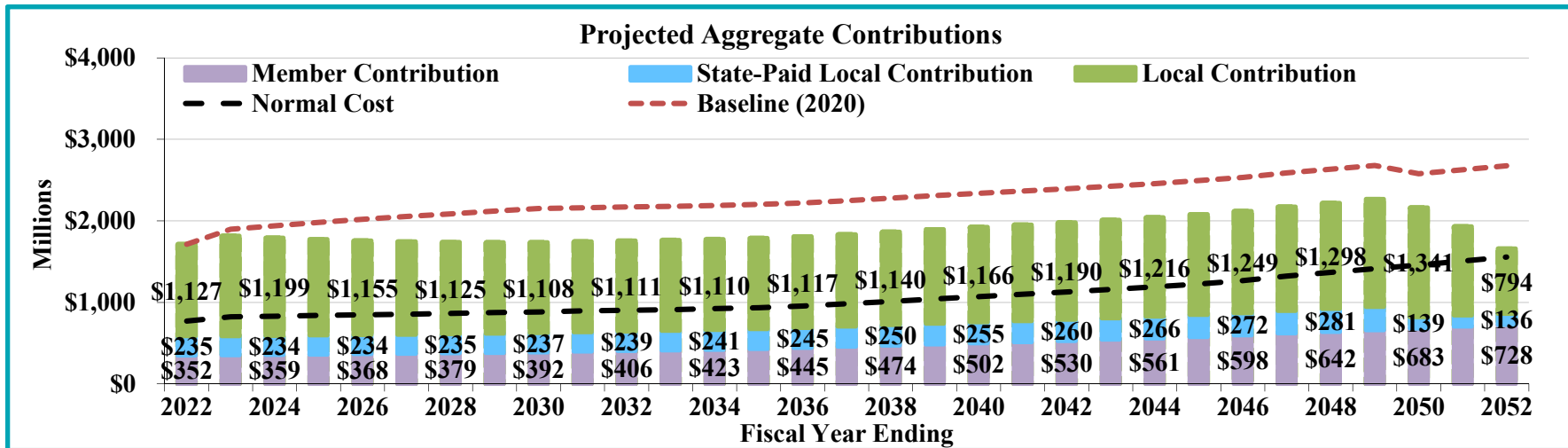
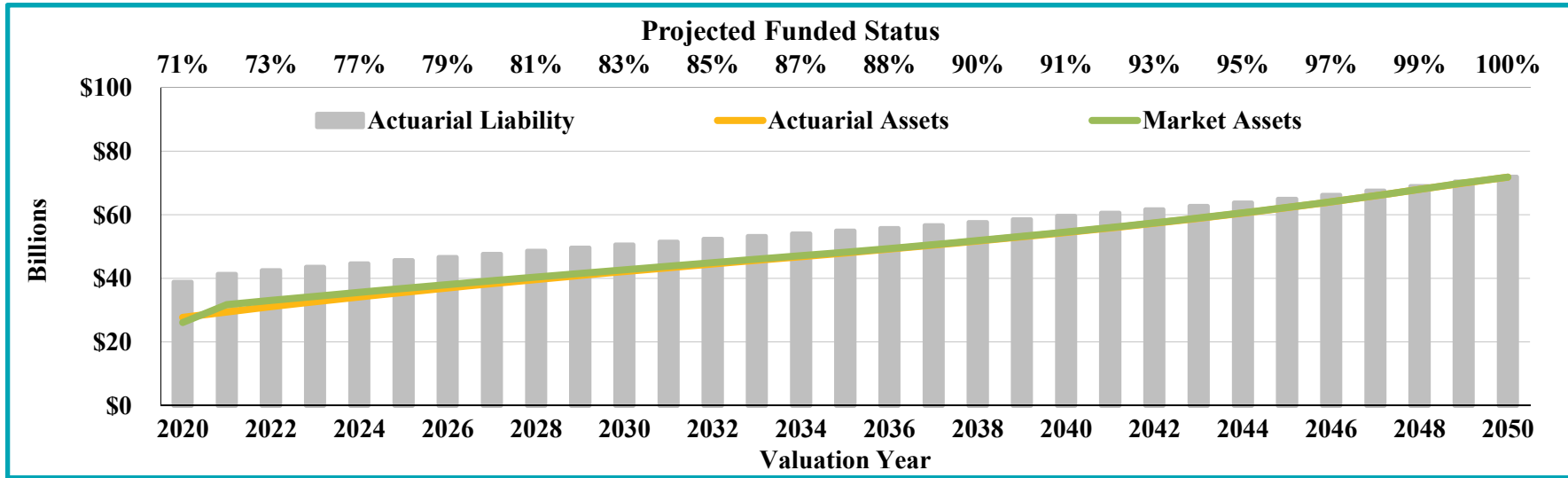


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SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

One-Year Positive Shock Scenario: 26.6% return FYE 2021, 7.0% after

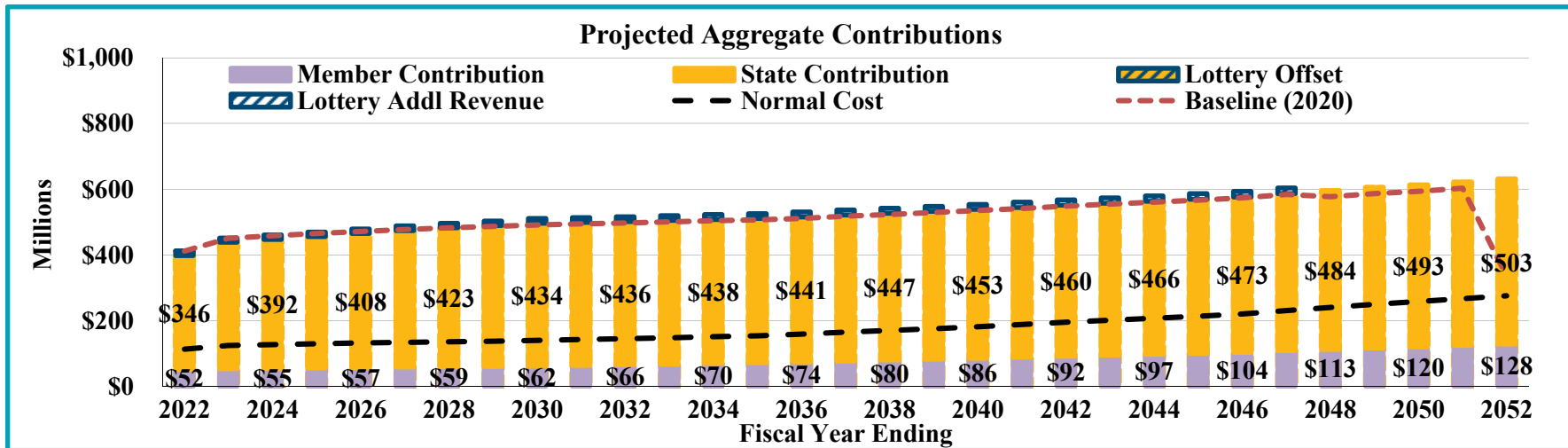
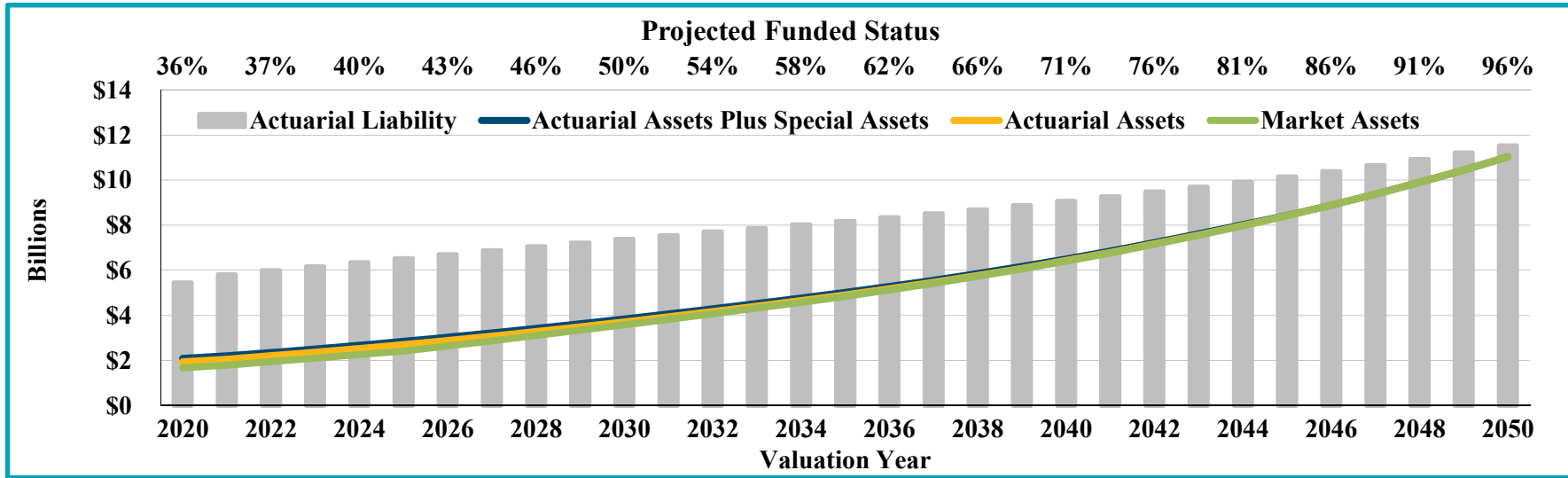
Local Employers



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SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

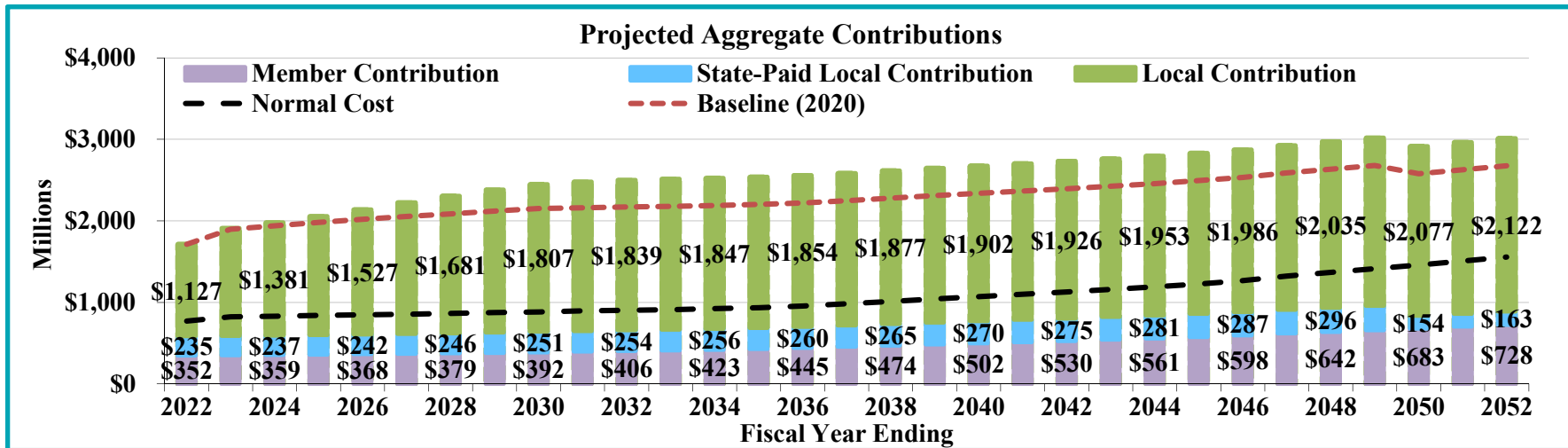
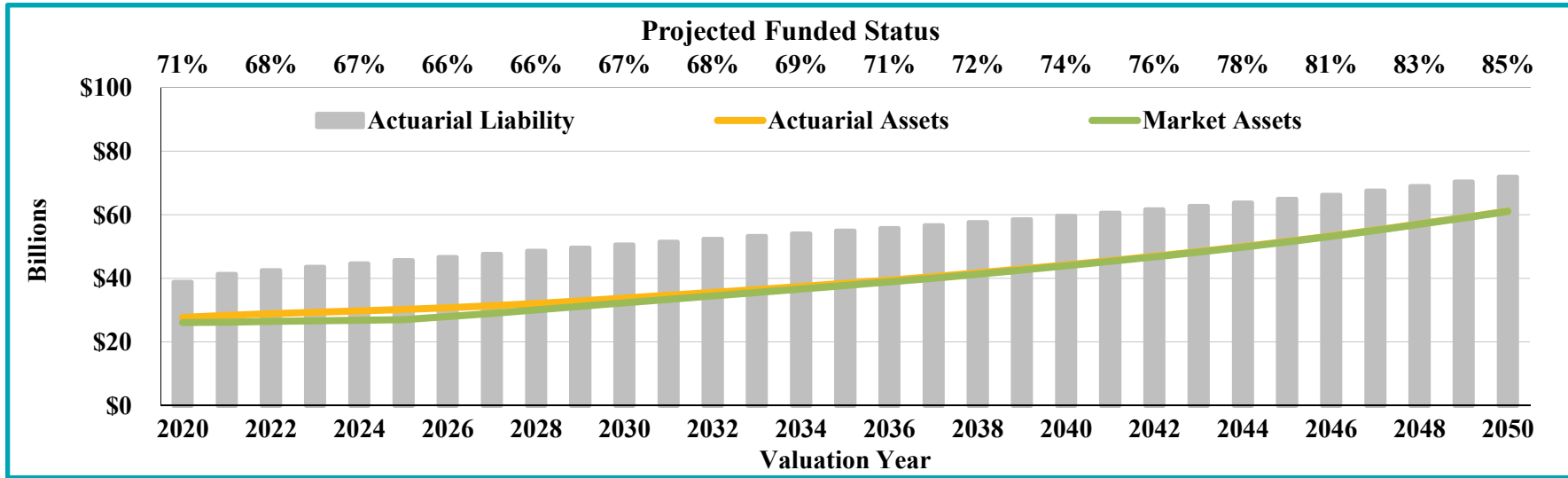
Five-Year Moderate Negative Scenario: 3.7% return FYE 2021-2025, 7.0% after  
 State



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SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

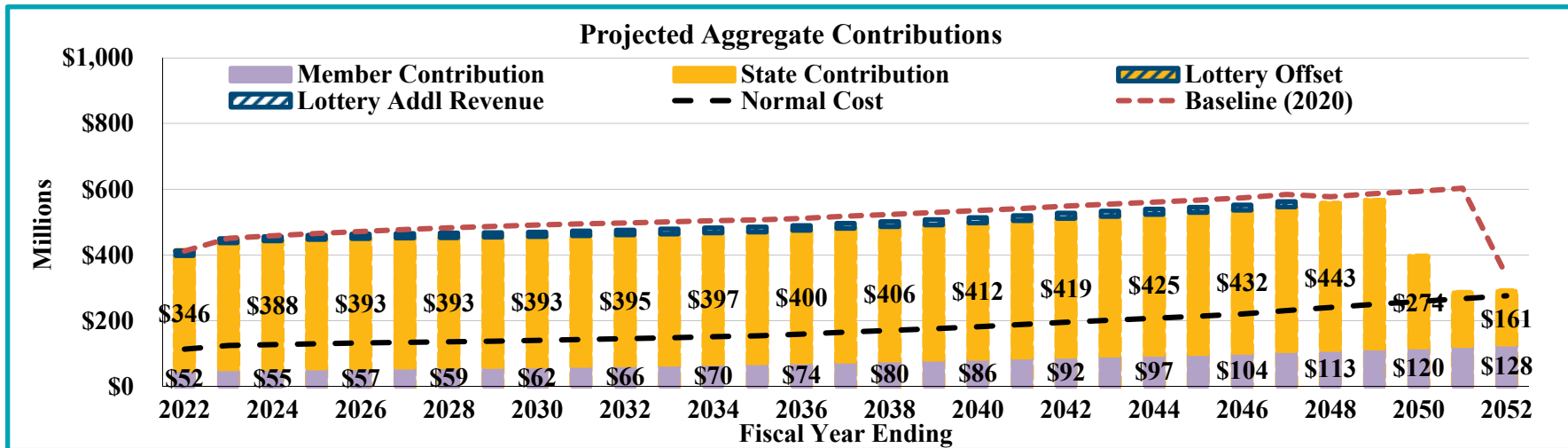
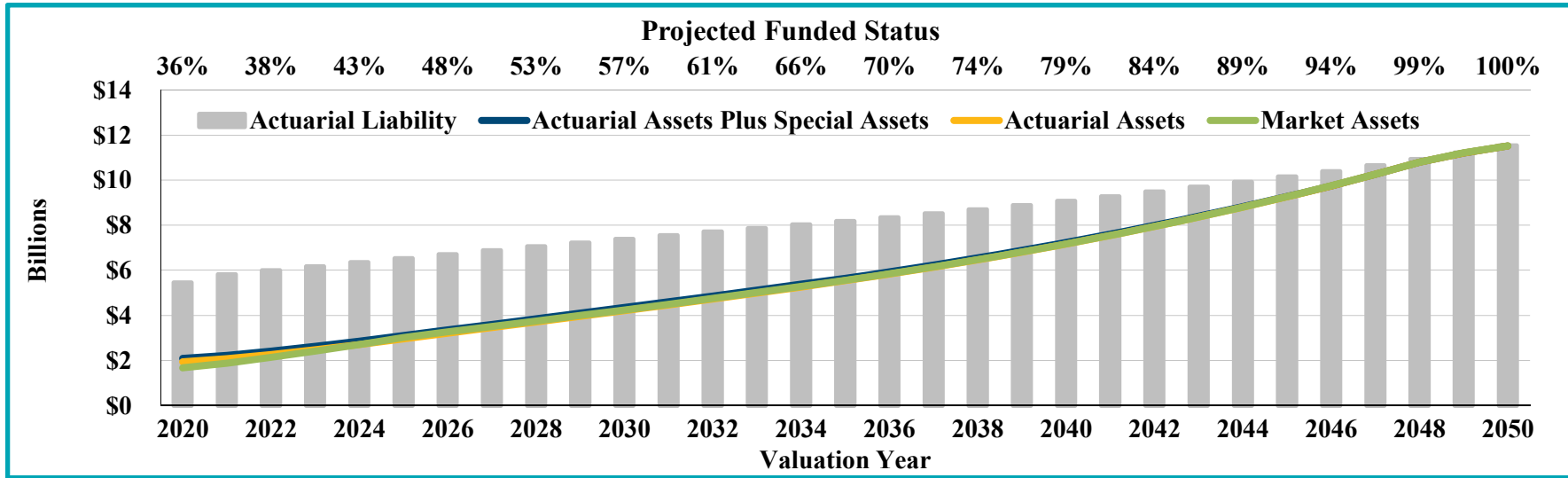
Five-Year Moderate Negative Scenario: 3.7% return FYE 2021-2025, 7.0% after  
 Local Employers



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SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

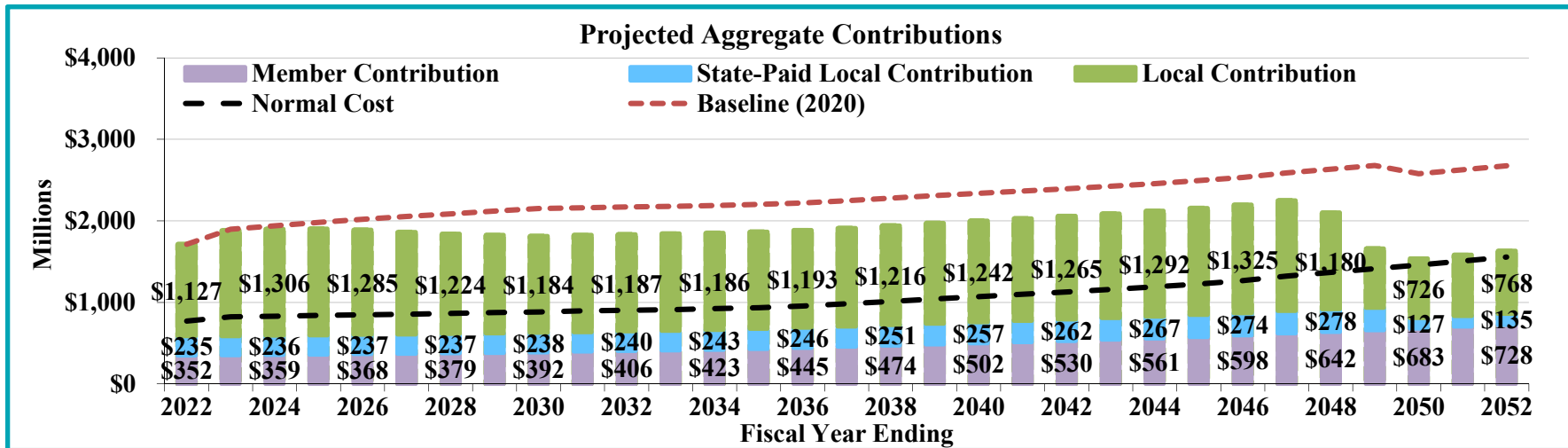
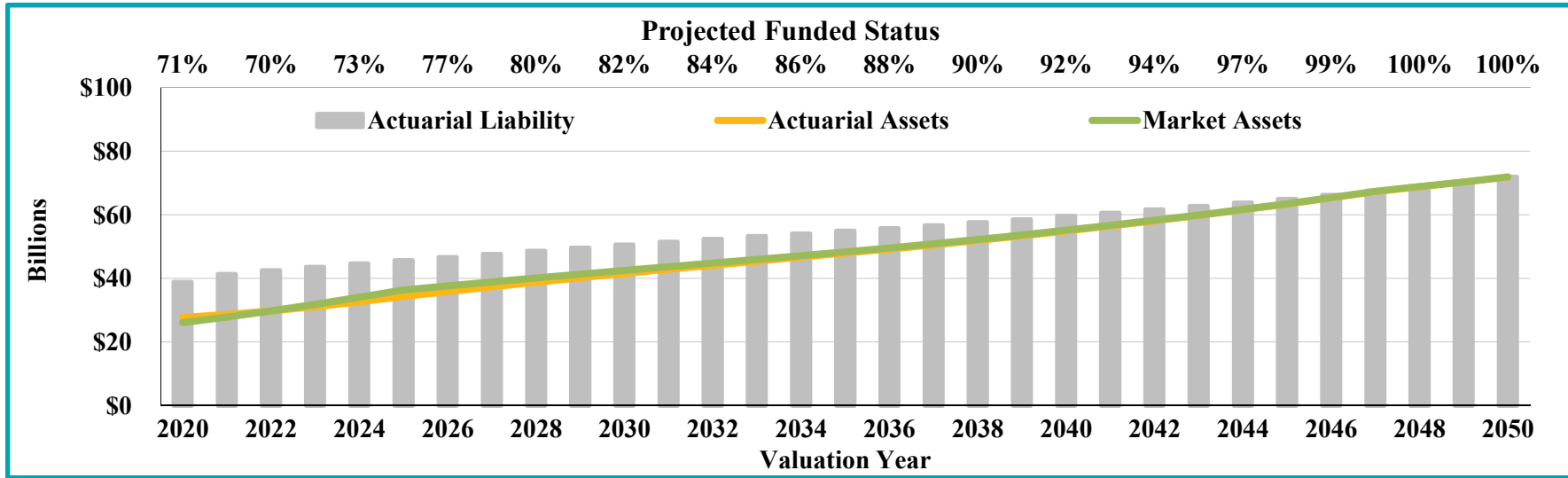
Five-Year Moderate Positive Scenario: 10.3% return FYE 2021-2025, 7.0% after  
 State



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SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

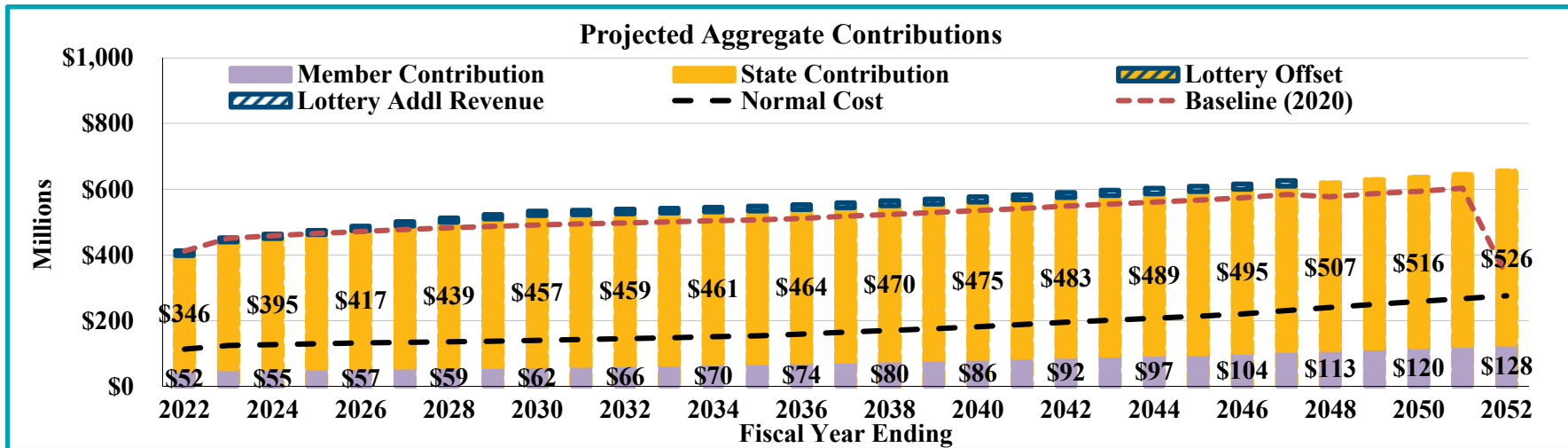
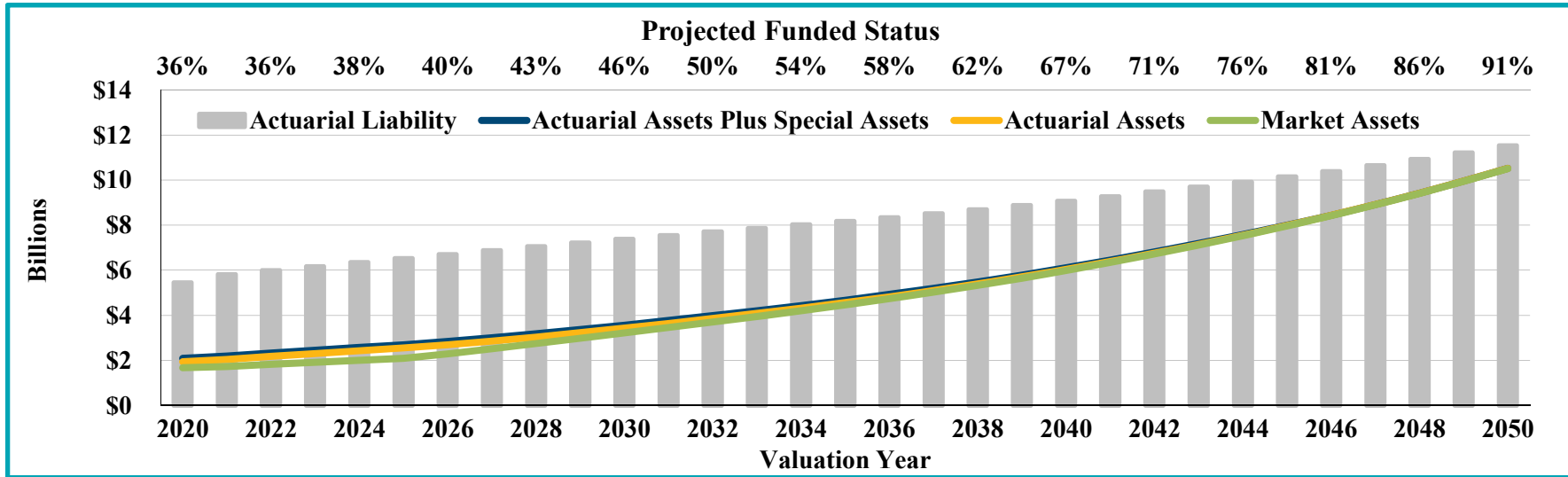
Five-Year Moderate Positive Scenario: 10.3% return FYE 2021-2025, 7.0% after  
 Local Employers



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SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

Five-Year Significant Negative Scenario: -0.8% return FYE 2021-2025, 7.0% after  
 State

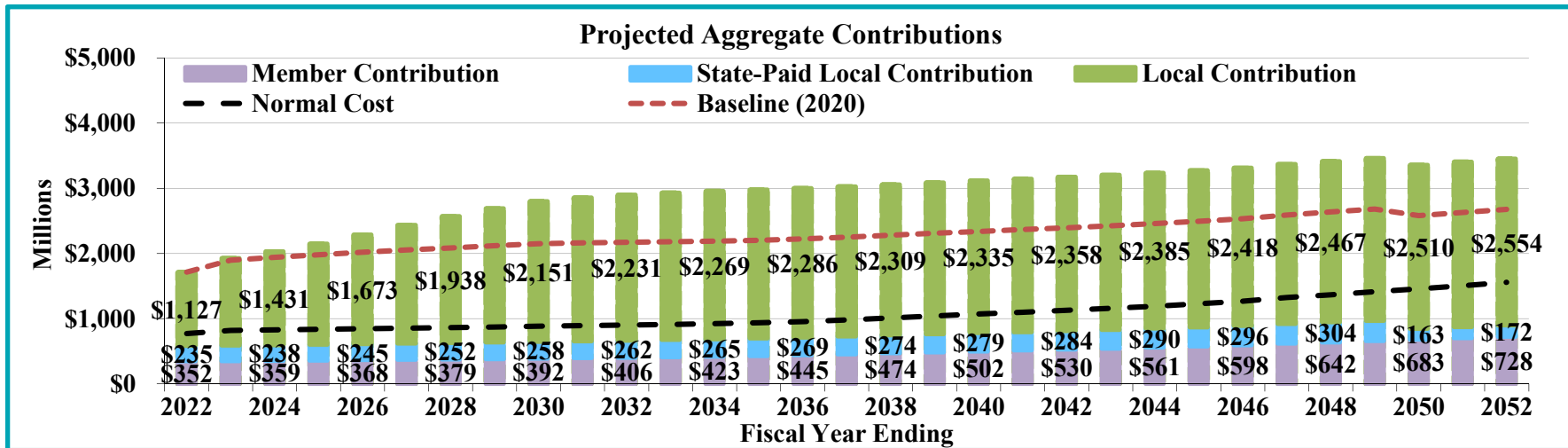
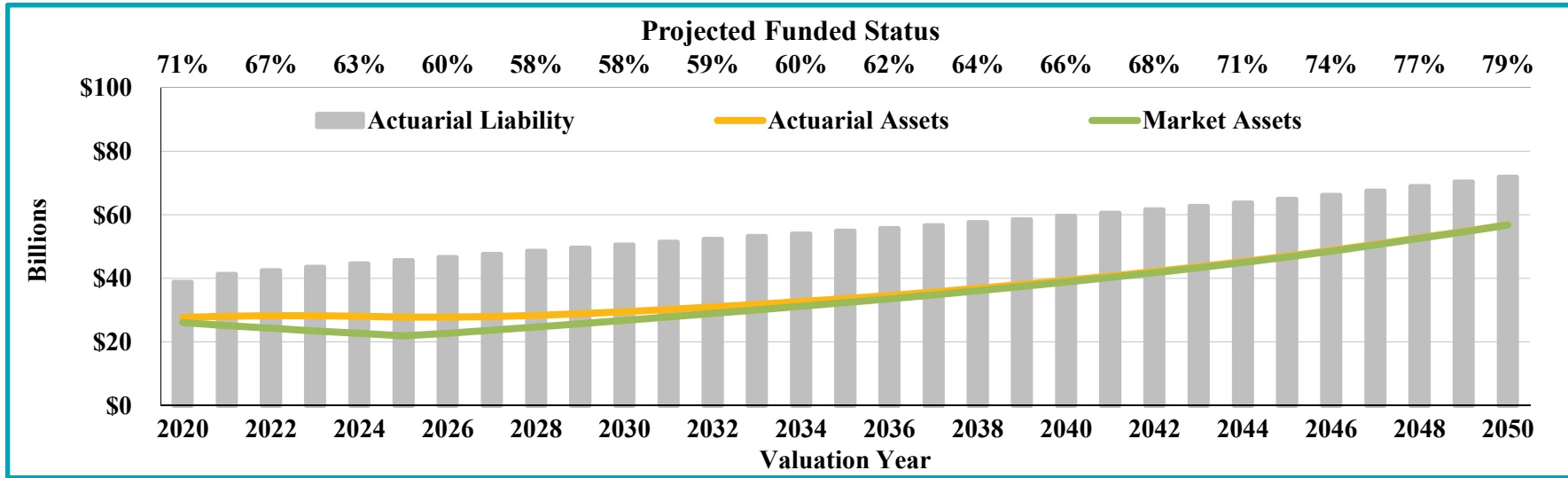


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Five-Year Significant Negative Scenario: -0.8% return FYE 2021-2025, 7.0% after

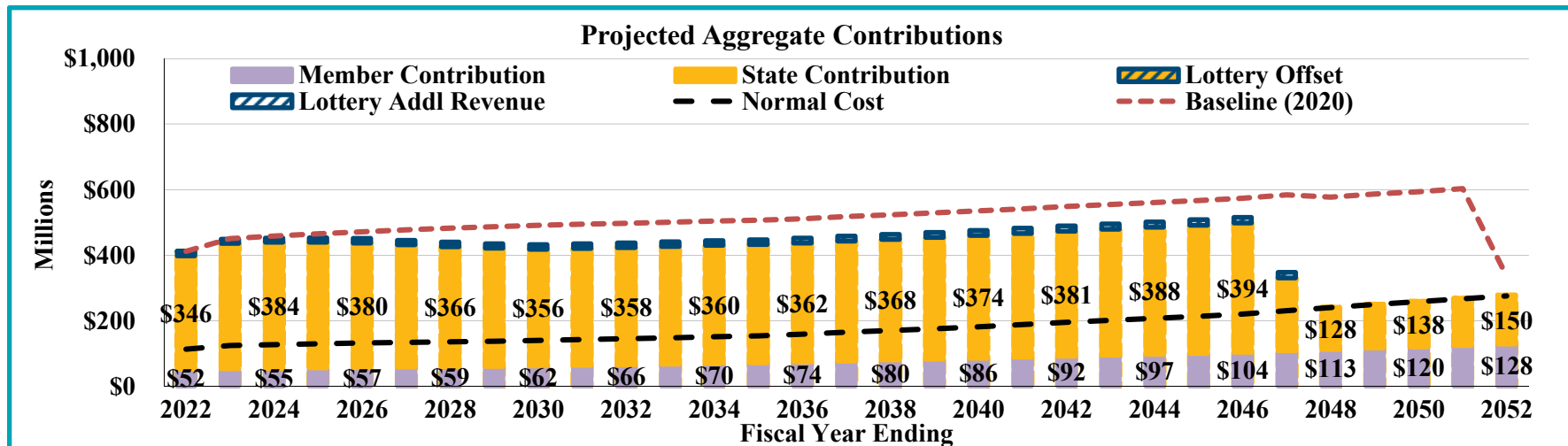
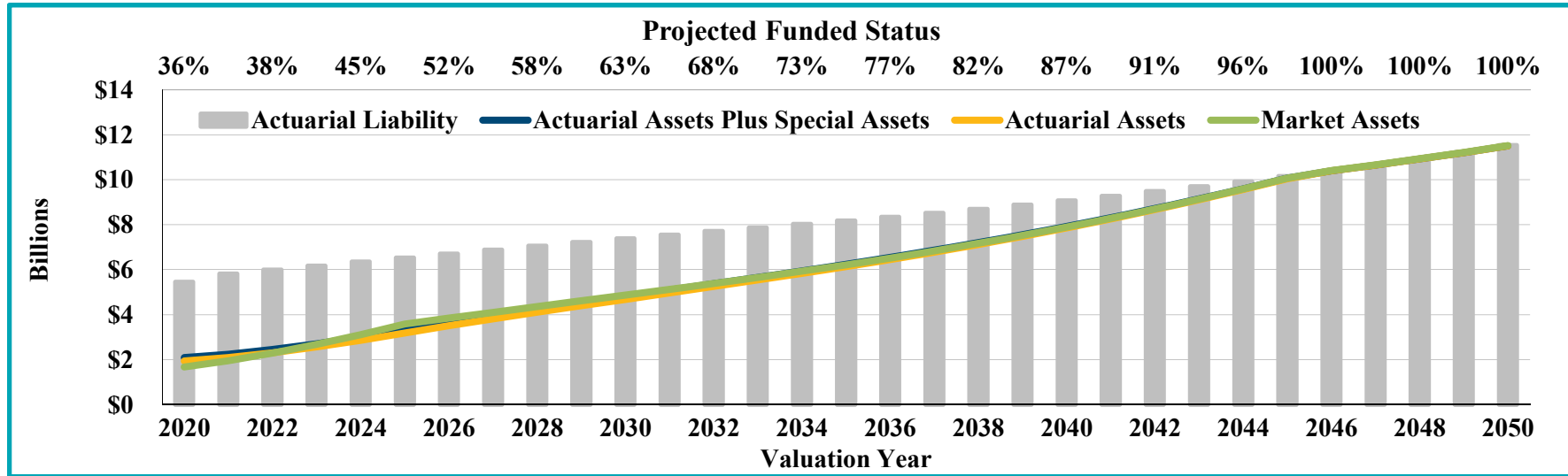
Local Employers



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SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

Five-Year Significant Positive Scenario: 15.3% return FYE 2021-2025, 7.0% after  
 State



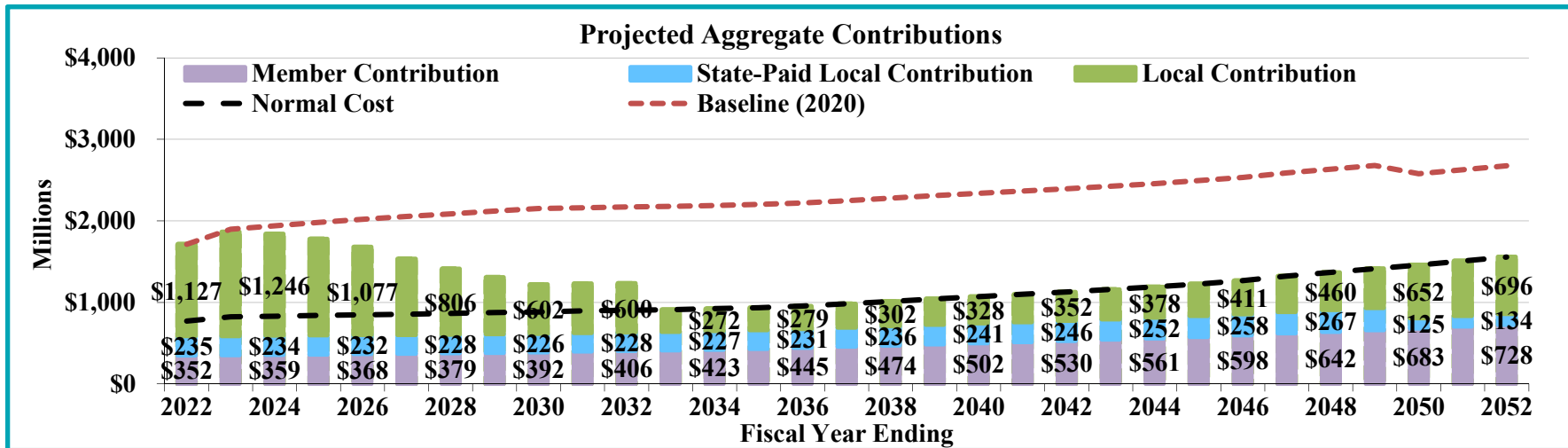
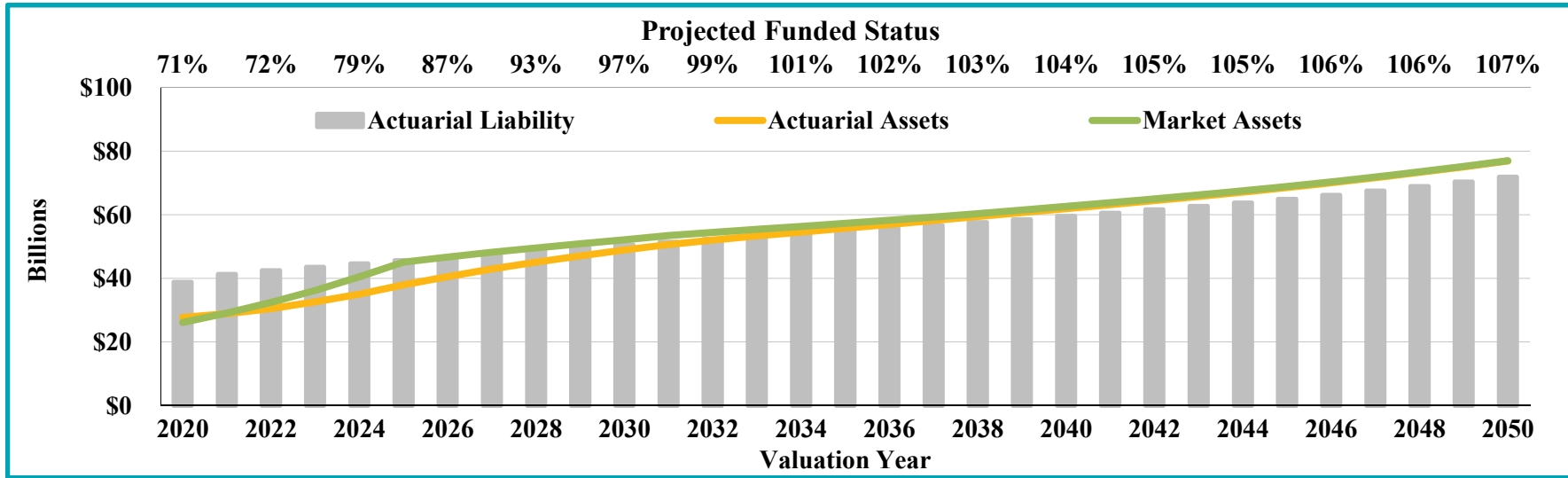


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Five-Year Significant Positive Scenario: 15.3% return FYE 2021-2025, 7.0% after

Local Employers



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These scenarios show that actual future investment returns have a significant impact on future contribution amounts. In each of the scenarios, the State and Local employer contribution amounts increase in FYE 2023 as the valuation investment rate of return assumption decreases from 7.30% to 7.00%.

The one-year negative shock scenario shows contribution amounts increasing after FYE 2023 for a few years before leveling off at a long-term annual contribution that is more than the baseline. Likewise, the one-year positive shock scenario shows contribution amounts decreasing after FYE 2023 and resulting in a long-term annual contribution that is less than the baseline. The five-year moderate and significant scenarios show contribution amounts that increase or decrease for about seven years after FYE 2023 before steadying at a long-term annual contribution amount that is more or less than the baseline.

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

The following table summarizes the impact on the State and Local employer contributions in FYE 2034 for the various investment return scenarios.

<b>Table II-2 FYE 2034 Contribution Impact (dollar amounts in millions)</b>						
	<b>1-Yr Shock</b>		<b>5-Yr Moderate</b>		<b>5-Yr Significant</b>	
	<b>Neg</b>	<b>Pos</b>	<b>Neg</b>	<b>Pos</b>	<b>Neg</b>	<b>Pos</b>
<b><u>State</u></b>						
Amount	\$20	(\$24)	\$19	(\$22)	\$42	(\$59)
Percent	5%	-6%	5%	-5%	10%	-14%
<b><u>Local Employers</u></b>						
Amount	\$357	(\$407)	\$330	(\$331)	\$752	(\$1,244)
Percent	24%	-27%	22%	-22%	50%	-82%

The contributions for Local employers are clearly more sensitive to the investment returns. This is caused by the funded status at the beginning of the projection period. The State is less well funded and, as a result, has less to gain or lose from positive or negative investment experience.

**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.**

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**SECTION II – ASSESSMENT AND DISCLOSURE OF RISK**

**Assumption Change Risk – Sensitivity Testing**

As shown in Table II-1, assumption changes over the last decade have increased the UAL by approximately \$2.5 billion. The most significant changes were reductions in the discount rate and projections of mortality improvement. The reductions in discount rates have been largely driven by declines in interest rates that affect expectations of future investment returns. If there are further 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, 2021 valuation.

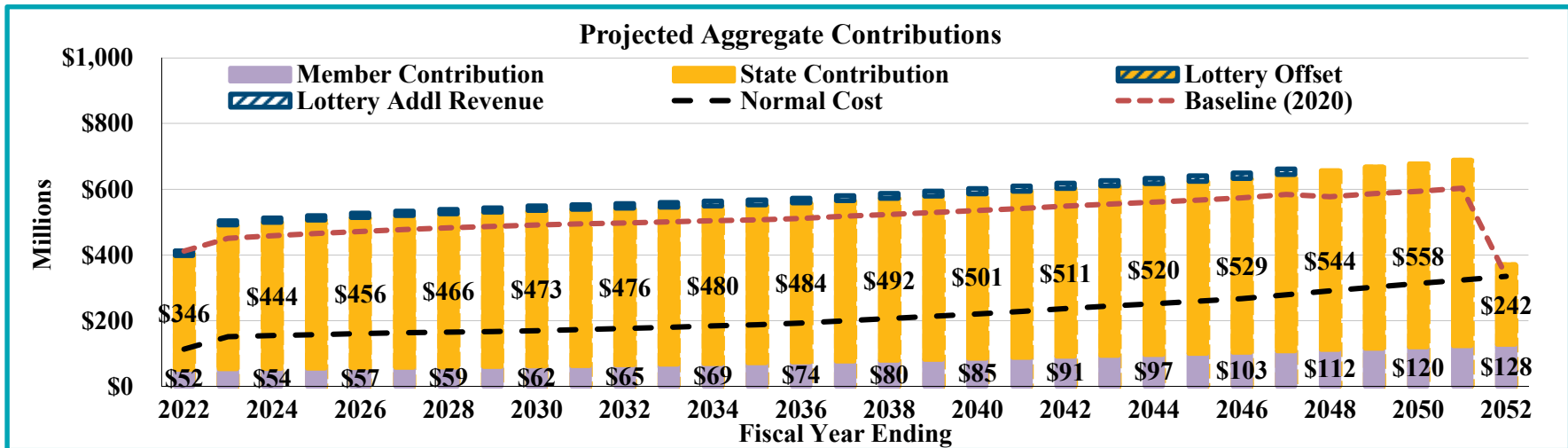
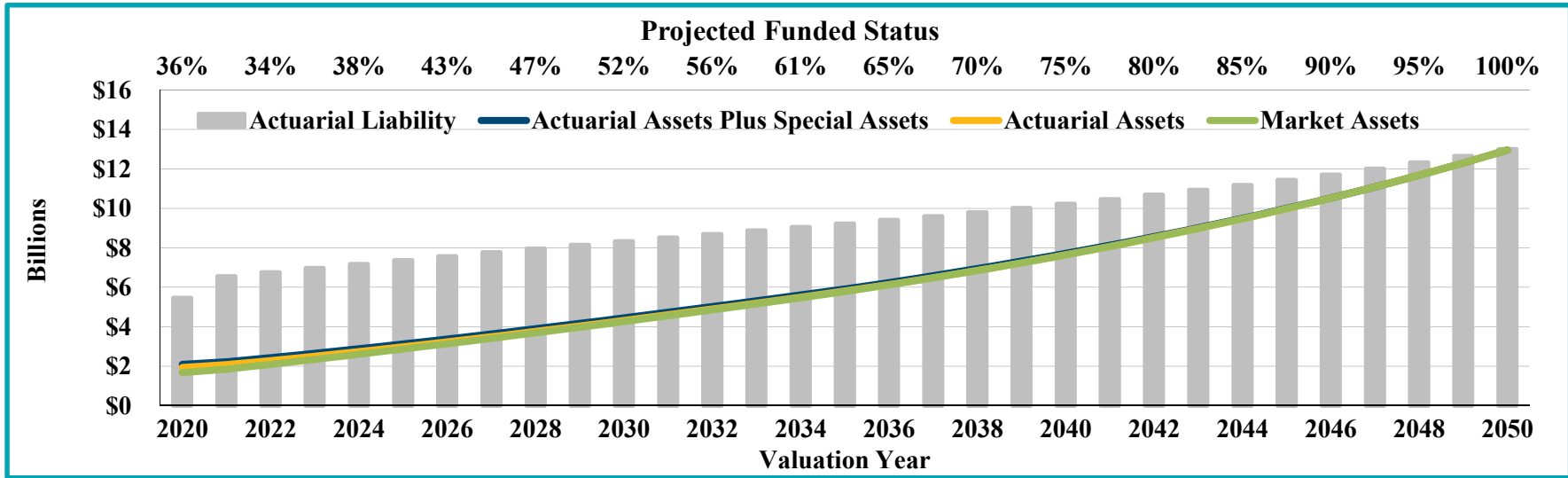
This scenario results in Statutory contributions that are about 15% higher for State and 33% higher for Local employers in FYE 2034. Again, the contributions for Local employers are more sensitive to assumption changes because of the funded status at the time of the change.

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6.00% Discount Rate and Investment Return Assumption Effective July 1, 2021

State

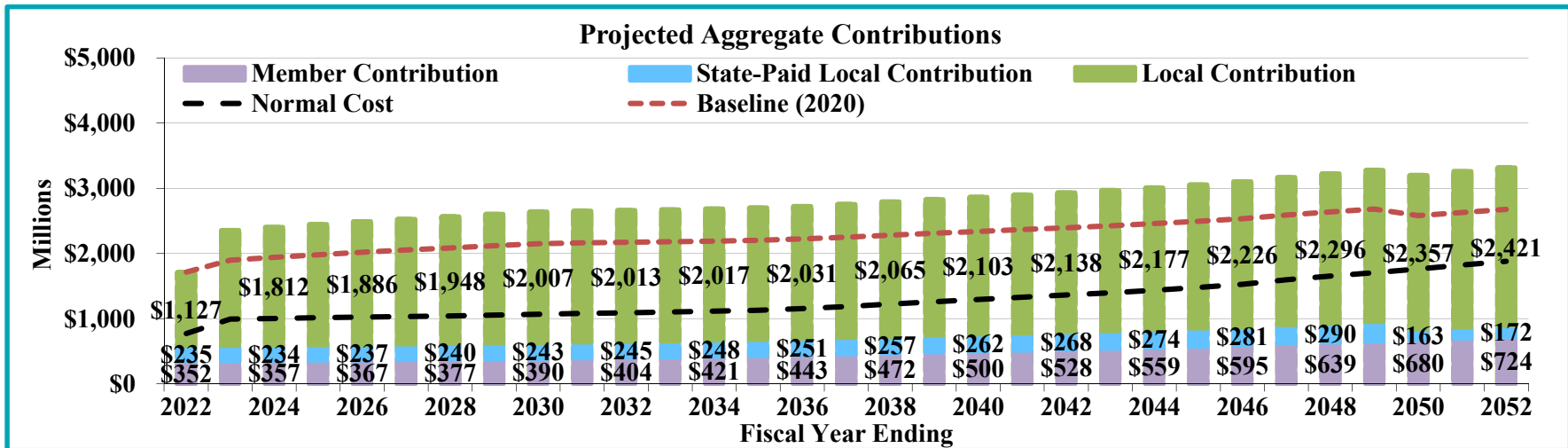
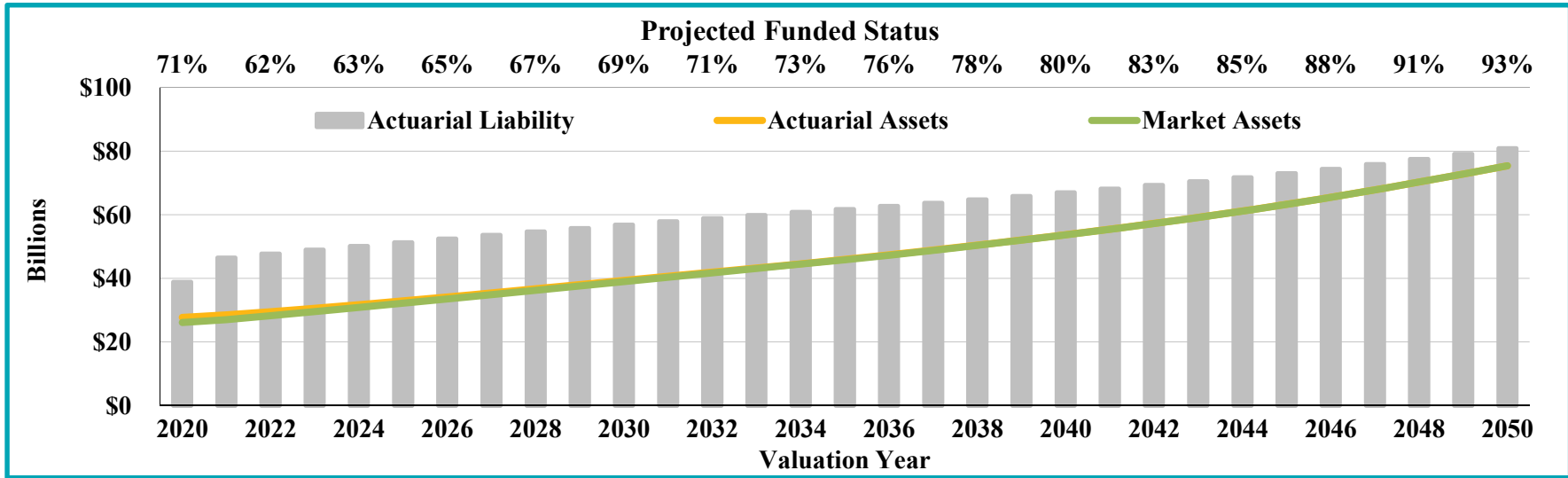


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**6.00% Discount Rate and Investment Return Assumption Effective July 1, 2021**

**Local Employers**



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**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, State appropriated contributions have consistently been less than the Statutory contributions and the tread water level, causing an increase in the UAL of about \$1.7 billion over the last ten years. The baseline projections assume the State appropriates 100% of the Statutory contribution beginning in FYE 2022, at which time contributions are projected to be greater than the tread water level.

Contribution risk is the potential for actual future contributions to deviate from expected future contributions. The graphs on the following pages illustrate the impact on projected future funded status and contribution amounts if the State appropriation remains at 78% of the Statutory contribution for each year in the future, rather than increasing to 100% of the Statutory contribution. In illustrating contribution risk sensitivity, we assume the State appropriation percent remains at the current level of 78%; however, we assume that Local employers will continue to contribute 100% of the Statutory contribution as they have done historically.

The gold and green outlines in the bottom graphs show the full Statutory contributions for the State and Local employers, respectively, with the shaded portion showing the anticipated appropriated amount.

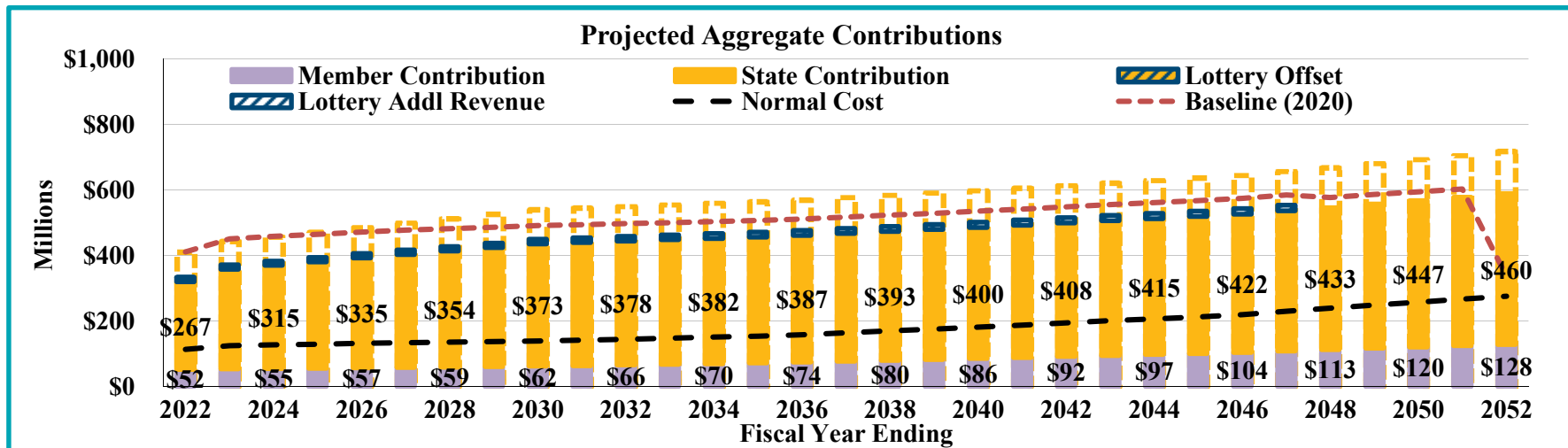
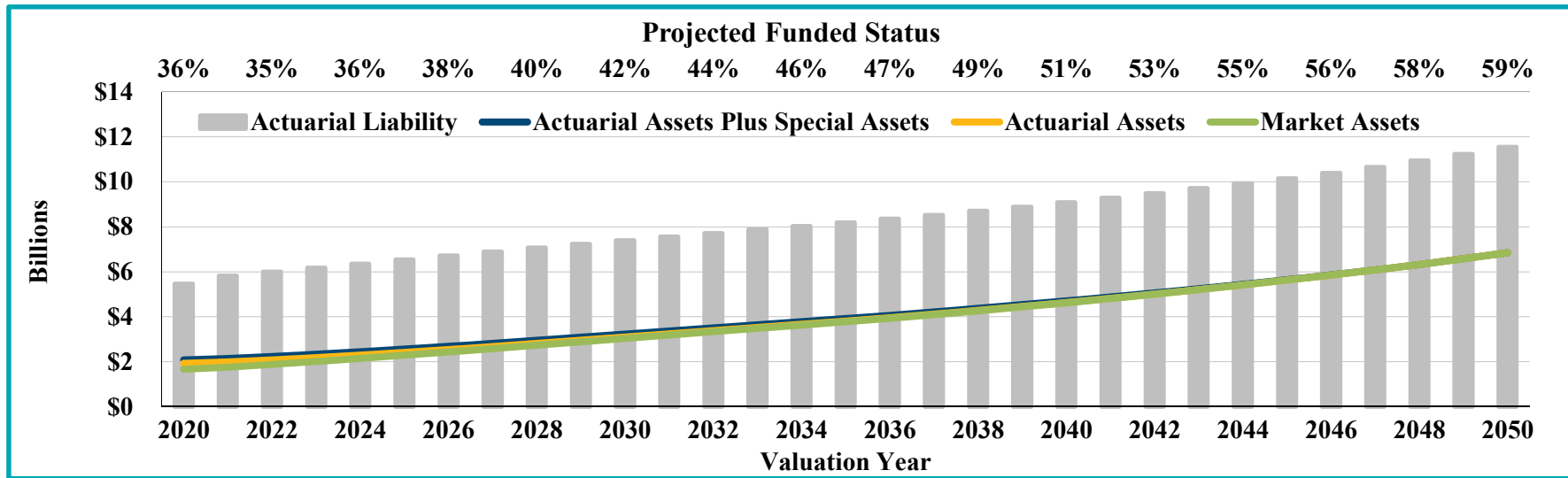
This scenario shows both the Statutory and appropriated State contributions gradually increasing over time. The Statutory contributions quickly exceed the baseline. The appropriated contributions are below the baseline initially and eventually grow to reach a similar level, but with a lower funded ratio. The funded ratio at the end of the projection period is 59% compared to 100% under the baseline projections for the State portion and 89% compared to 92% under the baseline projections for the Local employers' portion.

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State Appropriates 78% of Statutory Contribution for Fiscal Year Ending June 30, 2022 and Thereafter

State

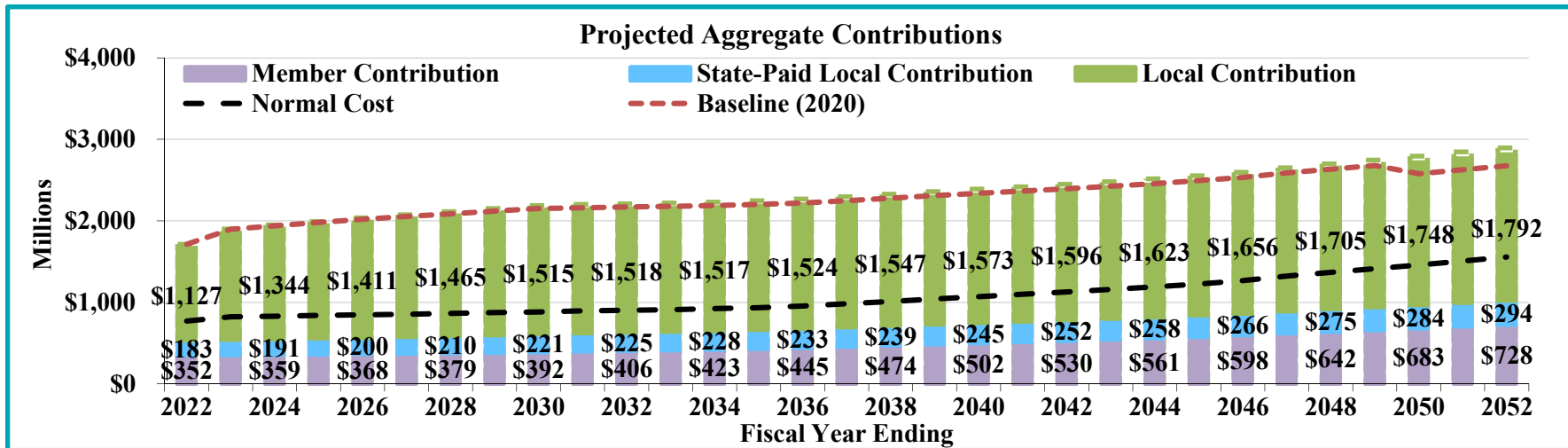
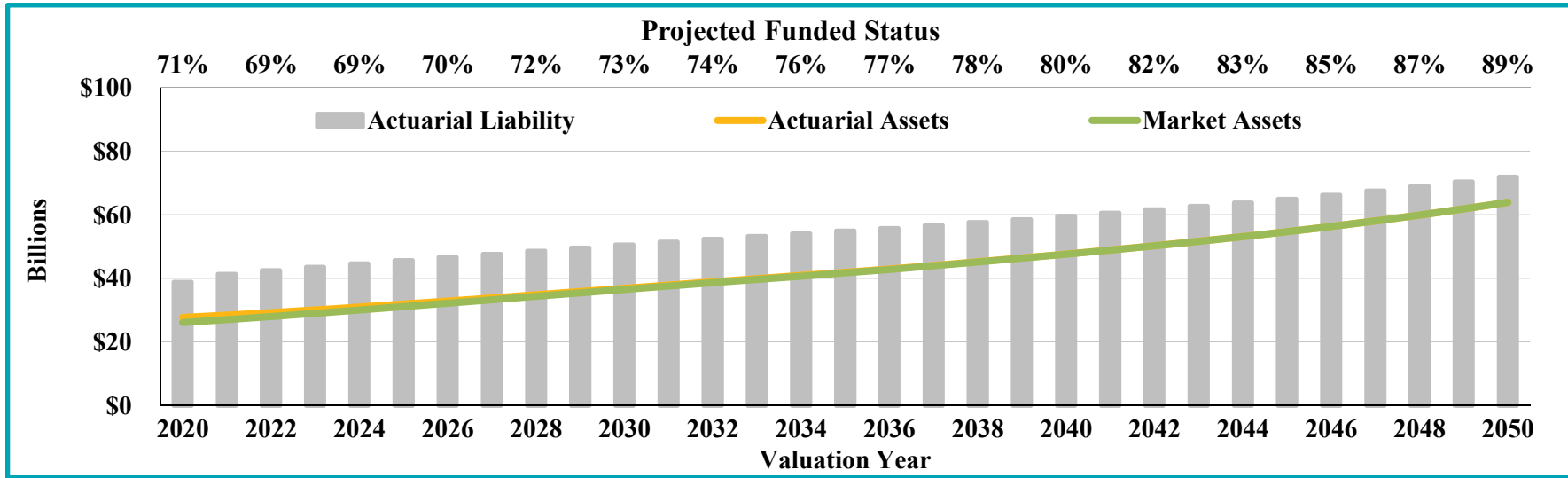


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State Appropriates 78% of Statutory Contribution for Fiscal Year Ending June 30, 2022 and Thereafter

Local Employers





**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.

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**SECTION III – ASSETS**

The System uses and discloses two different asset measurements for funding, both of 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 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 value of assets 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 value of assets which have consistently been greater than the market value of assets and recognizes investment losses slowly over time. Additionally, the method may produce an actuarial value of assets that falls outside of what is generally considered to be 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, 2019 and July 1, 2020,
- Statement of cash flows during the year,
- Development of the actuarial value of assets,
- Disclosure of investment performance for the year,
- Development of the Special Asset Value (SAV), and
- Development of the Actuarial Balance Sheet.

## **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, 2019 and June 30, 2020. Table III-2 presents the System's net cash flows from June 30, 2019 to June 30, 2020. Table III-3 presents the development of the Actuarial Value of Assets as of July 1, 2020. 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.

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**SECTION III – ASSETS**

<b>Table III-1 Statement of Assets at Market Value</b>		
	<b>June 30, 2020</b>	<b>June 30, 2019</b>
<b>Assets</b>		
Cash	\$ 7,614,664	\$ 3,616,695
Investment Holdings	24,753,164,898	25,311,934,008
Employers' Contributions Receivable - State	92,032,250	0
Employers' Contributions Receivable - Chapter 19	70,224,036	86,902,860
Employers' Contributions Receivable - NCGI State	780,511	271,735
Employers' Contributions Receivable - NCGI Local Employers	36,964,099	46,564,731
Employers' Contributions Receivable - Common L	1,968,000	1,572,000
Employers' Contributions Receivable - Local Employers	1,091,858,046	964,916,947
Employers' Contributions Receivable - Local Employers ERI	6,680,501	8,759,216
Employers' Contributions Receivable - Retroactive Contributions	5,547,687	6,787,639
Employers' Contributions Receivable - Delayed Enrollments	149,858	84,802
Employers' Contributions Receivable - Delayed Appropriations	452,824	393,635
Members' Contributions Receivable	55,812,952	58,868,315
Accrued Interest on Investments	3,804,535	3,727,503
Accounts Receivable - Other	5,729,483	3,949,920
New Jersey Mortgage Receivable	1,279,155,633	1,280,877,241
Loans Receivable	242,316,293	245,121,318
Interest Receivable on Loans	1,116,953	1,114,165
Securities Lending Collateral	464,984,342	326,879,274
<b>Total Assets</b>	<b>\$ 28,120,357,565</b>	<b>\$ 28,352,342,004</b>
<b>Liabilities</b>		
Pension Payroll Payable	\$ (183,615,074)	\$ (174,533,233)
Pension Adjustment Payroll Payable	(15,217,597)	(15,809,400)
Withholdings Payable	(29,161,076)	(27,400,661)
Death Benefits Payable	(7,819,466)	(3,591,393)
Securities Lending Collateral & Rebates Payable	(464,830,543)	(326,484,125)
Administrative Expenses Payable	0	(5,261,359)
Accounts Payable - Other	(7,585,964)	(6,840,888)
<b>Total Liabilities</b>	<b>\$ (708,229,720)</b>	<b>\$ (559,921,059)</b>
<b>Preliminary Market Value of Assets</b>	<b>\$ 27,412,127,845</b>	<b>\$ 27,792,420,945</b>
<b>Discounted Receivables</b>		
Expected Lottery Revenue	\$ 12,585,572	\$ 12,413,784
State Appropriations	412,822,354	352,559,110
<b>Adjustments to Financial Report</b>		
Discounting of Local Employers Appropriations Receivable	(55,605,478)	(49,600,780)
Discounting of Local Employers ERI Contributions Receivable	(479,163)	(644,271)
True-up of Present Value of Chapter 19, P.L. 2009		
Contributions Receivable	54,152,838	51,452,176
Exclusion of Reserve for Non-Contributory Group Insurance	(62,418,619)	(57,556,933)
<b>Market Value of Assets</b>	<b>\$ 27,773,185,349</b>	<b>\$ 28,101,044,031</b>

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
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**SECTION III – ASSETS**

**System Cash Flows as of June 30, 2020**

Table III-2 Changes in Market Values for FYE June 30, 2020			
	State	Local Employers	Total
<b>Additions</b>			
Contributions			
Member Contributions	\$ 54,985,258	\$ 361,447,921	\$ 416,433,179
Member Transfer Contributions	618,965	2,062,357	2,681,322
State and Local Appropriations	213,820,000	1,080,307,794	1,294,127,794
State Contributions on Behalf of Locals	0	154,309,000	154,309,000
State Lottery	12,180,000	0	12,180,000
NCGI Contributions	9,226,212	36,964,099	46,190,311
Transfers from Other Systems	25,139	150,788	175,927
Other Contributions - Delayed Enrollments	52,058	113,646	165,704
Other Contributions - Delayed Appropriations	(73,561)	677,397	603,836
Other Contributions - Retroactive	0	5,230,213	5,230,213
Other Contributions - Additional	0	997,622	997,622
Other - NCGI Adjustment	0	0	0
Total Contributions	\$ 290,834,071	\$ 1,642,260,837	\$ 1,933,094,908
Net Investment Income	(6,032,838)	431,576,194	425,543,356
<b>Total Additions</b>	<b>\$ 284,801,233</b>	<b>\$ 2,073,837,031</b>	<b>\$ 2,358,638,264</b>
<b>Deductions</b>			
Withdrawal of Member Contributions	\$ 2,420,845	\$ 6,529,963	\$ 8,950,808
Withdrawal of Member Transfer Contributions	71,206	321,573	392,779
Adjustment for Member Loans	30,028	0	30,028
Withdrawal of Transfer Contributions	43,020	70,522	113,542
Retirement Allowances	311,956,414	2,176,080,762	2,488,037,176
Pension Adjustment Benefits	21,402,231	161,500,080	182,902,311
Death Benefit Claims	9,226,212	36,419,183	45,645,395
Administrative Expenses	1,936,833	10,922,492	12,859,325
<b>Total Deductions</b>	<b>\$ 347,086,789</b>	<b>\$ 2,391,844,575</b>	<b>\$ 2,738,931,364</b>
<b>Net Increase/(Decrease)</b>	<b>\$ (62,285,556)</b>	<b>\$ (318,007,544)</b>	<b>\$ (380,293,100)</b>
<b>Preliminary Market Value of Assets Beginning of Year</b>	<b>\$ 1,480,980,637</b>	<b>\$ 26,311,440,308</b>	<b>\$ 27,792,420,945</b>
<b>Preliminary Market Value of Assets End of Year</b>	<b>\$ 1,418,695,081</b>	<b>\$ 25,993,432,764</b>	<b>\$ 27,412,127,845</b>
<b>Discounted Receivables</b>			
Expected Lottery Revenue	\$ 12,585,572	\$ 0	\$ 12,585,572
State Appropriations	241,905,594	170,916,760	412,822,354
<b>Adjustments to June 30, 2020 Financial Report</b>			
Discounting of Local Employers Appropriations Receivable	0	(55,605,478)	(55,605,478)
Discounting of Local Employers ERI Contributions Receivable	0	(479,163)	(479,163)
True-up of Present Value of Chapter 19, P.L. 2009			
Contributions Receivable	0	54,152,838	54,152,838
Exclusion of Reserve for Non-Contributory Group Insurance	0	(62,418,619)	(62,418,619)
<b>Market Value of Assets End of Year</b>	<b>\$ 1,673,186,247</b>	<b>\$ 26,099,999,102</b>	<b>\$ 27,773,185,349</b>
<b>Approximate Return</b>	<b>-0.42%</b>	<b>1.75%</b>	<b>1.63%</b>

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**SECTION III – ASSETS**

**Actuarial Value of Assets (AVA)**

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.

<b>Table III-3 Development of Actuarial Value of Assets for July 1, 2020</b>			
	<b>State</b>	<b>Local Employers</b>	<b>Total</b>
1. Preliminary Actuarial Value of Assets as of July 1, 2019 <sup>1</sup>	\$ 1,683,650,646	\$ 26,865,467,976	\$ 28,549,118,622
2. Net Cash Flow excluding Investment Income <sup>2</sup>	(56,252,718)	(724,090,939)	(780,343,657)
3. Expected Investment Income <sup>3</sup>	<u>118,989,874</u>	<u>1,835,668,263</u>	<u>1,954,658,137</u>
4. Expected Actuarial Value of Assets as of July 1, 2020: [1 + 2 + 3]	\$ 1,746,387,802	\$ 27,977,045,300	\$ 29,723,433,102
5. Preliminary Market Value of Assets as of June 30, 2020 <sup>4</sup>	\$ 1,418,695,081	\$ 25,948,222,364	\$ 27,366,917,445
6. 20% of Difference from MVA [20% * (5 - 4)]	\$ (65,538,544)	\$ (405,764,587)	\$ (471,303,131)
7. Preliminary Actuarial Value of Assets as of July 1, 2020: [4 + 6]	\$ 1,680,849,258	\$ 27,571,280,713	\$ 29,252,129,971
8. Discounted Receivables			
State Appropriations	\$ 241,905,594	\$ 170,916,760	\$ 412,822,354
Expected Lottery Revenue	12,585,572	0	12,585,572
Chapter 19, P.L. 2009 Contributions for FYE 2022 and Later	<u>0</u>	<u>100,196,237</u>	<u>100,196,237</u>
Total	\$ 254,491,166	\$ 271,112,997	\$ 525,604,163
9. Adjustments			
Discounting of Local Employers Appropriations Receivable	\$ 0	\$ (55,605,478)	\$ (55,605,478)
Discounting of Chapter 19, P.L. 2009 Contributions for FYE 2021	0	(1,312,162)	(1,312,162)
Exclusion of Reserve for Non-Contributory Group Insurance	<u>0</u>	<u>(62,418,619)</u>	<u>(62,418,619)</u>
Total	\$ 0	\$ (119,336,259)	\$ (119,336,259)
10. Actuarial Value of Assets as of July 1, 2020: [7 + 8 + 9]	\$ 1,935,340,424	\$ 27,723,057,451	\$ 29,658,397,875
11. Rate of Return on Actuarial Value of Assets	3.28%	5.69%	5.54%
12. Ratio of Actuarial Value of Assets to Market Value of Assets	115.7%	106.2%	106.8%

<sup>1</sup> Excludes discounted State appropriations receivable, present value of Chapter 19, P.L. 2009 and other adjustments.

<sup>2</sup> Amount for Local employers includes Chapter 19, P.L. 2009 contribution receivable for FYE 2021 of 25,492,799.

<sup>3</sup> Refer to Appendix B, Actuarial Methods, for details on the assumed timing of contributions.

<sup>4</sup> Amount for Local employers includes adjustments to June 30, 2020 Financial Report for the interest portion of Local employers ERI contributions receivable of \$(479,163) and true-up of Chapter 19, P.L. 2009 contributions for FYE 2021 of \$(44,731,237).

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**SECTION III – ASSETS**

**Investment Performance**

In reviewing the investment performance for the System's assets in aggregate, the market value of assets rate of return was 1.63% for the year ending June 30, 2020. This is compared to an assumed return of 7.30% for the same period. On an actuarial value of assets basis, the return for FYE 2020 was 5.54%.

The calculated returns for State and Local employers' portions separately differ due to the size of cash flows relative to the beginning of year asset value, the timing of contributions, and the income allocation methodology. For the year ending June 30, 2020 the market value of assets rate of return was -0.42% and 1.75% for the State and Local employers' portions, respectively. On an actuarial value of assets basis, the return for FYE 2020 was 3.28% and 5.69% for the State and Local employers' portions, respectively.

In Table III-4 we show the historical asset returns and the investment return assumption beginning with the year ending on June 30, 2000 for the System in aggregate. As of July 1, 1999, the actuarial value of assets was partially reset to recognize additional market value surplus.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
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**SECTION III – ASSETS**

**Table III-4  
Historical Rates of Return  
Total System**

<b>Year Ended June 30</b>	<b>Investment Return Assumption</b>	<b>Market Value<sup>1</sup></b>	<b>Actuarial Value<sup>2</sup></b>
2000	8.75%	11.86%	10.80%
2001	8.75%	-9.80%	6.92%
2002	8.75%	-8.61%	3.79%
2003	8.75%	3.31%	3.62%
2004	8.75%	14.16%	4.46%
2005	8.25%	8.77%	5.33%
2006	8.25%	9.79%	5.95%
2007	8.25%	17.14%	7.32%
2008	8.25%	-2.61%	5.56%
2009	8.25%	-15.49%	2.11%
2010	8.25%	13.34%	3.44%
2011	8.25%	17.97%	5.55%
2012	7.95%	2.47%	4.71%
2013	7.90%	11.72%	5.67%
2014	7.90%	16.79%	7.48%
2015	7.90%	4.08%	6.74%
2016	7.90%	-1.15%	5.35%
2017	7.65%	11.90%	6.30%
2018	7.50%	8.83%	6.89%
2019	7.50%	6.10%	6.71%
2020	7.30%	1.63%	5.54%

<sup>1</sup> Beginning in 2017, the returns are from the System's Actuarial Valuation Reports. Since the prior actuary did not calculate a market value return prior to 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.

<sup>2</sup> The prior actuary did not report an actuarial value of return in 2000. The return shown was calculated based on available information.

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**SECTION III – ASSETS**

Additionally, we show the compound annualized rates of return for various periods since the July 1, 1999 AVA partial reset 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.

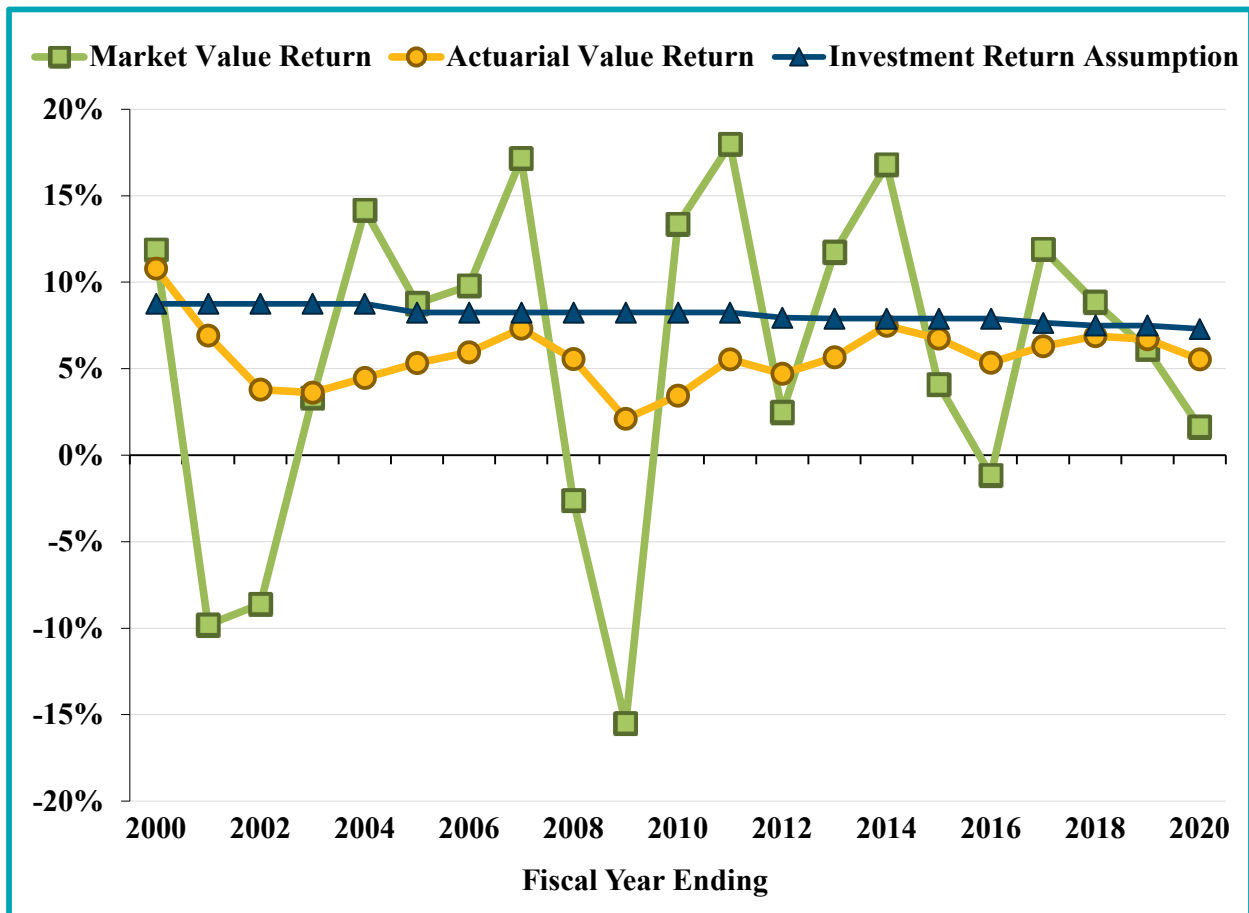
<b>Table III-5 Compound Annualized Rates of Returns</b>			
	<b>Return Assumption</b>	<b>Market Value</b>	<b>Actuarial Value</b>
Since July 1, 1999	8.14%	5.41%	5.71%
20-Year	8.11%	5.10%	5.46%
15-Year	7.93%	6.46%	5.68%
10-Year	7.77%	7.86%	6.09%
5-Year	7.57%	5.36%	6.16%
<b>Consecutive Five-Year Periods</b>			
2000 to 2004	8.75%	1.69%	5.88%
2005 to 2009	8.25%	2.86%	5.24%
2010 to 2014	8.05%	12.32%	5.36%
2015 to 2019	7.69%	5.86%	6.40%
2020 (One-Year)	7.30%	1.63%	5.54%



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SECTION III – ASSETS

We present the annual rates of return from Table III-4 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. 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 is closing in on the AVA with the possibility of AVA gains in the near future. However, both such instances (2007 and 2014) are followed by market value losses (large, sharp losses in 2008-2009 and small cumulative losses in 2015-2020).



**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
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**SECTION III – ASSETS**

**Development of Special Asset Value (SAV)**

Under Chapter 98, P.L. 2017, the Lottery Enterprise Contribution Act, PFRS receives 1.20% of the proceeds of the Lottery Enterprise for a term of 30 years. The value of the Lottery Enterprise is classified as a special asset. The special asset value is the present value of remaining lottery contributions to the retirement systems.

Table III-6 shows the development of the special asset value as of July 1, 2020. The depreciated value is a roll forward of the Lottery Enterprise Value from the appraisal date.

<b>Table III-6 Development of Special Asset Value as of July 1, 2020</b>		
1.	Lottery Enterprise Value as of Appraisal Date of June 30, 2017 <sup>1</sup>	\$ 13,535,103,380
2.	Depreciated Value as of end of Valuation Year at June 30, 2021 <sup>1</sup>	\$ 13,486,010,814
3.	Discounted Value as of July 1, 2020 at 7.30%	\$ 12,568,509,612
4.	Allocation to PFRS	1.20%
5.	Special Asset Value as of July 1, 2020	\$ 150,822,115

<sup>1</sup> Provided by the Division of Pensions and Benefits

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
JULY 1, 2020 ACTUARIAL VALUATION**

**SECTION III – ASSETS**

**Actuarial Balance Sheet**

Table III-7 Actuarial Balance Sheet as of July 1, 2020			
	State	Local Employers	Total
<b>Assets</b>			
<u>Retirement Fund Reserve (RFR)</u>			
Credited to Fund with Distribution of Income	\$ 3,520,990,198	\$ 25,897,438,610	\$ 29,418,428,808
Add/(Deduct) reserve transferable from/(to) ECR <sup>1</sup>	210,114,661	166,606,695	376,721,356
Adjusted RFR <sup>2</sup>	\$ 3,731,104,859	\$ 26,064,045,305 <sup>3</sup>	\$ 29,795,150,164
Members' Contributions Reserve (MCR) <sup>2</sup>	\$ 495,113,427	\$ 3,597,894,258	\$ 4,093,007,685
<u>Employers' Contributions Reserve (ECR)</u>			
Credited to Fund with Distribution of Income	\$ (2,080,763,201)	\$ (1,772,275,417)	\$ (3,853,038,618)
Add/(Deduct) reserve transferable from/(to) RFR	(210,114,661)	(166,606,695)	(376,721,356)
Adjusted ECR <sup>2</sup>	\$ (2,290,877,862)	\$ (1,938,882,112)	\$ (4,229,759,974)
Special Asset Value as of July 1, 2020	\$ 150,822,115	\$ 0	\$ 150,822,115
Present Value of Prospective Contributions by State and Local Employers to ECR	3,363,708,488	11,130,254,150	14,493,962,638
<b>Total Assets</b>	<b>\$ 5,449,871,027</b>	<b>\$ 38,853,311,601</b>	<b>\$ 44,303,182,628</b>
<b>Liabilities</b>			
<u>Payable from RFR</u>			
Retirees, Disableds, and Beneficiaries currently receiving benefits	\$ 3,731,104,859	\$ 26,064,045,305 <sup>3</sup>	\$ 29,795,150,164
<u>Payable from MCR and ECR</u>			
Active and Terminated Vested Members due a future benefit	\$ 1,718,766,168	\$ 12,789,266,296	\$ 14,508,032,464
<b>Total Liabilities</b>	<b>\$ 5,449,871,027</b>	<b>\$ 38,853,311,601</b>	<b>\$ 44,303,182,628</b>

<sup>1</sup> It is recommended that the RFR be put into balance each year by transferring assets from the ECR to the RFR so that the RFR will contain sufficient assets to cover the retiree and beneficiary liability.

<sup>2</sup> Actuarial Value of Assets equals RFR + MCR + ECR.

<sup>3</sup> Includes the present value of ERI payments of \$4,282,024.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
JULY 1, 2020 ACTUARIAL VALUATION**

**SECTION IV – LIABILITIES**

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

- Disclosure of liabilities at July 1, 2019 and July 1, 2020,
- 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 PFRS, 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.

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.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
JULY 1, 2020 ACTUARIAL VALUATION**

**SECTION IV – LIABILITIES**

Table IV-1 shows the actuarial liability, unfunded actuarial liability and funded ratio as of July 1, 2020 for the System. The unfunded actuarial liability (UAL) and funded ratio based on the actuarial value of assets plus the special asset value (AVA + SAV) is used to compare against the “target funded ratio” and is different from the UAL used in determining Statutory contributions which is based on just the actuarial value of assets (AVA).

<b>Table IV-1 Disclosure of Liabilities</b>			
	<b>State</b>	<b>Local Employers</b>	<b>Total</b>
<b>Actuarial Liability</b>			
Contributing Actives	\$ 1,657,078,818	\$ 12,539,778,322	\$ 14,196,857,140
Non-Contributing Actives	59,263,925	237,638,802	296,902,727
Deferred Vested	2,423,425	11,849,172	14,272,597
Retirees	3,006,151,557	21,459,992,893	24,466,144,450
Disabled	447,276,650	2,610,196,549	3,057,473,199
Beneficiaries	277,676,652	1,993,855,863	2,271,532,515
<b>Total Actuarial Liability</b>	<b>\$ 5,449,871,027</b>	<b>\$ 38,853,311,601</b>	<b>\$ 44,303,182,628</b>
Actuarial Value of Assets	<u>\$ 1,935,340,424</u>	<u>\$ 27,723,057,451</u>	<u>\$ 29,658,397,875</u>
Unfunded Actuarial Liability/(Surplus)	\$ 3,514,530,603	\$ 11,130,254,150	\$ 14,644,784,753
Funded Ratio (AVA)	35.51%	71.35%	66.94%
Actuarial Value of Assets + Special Asset Value	<u>\$ 2,086,162,539</u>	<u>\$ 27,723,057,451</u>	<u>\$ 29,809,219,990</u>
Unfunded Actuarial Liability/(Surplus)	\$ 3,363,708,488	\$ 11,130,254,150	\$ 14,493,962,638
Funded Ratio (AVA + SAV)	38.28%	71.35%	67.28%

<sup>1</sup> Includes the present value of ERI payments of \$4,282,024.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
JULY 1, 2020 ACTUARIAL VALUATION**

**SECTION IV – LIABILITIES**

Table IV-2 and Table IV-3 show the Actuarial Liability by Tier of contributing and non-contributing active members, respectively, for State and Local employers as of July 1, 2020.

<b>Table IV-2 Contributing Active Liabilities by Tier</b>				
	<b>Number of Members</b>	<b>Appropriation Payroll<sup>1</sup></b>	<b>Actuarial Liability</b>	<b>Gross Normal Cost</b>
<b>State</b>				
Tier 1	3,895	\$ 348,205,980	\$ 1,506,349,180	\$ 76,365,820
Tier 2	219	16,592,413	27,774,812	2,862,568
Tier 3	2,574	146,594,486	122,954,826	26,391,254
Total	<u>6,688</u>	<u>\$ 511,392,879</u>	<u>\$ 1,657,078,818</u>	<u>\$ 105,619,642</u>
<b>Local Employers</b>				
Tier 1	20,450	\$ 2,517,395,628	\$ 11,605,769,309	\$ 542,580,228
Tier 2	498	50,090,552	86,690,332	8,677,913
Tier 3	13,202	937,888,850	847,318,681	166,798,787
Total	<u>34,150</u>	<u>\$ 3,505,375,030</u>	<u>\$ 12,539,778,322</u>	<u>\$ 718,056,928</u>

<sup>1</sup> Excludes pay for members who attain the mandatory retirement age of 65 prior to midyear. Tier 1 members limited to the 401(a)(17) pay limit. Tier 2 and 3 members limited to the Social Security Wage Base.

<b>Table IV-3 Non-Contributing Active Liabilities by Tier</b>				
	<b>Number of Members</b>	<b>Last Reported Payroll</b>	<b>Actuarial Liability</b>	<b>Gross Normal Cost</b>
<b>State</b>				
Tier 1	219	\$ 16,439,701	\$ 53,061,204	\$ 0
Tier 2	9	634,641	897,323	0
Tier 3	198	9,422,564	5,305,398	0
Total	<u>426</u>	<u>\$ 26,496,906</u>	<u>\$ 59,263,925</u>	<u>\$ 0</u>
<b>Local Employers</b>				
Tier 1	733	\$ 66,041,513	\$ 222,341,645	\$ 0
Tier 2	14	1,264,585	1,866,919	0
Tier 3	421	22,856,077	13,430,238	0
Total	<u>1,168</u>	<u>\$ 90,162,175</u>	<u>\$ 237,638,802</u>	<u>\$ 0</u>

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
JULY 1, 2020 ACTUARIAL VALUATION**

**SECTION IV – LIABILITIES**

Tables IV-4 and IV-5 present the change in the actuarial liabilities, actuarial assets, and unfunded actuarial liability during the plan year for State and Local employers. 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.

For this purpose, we focus on the UAL without considering the SAV because this UAL is used to determine the Statutory contribution. The UAL is also prior to any adjustments for State-paid Local obligations.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
JULY 1, 2020 ACTUARIAL VALUATION**

**SECTION IV – LIABILITIES**

<b>Table IV-4 Development of 2020 Experience (Gain)/Loss State</b>			
	<b>Actuarial Liability</b>	<b>Actuarial Value of Assets</b>	<b>Unfunded Actuarial Liability/(Surplus)</b>
1. Value as of July 1, 2019	\$ 5,261,107,456	\$ (1,896,362,754)	\$ 3,364,744,702
2. Additions			
Normal Cost	\$ 100,745,385	\$ 0	\$ 100,745,385
Statutory State Contributions	0	(340,717,380)	(340,717,380)
Expected Member Contributions	0	(47,887,968)	(47,887,968)
Total Additions	<u>\$ 100,745,385</u>	<u>\$ (388,605,348)</u>	<u>\$ (287,859,963)</u>
3. Deductions			
Benefit Payments	\$ (335,809,518)	\$ 335,809,518	\$ 0
Expected Administrative Expenses	0	0	0
Total Deductions	<u>\$ (335,809,518)</u>	<u>\$ 335,809,518</u>	<u>\$ 0</u>
4. Net Transfers from Other Systems			
State Contributions	\$ (17,881)	\$ 17,881	\$ 0
Member Contributions	547,759	(547,759)	0
Total Net Transfers	<u>\$ 529,878</u>	<u>\$ (529,878)</u>	<u>\$ 0</u>
5. Expected Interest	\$ 379,393,091	\$ (128,129,440)	\$ 251,263,651
6. Expected Value as of July 1, 2020: [1 + 2 + 3 + 4 + 5]	\$ 5,405,966,292	\$ (2,077,817,902)	\$ 3,328,148,390
7. Other Changes			
Appropriation Adjustment	\$ 0	\$ 70,290,515	\$ 70,290,515
Contribution Timing	0	11,292,987	11,292,987
Actual Lottery Revenue	0	678,654	678,654
Other Employer Contributions	0	22,274	22,274
Actual Member Contributions	0	(7,351,778)	(7,351,778)
Change in Assumptions	0	0	0
Change in Benefits	0	0	0
Total Other Changes	<u>\$ 0</u>	<u>\$ 74,932,652</u>	<u>\$ 74,932,652</u>
8. Expected value after changes: [6 + 7]	\$ 5,405,966,292	\$ (2,002,885,250)	\$ 3,403,081,042
9. Actual Value as of July 1, 2020	\$ 5,449,871,027	\$ (1,935,340,424)	\$ 3,514,530,603
10. Actuarial (Gain)/Loss: [9 - 8]	\$ 43,904,735	\$ 67,544,826	\$ 111,449,561



**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
JULY 1, 2020 ACTUARIAL VALUATION**

**SECTION IV – LIABILITIES**

<b>Table IV-5 Development of 2020 Experience Gain/(Loss) Local Employers</b>			
	<b>Actuarial Liability</b>	<b>Actuarial Value of Assets</b>	<b>Unfunded Actuarial Liability/(Surplus)</b>
1. Value as of July 1, 2019	\$ 37,671,711,185	\$ (27,023,458,408)	\$ 10,648,252,777
2. Additions			
Normal Cost	\$ 710,430,955	\$ 0	\$ 710,430,955
Statutory Contributions	0	(1,309,252,528)	(1,309,252,528)
Expected Member Contributions	0	(334,310,940)	(334,310,940)
Total Additions	\$ 710,430,955	\$ (1,643,563,468)	\$ (933,132,513)
3. Deductions			
Benefit Payments	\$ (2,344,110,805)	\$ 2,344,110,805	\$ 0
Expected Administrative Expenses	0	0	0
Total Deductions	\$ (2,344,110,805)	\$ 2,344,110,805	\$ 0
4. Net Transfers from Other Systems			
Employer Contributions	\$ 80,266	\$ (80,266)	\$ 0
Member Contributions	1,740,784	(1,740,784)	0
Total Net Transfers	\$ 1,821,050	\$ (1,821,050)	\$ 0
5. Expected Interest	\$ 2,717,908,581	\$ (1,900,712,100)	\$ 817,196,481
6. Expected Value as of July 1, 2020: [1 + 2 + 3 + 4 + 5]	\$ 38,757,760,966	\$ (28,225,444,221)	\$ 10,532,316,745
7. Other Changes			
Appropriation Adjustment	\$ 0	\$ 55,272,457	\$ 55,272,457
Contribution Timing	0	63,265,611	63,265,611
Other Employer Contributions	0	(7,270,555)	(7,270,555)
Actual Member Contributions	0	(28,110,035)	(28,110,035)
ERI and Ch. 19 Receivables	0	(1,842,176)	(1,842,176)
Interest on NCGI Cash Flows	0	3,992,740	3,992,740
Change in Assumptions	0	0	0
Change in Benefits	0	0	0
Total Other Changes	\$ 0	\$ 85,308,042	\$ 85,308,042
8. Expected value after changes: [6 + 7]	\$ 38,757,760,966	\$ (28,140,136,179)	\$ 10,617,624,787
9. Actual Value as of July 1, 2020	\$ 38,853,311,601	\$ (27,723,057,451)	\$ 11,130,254,150
10. Actuarial (Gain)/Loss: [9 - 8]	\$ 95,550,635	\$ 417,078,728	\$ 512,629,363

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
JULY 1, 2020 ACTUARIAL VALUATION**

**SECTION IV – LIABILITIES**

Table IV-6 shows the components of the Actuarial (gain)/loss for the State as of July 1, 2020 and July 1, 2019.

<b>Table IV-6 Actuarial (Gain)/Loss Analysis State</b>		
<b>Components</b>	<b>July 1, 2020</b>	<b>July 1, 2019</b>
<b>Actuarial Value of Assets</b>		
Investment Return	\$ 65,538,544	\$ 50,667,502
Administrative Expenses	2,006,282	1,626,479
Total	<u>\$ 67,544,826</u>	<u>\$ 52,293,981</u>
<b>Actuarial Liability</b>		
Salary Increases	\$ 35,279,947	\$ (2,559,810)
New Entrants	3,263,172	4,599,240
Demographic Experience and Census Data Updates		
Contributing and Non-Contributing Actives	10,141,090	1,437,933
Inactives	<u>(4,230,596)</u>	<u>(4,157,684)</u>
Sub-Total	\$ 44,453,613	\$ (680,321)
Impact of Net Transfers from Other Systems	<u>(548,878)</u>	<u>(1,073,656)</u>
Total	\$ 43,904,735	\$ (1,753,977)
<b>Actuarial (Gain)/Loss</b>	<b>\$ 111,449,561</b>	<b>\$ 50,540,004</b>

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
JULY 1, 2020 ACTUARIAL VALUATION**

**SECTION IV – LIABILITIES**

Table IV-7 shows the components of the Actuarial (gain)/loss for Local employers as of July 1, 2020 and July 1, 2019.

<b>Table IV-7 Actuarial (Gain)/Loss Analysis Local Employers</b>		
<b>Components</b>	<b>July 1, 2020</b>	<b>July 1, 2019</b>
<b>Actuarial Value of Assets</b>		
Investment Return	\$ 405,764,587	\$ 154,026,781
Administrative Expenses	11,314,141	5,837,829
Total	<u>\$ 417,078,728</u>	<u>\$ 159,864,610</u>
<b>Actuarial Liability</b>		
Salary Increases	\$ 73,687,558	\$ 71,398,780
New Entrants	21,543,886	21,615,106
Demographic Experience and Census Data Updates		
Contributing and Non-Contributing Actives	29,185,707	3,610,078
Inactives	(26,980,168)	(1,645,661)
Sub-Total	<u>\$ 97,436,983</u>	<u>\$ 94,978,303</u>
Impact of Net Transfers from Other Systems	(1,886,348)	(2,285,408)
Total	<u>\$ 95,550,635</u>	<u>\$ 92,692,895</u>
<b>Actuarial (Gain)/Loss</b>	<b>\$ 512,629,363</b>	<b>\$ 252,557,505</b>

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
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**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 funding status of the Plan. 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 and Local employer funding requirements contains two components: the employer normal cost and an amortization of the unfunded actuarial liability (UAL). The UAL for this purpose does not include the special asset value. 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. Because the investment rate of return assumption is recommended by the State Treasurer, we provide no opinion on the reasonableness of the assumption.

For PFRS, 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. 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, 2018 valuation, the unfunded actuarial liability is amortized over a closed 30-year period as a level dollar amount. As of July 1, 2020 there are 28 years remaining.

Under Chapter 98, P.L. 2017, the Lottery Enterprise Contribution Act, PFRS receives 1.20% of the proceeds of the Lottery Enterprise for a term of 30 years. As of July 1, 2020 there are 26 years remaining. The State's pension contribution shall be reduced by the product of the allocable percentage for such retirement system, the adjustment percentage for such retirement system and the special asset adjustment.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
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**SECTION V – CONTRIBUTIONS**

Table V-1 shows the development of the Lottery Enterprise contribution offset. According to N.J. Statute the methodology for determining the adjustment percentage varies depending on the applicable fiscal year. The following table shows both calculations to illustrate how the adjustment percentage may change over time.

<b>Table V-1</b>	
<b>Development of Lottery Enterprise Contribution Offset for Fiscal Year Ending 2022</b>	
<b><u>For Fiscal Years Through 2022</u></b>	
1. Special Asset Adjustment for FYE 2022	\$ 1,095,871,137
2. Allocable Percentage to PFRS for Fiscal Years through 2022	1.20%
3. Adjustment Percentage	100.00%
4. Lottery Enterprise Contribution Offset as of June 30, 2021 [1 x 2 x 3]	13,150,454
<b><u>For Fiscal Years Beginning 2023</u></b>	
5. Special Asset Value Allocated to PFRS as of July 1, 2020	\$ 150,822,115
6. 26-Year Level Dollar Amortization payable June 30, 2021	13,108,812
7. Initial Special Asset Value Allocated to PFRS as of July 1, 2016	150,878,997
8. Maximum Special Asset Adjustment: 30-Year Level Dollar Amortization at 7.65%	12,962,136
9. Special Asset Adjustment as of June 30, 2021 [lesser of 6 and 8]	12,962,136
10. Adjustment Percentage	0.00%
11. Funded Ratio for Total System based on Actuarial Value + Special Asset Value	67.28%
12. Applicable Adjustment Percentage [if 11. < 50%, 10. - 3 x (50% - 11.), otherwise 10.]	0.00%

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
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**SECTION V – CONTRIBUTIONS**

Tables V-2 through V-5 show the development of the Statutory pension contributions for State and Local employers.

Table V-2 Development of Unfunded Actuarial Liability						
	July 1, 2020			July 1, 2019		
	State	Local Employers <sup>1</sup>	Total	State	Local Employers <sup>1</sup>	Total
<b>1. Actuarial Liability</b>	\$ 5,449,871,027	\$ 38,853,311,601	\$ 44,303,182,628	\$ 5,261,107,456	\$ 37,671,711,185	\$ 42,932,818,641
<b>2. Actuarial Value of Assets<sup>2</sup></b>	\$ 1,935,340,424	\$ 27,723,057,451	\$ 29,658,397,875	\$ 1,896,362,754	\$ 27,023,458,408	\$ 28,919,821,162
<b>3. Unfunded Actuarial Liability</b>						
a. Basic	\$ 3,360,477,736	\$ 9,126,926,260	\$ 12,487,403,996	\$ 3,216,749,453	\$ 8,687,187,621	\$ 11,903,937,074
b. Chapter 204, P.L. 1989	592,911	4,880,927	5,473,838	607,335	5,130,764	5,738,099
c. Chapter 247, P.L. 1993	0	125,489,565	125,489,565	0	126,826,727	126,826,727
d. Chapter 428, P.L. 1999 <sup>3</sup>	153,459,956	809,583,664	963,043,620	147,387,914	788,958,193	936,346,107
e. Chapter 109, P.L. 1979	0	690,845,279	690,845,279	0	674,624,145	674,624,145
f. Chapter 511, P.L. 1991	0	372,528,455	372,528,455	0	365,525,327	365,525,327
g. Total	\$ 3,514,530,603	\$ 11,130,254,150	\$ 14,644,784,753	\$ 3,364,744,702	\$ 10,648,252,777	\$ 14,012,997,479
<b>4. Adjustment to Unfunded Actuarial Liability for Phase-In of State-Paid Local Obligations</b>						
a. Chapter 247, P.L. 1993	\$ 118,826,114	\$ (118,826,114)	\$ 0	\$ 117,498,362	\$ (117,498,362)	\$ 0
b. Chapter 428, P.L. 1999 <sup>3</sup>	623,084,263	(623,084,263)	0	611,373,565	(611,373,565)	0
c. Chapter 109, P.L. 1979	690,845,279	(690,845,279)	0	674,624,145	(674,624,145)	0
d. Chapter 511, P.L. 1991	372,528,455	(372,528,455)	0	365,525,327	(365,525,327)	0
e. Total	\$ 1,805,284,111	\$ (1,805,284,111)	\$ 0	\$ 1,769,021,399	\$ (1,769,021,399)	\$ 0
<b>5. Net Unfunded Actuarial Liability [3 + 4]</b>	<b>\$ 5,319,814,714</b>	<b>\$ 9,324,970,039</b>	<b>\$ 14,644,784,753</b>	<b>\$ 5,133,766,101</b>	<b>\$ 8,879,231,378</b>	<b>\$ 14,012,997,479</b>

<sup>1</sup> Excludes UAL amounts due to Local Employer ERI programs and Chapter 19, P.L. 2009 Local Employer deferrals because receivables for these amounts are included in the AVA.

<sup>2</sup> AVA without Special Asset Value used to calculate the Statutory Contributions.

<sup>3</sup> Includes UAL amounts for Chapter 86, P.L. 2001 and Chapter 318, P.L. 2001. Based on established methodology, the Chapter 428, P.L. 1999 UAL is assumed to be a level percentage of the total UAL excluding amounts attributable to Chapter 86, P.L. 2001, Chapter 318, P.L. 2001, Chapter 109, P.L. 1979 and Chapter 511, P.L. 1991 as well as amounts attributable to the phase-in of State-paid Local obligations associated with Chapter 247, P.L. 1993 and Chapter 428, P.L. 1999. The percentage is 4% for State and 2% for Local.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
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**SECTION V – CONTRIBUTIONS**

Table V-3 Development of Unfunded Actuarial Liability Contribution							
	July 1, 2020 Valuation			July 1, 2019 Valuation			
	Fiscal Year Ending 2022 Payment			Fiscal Year Ending 2021 Payment			
	State	Local Employers <sup>1</sup>	Total	State	Local Employers <sup>1</sup>	Total	
<b>1. Amortization of UAL</b>							
a. Basic	\$ 265,553,587	\$ 721,233,170	\$ 986,786,757	\$ 251,432,809	\$ 679,022,105	\$ 930,454,914	
b. Chapter 204, P.L. 1989	70,686	581,900	652,586	68,881	581,902	650,783	
c. Chapter 247, P.L. 1993	0	9,916,508	9,916,508	0	9,913,237	9,913,237	
d. Chapter 428, P.L. 1999 <sup>2</sup>	12,126,800	63,975,382	76,102,182	11,520,374	61,667,836	73,188,210	
e. Chapter 109, P.L. 1979	0	54,592,369	54,592,369	0	52,731,071	52,731,071	
f. Chapter 511, P.L. 1991	0	29,438,156	29,438,156	0	28,570,786	28,570,786	
g. Total	<u>\$ 277,751,073</u>	<u>\$ 879,737,485</u>	<u>\$ 1,157,488,558</u>	<u>\$ 263,022,064</u>	<u>\$ 832,486,937</u>	<u>\$ 1,095,509,001</u>	
<b>2. Adjustment to UAL Contribution for State-Paid Local Obligations</b>							
a. Chapter 247, P.L. 1993	\$ 9,916,508	\$ (9,916,508)	\$ 0	\$ 9,913,237	\$ (9,913,237)	\$ 0	
b. Chapter 428, P.L. 1999 <sup>2</sup>	63,975,382	(63,975,382)	0	61,667,836	(61,667,836)	0	
c. Chapter 109, P.L. 1979	54,592,369	(54,592,369)	0	52,731,071	(52,731,071)	0	
d. Chapter 511, P.L. 1991	29,438,156	(29,438,156)	0	28,570,786	(28,570,786)	0	
e. Total	<u>\$ 157,922,415</u>	<u>\$ (157,922,415)</u>	<u>\$ 0</u>	<u>\$ 152,882,930</u>	<u>\$ (152,882,930)</u>	<u>\$ 0</u>	
<b>3. UAL Contribution as of Valuation Date [1 + 2]</b>	\$ 435,673,488	\$ 721,815,070	\$ 1,157,488,558	\$ 415,904,994	\$ 679,604,007	\$ 1,095,509,001	
<b>4. Interest to Beginning of Fiscal Year</b>	\$ 31,804,164	\$ 52,692,500	\$ 84,496,664	\$ 30,361,064	\$ 49,611,093	\$ 79,972,157	
<b>5. UAL Contribution as of Beginning of Fiscal Year [3 + 4]</b>	<b>\$ 467,477,652</b>	<b>\$ 774,507,570</b>	<b>\$ 1,241,985,222</b>	<b>\$ 446,266,058</b>	<b>\$ 729,215,100</b>	<b>\$ 1,175,481,158</b>	

<sup>1</sup> Excludes UAL amounts due to Local Employer ERI programs and Chapter 19, P.L. 2009 Local Employer deferrals because receivables for these amounts are included in the AVA.

<sup>2</sup> Includes UAL amounts for Chapter 86, P.L. 2001 and Chapter 318, P.L. 2001.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
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**SECTION V – CONTRIBUTIONS**

Table V-4 Development of Normal Cost							
	July 1, 2020 Valuation			July 1, 2019 Valuation			
	Fiscal Year Ending 2022 Payment			Fiscal Year Ending 2021 Payment			
	State	Local Employers	Total	State	Local Employers	Total	
<b>1. Gross Normal Cost, excluding NCGI Premium</b>							
a. Basic	\$ 96,607,376	\$ 656,939,940	\$ 753,547,316	\$ 91,993,313	\$ 649,945,075	\$ 741,938,388	
b. Chapter 247, P.L. 1993	0	54,740	54,740	0	80,932	80,932	
c. Chapter 428, P.L. 1999	1,426,634	8,786,815	10,213,449	1,522,304	8,812,509	10,334,813	
d. Chapter 109, P.L. 1979 <sup>1</sup>	5,625,322	38,559,125	44,184,447	5,357,280	37,960,469	43,317,749	
e. Chapter 511, P.L. 1991	1,960,310	13,716,308	15,676,618	1,872,488	13,631,970	15,504,458	
f. Total	<u>\$ 105,619,642</u>	<u>\$ 718,056,928</u>	<u>\$ 823,676,570</u>	<u>\$ 100,745,385</u>	<u>\$ 710,430,955</u>	<u>\$ 811,176,340</u>	
<b>2. Expected Member Contributions</b>	\$ (48,573,583)	\$ (328,293,672)	\$ (376,867,255)	\$ (46,230,283)	\$ (322,738,464)	\$ (368,968,747)	
<b>3. Employer Normal Cost [1 + 2]</b>	\$ 57,046,059	\$ 389,763,256	\$ 446,809,315	\$ 54,515,102	\$ 387,692,491	\$ 442,207,593	
<b>4. Portion of Local Normal Cost Payable by State</b>							
a. Chapter 247, P.L. 1993	\$ 54,740	\$ (54,740)	\$ 0	\$ 80,932	\$ (80,932)	\$ 0	
b. Chapter 428, P.L. 1999	8,786,815	(8,786,815)	0	8,812,509	(8,812,509)	0	
c. Chapter 109, P.L. 1979	38,559,125	(38,559,125)	0	37,960,469	(37,960,469)	0	
d. Chapter 511, P.L. 1991	13,716,308	(13,716,308)	0	13,631,970	(13,631,970)	0	
e. Total	<u>\$ 61,116,988</u>	<u>\$ (61,116,988)</u>	<u>\$ 0</u>	<u>\$ 60,485,880</u>	<u>\$ (60,485,880)</u>	<u>\$ 0</u>	
<b>5. Normal Cost Contribution as of Valuation Date [3 + 4]</b>	\$ 118,163,047	\$ 328,646,268	\$ 446,809,315	\$ 115,000,982	\$ 327,206,611	\$ 442,207,593	
<b>6. Interest to Beginning of Fiscal Year</b>	\$ 8,625,904	\$ 23,991,178	\$ 32,617,082	\$ 8,395,074	\$ 23,886,083	\$ 32,281,157	
<b>7. Normal Cost Contribution as of Beginning of Fiscal Year [5 + 6]</b>	\$ 126,788,951	\$ 352,637,446	\$ 479,426,397	\$ 123,396,056	\$ 351,092,694	\$ 474,488,750	
<b>8. Non-Contributory Group Insurance Premium of Beginning of Fiscal Year (one-year term cost)</b>	N/A	\$ 38,420,336	\$ 38,420,336	N/A	\$ 36,964,099	\$ 36,964,099	

<sup>1</sup> Per statute, 1.1% of appropriation payroll



**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
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**SECTION V – CONTRIBUTIONS**

**Table V-5  
Development of Statutory Pension Contributions**

As of Beginning of Fiscal Year	July 1, 2020 Valuation			July 1, 2019 Valuation		
	Fiscal Year Ending 2022 Payment			Fiscal Year Ending 2021 Payment		
	State	Local Employers	Total	State	Local Employers	Total
<b>1. Normal Cost Contribution<sup>1</sup></b>						
a. Basic	\$ 51,540,260	\$ 352,637,446	\$ 404,177,706	\$ 49,103,731	\$ 351,092,694	\$ 400,196,425
b. Chapter 247, P.L. 1993	58,736	0	58,736	86,840	0	86,840
c. Chapter 428, P.L. 1999	10,959,032	0	10,959,032	11,089,256	0	11,089,256
d. Chapter 109, P.L. 1979	47,409,912	0	47,409,912	46,479,944	0	46,479,944
e. Chapter 511, P.L. 1991	16,821,011	0	16,821,011	16,636,285	0	16,636,285
f. Total	\$ 126,788,951	\$ 352,637,446	\$ 479,426,397	\$ 123,396,056	\$ 351,092,694	\$ 474,488,750
<b>2. UAL Contribution<sup>1,2</sup></b>						
a. Basic	\$ 284,938,999	\$ 773,883,191	\$ 1,058,822,190	\$ 269,787,404	\$ 728,590,719	\$ 998,378,123
b. Chapter 204, P.L. 1989	75,846	624,379	700,225	73,910	624,381	698,291
c. Chapter 247, P.L. 1993	10,640,413	0	10,640,413	10,636,903	0	10,636,903
d. Chapter 428, P.L. 1999	81,657,641	0	81,657,641	78,530,949	0	78,530,949
e. Chapter 109, P.L. 1979	58,577,612	0	58,577,612	56,580,439	0	56,580,439
f. Chapter 511, P.L. 1991	31,587,141	0	31,587,141	30,656,453	0	30,656,453
g. Total	\$ 467,477,652	\$ 774,507,570	\$ 1,241,985,222	\$ 446,266,058	\$ 729,215,100	\$ 1,175,481,158
<b>3. Total Statutory Pension Contribution: [1 + 2]</b>	\$ 594,266,603	\$ 1,127,145,016	\$ 1,721,411,619	\$ 569,662,114	\$ 1,080,307,794	\$ 1,649,969,908
<b>4. Lottery Enterprise Contribution Offset</b>	\$ (13,150,454)	\$ 0	\$ (13,150,454)	\$ (13,012,258)	\$ 0	\$ (13,012,258)
<b>5. Net Pension Contribution: [3 + 4]</b>	\$ 581,116,149	\$ 1,127,145,016	\$ 1,708,261,165	\$ 556,649,856	\$ 1,080,307,794	\$ 1,636,957,650
<b>6. Non-Contributory Group Insurance Premium</b>	N/A	\$ 38,420,336	\$ 38,420,336	N/A	\$ 36,964,099	\$ 36,964,099

<sup>1</sup> State amounts for Chapter 247, P.L. 1993, Chapter 428, P.L. 1999, Chapter 109, P.L. 1979 and Chapter 511, P.L. 1991 include contributions toward State-paid Local obligations, both amounts attributable to the current fiscal year and amounts that were not contributed in prior years due to the phase-in of contributions. The total State-paid Local obligations are \$235,029,281 and \$228,944,734 for the July 1, 2020 and July 1, 2019 valuations, respectively.

<sup>2</sup> Excludes UAL amounts due to Local Employer ERI programs and Chapter 19, P.L. 2009 Local Employer deferrals because receivables for these amounts are included in the AVA. Refer to Appendices E and F for additional information regarding these payments.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
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**SECTION V – CONTRIBUTIONS**

Table V-6 shows the State and Local employers' contributions as a percentage of appropriation payroll for FYE 2022 compared to FYE 2021. These rates are appropriate for evaluating the total cost of the System as well as the changes from the prior year. For a breakdown of contribution rates by chapter law for administration purposes, refer to Table V-7.

<b>Table V-6 Pension Contributions as a Percent of Appropriation Payroll<sup>1</sup></b>						
<b>As of Beginning of Fiscal Year</b>	<b>July 1, 2020 Valuation Fiscal Year Ending 2022 Payment</b>			<b>July 1, 2019 Valuation Fiscal Year Ending 2021 Payment</b>		
	<b>State</b>	<b>Local Employers</b>	<b>Total</b>	<b>State</b>	<b>Local Employers</b>	<b>Total</b>
<b><u>Prior to Statutory State-Paid Local Adjustments and Prior to Lottery Enterprise Contribution Offset</u></b>						
Normal Cost Contribution Rate	11.969%	11.931%	11.936%	12.011%	12.054%	12.049%
UAL Contribution Rate <sup>2</sup>	<u>58.277%</u>	<u>26.929%</u>	<u>30.920%</u>	<u>57.948%</u>	<u>25.884%</u>	<u>29.850%</u>
Total Pension Contribution Rate	70.246%	38.860%	42.856%	69.959%	37.938%	41.899%
Non-Contributory Group Insurance Premium Rate	N/A	1.096%	N/A	N/A	1.071%	N/A
<b><u>After Statutory State-Paid Local Adjustments and Prior to Lottery Enterprise Contribution Offset</u></b>						
Normal Cost Contribution Rate	24.793%	10.060%	11.936%	25.337%	10.174%	12.049%
UAL Contribution Rate <sup>2</sup>	<u>91.413%</u>	<u>22.095%</u>	<u>30.920%</u>	<u>91.631%</u>	<u>21.131%</u>	<u>29.850%</u>
Total Statutory Pension Contribution Rate	116.206%	32.155%	42.856%	116.968%	31.305%	41.899%
Non-Contributory Group Insurance Premium Rate	N/A	1.096%	N/A	N/A	1.071%	N/A

<sup>1</sup> Excludes UAL amounts due to Local Employer ERI programs and Chapter 19, P.L. 2009 Local Employer deferrals because receivables for these amounts are included in the AVA.

<sup>2</sup> In order to demonstrate the total costs of the System, these rates include the contributions associated with Chapter 204, P.L. 1989. However, the Chapter 204, P.L. 1989 contributions are payable by individual employers as specified in Table V-8.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
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**SECTION V – CONTRIBUTIONS**

Table V-7 shows the State and Local employers' contributions as a percentage of appropriation payroll for FYE 2022 compared to FYE 2021. These contribution rates by chapter law are intended for administration purposes and may not be appropriate for other uses.

Table V-7 Statutory Pension Contributions as a Percent of Appropriation Payroll				
	July 1, 2020 Valuation		July 1, 2019 Valuation	
	Fiscal Year Ending 2022 Payment		Fiscal Year Ending 2021 Payment	
	State	Local Employers	State	Local Employers
<b>1. Normal Cost Contribution Rate<sup>1</sup></b>				
Basic Allowances	10.078%	10.057%	10.082%	10.171%
Chapter 247, P.L. 1993				
PERS Local normal rate for individuals without past service	N/A	15.768%	N/A	15.448%
PERS Local normal rate for individuals with past service	N/A	2.182%	N/A	2.226%
Portion of Municipalities & Local Groups costs payable by the State	0.011%	N/A	0.018%	N/A
Chapter 428, P.L. 1999	2.143%	N/A	2.277%	N/A
Chapter 109, P.L. 1979	9.271%	N/A	9.544%	N/A
Chapter 511, P.L. 1991	3.289%	N/A	3.416%	N/A
<b>2. UAL Contribution Rate<sup>1,2</sup></b>				
Basic Allowances	55.718%	22.093%	55.395%	21.135%
Chapter 204, P.L. 1989 <sup>3</sup>	-	-	-	-
Chapter 247, P.L. 1993	2.081%	N/A	2.184%	N/A
Chapter 428, P.L. 1999 <sup>4</sup>	15.968%	N/A	16.125%	N/A
Chapter 109, P.L. 1979	11.455%	N/A	11.618%	N/A
Chapter 511, P.L. 1991	6.177%	N/A	6.295%	N/A
<b>3. Non-Contributory Group Insurance Premium Rate</b>				
	N/A	1.096%	N/A	1.071%

<sup>1</sup> State rates for Chapter 247, P.L. 1993, Chapter 428, P.L. 1999, Chapter 109, P.L. 1979 and Chapter 511, P.L. 1991 include contributions toward State-paid Local obligations, both amounts attributable to the current fiscal year and amounts that were not contributed in prior years due to the phase-in of contributions.

<sup>2</sup> Excludes UAL contributions due to Local Employer ERI programs and Chapter 19, P.L. 2009 Local Employer deferrals because receivables for these amounts are included in the AVA.

<sup>3</sup> Refer to Table V-8 for employer-specific costs under Chapter 204.

<sup>4</sup> Includes UAL contribution rates for Chapter 86, P.L. 2001 and Chapter 318, P.L. 2001.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
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**SECTION V – CONTRIBUTIONS**

Table V-8 determines the recommended FYE 2022 payment under Chapter 204, P.L. 1989 for applicable locations. Chapter 204 allowed employees who were previously excluded on the basis of their titles from PFRS membership to enter the System. Employers of such employees are required to make additional contributions to fund these benefits.

Table V-8 Chapter 204, P.L. 1989 Payment Schedule					
Location Number	Location Name	July 1, 2020 Valuation Fiscal Year Ending 2022		July 1, 2019 Valuation Fiscal Year Ending 2021	
		Payment as of Beginning of Fiscal Year	Years Remaining	Payment as of Beginning of Fiscal Year	Years Remaining
<b>State Locations</b>					
00053	Juvenile Justice Comm/Community Prog.	\$ 2,179	12	\$ 2,125	13
00323	Dept. Div. Of Human Resources	70,005	12	68,216	13
00498	Rutgers Biomedical	3,662	12	3,569	13
	<b>Total</b>	<b>\$ 75,846</b>		<b>\$ 73,910</b>	
<b>Municipalities and Local Groups</b>					
21202	Camden City	\$ 90,895	12	\$ 90,895	13
39300	Belmar Borough	12,159	12	12,159	13
46800	Roxbury Township	23,010	12	23,010	13
49700	West Windsor Township	34,131	12	34,132	13
57700	Sea Isle City	6,175	12	6,175	13
62400	NJ Institute of Technology	98,470	12	98,471	13
62500	Brookdale Community College	107,002	12	107,002	13
62700	Essex County College	32,157	12	32,157	13
75000	Lakewood Twp Fire District #1	17,077	12	17,077	13
75700	Middlesex County College	118,938	12	118,939	13
76200	Lower Camden Co Reg HS Dist #1	2,568	12	2,568	13
77500	Hopewell Twp Fire District #1	10,583	12	10,583	13
78600	South Jersey Transit Authority	51,941	12	51,941	13
78700	Washington Twp Bd of Fire Comm	18,169	12	18,168	13
79600	Upper Freehold Township	1,104	12	1,104	13
	<b>Total</b>	<b>\$ 624,379</b>		<b>\$ 624,381</b>	

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
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**SECTION V – CONTRIBUTIONS**

Table V-9 determines the FYE 2022 pension contribution for certain State colleges.

Table V-9 Fiscal Year Ending 2022 Pension Contributions for State College Locations							
Location	Location Name	Number of Members	2020 Appropriation Payroll	Normal Cost Contribution	UAL Contribution	Lottery Enterprise Offset <sup>1</sup>	Net FYE 2022 Pension Contribution
00410	Rowan University	31	\$ 2,235,887	\$ 554,340	\$ 2,043,551	\$ (957,252)	\$ 1,640,639
00412	Kean University	12	864,247	214,272	789,903	(370,011)	634,164
00413	William Paterson University of NJ	26	1,834,394	454,799	1,676,596	(785,360)	1,346,035
00414	Montclair State University	34	2,873,841	712,508	2,626,627	(1,230,379)	2,108,756
00415	The College of New Jersey	12	863,544	214,097	789,260	(369,710)	633,647
00421	Stockton University	22	1,379,011	341,896	1,260,386	(590,397)	1,011,885
00498	Rutgers University	129	10,020,359	2,484,334	9,162,049	(4,290,022)	7,356,361
62400	NJ Institute of Technology	27	2,225,452	551,753	2,132,484	(952,784)	1,731,453
<b>Total</b>		<b>293</b>	<b>\$ 22,296,735</b>	<b>\$ 5,527,999</b>	<b>\$ 20,480,856</b>	<b>\$ (9,545,915)</b>	<b>\$ 16,462,940</b>

<sup>1</sup> 72.59% of the total Lottery Enterprise contribution offset for FYE 2022 is allocated to each State college location based on the location's 2020 appropriation payroll. The percentage allocation to State colleges was determined using 2020 contributing active, non-contributing active and retiree headcounts for locations deemed to be eligible for funding under the Lottery Enterprise.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
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**APPENDIX A – MEMBERSHIP INFORMATION**

The data for this valuation was provided by the New Jersey Division of Pensions and Benefits as of July 1, 2020. 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. The following is a list of data tables contained in this section:

- A-1 to A-3: Contributing Active Member Data by Tier
- A-4 to A-6: Non-Contributing Active Member Data by Tier
- A-7: Inactive Member Data by Status
- A-8: Reconciliation of Plan Membership
- A-9 to A-12: Contributing Active Member Data by Age and Service
- A-13 to A-16: Inactive Member Data by Age and Status
- A-17: Active Member Data by Gender
- A-18: Inactive Member Data by Gender
- A-19: Active Member Data by Employer Group
- A-20: Inactive Member Data by Employer Group

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
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**APPENDIX A – MEMBERSHIP INFORMATION**

<b>Table A-1 Contributing Active Member Data by Tier State</b>			
	<b>July 1, 2020</b>	<b>July 1, 2019</b>	<b>% Change</b>
<b><u>Tier 1</u></b>			
Count	3,895	4,143	-6.0%
Average Age	45.7	45.1	1.5%
Average Service	18.5	17.8	4.1%
Total Annual Salary	\$ 348,205,980	\$ 351,194,541	-0.9%
Average Salary	\$ 89,398	\$ 84,768	5.5%
<b><u>Tier 2</u></b>			
Count	219	229	-4.4%
Average Age	36.7	35.8	2.6%
Average Service	9.6	8.6	11.6%
Total Annual Salary	\$ 16,592,413	\$ 15,063,572	10.1%
Average Salary	\$ 75,764	\$ 65,780	15.2%
<b><u>Tier 3</u></b>			
Count	2,574	2,503	2.8%
Average Age	31.3	30.5	2.6%
Average Service	4.4	3.7	19.5%
Total Annual Salary	\$ 146,594,486	\$ 120,767,349	21.4%
Average Salary	\$ 56,952	\$ 48,249	18.0%
<b><u>Total</u></b>			
Count	6,688	6,875	-2.7%
Average Age	39.9	39.4	1.1%
Average Service	12.8	12.3	3.6%
Total Annual Salary	\$ 511,392,879	\$ 487,025,462	5.0%
Average Salary	\$ 76,464	\$ 70,840	7.9%

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
JULY 1, 2020 ACTUARIAL VALUATION**

**APPENDIX A – MEMBERSHIP INFORMATION**

<b>Table A-2 Contributing Active Member Data by Tier Local Employers</b>			
	<b>July 1, 2020</b>	<b>July 1, 2019</b>	<b>% Change</b>
<b><u>Tier 1</u></b>			
Count	20,450	22,064	-7.3%
Average Age	45.3	44.9	1.0%
Average Service	19.2	18.7	2.6%
Total Annual Salary	\$ 2,517,395,628	\$ 2,630,694,324	-4.3%
Average Salary	\$ 123,100	\$ 119,230	3.2%
<b><u>Tier 2</u></b>			
Count	498	504	-1.2%
Average Age	36.0	35.1	2.8%
Average Service	9.8	8.8	11.5%
Total Annual Salary	\$ 50,090,552	\$ 46,964,478	6.7%
Average Salary	\$ 100,583	\$ 93,183	7.9%
<b><u>Tier 3</u></b>			
Count	13,202	11,596	13.8%
Average Age	31.4	30.9	1.7%
Average Service	4.7	4.1	12.6%
Total Annual Salary	\$ 937,888,850	\$ 773,292,945	21.3%
Average Salary	\$ 71,041	\$ 66,686	6.5%
<b><u>Total</u></b>			
Count	34,150	34,164	0.0%
Average Age	39.8	40.0	-0.4%
Average Service	13.5	13.6	-1.3%
Total Annual Salary	\$ 3,505,375,030	\$ 3,450,951,747	1.6%
Average Salary	\$ 102,646	\$ 101,011	1.6%



**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
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<b>Table A-3</b>			
<b>Contributing Active Member Data by Tier</b>			
<b>Total</b>			
	<b>July 1, 2020</b>	<b>July 1, 2019</b>	<b>% Change</b>
<b><u>Tier 1</u></b>			
Count	24,345	26,207	-7.1%
Average Age	45.4	44.9	1.1%
Average Service	19.1	18.6	2.8%
Total Annual Salary	\$ 2,865,601,608	\$ 2,981,888,865	-3.9%
Average Salary	\$ 117,708	\$ 113,782	3.5%
<b><u>Tier 2</u></b>			
Count	717	733	-2.2%
Average Age	36.2	35.3	2.7%
Average Service	9.7	8.7	11.5%
Total Annual Salary	\$ 66,682,965	\$ 62,028,050	7.5%
Average Salary	\$ 93,003	\$ 84,622	9.9%
<b><u>Tier 3</u></b>			
Count	15,776	14,099	11.9%
Average Age	31.4	30.8	1.8%
Average Service	4.6	4.1	13.8%
Total Annual Salary	\$ 1,084,483,336	\$ 894,060,294	21.3%
Average Salary	\$ 68,743	\$ 63,413	8.4%
<b><u>Total</u></b>			
Count	40,838	41,039	-0.5%
Average Age	39.8	39.9	-0.2%
Average Service	13.4	13.4	-0.5%
Total Annual Salary	\$ 4,016,767,909	\$ 3,937,977,209	2.0%
Average Salary	\$ 98,359	\$ 95,957	2.5%

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<b>Table A-4</b>				
<b>Non-Contributing Active Member Data by Tier State</b>				
	<b>July 1, 2020</b>	<b>July 1, 2019</b>	<b>% Change</b>	
<b><u>Tier 1</u></b>				
Count	219	210	4.3%	
Average Age	49.4	49.2	0.4%	
Average Service	14.4	13.9	3.2%	
Total Last Reported Pay	\$ 16,439,701	\$ 15,035,446	9.3%	
Average Last Reported Pay	\$ 75,067	\$ 71,597	4.8%	
<b><u>Tier 2</u></b>				
Count	9	7	28.6%	
Average Age	38.7	32.9	17.6%	
Average Service	8.0	7.0	13.2%	
Total Last Reported Pay	\$ 634,641	\$ 449,914	41.1%	
Average Last Reported Pay	\$ 70,516	\$ 64,273	9.7%	
<b><u>Tier 3</u></b>				
Count	198	147	34.7%	
Average Age	30.4	30.4	0.2%	
Average Service	2.7	2.5	7.9%	
Total Last Reported Pay	\$ 9,422,564	\$ 6,493,837	45.1%	
Average Last Reported Pay	\$ 47,589	\$ 44,176	7.7%	
<b><u>Total</u></b>				
Count	426	364	17.0%	
Average Age	40.3	41.3	-2.3%	
Average Service	8.8	9.2	-3.9%	
Total Last Reported Pay	\$ 26,496,906	\$ 21,979,197	20.6%	
Average Last Reported Pay	\$ 62,199	\$ 60,382	3.0%	

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<b>Table A-5</b>				
<b>Non-Contributing Active Member Data by Tier</b>				
<b>Local Employers</b>				
	<b>July 1, 2020</b>	<b>July 1, 2019</b>	<b>% Change</b>	
<b><u>Tier 1</u></b>				
Count	733	717	2.2%	
Average Age	48.9	48.0	1.8%	
Average Service	14.9	14.4	3.1%	
Total Last Reported Pay	\$ 66,041,513	\$ 62,830,908	5.1%	
Average Last Reported Pay	\$ 90,098	\$ 87,630	2.8%	
<b><u>Tier 2</u></b>				
Count	14	12	16.7%	
Average Age	36.6	34.8	5.2%	
Average Service	8.3	7.7	7.4%	
Total Last Reported Pay	\$ 1,264,585	\$ 1,065,134	18.7%	
Average Last Reported Pay	\$ 90,328	\$ 88,761	1.8%	
<b><u>Tier 3</u></b>				
Count	421	388	8.5%	
Average Age	30.6	30.2	1.1%	
Average Service	2.8	2.7	2.5%	
Total Last Reported Pay	\$ 22,856,077	\$ 20,476,685	11.6%	
Average Last Reported Pay	\$ 54,290	\$ 52,775	2.9%	
<b><u>Total</u></b>				
Count	1,168	1,117	4.6%	
Average Age	42.1	41.7	1.0%	
Average Service	10.4	10.3	1.5%	
Total Last Reported Pay	\$ 90,162,175	\$ 84,372,727	6.9%	
Average Last Reported Pay	\$ 77,194	\$ 75,535	2.2%	

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<b>Table A-6</b>				
<b>Non-Contributing Active Member Data by Tier</b>				
<b>Total</b>				
	<b>July 1, 2020</b>	<b>July 1, 2019</b>	<b>% Change</b>	
<b><u>Tier 1</u></b>				
Count	952	927	2.7%	
Average Age	49.0	48.3	1.5%	
Average Service	14.8	14.3	3.1%	
Total Last Reported Pay	\$ 82,481,214	\$ 77,866,354	5.9%	
Average Last Reported Pay	\$ 86,640	\$ 83,998	3.1%	
<b><u>Tier 2</u></b>				
Count	23	19	21.1%	
Average Age	37.4	34.1	9.8%	
Average Service	8.2	7.5	9.3%	
Total Last Reported Pay	\$ 1,899,226	\$ 1,515,048	25.4%	
Average Last Reported Pay	\$ 82,575	\$ 79,739	3.6%	
<b><u>Tier 3</u></b>				
Count	619	535	15.7%	
Average Age	30.5	30.3	0.8%	
Average Service	2.8	2.7	3.8%	
Total Last Reported Pay	\$ 32,278,641	\$ 26,970,522	19.7%	
Average Last Reported Pay	\$ 52,146	\$ 50,412	3.4%	
<b><u>Total</u></b>				
Count	1,594	1,481	7.6%	
Average Age	41.7	41.6	0.1%	
Average Service	10.0	10.0	-0.1%	
Total Last Reported Pay	\$ 116,659,081	\$ 106,351,924	9.7%	
Average Last Reported Pay	\$ 73,186	\$ 71,811	1.9%	

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<b>Table A-7 Inactive Member Data by Status</b>						
	<b>July 1, 2020</b>			<b>July 1, 2019</b>		
	<b>State</b>	<b>Local Employers</b>	<b>Total</b>	<b>State</b>	<b>Local Employers</b>	<b>Total</b>
<b>Retirees</b>						
Count	4,935	27,920	32,855	4,827	27,150	31,977
Annual Retirement Allowances	\$ 263,843,364	\$ 1,924,749,589	\$ 2,188,592,953	\$ 255,828,311	\$ 1,832,903,564	\$ 2,088,731,875
Average Retirement Allowance	\$ 53,464	\$ 68,938	\$ 66,614	\$ 52,999	\$ 67,510	\$ 65,320
<b>Beneficiaries</b>						
Count	895	6,786	7,681	871	6,676	7,547
Annual Retirement Allowances	\$ 29,293,276	\$ 233,299,024	\$ 262,592,300	\$ 28,019,651	\$ 224,601,091	\$ 252,620,742
Average Retirement Allowance	\$ 32,730	\$ 34,379	\$ 34,187	\$ 32,170	\$ 33,643	\$ 33,473
<b>Ordinary Disability</b>						
Count	732	2,233	2,965	737	2,249	2,986
Annual Retirement Allowances	\$ 20,398,243	\$ 68,770,538	\$ 89,168,781	\$ 20,460,920	\$ 68,527,402	\$ 88,988,322
Average Retirement Allowance	\$ 27,866	\$ 30,797	\$ 30,074	\$ 27,762	\$ 30,470	\$ 29,802
<b>Accidental Disability</b>						
Count	375	2,695	3,070	368	2,659	3,027
Annual Retirement Allowances	\$ 17,270,859	\$ 147,953,501	\$ 165,224,360	\$ 16,838,336	\$ 143,626,501	\$ 160,464,837
Average Retirement Allowance	\$ 46,056	\$ 54,899	\$ 53,819	\$ 45,756	\$ 54,015	\$ 53,011
<b>In-Pay Total</b>						
Count	<b>6,937</b>	<b>39,634</b>	<b>46,571</b>	<b>6,803</b>	<b>38,734</b>	<b>45,537</b>
Annual Retirement Allowances	<b>\$ 330,805,742</b>	<b>\$ 2,374,772,652</b>	<b>\$ 2,705,578,394</b>	<b>\$ 321,147,218</b>	<b>\$ 2,269,658,558</b>	<b>\$ 2,590,805,776</b>
Average Retirement Allowance	<b>\$ 47,687</b>	<b>\$ 59,918</b>	<b>\$ 58,096</b>	<b>\$ 47,207</b>	<b>\$ 58,596</b>	<b>\$ 56,895</b>
<b>Deferred Vested Members</b>						
Count	13	54	67	13	52	65
Annual Retirement Allowances	\$ 232,668	\$ 1,293,228	\$ 1,525,896	\$ 273,984	\$ 1,240,212	\$ 1,514,196
Average Retirement Allowance	\$ 17,898	\$ 23,949	\$ 22,775	\$ 21,076	\$ 23,850	\$ 23,295

QDRO benefits included with member records for valuation purposes.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
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<b>Table A-8 Reconciliation of Plan Membership from July 1, 2019 to July 1, 2020</b>							
	<b>Contributing Actives</b>	<b>Non-Contrib. Actives</b>	<b>Deferred Vested</b>	<b>Retired</b>	<b>Disabled</b>	<b>Beneficiaries</b>	<b>Total</b>
1. July 1, 2019	41,039	1,481	65	31,977	6,013	7,547	88,122
2. Additions							
a. New Entrants	2,004	54					2,058
b. New Beneficiaries						109	109
c. Data Corrections			1	2	1		4
d. Total	<u>2,004</u>	<u>54</u>	<u>1</u>	<u>2</u>	<u>1</u>	<u>109</u>	<u>2,171</u>
3. Reductions							
a. Withdrawal/Certain Period End	(120)	(214)	(1)			(39)	(374)
b. Died without Beneficiary	(10)	(3)		(387)	(73)	(376)	(849)
c. Data Corrections							0
d. Total	<u>(130)</u>	<u>(217)</u>	<u>(1)</u>	<u>(387)</u>	<u>(73)</u>	<u>(415)</u>	<u>(1,223)</u>
4. Changes in Status							
a. Contributing Actives	230	(230)					0
b. Non-Contributing Actives	(592)	592					0
c. Deferred Vested	(1)	(5)	6				0
e. Retired	(1,607)	(26)	(4)	1,637			0
f. Disabled	(79)	(51)		(16)	146		0
g. Died with Beneficiary	(26)	(4)		(358)	(52)	440	0
h. Total	<u>(2,075)</u>	<u>276</u>	<u>2</u>	<u>1,263</u>	<u>94</u>	<u>440</u>	<u>0</u>
5. July 1, 2020	<b>40,838</b>	<b>1,594</b>	<b>67</b>	<b>32,855</b>	<b>6,035</b>	<b>7,681</b>	<b>89,070</b>

QDRO benefits included with member records for valuation purposes.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
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**APPENDIX A – MEMBERSHIP INFORMATION**

**Table A-9  
Counts by Age and Service Distribution of Contributing Active Members  
State**

Attained Age	Years of Service								Total No.
	Under 1 No.	1 to 4 No.	5 to 9 No.	10 to 14 No.	15 to 19 No.	20 to 24 No.	25 to 29 No.	30 & up No.	
Under 30	138	772	171	1	0	0	0	0	1,082
30 to 34	64	436	541	117	4	0	0	0	1,162
35 to 39	13	152	320	472	165	11	0	0	1,133
40 to 44	0	10	116	295	516	231	0	0	1,168
45 to 49	0	0	10	132	451	565	35	0	1,193
50 to 54	0	0	0	15	228	397	63	10	713
55 & up	0	0	0	0	22	163	27	25	237
<b>Total</b>	<b>215</b>	<b>1,370</b>	<b>1,158</b>	<b>1,032</b>	<b>1,386</b>	<b>1,367</b>	<b>125</b>	<b>35</b>	<b>6,688</b>

**Table A-10  
Counts by Age and Service Distribution of Contributing Active Members  
State**

Attained Age	Years of Service								Total Comp.
	Under 1 Comp.	1 to 4 Comp.	5 to 9 Comp.	10 to 14 Comp.	15 to 19 Comp.	20 to 24 Comp.	25 to 29 Comp.	30 & up Comp.	
Under 30	\$ 42,076	\$ 50,194	\$ 63,757	\$ 69,631	\$ 0	\$ 0	\$ 0	\$ 0	\$ 51,320
30 to 34	41,993	51,969	69,707	77,360	72,388	0	0	0	62,304
35 to 39	40,345	53,598	71,188	82,699	87,209	87,707	0	0	75,763
40 to 44	0	55,088	71,472	84,027	90,458	93,992	0	0	87,344
45 to 49	0	0	77,584	84,785	88,502	94,408	98,054	0	91,076
50 to 54	0	0	0	86,559	86,961	93,298	99,016	94,179	91,647
55 & up	0	0	0	0	88,765	89,739	96,148	97,360	91,183
<b>Total</b>	<b>\$ 41,946</b>	<b>\$ 51,172</b>	<b>\$ 69,483</b>	<b>\$ 82,784</b>	<b>\$ 88,780</b>	<b>\$ 93,405</b>	<b>\$ 98,127</b>	<b>\$ 96,451</b>	<b>\$ 76,464</b>

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
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**APPENDIX A – MEMBERSHIP INFORMATION**

**Table A-11  
Average Appropriation Pay by Age and Service Distribution of Contributing Active Members  
Local Employers**

Attained Age	Years of Service								Total No.
	Under 1 No.	1 to 4 No.	5 to 9 No.	10 to 14 No.	15 to 19 No.	20 to 24 No.	25 to 29 No.	30 & up No.	
Under 30	719	3,789	1,000	11	0	0	0	0	5,519
30 to 34	208	1,854	3,041	1,125	35	0	0	0	6,263
35 to 39	31	602	1,424	2,685	1,442	36	0	0	6,220
40 to 44	0	84	472	1,264	2,654	1,090	12	0	5,576
45 to 49	0	2	51	580	1,457	2,790	663	14	5,557
50 to 54	0	1	0	95	619	1,484	1,015	246	3,460
55 & up	0	0	2	3	35	567	489	459	1,555
<b>Total</b>	<b>958</b>	<b>6,332</b>	<b>5,990</b>	<b>5,763</b>	<b>6,242</b>	<b>5,967</b>	<b>2,179</b>	<b>719</b>	<b>34,150</b>

**Table A-12  
Average Appropriation Pay by Age and Service Distribution of Contributing Active Members  
Local Employers**

Attained Age	Years of Service								Total Comp.
	Under 1 Comp.	1 to 4 Comp.	5 to 9 Comp.	10 to 14 Comp.	15 to 19 Comp.	20 to 24 Comp.	25 to 29 Comp.	30 & up Comp.	
Under 30	\$ 46,678	\$ 59,270	\$ 78,010	\$ 72,683	\$ 0	\$ 0	\$ 0	\$ 0	\$ 61,052
30 to 34	45,135	62,780	86,615	101,207	107,316	0	0	0	80,918
35 to 39	48,084	64,278	89,597	109,524	117,616	124,514	0	0	102,239
40 to 44	0	68,282	93,325	108,733	121,309	131,523	155,887	0	117,362
45 to 49	0	84,974	95,342	107,500	117,785	131,612	144,149	148,028	126,657
50 to 54	0	57,876	0	109,553	115,137	126,432	144,496	153,649	131,162
55 & up	0	0	119,494	175,816	117,422	123,829	138,998	153,782	137,391
<b>Total</b>	<b>\$ 46,389</b>	<b>\$ 60,901</b>	<b>\$ 86,501</b>	<b>\$ 107,488</b>	<b>\$ 118,921</b>	<b>\$ 129,525</b>	<b>\$ 143,219</b>	<b>\$ 153,624</b>	<b>\$ 102,646</b>



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<b>Table A-13 Counts by Age and Status of Inactive Members State</b>					
<b>Attained Age</b>	<b>Status</b>				<b>Total</b>
	Retiree	Beneficiary	Ordinary Disability	Accidental Disability	
Under 45	6	85	71	71	233
45 to 49	183	37	86	66	372
50 to 54	729	41	120	87	977
55 to 59	1,122	65	107	57	1,351
60 to 64	992	114	116	44	1,266
65 to 69	797	124	93	26	1,040
70 to 74	573	139	77	17	806
75 to 79	295	117	43	2	457
80 to 84	163	86	15	2	266
85 & up	75	87	4	3	169
<b>Total</b>	<b>4,935</b>	<b>895</b>	<b>732</b>	<b>375</b>	<b>6,937</b>

<b>Table A-14 Average Retirement Allowances by Age and Status of Inactive Members State</b>					
<b>Attained Age</b>	<b>Status</b>				<b>Total</b>
	Retiree	Beneficiary	Ordinary Disability	Accidental Disability	
Under 45	\$ 50,151	\$ 19,342	\$ 28,473	\$ 46,110	\$ 31,074
45 to 49	57,653	38,040	28,888	48,702	47,465
50 to 54	58,794	35,967	29,056	48,182	53,238
55 to 59	56,371	37,553	27,395	45,391	52,708
60 to 64	54,469	37,598	29,283	44,714	50,303
65 to 69	53,154	36,823	27,001	43,547	48,628
70 to 74	50,290	35,375	26,573	40,003	45,235
75 to 79	43,567	31,030	24,569	43,058	38,567
80 to 84	38,650	29,590	25,738	35,915	34,972
85 & up	33,565	27,376	19,431	21,977	29,839
<b>Total</b>	<b>\$ 53,464</b>	<b>\$ 32,730</b>	<b>\$ 27,866</b>	<b>\$ 46,056</b>	<b>\$ 47,687</b>

QDRO benefits included with member records for valuation purposes.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
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<b>Table A-15 Counts by Age and Status of Inactive Members Local Employers</b>					
<b>Attained Age</b>	<b>Status</b>				<b>Total</b>
	<b>Retiree</b>	<b>Beneficiary</b>	<b>Ordinary Disability</b>	<b>Accidental Disability</b>	
Under 45	29	246	236	379	890
45 to 49	975	120	315	479	1,889
50 to 54	3,820	217	400	576	5,013
55 to 59	4,924	343	363	426	6,056
60 to 64	4,626	558	271	260	5,715
65 to 69	4,212	732	238	196	5,378
70 to 74	3,985	1,002	221	184	5,392
75 to 79	2,770	1,115	115	111	4,111
80 to 84	1,559	983	48	40	2,630
85 & up	1,020	1,470	26	44	2,560
<b>Total</b>	<b>27,920</b>	<b>6,786</b>	<b>2,233</b>	<b>2,695</b>	<b>39,634</b>

<b>Table A-16 Average Retirement Allowances by Age and Status of Inactive Members Local Employers</b>					
<b>Attained Age</b>	<b>Status</b>				<b>Total</b>
	<b>Retiree</b>	<b>Beneficiary</b>	<b>Ordinary Disability</b>	<b>Accidental Disability</b>	
Under 45	\$ 62,982	\$ 25,251	\$ 35,647	\$ 64,074	\$ 45,770
45 to 49	76,730	44,894	34,855	61,940	63,974
50 to 54	79,235	45,658	34,055	61,181	72,102
55 to 59	77,319	44,271	32,981	58,101	71,437
60 to 64	74,663	42,159	32,160	53,690	68,519
65 to 69	69,700	40,167	28,360	42,862	62,873
70 to 74	62,929	37,133	22,829	35,295	55,549
75 to 79	55,565	34,484	17,873	28,364	48,059
80 to 84	50,449	30,462	17,724	25,031	41,995
85 & up	41,581	25,904	14,148	22,838	31,978
<b>Total</b>	<b>\$ 68,938</b>	<b>\$ 34,379</b>	<b>\$ 30,797</b>	<b>\$ 54,899</b>	<b>\$ 59,918</b>

QDRO benefits included with member records for valuation purposes.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
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**APPENDIX A – MEMBERSHIP INFORMATION**

**Table A-17  
Active Member Data by Gender**

	Male			Female		
	State	Local Employers	Total	State	Local Employers	Total
<b>Contributing Actives</b>						
Count	5,496	30,966	36,462	1,192	3,184	4,376
Total Annual Salary	\$ 419,835,519	\$ 3,208,730,713	\$ 3,628,566,232	\$ 91,557,360	\$ 296,644,317	\$ 388,201,677
Average Annual Salary	\$ 76,389	\$ 103,621	\$ 99,516	\$ 76,810	\$ 93,167	\$ 88,712
<b>Non-Contributing Actives</b>						
Count	320	1,009	1,329	106	159	265
Total Last Reported Pay	\$ 19,470,485	\$ 77,998,386	\$ 97,468,871	\$ 7,026,421	\$ 12,163,789	\$ 19,190,210
Average Last Reported Pay	\$ 60,845	\$ 77,303	\$ 73,340	\$ 66,287	\$ 76,502	\$ 72,416

**Table A-18  
Inactive Member Data by Gender**

	Male			Female		
	State	Local Employers	Total	State	Local Employers	Total
<b>Retirees and Beneficiaries</b>						
Count	5,131	31,176	36,307	1,806	8,458	10,264
Annual Retirement Allowances	\$ 258,761,872	\$ 2,044,370,655	\$ 2,303,132,527	\$ 72,043,870	\$ 330,401,997	\$ 402,445,867
Average Retirement Allowance	\$ 50,431	\$ 65,575	\$ 63,435	\$ 39,891	\$ 39,064	\$ 39,209
<b>Deferred Vested</b>						
Count	13	47	60	0	7	7
Annual Retirement Allowances	\$ 232,668	\$ 1,116,084	\$ 1,348,752	\$ 0	\$ 177,144	\$ 177,144
Average Retirement Allowance	\$ 17,898	\$ 23,746	\$ 22,479	\$ 0	\$ 25,306	\$ 25,306

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
JULY 1, 2020 ACTUARIAL VALUATION**

**APPENDIX A – MEMBERSHIP INFORMATION**

**Table A-19  
Active Member Data by Employer Group**

	Police Officers			Firefighters		
	State	Local Employers	Total	State	Local Employers	Total
<b>Contributing Actives</b>						
Count	6,641	27,531	34,172	47	6,619	6,666
Total Annual Salary	\$ 508,153,401	\$ 2,830,430,380	\$ 3,338,583,781	\$ 3,239,478	\$ 674,944,650	\$ 678,184,128
Average Annual Salary	\$ 76,518	\$ 102,809	\$ 97,699	\$ 68,925	\$ 101,971	\$ 101,738
<b>Non-Contributing Actives</b>						
Count	424	1,048	1,472	2	120	122
Total Annual Salary	\$ 26,390,238	\$ 81,070,790	\$ 107,461,028	\$ 106,668	\$ 9,091,385	\$ 9,198,053
Average Annual Salary	\$ 62,241	\$ 77,358	\$ 73,003	\$ 53,334	\$ 75,762	\$ 75,394

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**APPENDIX A – MEMBERSHIP INFORMATION**

Table A-20 Inactive Member Data by Employer Group						
	Police Officers			Firefighters		
	State	Local Employers	Total	State	Local Employers	Total
<b>Retirees and Beneficiaries</b>						
Count	6,630	28,737	35,367	68	6,906	6,974
Annual Retirement Allowances	\$ 321,227,002	\$ 1,816,028,114	\$ 2,137,255,116	\$ 2,729,561	\$ 451,516,575	\$ 454,246,136
Average Retirement Allowance	\$ 48,451	\$ 63,195	\$ 60,431	\$ 40,141	\$ 65,380	\$ 65,134
<b>Deferred Vested</b>						
Count	13	51	64	0	3	3
Annual Retirement Allowances	\$ 232,668	\$ 1,211,040	\$ 1,443,708	\$ 0	\$ 82,188	\$ 82,188
Average Retirement Allowance	\$ 17,898	\$ 23,746	\$ 22,558	\$ 0	\$ 27,396	\$ 27,396

Table A-20 (cont.) Inactive Member Data by Employer Group			
	Unknown		
	State	Local Employers	Total
<b>Retirees and Beneficiaries</b>			
Count	239	3,991	4,230
Annual Retirement Allowances	\$ 6,849,179	\$ 107,227,963	\$ 114,077,142
Average Retirement Allowance	\$ 28,658	\$ 26,867	\$ 26,969
<b>Deferred Vested</b>			
Count	0	0	0
Annual Retirement Allowances	\$ 0	\$ 0	\$ 0
Average Retirement Allowance	\$ 0	\$ 0	\$ 0

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
JULY 1, 2020 ACTUARIAL VALUATION**

**APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS**

**A. Actuarial Assumptions**

- 1. Investment Rate of Return** 7.30% per annum, compounded annually.
- 2. Administrative Expenses** No explicit assumption is made for administrative expenses for funding purposes per the funding methodology prescribed by N. J. Statute.
- 3. Cost-of-Living Adjustments (COLAs)** No future COLAs are assumed. Previously granted COLAs are included in the data.
- 4. Salary Increases** Salaries increase rates are as follows:

Service	Rates
0	15.25%
1	15.25
2	12.75
3	10.75
4	10.25
5	9.25
6	8.25
7	7.25
8	5.75
9	5.25
10	4.75
11	4.25
12	3.75
13+	3.25

Salary increases are assumed to occur on July 1.

- 5. 401(a)(17) Pay Limit** \$285,000 in 2020 increasing 2.75% per annum, compounded annually.
- 6. Social Security Wage Base** \$137,700 in 2020 increasing 3.25% per annum, compounded annually.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
JULY 1, 2020 ACTUARIAL VALUATION**

**APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS**

**7. Termination**

Termination rates are as follows:

Service	Rates
0	2.00%
1	2.00
2	1.90
3	1.80
4	1.70
5	1.60
6	1.50
7	1.40
8	1.00
9	0.80
10	0.80
11	0.50
12	0.45
13	0.40
14	0.35
15	0.30
16	0.25
17	0.20
18	0.15
19	0.10
20	0.00

No termination is assumed after attainment of retirement eligibility.

All terminating members are assumed to elect a refund of contributions.

**8. Disability**

Representative disability rates are as follows:

Age	Ordinary Disability	Accidental Disability
20	0.030%	0.020%
25	0.045	0.030
30	0.105	0.100
35	0.205	0.250
40	0.345	0.400
45	0.340	0.380
50	0.240	0.280
55	0.200	0.180
59+	0.500	0.160

POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
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APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

Both ordinary and accidental disability rates apply at all ages until the mandatory retirement age of 65.

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

No members 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: The Pub-2010 Safety Employee mortality table [*PubS-2010 Employee*] as published by the Society of Actuaries with a 105.6% adjustment for males and 102.5% adjustment for females, and with future improvement from the base year of 2010 on a generational basis using SOA's Scale MP-2018. 5% of the deaths are assumed to be accidental.

Healthy Retirees (Healthy Annuitants): The Pub-2010 Safety Retiree Below-Median Income Weighted mortality table [*PubS-2010(B) Healthy Retiree*] as published by the Society of Actuaries with a 96.7% adjustment for males and 96.0% adjustment for females, and with future improvement from the base year of 2010 on a generational basis using SOA's Scale MP-2018.

Beneficiaries (Contingent Annuitants): The Pub-2010 General Retiree Below-Median Income Weighted mortality table [*PubG-2010(B) 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-2018.

Disabled Mortality (Disabled Annuitants): The Pub-2010 Safety Disabled Retiree mortality table [*PubS-2010 Disabled Retiree*] as published by the Society of Actuaries with a 152.0% adjustment for males and 109.3% adjustment for females, and with future improvement from the base year of 2010 on a generational basis using SOA's Scale MP-2018.



**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
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**APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS**

**10. Retirement**

For those with less than 25 years of service:

Age	Rates
40-49	2.00%
50-57	3.00
58	3.50
59	4.25
60	5.00
61	8.00
62	10.00
63	12.00
64	14.00

For those with 25 years of service:

Age	Rates
48 or younger	45.00%
49-54	50.00
55-59	55.00
60	60.00
61	65.00
62	70.00
63	75.00
64	90.00

For those with 26 or more years of service:

Age	Rates
53 or younger	22.00%
54-59	24.00
60	26.00
61	28.00
62-63	30.00
64	40.00

Mandatory retirement at age 65.

**11. Family  
Composition  
Assumptions**

For members not currently in receipt, 90% of members are assumed married to spouses of the opposite sex. Males are assumed to be three 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 three years older than females.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
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**APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS**

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 19 are assumed to receive a benefit until age 19 while those over age 19 are assumed to receive a benefit for the remainder of their lifetime.

**12. Non-Contributory  
Group Insurance  
Benefit Form of  
Payment**

All benefits are assumed to be paid as lump sums.

**13. 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.

Inactive participants receiving benefits according to the 2019 data but omitted from the 2020 data are assumed to have died without a beneficiary.

Participants' Tiers are not included on the census data. Tier is determined based on the enrollment date on the census data.

**14. 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, 2013 – June 30, 2018 Experience Study, which was approved by the Board of Trustees on January 13, 2020.

The investment return assumption was recommended by the State Treasurer.

**15. Changes in  
Assumptions since  
Last Valuation**

None.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
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**APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS**

**B. Projection Assumptions**

- 1. Investment Rate of Return** July 1, 2021 and later valuations: 7.00% per annum, compounded annually.
  
- 2. Appropriation Percentages** The State is assumed to appropriate 100% of the Statutory contribution in FYE 2022 and each year thereafter.
  
- 3. Administrative Expenses** The actual administrative expenses paid in FYE 2020 are assumed to increase by 2.75% per annum, compounded annually.
  
- 4. New Entrants**
  - Contributing active population assumed to remain at 2020 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 2020 data.
  - New entrant salary assumed to increase with the 13+ years of service salary increase rates.
  
- 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, 2020 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, 2020 and do not reflect the impact of any changes in benefits or actuarial assumptions that may be adopted after July 1, 2020 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 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 and Local employer contributions are described below.

**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. Refunds are valued as the Aggregate Contributions as of the valuation date as provided by the Division of Pensions and Benefits. 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, 2018 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, 2028 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.

Certain portions of the normal cost and unfunded actuarial liabilities attributable to Local employers are payable by the State and/or over different periods in accordance with the NJ State Statutes.

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.

The non-contributory group life insurance benefit is funded separately through a term cost.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
JULY 1, 2020 ACTUARIAL VALUATION**

**APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS**

**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 rate of 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.

**3. Contributions**

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.

Local employers' contributions are expected to be paid on April 1<sup>st</sup>, 21 months after the associated valuation date.

Chapter 98, P.L. 2017, the Lottery Enterprise Contribution Act, allows the PFRS to receive 1.20% of the proceeds of the Lottery Enterprise, based upon their members' past or present employment in schools and institutions in the State for a term of 30 years. Revenues from Chapter 98, P.L. 2017, the Lottery Enterprise Contribution Act are assumed to be contributed to the trust on a monthly basis. The State's pension contribution is reduced by the product of the allocable percentage for the PFRS, the adjustment percentage, and the special asset value.

Contributions payable in the fiscal year starting on the valuation date are included in the actuarial value of assets as receivable contributions, discounted by the applicable valuation interest rate.

Legislation has provided for additional benefits and/or funding requirements which are included in this valuation and are described as follows.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
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**APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS**

Early Retirement Incentive Programs

The following legislation provides additional retirement benefits to certain employees of Local employers: Chapter 59, P.L. 1999, Chapter 126, P.L. 2000 and Chapter 130, P.L. 2003. The cost of the enhanced pension benefits will be funded by employer contributions to the retirement system and paid by the employer that elected to participate over amortization periods elected by the employer to the extent permitted by NJ Statute.

Chapter 59, P.L. 1999 authorizes municipalities, counties and other local units of government that enter into agreements to provide governmental services on a joint or consolidated basis, municipalities that join together to establish a new consolidated municipality, or school districts that have merged with one or more other school districts due solely to a municipal consolidation, to offer incentive programs for retirement or termination of employment for employees affected by the consolidation agreements. "County ERI Section 44" of Chapter 126, P.L. 2000 permitted local units to offer early retirement or termination incentives to certain employees of county governing bodies. Chapter 130, P.L. 2003 extended an Early Retirement Incentive Program similar to that offered by the State under Chapter 23, P.L. 2002 to members of Local employer locations. Appendix E lists all applicable locations and summarizes the contribution requirements under Chapter 59, Chapter 126 and Chapter 130.

Chapter 109, P.L.1979

Chapter 109, P.L. 1979 increased special retirement benefits for members who retire with 25 years of service from 50% to 60% of average final compensation. Under the provisions of this chapter, the State is liable for the increase in the normal contribution to fund the benefits provided by this act. As required by Chapter 109, additional State contributions of 1.1% of covered salary are required to provide for this additional benefit.

Chapter 204, P.L. 1989

Chapter 204 allowed employees who were previously excluded on the basis of their titles from PFRS membership to enter the System. Employers of such employees are required to contribute any additional contribution necessary to fund any unfunded actuarial liability arising from Chapter 204. The valuation reflects the additional actuarial liability for three State locations and fifteen Municipality and Local Group locations with certain employees participating in the System under the provisions of this legislation. Section V lists all applicable locations and the required contributions.

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**APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS**

Chapter 511, P.L. 1991

Chapter 511 increased the benefit payable to the surviving spouse of a retiree from 35% to 50% of the retiree's average final compensation. This law also raised the minimum annual spouse's benefit from \$1,600 to \$4,500 for benefits granted prior to January 14, 1992. Chapter 511 required that the normal cost and actuarial liability contribution attributable to this chapter be separately determined. As a result of Chapter 115, P.L. 1997, the actuarial liability contribution attributable to Chapter 511 was eliminated at that time. However, because of the reductions (and anticipated reductions) in the required State contributions for fiscal years 2004 through 2021 due to the various Appropriation Acts and Chapter 1, P.L. 2010, the remaining required contributions that have not been made have been set up as an unfunded actuarial liability attributable to Chapter 511.

Chapter 247, P.L. 1993 and Chapter 201, P.L. 2001

Chapter 247 requires the State to pay the difference between the PFRS normal cost rate and the PERS normal cost rate for certain members who transferred into PFRS as of January 1, 1992 or later. In addition, the law requires the State to pay the "System" unfunded actuarial liability contribution for Municipalities and Local Groups that transferred into PFRS on and after January 1, 1992 without past service.

Chapter 201, P.L. 2001 made changes to Chapter 247, P.L. 1993 with respect to the benefits payable to members who transferred from PERS to PFRS as a result of the Chapter 247 legislation. The resulting increase in the unfunded actuarial liabilities due to the increased benefits was fully funded by the recognition of additional market value surplus in the determination of the actuarial value of assets in the July 1, 1999 valuation. However, because of the reductions (and anticipated reductions) in the required State contributions for fiscal years 2004 through 2021 due to the various Appropriation Acts and Chapter 1, P.L. 2010, the remaining required contributions which were not paid have been added to the Chapter 247 unfunded actuarial liability and will be included in future State contributions.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
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**APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS**

Chapter 428, P.L. 1999

Chapter 428, P.L. 1999 made the following changes to the benefit provisions:

- Changed the compensation basis for benefits from 3-year average compensation to final compensation.
- Added a service retirement benefit of 50% of final compensation for members as of the date of enactment who retire with 20 years of service and for all other members at age 55 with 20 years of service.
- Added an additional service retirement benefit of 3% of final compensation per year of service in excess of 20 years for those who retire with less than 25 years of service.
- Reduced the service requirement for ordinary disability retirement from 5 years to 4 years.
- Added the special involuntary disability benefit.
- Changed the preretirement death benefit from a refund of contributions to a spousal annuity equal to 50% of final compensation.

Chapter 8, P.L. 2000 required that, if valuation assets are insufficient to fund the normal cost and actuarial liability costs attributable to Chapter 428, P.L. 1999, the contribution required to fund these costs for the State and other employers shall be paid by the State. For the current valuation, valuation assets were not sufficient to fund the costs attributable to Chapter 428. In addition, because of the reductions (and anticipated reductions) in the required State contributions for fiscal years 2004 through 2021 due to the various Appropriation Acts and Chapter 1, P.L. 2010, the remaining required contributions which were not paid have been added to the Chapter 428 unfunded actuarial liability and will be included in future State contributions.

Chapter 86, P.L. 2001 amended the active death benefits provided to a beneficiary of a member who died in active duty on or after January 1, 1998 and before January 18, 2000. The law required an eligible beneficiary to apply for the increased benefits within 90 days of enactment and return the member's aggregate contributions to the System. The State is liable for all costs to the System attributable to this law, and these costs have been included in the Chapter 428 actuarial liability contributions.

Chapter 318, P.L. 2001 amended the active death benefits provided to a beneficiary of a member with 10 or more years of service who died in active service on or after June 1, 1995 and before January 1, 1998 and whose beneficiary had, on May 1, 2001, an appeal of a denial of a benefit related to death in the line of duty pending before the Board of Trustees. The law requires that the appeal be withdrawn or denied and that an eligible beneficiary apply for the increased benefits and return the member's aggregate contributions received. The State is liable for all costs to the System attributable to this law and these costs are also included in the Chapter 428 actuarial liability contributions.



**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
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**APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS**

Chapter 19, P.L. 2009

Chapter 19 provided that the State Treasurer will reduce for Local employers the normal and actuarial liability contributions to 50% of the amount certified for fiscal year 2009. The remaining 50% of the contribution (unfunded actuarial liability) will be paid by the Local employers in level annual payments over a period of 15 years with the first payment due in the fiscal year ending June 30, 2012. The unfunded liability will be adjusted by the rate of return on the actuarial value of assets. The legislation also provided that a Local employer may pay 100% of the contribution for the fiscal year 2009. Such an employer will be credited with the full payment and any such amounts will not be included in their unfunded actuarial liability. In addition, certain Local employers who were eligible to defer 50% of their fiscal year 2009 pension contributions but instead paid 100% of the fiscal year 2009 pension contributions were permitted to defer 50% of their 2010 fiscal year pension contributions. The unfunded actuarial liability will be paid by these Local employers over a period of 15 years with the first payment due in the fiscal year ending June 30, 2012. The unfunded actuarial liability will be adjusted by the rate of return on the actuarial value of assets.

**4. 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 a basic understanding of it and have used ProVal in accordance with its original intended purpose. We have not identified any material inconsistencies in assumptions or output of ProVal that would affect this actuarial valuation.

**5. Changes in Actuarial Methods since Last Valuation**

None.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
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**APPENDIX C – SUMMARY OF PLAN PROVISIONS**

This summary of Plan provisions provides an overview of the major provisions of the PFRS used in the actuarial valuation. It is not intended to replace the more precise language of the NJ State Statutes, Title 43, Chapter 16A, 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, 2020 and does not reflect the impact of any changes in the benefits that may have been approved after the valuation date.

**1. Eligibility of Membership**

Eligibility is restricted to eligible police officers and firefighters in an eligible job title of classification who also meet the age, medical and training criteria for membership. The maximum enrollment age is 35.

- a) Tier 1 Member: Any member hired on or before May 21, 2010.
- b) Tier 2 Member: Any member hired after May 21, 2010 and on or before June 28, 2011.
- c) Tier 3 Member: Any member hired after June 28, 2011.

**2. Plan Year**

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

**3. Creditable Service**

A year of service is credited for each year an employee is a Member of the Retirement System plus service, if any, covered by a prior service liability.

**4. Compensation**

Base salary upon which contributions by a Member to the Annuity Savings Fund were based in the last year of service. Chapter 113, P.L. 1997 provides that Compensation 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, Compensation cannot exceed the annual maximum wage contribution base for Social Security, pursuant to the Federal Insurance Contribution Act.

**5. Final Compensation**

Annual compensation received by the Member in the last 12 months of Creditable Service preceding his retirement. Chapter 1, P.L. 2010 provides that for members hired on or after May 22, 2010, Final Compensation means the average annual compensation for the three fiscal years of membership providing the largest benefit.

APPENDIX C – SUMMARY OF PLAN PROVISIONS

**6. Aggregate Contributions**

The sum of all amounts deducted from the compensation of a Member or contributed by him or on his behalf without interest.

**7. Member Contributions**

Each Member contributes 10% of base salary.

**8. Benefits**

**a) Service and Special Retirement**

Mandatory retirement at age 65, except a Member hired prior to January 1, 1987 may remain a Member until attaining the earlier of age 68 or 25 years of Creditable Service. Voluntary retirement prior to age 65.

- (1) Service Retirement: For a Member enrolled as of January 18, 2000, age 55 or 20 years of Creditable Service. For a Member enrolled after January 18, 2000, age 55.

Benefit is an annual retirement allowance comprised of a member annuity plus an employer pension which together will provide a total allowance of:

- a. 2% of Final Compensation for each year of Creditable Service up to 30 years plus 1% of Final Compensation for each year of Creditable Service over 30 years.
- b. 50% of Final Compensation for Members with 20 or more years of Creditable Service.
- c. 50% of Final Compensation plus 3% of Final Compensation for each year of Creditable Service in excess of 20 years for Members as of January 18, 2000 who would have 20 years of Creditable Service but not 25 years at age 65.

- (2) Special Retirement: 25 years of Creditable Service.

Benefit is in an annual retirement allowance comprised of a member annuity plus an employer pension which together will provide a total allowance of:

- a. For Members enrolled on or before June 28, 2011, 65% of Final Compensation plus 1% of Final Compensation for each year of Creditable Service in excess of 25 years with a maximum of 70% of Final Compensation, except for those members with 30 or more years of Creditable Service on June 30, 1979.
- b. For Members hired after June 28, 2011, 60% of Final Compensation plus 1% of Final Compensation for each year of Creditable Service in excess of 25 years with a maximum of 65% of Final Compensation.

**APPENDIX C – SUMMARY OF PLAN PROVISIONS**

**b) Deferred Retirement**

Termination of service prior to age 55 with 10 years of Creditable Service.

Benefit is either a refund of Aggregate Contributions, or a deferred life annuity commencing at age 55 comprised of a member annuity plus an employer pension which together will provide a total allowance of 2% of Final Compensation for each year of Creditable Service up to 30 plus 1% of Final Compensation for each year of Creditable Service over 30 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 10 years of service credit.

Benefit is a return of Aggregate Contributions.

**d) Death Benefits**

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

- a. Lump sum payment equal to 350% of Compensation, also known as the non-contributory 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 Aggregate Contributions.

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

- a. Lump sum payment equal to 350% of Compensation, also known as the non-contributory group life insurance benefit, plus
- b. Spousal life annuity of 70% of Compensation payable until spouse's death or remarriage. If there is no surviving spouse or upon death or remarriage, 70% of Compensation payable to dependent children in equal shares. If there is no surviving spouse or dependent child(ren), 25% (40%) of 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 Aggregate Contributions.

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**APPENDIX C – SUMMARY OF PLAN PROVISIONS**

(3) Death After Retirement: Death of a retired Member. Benefit is equal to:

- a. Lump sum payment equal to 50% of Compensation for a Member retired under service, special or deferred retirement. For a Member receiving a disability benefit, lump sum payment of 350% of 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 non-contributory group life insurance benefit, plus
- b. For Members who retired on or after January 1, 1968, spouse life annuity of 50% of Final Compensation plus 15% (25%) of Final Compensation for one (two or more) dependent child(ren). The minimum benefit is \$4,500 per year. 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 Creditable Service and totally and permanently incapacitated from the performance of usual or available duties.

Benefit is an annual retirement allowance comprised of a member annuity plus an employer pension which together equal the greater of:

- a. 40% of Final Compensation, or
- b. 1.5% of Final Compensation for each year of Creditable Service.

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

Benefit is an annual retirement allowance comprised of a member annuity plus an employer pension which together will provide a total allowance of:

- a. For Members with 20 years of Creditable Service but less than 25 years, 50% of Final Compensation plus 3% of Final Compensation for each year of Creditable Service 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 regular or assigned duties and such member is mentally or physically incapacitated for the performance of his usual 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.

## APPENDIX C – SUMMARY OF PLAN PROVISIONS

Benefit is an annual retirement allowance comprised of a member annuity plus an employer pension which together will provide a total allowance of 2/3 of annual rate of compensation at the time of the traumatic event or retirement, whichever is greater.

- (4) Special Disability Retirement: Under age 55 with 5 years of Creditable Service and received a heart transplant.

Benefit is an annual retirement allowance comprised of a member annuity plus an employer pension which together will provide a total allowance of 50% of Final Compensation.

### 9. Forms of Payment

No optional forms of payment are available.

### 10. Cost-of-Living Adjustments

Also known as Pension Adjustments. Provided annually to retirees and survivors after 24 months of retirement prior to July 1, 2011. Chapter 78, P.L. 2011 eliminated future adjustments effective July 1, 2011. Adjustments may be reinstated in the future subject to certain conditions outlined in Chapter 78, P.L. 2011.

### 11. Changes in Plan Provisions since Last Valuation

Chapter 157, P.L. 2019 expanded the definition of regular or assigned duties for purposes of accidental disability retirement to include World Trade Center (WTC) rescue, recovery, or cleanup operations between September 11, 2001 and October 11, 2011 under certain conditions. 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.

Chapter 305, P.L. 2019 increased the benefit for a surviving child in the event of ordinary death while in active service. Previously, if there was no surviving spouse, or upon the surviving spouse's death or remarriage, a total of 20% (35%, 50%) of final compensation was payable to one (two, three or more) dependent child(ren). Under Chapter 305, P.L. 2019, if there is no surviving spouse, or upon the surviving spouse's death or remarriage, 50% of final compensation is payable to surviving children in equal shares.

Chapter 54, P.L. 2020 amends eligibility for accidental disability and accidental death benefits for PFRS members when related to the contraction of COVID-19 during the Public Health Emergency declared by the Governor in Executive Order 103 of 2020, as extended.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
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**APPENDIX D – HISTORICAL DATA AND REQUIRED EXHIBITS**

The information on the following tables for State and Local employers 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.

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**APPENDIX D – HISTORICAL DATA AND REQUIRED EXHIBITS**

**Table D-1  
Historical Summary of Assets and Liabilities  
State**

Valuation Date July 1,	Market Value of Assets	Actuarial Value of Assets with Special Asset Value <sup>1</sup>	Actuarial Liability	Funded Ratio	
				Market Value	Actuarial Value
2020	\$ 1,673,186,247	\$ 2,086,162,539	\$ 5,449,871,027	30.7%	38.3%
2019	1,693,692,745	2,047,752,683	5,261,107,456	32.2%	38.9%
2018	1,683,271,926	2,023,529,750	4,983,733,970	33.8%	40.6%
2017	1,680,114,357	2,038,961,264	4,873,081,731	34.5%	41.8%
2016	1,646,171,965	2,079,326,401	4,676,642,040	35.2%	44.5%
2015	1,831,003,301	2,004,579,109	4,516,438,165	40.5%	44.4%
2014	1,950,490,493	2,062,185,965	4,365,609,664	44.7%	47.2%
2013	1,896,198,371	2,127,491,585	4,188,523,037	45.3%	50.8%
2012	1,829,418,795	2,137,727,566	4,026,954,882	45.4%	53.1%
2011	1,944,214,316	2,173,255,647	3,926,525,679	49.5%	55.3%

<sup>1</sup> Includes Special Asset Value beginning with July 1, 2016 valuation

**Table D-2  
Historical Summary of Employer Contributions<sup>1</sup>  
State**

Fiscal Year Ending June 30,	Statutory Contribution / Actuarially Determined Contribution	Actual Pension Contribution	Lottery Revenue	Contribution Deficiency/ (Excess)	Percentage of Contribution Covered
2021 <sup>2</sup>	\$ 569,662,114	\$ 431,324,191	\$ 13,036,855	\$ 125,301,068	78.0%
2020	544,579,266	368,129,000	12,180,000	164,270,266	69.8%
2019	529,722,755	307,999,000	13,260,000	208,463,755	60.6%
2018	502,917,964	239,446,000	11,712,026	251,759,938	49.9%
2017	483,877,347	195,221,000	0	288,656,347	40.3%
2016	461,081,051	138,324,000	0	322,757,051	30.0%
2015	414,316,953	139,297,000	0	275,019,953	33.6%
2014	389,689,529	115,623,000	0	274,066,529	29.7%
2013	393,637,547	112,468,000	0	281,169,547	28.6%
2012	375,234,766	53,606,000	0	321,628,766	14.3%

<sup>1</sup> Excludes contributions for NCGI and includes Local obligations payable by the State

<sup>2</sup> Reflects the State's planned contribution of 78% of the Statutory contribution and expected Lottery revenue



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**APPENDIX D – HISTORICAL DATA AND REQUIRED EXHIBITS**

**Table D-3  
Historical Summary of Assets and Liabilities  
Local Employers**

Valuation Date July 1,	Market Value of Assets	Actuarial Value of Assets	Actuarial Liability	Funded Ratio	
				Market Value	Actuarial Value
2020	\$ 26,099,999,102	\$ 27,723,057,451	\$ 38,853,311,601	67.2%	71.4%
2019	26,407,351,286	27,023,458,408	37,671,711,185	70.1%	71.7%
2018	25,680,517,916	26,109,128,660	35,523,376,524	72.3%	73.5%
2017	24,351,431,023	25,183,776,588	34,474,127,537	70.6%	73.1%
2016	22,469,694,913	24,420,145,823	32,793,439,210	68.5%	74.5%
2015	23,360,020,456	23,935,037,150	31,205,965,303	74.9%	76.7%
2014	23,143,934,984	23,066,498,788	30,239,286,907	76.5%	76.3%
2013	20,734,802,380	22,170,221,173	28,811,698,272	72.0%	76.9%
2012	19,296,197,115	21,549,327,079	27,705,168,437	69.6%	77.8%
2011	19,405,816,249	21,051,681,692	26,978,632,188	71.9%	78.0%

**Table D-4  
Historical Summary of Employer Contributions<sup>1</sup>  
Local Employers**

Fiscal Year Ending June 30,	Statutory Contribution / Actuarially Determined Contribution	Actual Pension Contribution	Contribution Deficiency/ (Excess)	Percentage of Contribution Covered
2020	991,786,398	991,786,398	0	100.0%
2019	968,867,296	968,540,115	327,181	100.0%
2018	877,147,545	877,147,545	0	100.0%
2017	807,438,390	807,438,390	0	100.0%
2016	804,063,662	804,063,662	0	100.0%
2015	760,533,458	760,533,458	0	100.0%
2014	726,928,577	726,928,577	0	100.0%
2013	776,511,374	776,511,374	0	100.0%
2012	762,531,584	762,531,584	0	100.0%

<sup>1</sup> Excludes contributions for NCGI and Local obligations payable by the State and includes ERIs and Chapter 19, P.L. 2009 payments

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**APPENDIX D – HISTORICAL DATA AND REQUIRED EXHIBITS**

In accordance with the Government Finance Officers Association (GFOA) and their recommended checklist for Comprehensive Annual 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 the report.

**Table D-5  
Schedule of Retirees and Beneficiaries Added to and Removed From Rolls  
State**

Valuation Date July 1,	Added to Rolls		Removed from Rolls		Rolls at End of Year		Average Annual Allowance <sup>1,2,3</sup>	% Increase in Average Annual Allowance <sup>1,2</sup>
	Number <sup>3</sup>	Annual Allowance	Number <sup>1,2</sup>	Annual Allowance	Number <sup>1,2,3</sup>	Annual Allowance		
2020	271	\$ 14,487,175	137	\$ 5,025,049	6,937	\$ 330,805,742	\$ 47,687	1.02%
2019	249	12,168,447	119	4,338,355	6,803	321,147,218	47,207	0.55%
2018	256	12,439,023	131	4,867,322	6,673	313,277,156	46,947	7.64%
2017	372	17,056,592	172	5,162,512	7,007	305,608,112	43,615	1.07%
2016	407	17,916,150	188	5,868,202	6,807	293,751,067	43,154	0.84%
2015	597	27,506,231	136	4,428,009	6,588	281,941,189	42,796	1.24%
2014	411	18,319,747	125	3,624,098	6,127	259,008,914	42,273	1.08%
2013	562	25,376,310	144	3,961,938	5,841	244,287,186	41,823	1.68%
2012	483	21,936,867	83	2,596,132	5,423	223,064,017	41,133	1.49%
2011	578	26,839,762	117	3,116,709	5,023	203,579,687	40,530	3.79%

<sup>1</sup> Beginning with the 2018 valuation, QDRO records excluded from headcounts and QDRO benefits included with member records. This change resulted in 459 fewer records on the rolls as of July 1, 2018.

<sup>2</sup> Location 91999 was reclassified as a Local employer beginning with the 2016 valuation; 30 retirees receiving \$1,361,259 and 6 beneficiaries receiving \$168,613 were removed from the State rolls in 2016.

<sup>3</sup> Location 91999 was reclassified as a State employer beginning with the 2018 valuation; 29 retirees receiving \$1,398,446 and 5 beneficiaries receiving \$123,147 were added to the State rolls in 2018.

**Table D-6  
Schedule of Retirees and Beneficiaries Added to and Removed From Rolls  
Local Employers**

Valuation Date July 1,	Added to Rolls		Removed from Rolls		Rolls at End of Year		Average Annual Allowance <sup>1,2,3</sup>	% Increase in Average Annual Allowance <sup>1,2</sup>
	Number <sup>2</sup>	Annual Allowance	Number <sup>1,3</sup>	Annual Allowance	Number <sup>1,2,3</sup>	Annual Allowance		
2020	2,051	\$ 151,159,484	1,151	\$ 47,184,702	39,634	\$ 2,374,772,652	\$ 59,918	2.26%
2019	1,890	134,104,687	1,050	42,654,216	38,734	2,269,658,558	58,596	1.99%
2018	1,740	121,278,555	1,169	45,359,799	37,894	2,177,011,512	57,450	8.15%
2017	1,879	119,494,770	1,157	41,177,074	39,540	2,100,385,456	53,121	1.97%
2016	2,131	127,903,000	977	33,478,631	38,818	2,022,136,965	52,093	1.77%
2015	2,223	137,472,290	1,008	34,566,655	37,664	1,927,850,322	51,185	2.23%
2014	2,157	125,562,304	1,061	37,217,915	36,449	1,824,960,208	50,069	2.01%
2013	2,126	123,863,237	1,062	34,299,782	35,353	1,735,172,993	49,081	2.32%
2012	2,131	119,315,514	855	29,526,388	34,289	1,644,739,476	47,967	1.94%
2011	2,613	157,395,175	954	29,687,515	33,013	1,553,435,879	47,055	4.41%

<sup>1</sup> Beginning with the 2018 valuation, QDRO records excluded from headcounts and QDRO benefits included with member records. This change resulted in 2,217 fewer records on the rolls as of July 1, 2018.

<sup>2</sup> Location 91999 was reclassified as a Local employer beginning with the 2016 valuation; 30 retirees receiving \$1,361,259 and 6 beneficiaries receiving \$168,613 were added to the Local employer rolls in 2016.

<sup>3</sup> Location 91999 was reclassified as a State employer beginning with the 2018 valuation; 29 retirees receiving \$1,398,446 and 5 beneficiaries receiving \$123,147 were removed from the Local employer rolls in 2018.

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**APPENDIX D – HISTORICAL DATA AND REQUIRED EXHIBITS**

**Table D-7**  
**Schedule of Retirees and Beneficiaries Added to and Removed From Rolls**  
**Total**

Valuation Date July 1,	Added to Rolls		Removed from Rolls		Rolls at End of Year		Average Annual Allowance <sup>1,2,3</sup>	% Increase in Average Annual Allowance <sup>1,2,3</sup>
	Number <sup>2,3</sup>	Annual Allowance	Number <sup>1,2,3</sup>	Annual Allowance	Number <sup>1,2,3</sup>	Annual Allowance		
2020	2,322	\$ 165,646,659	1,288	\$ 52,209,751	46,571	\$ 2,705,578,394	\$ 58,096	2.11%
2019	2,139	146,273,134	1,169	46,992,571	45,537	2,590,805,776	56,895	1.82%
2018	1,996	133,717,578	1,300	50,227,121	44,567	2,490,288,668	55,877	8.10%
2017	2,251	136,551,362	1,329	46,339,586	46,547	2,405,993,568	51,690	1.83%
2016	2,538	145,819,150	1,165	39,346,833	45,625	2,315,888,032	50,759	1.65%
2015	2,820	164,978,521	1,144	38,994,664	44,252	2,209,791,511	49,937	2.02%
2014	2,568	143,882,051	1,186	40,842,013	42,576	2,083,969,122	48,947	1.86%
2013	2,688	149,239,547	1,206	38,261,720	41,194	1,979,460,179	48,052	2.17%
2012	2,614	141,252,381	938	32,122,520	39,712	1,867,803,493	47,034	1.82%
2011	3,191	184,234,937	1,071	32,804,224	38,036	1,757,015,566	46,193	4.27%

<sup>1</sup> Beginning with the 2018 valuation, QDRO records excluded from headcounts and QDRO benefits included with member records. This change resulted in 2,676 fewer records on the rolls as of July 1, 2018.

<sup>2</sup> Location 91999 was reclassified as a Local employer beginning with the 2016 valuation; 30 retirees receiving \$1,361,259 and 6 beneficiaries receiving \$168,613 were added to the Local employer rolls and removed from the State rolls in 2016.

<sup>3</sup> Location 91999 was reclassified as a State employer beginning with the 2018 valuation; 29 retirees receiving \$1,398,446 and 5 beneficiaries receiving \$123,147 were added to the State rolls and removed from the Local employer rolls in 2018.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
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**APPENDIX D – HISTORICAL DATA AND REQUIRED EXHIBITS**

**Table D-8  
Schedule of Active Member Valuation Data  
State**

Valuation Date July 1,	Number of Contributing Active Members <sup>1</sup>	Annual Compensation <sup>1</sup>	Annual Average Compensation <sup>1</sup>	% Increase in Average Annual Compensation <sup>1</sup>	Number of Participating Employers <sup>2</sup>
2020	6,688	\$ 511,392,879	\$ 76,464	7.94%	38
2019	6,875	487,025,462	70,840	0.47%	38
2018	6,807	479,941,514	70,507	-1.07%	40
2017	7,072	504,025,065	71,271	-3.00%	N/A
2016	6,911	507,802,380	73,477	-2.38%	N/A
2015	6,883	518,087,705	75,271	-0.14%	N/A
2014	7,025	529,501,284	75,374	0.54%	N/A
2013	7,098	532,147,062	74,971	-0.65%	N/A
2012	7,187	542,344,707	75,462	-0.31%	N/A
2011	7,237	547,809,629	75,696	4.07%	N/A

<sup>1</sup> Prior to July 1, 2018, includes non-contributing active members

<sup>2</sup> Number of locations reporting contributing active members. For GASB reporting purposes, the State may be considered the participating employer for multiple locations.

**Table D-9  
Schedule of Active Member Valuation Data  
Local Employers**

Valuation Date July 1,	Number of Contributing Active Members <sup>1</sup>	Annual Compensation <sup>1</sup>	Annual Average Compensation <sup>1</sup>	% Increase in Average Annual Compensation <sup>1</sup>	Number of Participating Employers <sup>2</sup>
2020	34,150	\$ 3,505,375,030	\$ 102,646	1.62%	574
2019	34,164	3,450,951,747	101,011	1.32%	575
2018	34,013	3,390,777,193	99,691	1.01%	576
2017	34,447	3,399,605,586	98,691	0.68%	N/A
2016	33,878	3,320,721,980	98,020	0.27%	N/A
2015	33,476	3,272,560,644	97,758	-0.38%	N/A
2014	33,081	3,246,344,549	98,133	0.99%	N/A
2013	33,274	3,233,135,473	97,167	1.52%	N/A
2012	33,632	3,218,932,891	95,710	3.85%	N/A
2011	34,762	3,203,676,618	92,160	3.96%	N/A

<sup>1</sup> Prior to July 1, 2018, includes non-contributing active members

<sup>2</sup> Number of locations reporting contributing active members.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
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**APPENDIX D – HISTORICAL DATA AND REQUIRED EXHIBITS**

**Table D-10  
Schedule of Active Member Valuation Data  
Total**

Valuation Date July 1,	Number of Contributing Active Members <sup>1</sup>	Annual Compensation <sup>1</sup>	Annual Average Compensation <sup>1</sup>	% Increase in Average Annual Compensation <sup>1</sup>	Number of Participating Employers <sup>2</sup>
2020	40,838	\$ 4,016,767,909	\$ 98,359	2.50%	612
2019	41,039	3,937,977,209	95,957	1.19%	613
2018	40,820	3,870,718,707	94,824	0.85%	616
2017	41,519	3,903,630,651	94,020	0.17%	N/A
2016	40,789	3,828,524,360	93,861	-0.07%	N/A
2015	40,359	3,790,648,349	93,923	-0.24%	N/A
2014	40,106	3,775,845,833	94,147	0.95%	N/A
2013	40,372	3,765,282,535	93,265	1.22%	N/A
2012	40,819	3,761,277,598	92,145	3.16%	N/A
2011	41,999	3,751,486,247	89,323	3.96%	N/A

<sup>1</sup> Prior to July 1, 2018, includes non-contributing active members

<sup>2</sup> Number of locations reporting contributing active members. For GASB reporting purposes, the State may be considered the participating employer for multiple locations.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
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**APPENDIX D – HISTORICAL DATA AND REQUIRED EXHIBITS**

**Table D-11  
Schedule of Funding Progress  
State**

Valuation Date July 1,	Actuarial Value of Assets <sup>1</sup> (a)	Actuarial Accrued Liability (b)	(Surplus)/Unfunded		Covered Payroll <sup>2</sup> (d)	(Surplus)/Unfunded Actuarial Accrued Liability as % of Covered Payroll (c) / (d)
			Actuarial Accrued Liability (c) = (b) - (a)	Funded Ratio (a) / (b)		
2020	\$ 1,935,340,424	\$ 5,449,871,027	\$ 3,514,530,603	35.51%	\$ 511,392,879	687.25%
2019	1,896,362,754	5,261,107,456	3,364,744,702	36.04%	487,025,462	690.88%
2018	1,872,048,766	4,983,733,970	3,111,685,204	37.56%	479,941,514	648.35%
2017	1,887,486,318	4,873,081,731	2,985,595,413	38.73%	504,025,065	592.35%
2016	1,928,447,404	4,676,642,040	2,748,194,636	41.24%	507,802,380	541.19%
2015	2,004,579,109	4,516,438,165	2,511,859,056	44.38%	518,087,705	484.83%
2014	2,062,185,965	4,365,609,664	2,303,423,699	47.24%	529,501,284	435.02%
2013	2,127,491,585	4,188,523,037	2,061,031,452	50.79%	532,147,062	387.30%
2012	2,137,727,566	4,026,954,882	1,889,227,316	53.09%	542,344,707	348.34%
2011	2,173,255,647	3,926,525,679	1,753,270,032	55.35%	547,809,629	320.05%

<sup>1</sup> Includes receivable amounts

<sup>2</sup> Prior to July 1, 2018, includes non-contributing active members

**Table D-12  
Schedule of Funding Progress  
Local Employers**

Valuation Date July 1,	Actuarial Value of Assets <sup>1</sup> (a)	Actuarial Accrued Liability (b)	(Surplus)/Unfunded		Covered Payroll <sup>2</sup> (d)	(Surplus)/Unfunded Actuarial Accrued Liability as % of Covered Payroll (c) / (d)
			Actuarial Accrued Liability (c) = (b) - (a)	Funded Ratio (a) / (b)		
2020	\$27,723,057,451	\$ 38,853,311,601	\$ 11,130,254,150	71.35%	\$3,505,375,030	317.52%
2019	27,023,458,408	37,671,711,185	10,648,252,777	71.73%	3,450,951,747	308.56%
2018	26,109,128,660	35,523,376,524	9,414,247,864	73.50%	3,390,777,193	277.64%
2017	25,183,776,588	34,474,127,537	9,290,350,949	73.05%	3,399,605,586	273.28%
2016	24,420,145,823	32,793,439,210	8,373,293,387	74.47%	3,320,721,980	252.15%
2015	23,935,037,150	31,205,965,303	7,270,928,153	76.70%	3,272,560,644	222.18%
2014	23,066,498,788	30,239,286,907	7,172,788,119	76.28%	3,246,344,549	220.95%
2013	22,170,221,173	28,811,698,272	6,641,477,099	76.95%	3,233,135,473	205.42%
2012	21,549,327,079	27,705,168,437	6,155,841,358	77.78%	3,218,932,891	191.24%
2011	21,051,681,692	26,978,632,188	5,926,950,496	78.03%	3,203,676,618	185.00%

<sup>1</sup> Includes receivable amounts

<sup>2</sup> Prior to July 1, 2018, includes non-contributing active members

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
JULY 1, 2020 ACTUARIAL VALUATION**

**APPENDIX D – HISTORICAL DATA AND REQUIRED EXHIBITS**

**Table D-13  
Schedule of Funding Progress  
Total**

Valuation Date July 1,	Actuarial Value of Assets <sup>1</sup> (a)	Actuarial Accrued Liability (b)	(Surplus)/Unfunded Actuarial Liability (c) = (b) - (a)	Funded Ratio (a) / (b)	Covered Payroll <sup>2</sup> (d)	(Surplus)/Unfunded Actuarial Accrued Liability as % of Covered Payroll (c) / (d)
2020	\$29,658,397,875	\$ 44,303,182,628	\$ 14,644,784,753	66.94%	\$4,016,767,909	364.59%
2019	28,919,821,162	42,932,818,641	14,012,997,479	67.36%	3,937,977,209	355.84%
2018	27,981,177,426	40,507,110,494	12,525,933,068	69.08%	3,870,718,707	323.61%
2017	27,071,262,906	39,347,209,268	12,275,946,362	68.80%	3,903,630,651	314.48%
2016	26,348,593,227	37,470,081,250	11,121,488,023	70.32%	3,828,524,360	290.49%
2015	25,939,616,259	35,722,403,468	9,782,787,209	72.61%	3,790,648,349	258.08%
2014	25,128,684,753	34,604,896,571	9,476,211,818	72.62%	3,775,845,833	250.97%
2013	24,297,712,758	33,000,221,309	8,702,508,551	73.63%	3,765,282,535	231.12%
2012	23,687,054,645	31,732,123,319	8,045,068,674	74.65%	3,761,277,598	213.89%
2011	23,224,937,339	30,905,157,867	7,680,220,528	75.15%	3,751,486,247	204.72%

<sup>1</sup> Includes receivable amounts

<sup>2</sup> Prior to July 1, 2018, includes non-contributing active members

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
JULY 1, 2020 ACTUARIAL VALUATION**

**APPENDIX D – HISTORICAL DATA AND REQUIRED EXHIBITS**

**Table D-14  
Schedule of Funded Liabilities by Type (Solvency Test)  
State**

Valuation Date July 1,	Actuarial Accrued Liability for			Actuarial Value of Assets <sup>1</sup>	Portion of Actuarial Liabilities Covered by Actuarial Value of Assets		
	Contributing & Non-Contributing Active Member Contributions (1)	Retirees, Beneficiaries & Deferred Vested <sup>2</sup> (2)	Contributing & Non-Contributing Active Member Benefits Financed by Employer <sup>1</sup> (3)		(1)	(2)	(3)
2020	\$ 542,459,438	\$ 3,733,528,284	\$ 1,173,883,305	\$ 1,935,340,424	100.00%	37.31%	0.00%
2019	521,602,269	3,646,779,490	1,092,725,697	1,896,362,754	100.00%	37.70%	0.00%
2018	500,503,234	3,483,286,430	999,944,306	1,872,048,766	100.00%	39.38%	0.00%
2017	475,818,046	3,424,967,760	972,295,925	1,887,486,318	100.00%	41.22%	0.00%
2016	463,313,193	3,266,044,658	947,284,189	1,928,447,404	100.00%	44.86%	0.00%
2015	453,476,665	3,068,942,554	994,018,946	2,004,579,109	100.00%	50.54%	0.00%
2014	461,707,703	2,836,126,945	1,067,775,016	2,062,185,965	100.00%	56.43%	0.00%
2013	446,509,394	2,645,278,934	1,096,734,709	2,127,491,585	100.00%	63.55%	0.00%
2012	444,953,351	2,418,803,841	1,163,197,690	2,137,727,566	100.00%	69.98%	0.00%
2011	434,353,581	2,240,031,414	1,252,140,684	2,173,255,647	100.00%	77.63%	0.00%

<sup>1</sup> Prior to July 1, 2018, actuarial accrued liability for deferred vesteds included under (3) instead of (2)

<sup>2</sup> Includes receivable amounts

**Table D-15  
Schedule of Funded Liabilities by Type (Solvency Test)  
Local Employers**

Valuation Date July 1,	Actuarial Accrued Liability for			Actuarial Value of Assets <sup>1</sup>	Portion of Actuarial Liabilities Covered by Actuarial Value of Assets		
	Contributing & Non-Contributing Active Member Contributions (1)	Retirees, Beneficiaries & Deferred Vested <sup>2</sup> (2)	Contributing & Non-Contributing Active Member Benefits Financed by Employer <sup>1</sup> (3)		(1)	(2)	(3)
2020	\$ 3,498,478,260	\$ 26,075,894,477	\$ 9,278,938,864	\$ 27,723,057,451	100.00%	92.90%	0.00%
2019	3,446,814,312	24,931,997,761	9,292,899,112	27,023,458,408	100.00%	94.56%	0.00%
2018	3,358,899,795	23,292,240,823	8,872,235,906	26,109,128,660	100.00%	97.67%	0.00%
2017	3,247,943,768	22,521,319,267	8,704,864,502	25,183,776,588	100.00%	97.40%	0.00%
2016	3,131,241,592	21,445,939,675	8,216,257,943	24,420,145,823	100.00%	99.27%	0.00%
2015	3,028,571,346	19,956,349,181	8,221,044,776	23,935,037,150	100.00%	100.00%	11.56%
2014	2,953,537,557	18,953,799,304	8,331,950,046	23,066,498,788	100.00%	100.00%	13.91%
2013	2,842,256,925	17,710,792,805	8,258,648,542	22,170,221,173	100.00%	100.00%	19.58%
2012	2,726,801,462	16,780,025,399	8,198,341,576	21,549,327,079	100.00%	100.00%	24.91%
2011	2,611,348,759	16,074,784,440	8,292,498,989	21,051,681,692	100.00%	100.00%	28.53%

<sup>1</sup> Prior to July 1, 2018, actuarial accrued liability for deferred vesteds included under (3) instead of (2)

<sup>2</sup> Includes receivable amounts



**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
JULY 1, 2020 ACTUARIAL VALUATION**

**APPENDIX D – HISTORICAL DATA AND REQUIRED EXHIBITS**

**Table D-16  
Schedule of Funded Liabilities by Type (Solvency Test)  
Total**

Valuation Date July 1,	Actuarial Accrued Liability for			Actuarial Value of Assets <sup>2</sup>	Portion of Actuarial Liabilities Covered by Actuarial Value of Assets		
	Contributing & Non-Contributing Active Member Contributions (1)	Retirees, Beneficiaries & Deferred Vested <sup>1</sup> (2)	Contributing & Non-Contributing Active Member Benefits Financed by Employer <sup>1</sup> (3)		(1)	(2)	(3)
2020	\$ 4,040,937,698	\$ 29,809,422,761	\$ 10,452,822,169	\$ 29,658,397,875	100.00%	85.94%	0.00%
2019	3,968,416,581	28,578,777,251	10,385,624,809	28,919,821,162	100.00%	87.31%	0.00%
2018	3,859,403,029	26,775,527,253	9,872,180,212	27,981,177,426	100.00%	90.09%	0.00%
2017	3,723,761,814	25,946,287,027	9,677,160,427	27,071,262,906	100.00%	89.98%	0.00%
2016	3,594,554,785	24,711,984,333	9,163,542,132	26,348,593,227	100.00%	92.08%	0.00%
2015	3,482,048,011	23,025,291,735	9,215,063,722	25,939,616,259	100.00%	97.53%	0.00%
2014	3,415,245,260	21,789,926,249	9,399,725,062	25,128,684,753	100.00%	99.65%	0.00%
2013	3,288,766,319	20,356,071,739	9,355,383,251	24,297,712,758	100.00%	100.00%	6.98%
2012	3,171,754,813	19,198,829,240	9,361,539,266	23,687,054,645	100.00%	100.00%	14.06%
2011	3,045,702,340	18,314,815,854	9,544,639,673	23,224,937,339	100.00%	100.00%	19.53%

<sup>1</sup> Prior to July 1, 2018, actuarial accrued liability for deferred vesteds included under (3) instead of (2)

<sup>2</sup> Includes receivable amounts

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
JULY 1, 2020 ACTUARIAL VALUATION**

**APPENDIX D – HISTORICAL DATA AND REQUIRED EXHIBITS**

**Table D-17  
Analysis of Financial Experience  
Change in Unfunded Actuarial Accrued Liability  
State<sup>1</sup>**

Valuation Date July 1,	Actuarial Value of Asset Investment (Gain)/Loss	Actuarial Accrued Liability (Gain)/Loss	Assumption & Method Changes	Plan Changes	Contributions <sup>2</sup>	Change in Unfunded Actuarial Accrued Liability
2020	\$ 65,538,544	\$ 43,904,735	\$ 0	\$ 0	\$ 40,342,622	\$ 149,785,901
2019	50,667,502	(1,753,977)	141,225,547	0	62,920,426	253,059,498
2018	47,194,210	(21,317,092)	(918,724)	0	101,131,397	126,089,791
2017	N/A	N/A	N/A	N/A	N/A	237,400,777
2016	N/A	N/A	N/A	N/A	N/A	236,335,580
2015	N/A	N/A	N/A	N/A	N/A	208,435,357
2014	N/A	N/A	N/A	N/A	N/A	242,392,247
2013	N/A	N/A	N/A	N/A	N/A	171,804,136
2012	N/A	N/A	N/A	N/A	N/A	135,957,284
2011	N/A	N/A	N/A	N/A	N/A	271,563,732

<sup>1</sup> Prior actuary did not provide enough information for the sources of (gain)/loss split by State and Local employers.

<sup>2</sup> Change due to contributions (greater)/less than normal cost plus interest on the Unfunded Actuarial Accrued Liability.

**Table D-18  
Analysis of Financial Experience  
Change in Unfunded Actuarial Accrued Liability  
Local<sup>1</sup>**

Valuation Date July 1,	Actuarial Value of Asset Investment (Gain)/Loss	Actuarial Accrued Liability (Gain)/Loss	Assumption & Method Changes	Plan Changes	Contributions <sup>2</sup>	Change in Unfunded Actuarial Accrued Liability
2020	\$ 405,764,587	\$ 95,550,635	\$ 0	\$ 0	\$ (19,313,849)	\$ 482,001,373
2019	154,026,781	92,692,895	980,278,502	0	7,006,735	1,234,004,913
2018	107,152,686	28,336,995	(52,999,153)	0	41,406,387	123,896,915
2017	N/A	N/A	N/A	N/A	N/A	917,057,562
2016	N/A	N/A	N/A	N/A	N/A	1,102,365,234
2015	N/A	N/A	N/A	N/A	N/A	98,140,034
2014	N/A	N/A	N/A	N/A	N/A	531,311,020
2013	N/A	N/A	N/A	N/A	N/A	485,635,741
2012	N/A	N/A	N/A	N/A	N/A	228,890,862
2011	N/A	N/A	N/A	N/A	N/A	692,818,357

<sup>1</sup> Prior actuary did not provide enough information for the sources of (gain)/loss split by State and Local employers.

<sup>2</sup> Change due to contributions (greater)/less than normal cost plus interest on the Unfunded Actuarial Accrued Liability.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
JULY 1, 2020 ACTUARIAL VALUATION**

**APPENDIX D – HISTORICAL DATA AND REQUIRED EXHIBITS**

Table D-19  
Analysis of Financial Experience  
Change in Unfunded Actuarial Accrued Liability  
Total

Valuation Date July 1,	Actuarial Value of Asset Investment (Gain)/Loss	Actuarial Accrued Liability (Gain)/Loss	Assumption & Method Changes	Plan Changes	Contributions <sup>1</sup>	Change in Unfunded Actuarial Accrued Liability
2020	\$ 471,303,131	\$ 139,455,370	\$ 0	\$ 0	\$ 21,028,773	\$ 631,787,274
2019	204,694,283	90,938,918	1,121,504,049	0	69,927,161	1,487,064,411
2018	154,346,896	7,019,903	(53,917,877)	0	142,537,784	249,986,706
2017	259,929,381	58,991,642	657,629,731	0	177,907,585	1,154,458,339
2016	558,181,587	110,733,636	432,218,931	0	237,566,660	1,338,700,814
2015	187,148,126	101,636,627	(179,494,261)	0	197,284,899	306,575,391
2014	8,564,819	85,366,939	359,942,089	0	319,829,420	773,703,267
2013	416,678,002	101,967,970	0	0	138,793,905	657,439,877
2012	640,359,684	(279,145,857)	(150,622,578)	0	154,256,897	364,848,146
2011	468,726,694	(90,100,503)	317,737,523	0	268,018,375	964,382,089

<sup>1</sup> Change due to contributions (greater)/less than normal cost plus interest on the Unfunded Actuarial Accrued Liability.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
JULY 1, 2020 ACTUARIAL VALUATION**

**APPENDIX E – EARLY RETIREMENT INCENTIVE PROGRAMS**

<b>Table E-1</b>				
<b>Local Employers ERI 1 Contribution Schedule</b>				
<b>Location Number</b>	<b>Location Name</b>	<b>Fiscal Year 2022 Payment</b>	<b>Present Value as of 7/1/2020</b>	
22100	East Rutherford Borough	\$ 87,812	\$ 742,224	
25500	Glen Ridge Borough	63,141	533,698	
34600	Wallington Borough	41,282	348,935	
38800	Phillipsburg Town	12,358	104,451	
43400	Bound Brook Borough	36,693	310,140	
54400	Linwood City	57,534	486,305	
57100	Mine Hill Township	20,058	169,539	
61200	Raritan Township	60,466	511,087	
	<b>Total</b>	<b>\$ 379,344</b>	<b>\$ 3,206,379</b>	

Consistent with established methodology, payment amounts calculated using a payment date 21 months after the valuation date.

Present values as of July 1, 2020 exclude expected payments for fiscal year ending 2021.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
JULY 1, 2020 ACTUARIAL VALUATION**

**APPENDIX E – EARLY RETIREMENT INCENTIVE PROGRAMS**

<b>Table E-2</b>				
<b>Local Employers ERI Contribution Schedules due to Recent ERI Legislation</b>				
<b>Location Number</b>	<b>Location Name</b>	<b>Years and Form of Payment</b>	<b>ERI Information Fiscal Year 2022 Payment</b>	<b>Present Value as of 7/1/2020</b>
<b>Chapter 126, P.L. 2000</b>				
72000	Union County	15 Year - Level	\$ 49,151	\$ 121,682
72001	Union County	15 Year - Level	17,575	43,510
72003	Union County (Effective 2006)	15 Year - Level	197,542	489,047
	<b>Sub-Total</b>		<b>\$ 264,268</b>	<b>\$ 654,239</b>
<b>Chapter 130, P.L. 2003</b>				
22100	East Rutherford Borough	15 Year - Increasing	\$ 56,420	\$ 49,875
33300	Wood-Ridge Borough	15 Year - Increasing	38,860	34,352
35400	Belleville Township	15 Year - Increasing	54,029	47,761
36000	Livingston Township	15 Year - Increasing	85,242	75,354
43600	Roseland Borough	15 Year - Increasing	45,360	40,098
49300	Berkeley Heights Township	15 Year - Increasing	44,445	39,289
56500	Franklin Township	15 Year - Increasing	40,510	35,811
61200	Raritan Township	15 Year - Increasing	28,085	24,827
62600	Monroe Township	15 Year - Increasing	22,761	20,121
72000	Union County	15 Year - Increasing	1,311	1,159
72003	Union County	15 Year - Increasing	59,682	52,759
	<b>Sub-Total</b>		<b>\$ 476,705</b>	<b>\$ 421,406</b>
	<b>Total</b>		<b>\$ 740,973</b>	<b>\$ 1,075,645</b>

Consistent with established methodology, payment amounts calculated using a payment date 21 months after the valuation date.

Present values as of July 1, 2020 exclude expected payments for fiscal year ending 2021.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
JULY 1, 2020 ACTUARIAL VALUATION**

**APPENDIX F – CHAPTER 19, P. L. 2009**

**Table F-1  
Local Employer Chapter 19, P.L. 2009 Deferral and Payment Schedule**

Location Number	Location Name	Fiscal Year 2022 Payment	Present Value as of 7/1/2020
20300	Bayonne City	\$ 631,610	\$ 2,436,823
20400	Salem City	24,929	96,178
20600	Plainfield City	361,240	1,393,704
21001	Elizabeth City	504,622	1,946,888
21002	Elizabeth City	361,230	1,393,664
21101	Newark City	1,885,125	7,273,021
21102	Newark City	920,457	3,551,224
21202	Camden City	313,449	1,209,319
21300	North Plainfield Borough	112,578	434,340
21600	Somerville Borough	44,552	171,887
21800	Roselle Borough	144,979	559,345
22000	Freehold Borough	53,771	207,453
22400	Union City	306,653	1,183,100
22501	Passaic City	273,582	1,055,509
22502	Passaic City	181,520	700,325
22800	Metuchen Borough	39,424	152,104
23000	West New York Town	178,009	686,777
23200	Oradell Borough	35,333	136,319
23301	Hoboken City	222,662	859,054
23302	Hoboken City	214,162	826,261
23400	Audubon Borough	25,765	99,404
23800	East Orange City	555,164	2,141,884
23900	Maplewood Township	160,334	618,588
24100	Hightstown Borough	20,261	78,168
24200	West Milford Township	81,155	313,104
24400	Saddle Brook Township	68,301	263,512
24500	Perth Amboy City	276,511	1,066,809
24600	Secaucus Town	105,416	406,706
24800	Lyndhurst Township	91,112	351,519
24900	Orange City	255,178	984,503
25500	Glen Ridge Borough	37,629	145,177
25600	Guttenberg Town	31,068	119,863
25801	Collingswood Borough	44,375	171,203
25802	Collingswood Borough	19,018	73,375
26100	Dunellen Borough	19,009	73,338

Consistent with established methodology, payment amounts calculated using a payment date 21 months after the valuation date.

Present values as of July 1, 2020 exclude expected payments for fiscal year ending 2021.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
JULY 1, 2020 ACTUARIAL VALUATION**

**APPENDIX F – CHAPTER 19, P. L. 2009**

<b>Table F-1 (cont.) Local Employer Chapter 19, P.L. 2009 Deferral and Payment Schedule</b>			
<b>Location Number</b>	<b>Location Name</b>	<b>Fiscal Year 2022 Payment</b>	<b>Present Value as of 7/1/2020</b>
26600	Fairview Borough	\$ 54,145	\$ 208,899
26700	Keansburg Borough	45,250	174,581
27300	New Milford Borough	58,501	225,702
27400	Paramus Borough	189,253	730,158
27600	South Amboy City	38,293	147,740
27700	Weehawken Township	93,014	358,857
28000	Hackensack City	392,942	1,516,012
28500	Penns Grove Borough	18,991	73,271
28600	Matawan Borough	34,060	131,409
28700	Cedar Grove Township	51,675	199,368
28900	Bogota Borough	21,966	84,746
29100	Irvington Township	456,837	1,762,529
29200	Cinnaminson Township	65,312	251,981
29500	Little Ferry Borough	29,286	112,988
29700	Garwood Borough	23,591	91,016
30701	Paterson City	494,563	1,908,080
30702	Paterson City	391,367	1,509,937
30801	Atlantic City	484,933	1,870,926
30802	Atlantic City	359,457	1,386,827
31100	Fanwood Borough	28,716	110,788
31300	East Hanover Township	62,942	242,839
31600	Rutherford Borough	72,053	277,988
31800	Harrison Township	164,930	636,320
32200	Gloucester City	74,426	287,144
32600	Union Township	361,941	1,396,408
32700	Bloomfield Township	340,819	1,314,917
32900	Morristown Town	126,772	489,099
33200	Asbury Park City	189,782	732,198
33401	Trenton City	481,266	1,856,777
33402	Trenton City	359,370	1,386,489
33800	Lakewood Township	195,484	754,197
34000	North Arlington Borough	59,872	230,991
34100	Rahway City	210,082	810,520
34200	Verona Township	49,786	192,078
34301	Hillside Township	111,728	431,058

Consistent with established methodology, payment amounts calculated using a payment date 21 months after the valuation date.

Present values as of July 1, 2020 exclude expected payments for fiscal year ending 2021.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
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**APPENDIX F – CHAPTER 19, P. L. 2009**

<b>Table F-1 (cont.) Local Employer Chapter 19, P.L. 2009 Deferral and Payment Schedule</b>			
<b>Location Number</b>	<b>Location Name</b>	<b>Fiscal Year 2022 Payment</b>	<b>Present Value as of 7/1/2020</b>
34302	Hillside Township	\$ 77,293	\$ 298,205
34600	Wallington Borough	40,451	156,064
34700	East Newark Borough	7,101	27,397
34800	Clifton City	479,889	1,851,467
34900	Wildwood City	80,996	312,492
35000	Palisades Park Borough	54,989	212,156
35100	Pleasantville City	163,418	630,483
35400	Belleville Township	291,807	1,125,822
35500	Dover Town	63,854	246,356
35600	South Orange Village	151,377	584,031
35800	Garfield City	109,911	424,050
35900	Linden City	398,879	1,538,918
36200	Bridgeton City	88,711	342,259
36400	Washington Borough	17,825	68,772
36700	Fairfield Township	59,500	229,558
36900	Middlesex Borough	47,616	183,706
37000	Middletown Township	170,826	659,065
37400	Maywood Borough	45,983	177,406
37700	Piscataway Township	137,931	532,153
38101	Jersey City	1,270,471	4,901,618
38102	Jersey City Fire Dept.	963,205	3,716,154
38500	Runnemede Borough	28,737	110,869
39500	Mountainside Borough	36,765	141,843
39900	Long Branch City	171,342	661,056
40400	Wanaque Borough	37,140	143,290
41000	Manville Borough	37,108	143,165
41400	Oceanport Borough	24,466	94,392
41500	Haworth Borough	19,744	76,174
41600	Little Falls Twp	33,237	128,233
41900	North Haledon Borough	26,470	102,124
42000	Haledon Borough	27,294	105,304
42500	Wharton Borough	31,199	120,371
43000	West Paterson Borough	39,819	153,624
43100	Ewing Township	144,003	555,580
43400	Bound Brook Borough	35,168	135,683

Consistent with established methodology, payment amounts calculated using a payment date 21 months after the valuation date.

Present values as of July 1, 2020 exclude expected payments for fiscal year ending 2021.



**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
JULY 1, 2020 ACTUARIAL VALUATION**

**APPENDIX F – CHAPTER 19, P. L. 2009**

Table F-1 (cont.) Local Employer Chapter 19, P.L. 2009 Deferral and Payment Schedule			
Location Number	Location Name	Fiscal Year 2022 Payment	Present Value as of 7/1/2020
43500	Emerson Borough	\$ 34,751	\$ 134,071
43600	Roseland Borough	42,011	162,083
43700	Norwood Borough	23,970	92,480
43800	Prospect Park Borough	23,241	89,665
44100	Englewood Cliffs Borough	60,746	234,366
44800	Englishtown Borough	5,590	21,569
44900	Ringwood Borough	34,554	133,315
46300	Borough of Lake Como	14,143	54,564
46400	Aberdeen Township	47,761	184,267
46600	West Long Branch Borough	27,328	105,435
46700	Pt Pleasant Beach Borough	39,884	153,878
47300	Brooklawn Borough	6,206	23,944
47800	Hopatcong Borough	41,193	158,928
47900	West Deptford Township	55,448	213,926
48200	South Bound Brook Borough	20,030	77,279
48600	Gloucester Township	154,589	596,422
48800	Upper Saddle River Boro	33,698	130,011
49100	Willingboro Township	116,529	449,584
50000	Brielle Borough	25,748	99,338
50700	South Brunswick Township	128,696	496,524
51100	Jefferson Township	59,928	231,208
51600	Wall Township	130,470	503,369
52800	Berlin Borough	24,060	92,827
53500	Winslow Township	111,972	431,999
53900	Berkeley Township Municipal Bld	125,206	483,059
54100	Mansfield Township	17,505	67,535
54300	Lebanon Township	11,827	45,628
54700	Seaside Heights Borough	32,738	126,307
54800	Manchester Township	91,128	351,581
55100	Pine Hill Borough	27,123	104,644
55300	Lindenwold Borough	57,503	221,854
55700	Bloomingtondale Borough	25,470	98,266
56000	Howell Township	159,423	615,073
56200	Plainsboro Township	59,309	228,819
56300	Marlboro Township	133,816	516,278

Consistent with established methodology, payment amounts calculated using a payment date 21 months after the valuation date.

Present values as of July 1, 2020 exclude expected payments for fiscal year ending 2021.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY  
JULY 1, 2020 ACTUARIAL VALUATION**

**APPENDIX F – CHAPTER 19, P. L. 2009**

Table F-1 (cont.) Local Employer Chapter 19, P.L. 2009 Deferral and Payment Schedule			
Location Number	Location Name	Fiscal Year 2022 Payment	Present Value as of 7/1/2020
56500	Franklin Township	\$ 35,312	\$ 136,238
58200	Egg Harbor Township	124,065	478,656
58400	Holmdel Township	72,593	280,073
58500	Milltown Borough	23,060	88,968
58900	Buena Borough	7,171	27,668
59000	Eastampton Township	22,853	88,168
59800	Chesilhurst Borough	8,519	32,869
59900	Egg Harbor City	15,057	58,091
60000	Harrison Township	17,311	66,789
60100	Woodbury Heights Borough	7,904	30,494
60600	Waterfront Comm of NY Harbor	1,951	7,527
61000	Somerdale Borough	15,025	57,969
61200	Raritan Township	56,115	216,499
62300	NJ Transit Corporation	270,895	1,045,143
63100	Allentown Borough	7,211	27,822
63300	Barneгат Township	39,849	153,742
67700	Lambertville City	10,114	39,020
68000	Lawnside Borough	7,954	30,686
68800	Mount Arlington Borough	14,022	54,098
69000	National Park Borough	4,535	17,496
70404	Camden County Regional	550,941	2,125,592
71600	Passaic County	913,006	3,522,477
71603	Passaic County	130,557	503,702
72000	Union County	426,182	1,644,259
72001	Union County	70,130	270,569
72003	Union County	328,292	1,266,588
72700	South Toms River Borough	7,543	29,102
73500	Union Beach Borough	12,809	49,418
74000	West Amwell Township	3,437	13,260
74100	Winfield Township	6,091	23,499
74400	Hamilton Twp Fire Comm Dist	10,496	40,496
75000	Lakewood Twp Fire District #1	5,130	19,793
75900	Gloucester Twp Fire District #2	3,486	13,451
79000	North Hudson Reg Fire & Rescue	528,962	2,040,793
<b>Total</b>		<b>\$ 25,970,285</b>	<b>\$ 100,196,237</b>

Consistent with established methodology, payment amounts calculated using a payment date 21 months after the valuation date.

Present values as of July 1, 2020 exclude expected payments for fiscal year ending 2021.

**APPENDIX G – 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:

$$\frac{\text{Amount}}{\text{Payment}} \times \frac{\text{Probability of}}{(1 - .01)} \times \frac{1}{(1 + \text{Investment Return})} = \$90$$

**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 G – 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 G – 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.

**16. Unfunded Actuarial Liability**

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