



Police and Firemen's Retirement System of New Jersey

Actuarial Valuation Report as of July 1, 2019

Produced by Cheiron

March 2020

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LETTER OF TRANSMITTAL

March 26, 2020

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, 2019 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 2021. Future results may differ significantly from the current results presented in this report due to such factors as the following: plan experience differing from that anticipated by the assumptions; changes in assumptions; and changes in plan provisions or applicable law.

The demographic and economic (other than the investment rate of return) actuarial assumptions are based on the recommendations 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,

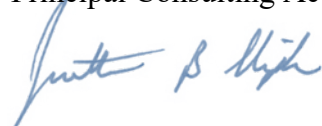
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**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2019 ACTUARIAL VALUATION**

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) 2021.

In this section we present a summary of the principal valuation results. This includes the basis upon which the July 1, 2019 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
JULY 1, 2019 ACTUARIAL VALUATION**

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Valuation Basis

The July 1, 2019 valuation results are based on the same actuarial methods as used in the July 1, 2018 valuation. The demographic and economic assumptions, aside from the valuation interest rate, were 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 valuation is based on plan provisions in effect as of July 1, 2019 and does not reflect the impact of any changes in benefits that may have been approved after the valuation date.

This report is prepared using census data and financial information as of July 1, 2019 provided by the Division of Pensions and Benefits and does not reflect any subsequent changes in the membership or the assets.

The Appropriations Act of Fiscal Year 2019 reduced the State pension contribution from the Statutory amount of \$529,722,755 to \$321,259,000. This amount includes revenue of \$13,260,000 from the Lottery Enterprise Contribution Act.

The potential impact of the Appropriations Act of 2020 reduces the State pension contribution for Fiscal Year 2020 from the Statutory amount of \$544,579,266 to \$381,218,980 (70% of the State Statutory contribution less the Lottery Enterprise Contribution Offset plus expected revenue from the Lottery Enterprise Contribution Act {70% x \$544,579,266 - \$12,845,413 + \$12,858,907}). The pension contribution amount of \$381,218,980 includes expected State-paid Local contributions of \$159,084,797. This valuation reflects the potential impact of the Appropriations Act of 2020.

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, 2019 valuation, 27 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.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2019 ACTUARIAL VALUATION**

SECTION I – BOARD SUMMARY

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, 2019 ACTUARIAL VALUATION**

SECTION I – BOARD SUMMARY

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

Valuation Date Fiscal Year Ending (FYE)	July 1, 2019 2021	July 1, 2018 2020	% Change
<u>Member Data</u>			
Contributing Actives	6,875	6,807	1.0%
Non-Contributing Actives	364	362	0.6%
Deferred Vesteds	13	6	116.7%
Retirees and Beneficiaries ¹	6,803	6,673	1.9%
Total Members	14,055	13,848	1.5%
Appropriation Payroll ²	\$ 487,025,462	\$ 479,941,514	1.5%
Annual Retirement Allowances in Pay	\$ 321,147,218	\$ 313,277,156	2.5%
<u>Assets and Liabilities</u>			
Actuarial Liability	\$ 5,261,107,456	\$ 4,983,733,970	5.6%
Actuarial Value of Assets (AVA) ³	1,896,362,754	1,872,048,766	1.3%
Unfunded Actuarial Liability/(Surplus)	\$ 3,364,744,702	\$ 3,111,685,204	8.1%
Funded Ratio (AVA)	36.0%	37.6%	-1.6%
Actuarial Value of Assets ³ including Special Asset Value (AVA + SAV)	\$ 2,047,752,683	\$ 2,023,529,750	1.2%
Unfunded Actuarial Liability/(Surplus)	\$ 3,213,354,773	\$ 2,960,204,220	8.6%
Funded Ratio (AVA + SAV)	38.9%	40.6%	-1.7%
Market Value of Assets (MVA) ³	\$ 1,693,692,745	\$ 1,683,271,926	0.6%
Unfunded Actuarial Liability/(Surplus)	\$ 3,567,414,711	\$ 3,300,462,044	8.1%
Funded Ratio (MVA)	32.2%	33.8%	-1.6%
<u>Contribution Amounts</u>			
State Normal Cost at End of Year ⁴	\$ 123,396,056	\$ 122,009,526	1.1%
Amortization Payment of UAL ⁴	446,266,058	422,569,740	5.6%
Total Statutory Contribution for FYE	\$ 569,662,114	\$ 544,579,266	4.6%
Percent Appropriated	80.0%	70.0%	10.0%
State Appropriation for Pension	\$ 455,729,691	\$ 381,205,486	19.5%
Lottery Enterprise Contribution Offset	(13,012,258)	(12,845,413)	1.3%
Net State Contribution	\$ 442,717,433	\$ 368,360,073	20.2%

¹ QDRO recipients are excluded from member counts

² Limited annual compensation for contributing actives

³ Includes discounted State receivable contributions and Lottery proceeds as shown in Table III-2

⁴ Includes \$228,944,734 and \$227,263,995 for FYE 2021 and 2020, 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, 2019 ACTUARIAL VALUATION**

SECTION I – BOARD SUMMARY

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

Valuation Date Fiscal Year Ending (FYE)	July 1, 2019 2021	July 1, 2018 2020	% Change
<u>Member Data</u>			
Contributing Actives	34,164	34,013	0.4%
Non-Contributing Actives	1,117	1,113	0.4%
Deferred Vesteds	52	36	44.4%
Retirees and Beneficiaries ¹	38,734	37,894	2.2%
Total Members	74,067	73,056	1.4%
Appropriation Payroll ²	\$ 3,450,951,747	\$ 3,390,777,193	1.8%
Annual Retirement Allowances in Pay	\$ 2,269,658,558	\$ 2,177,011,512	4.3%
<u>Assets and Liabilities</u>			
Actuarial Liability	\$ 37,671,711,185	\$ 35,523,376,524	6.0%
Actuarial Value of Assets (AVA) ³	27,023,458,408	26,109,128,660	3.5%
Unfunded Actuarial Liability/(Surplus)	\$ 10,648,252,777	\$ 9,414,247,864	13.1%
Funding Ratio (AVA)	71.7%	73.5%	-1.8%
Market Value of Assets (MVA) ³	\$ 26,407,351,286	\$ 25,680,517,916	2.8%
Unfunded Actuarial Liability/(Surplus)	\$ 11,264,359,899	\$ 9,842,858,608	14.4%
Funding Ratio (MVA)	70.1%	72.3%	-2.2%
<u>Contribution Amounts</u>			
Employer Normal Cost at End of Year ⁴	\$ 351,092,694	\$ 325,433,661	7.9%
Amortization Payment of UAL ⁴	729,215,100	638,214,381	14.3%
ERI Payments	2,528,630	2,670,679	-5.3%
Chapter 19, P.L. 2009 Payments	25,492,799	25,467,677	0.1%
Total Statutory Contribution for FYE	\$ 1,108,329,223	\$ 991,786,398	11.8%
Non-Contributory Group Insurance Contribution	\$ 36,964,099	\$ 46,564,731	-20.6%

¹ QDRO recipients are excluded from member counts

² Limited annual compensation for contributing actives

³ Includes discounted State receivable contributions as shown in Table III-2

⁴ Excludes \$228,944,734 and \$227,263,995 for FYE 2021 and 2020, 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
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The key results of the July 1, 2019 actuarial valuation for the State are as follows:

- The total Statutory contribution, including Local obligations payable by the State, increased from \$544.6 million for FYE 2020 to \$569.7 million for FYE 2021 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 37.6% to 36.0%. The funded ratio based on actuarial asset value plus special asset value decreased from 40.6% as of July 1, 2018 to 38.9% as of July 1, 2019. Using the market value of assets, the funded ratio also decreased from 33.8% to 32.2%.
- The unfunded actuarial liability based on the actuarial asset value plus special asset value increased from \$3.0 billion as of July 1, 2018 to \$3.2 billion as of July 1, 2019. The unfunded actuarial liability used in determining the Statutory contributions (excess of actuarial liability over the actuarial value of assets) increased from \$3.1 billion to \$3.4 billion.
- During the year there was a total actuarial experience loss of \$50.5 million, consisting of an asset loss of \$52.3 million offset by a liability gain of \$1.8 million.
- The reduction in the assumed rate of investment return from 7.50% to 7.30% increased the actuarial liability by \$119.7 million.
- The updates in the assumed rates of termination, disability, retirement, mortality, salary increase and inflation as a result of the recently completed experience study increased the actuarial liability by \$21.5 million.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2019 ACTUARIAL VALUATION**

SECTION I – BOARD SUMMARY

The key results of the July 1, 2019 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 \$991.8 million for FYE 2020 to \$1,108.3 million for FYE 2021.
- The funded ratio, the ratio of actuarial asset value over liabilities, decreased from 73.5% as of July 1, 2018 to 71.7% as of July 1, 2019. Using the market value of assets, the funded ratio also decreased from 72.3% to 70.1%.
- The unfunded actuarial liability increased from \$9.4 billion as of July 1, 2018 to \$10.6 billion as of July 1, 2019 on an actuarial asset value basis.
- During the year there was a total actuarial experience loss of \$252.6 million, consisting of an asset loss of \$159.9 million and a liability loss of \$92.7 million.
- The reduction in the assumed rate of investment return from 7.50% to 7.30% increased the actuarial liability by \$845.5 million.
- The updates in the assumed rates of termination, disability, retirement, mortality, salary increase and inflation as a result of the recently completed experience study increased the actuarial liability by \$134.7 million.

SECTION I – BOARD SUMMARY

Recent Trends

Although most of the attention given to the valuation reflects the most recently computed unfunded actuarial liability, funded ratio, and contribution amounts, each valuation is merely a snapshot of the long-term progress of a pension fund. It is important to take a step back from these latest results and view them in the context of the System's recent history. Below, we present a series of graphs which display key factors in the valuations of the last 10 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 10 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.

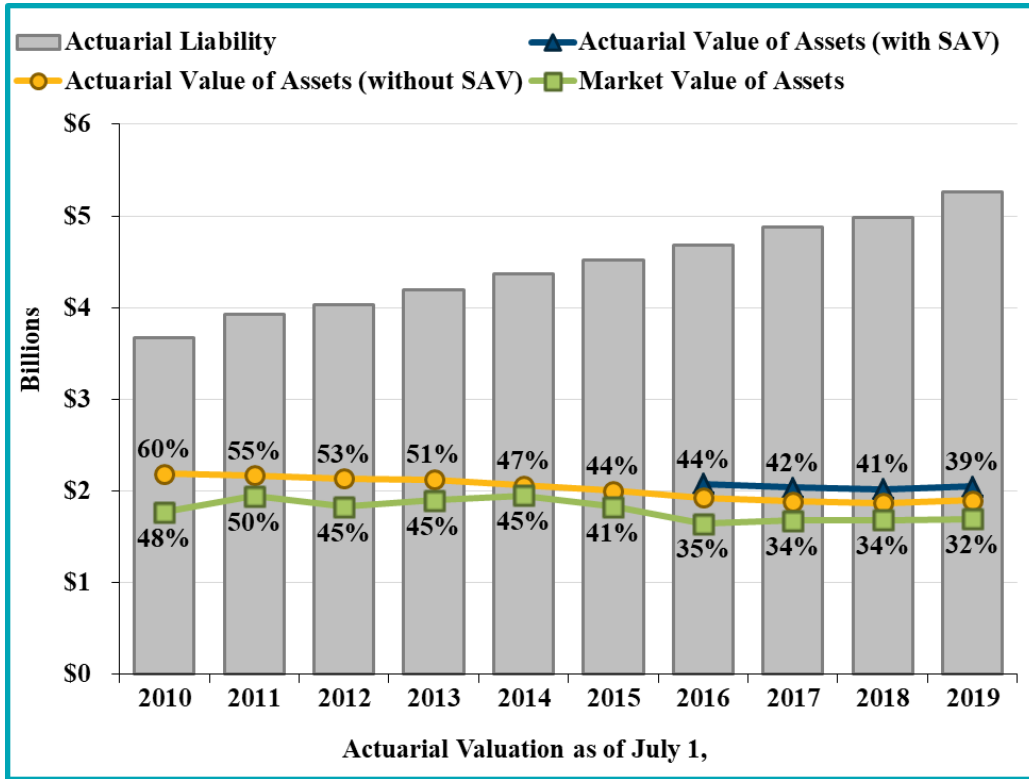
For the State, the funded ratios have been decreasing over time in part due to decreases in the discount rate, recognition of the 2008/2009 market losses and because the State has not been making the full Statutory contribution for the entire period shown.

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.

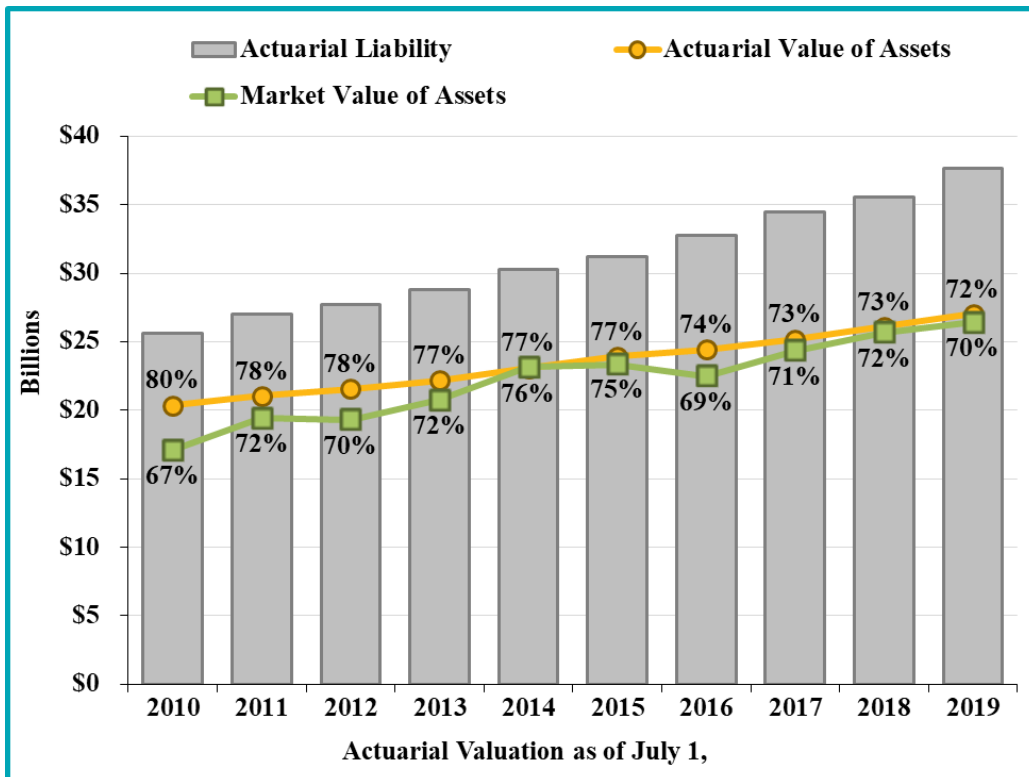
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JULY 1, 2019 ACTUARIAL VALUATION**

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.

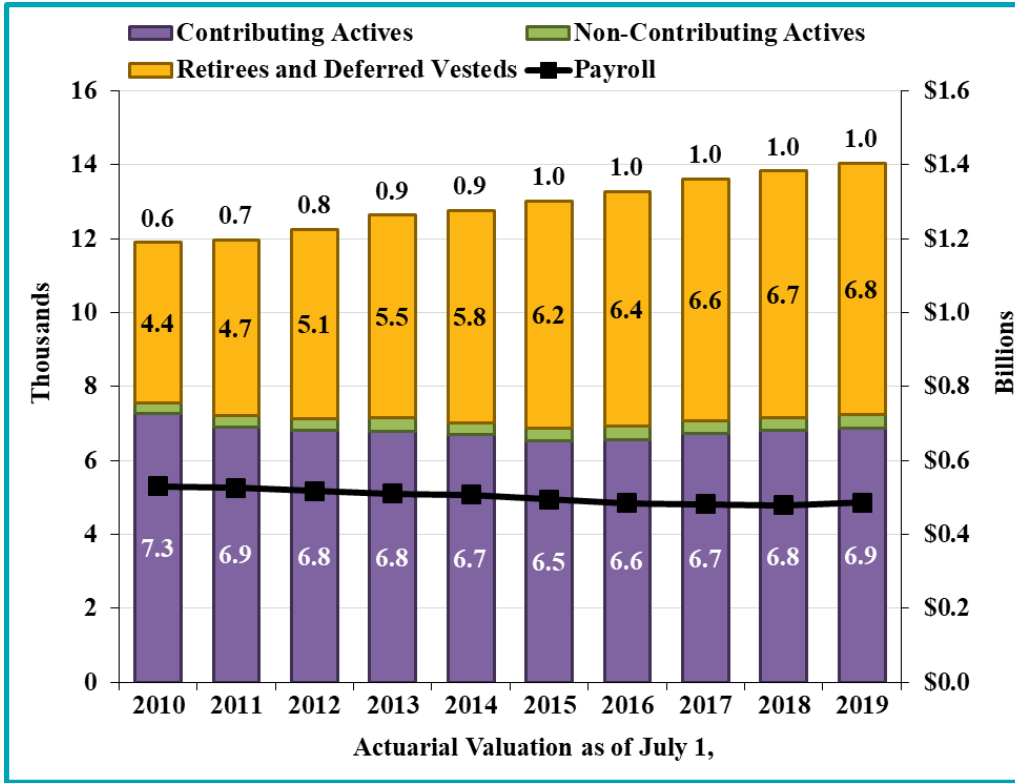
With the current inactive-to-active ratio of around 1.0 to 1.2, there are almost as many active members as inactive members implying that the risk factors for both the State and Local employers are not at a high level relative to other mature pension systems.

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.

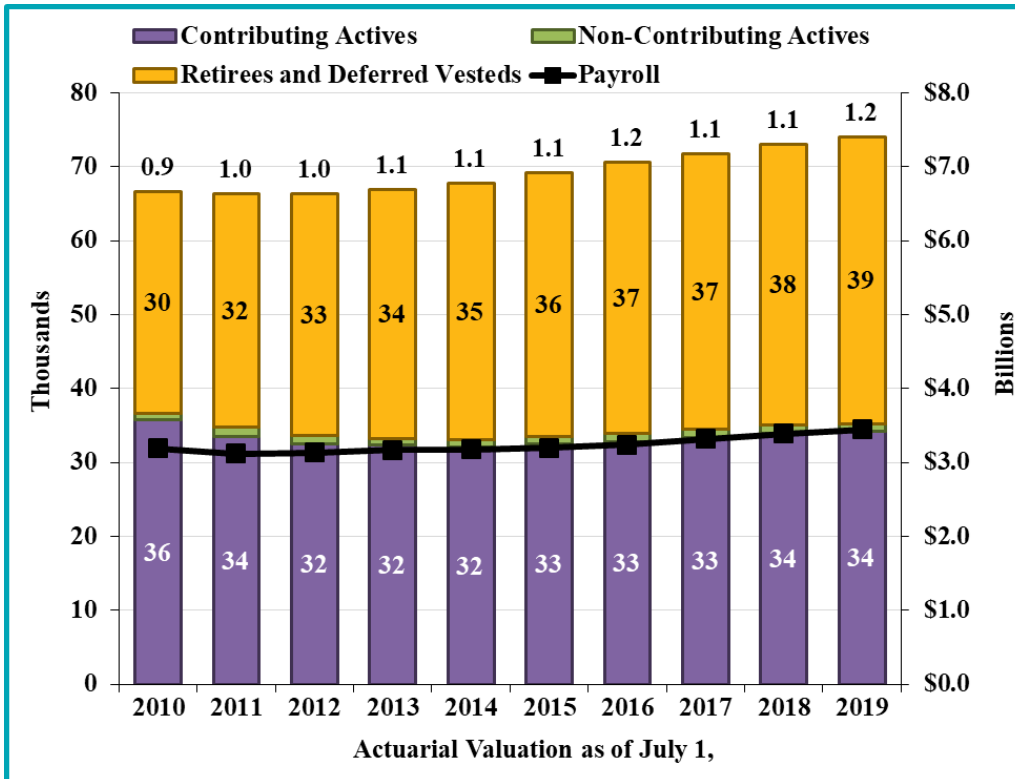
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State



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 which excludes investment return has been negative. This illustrates that contributions have not been sufficient to cover benefits and expenses in any years over the past decade. A major implication of 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.

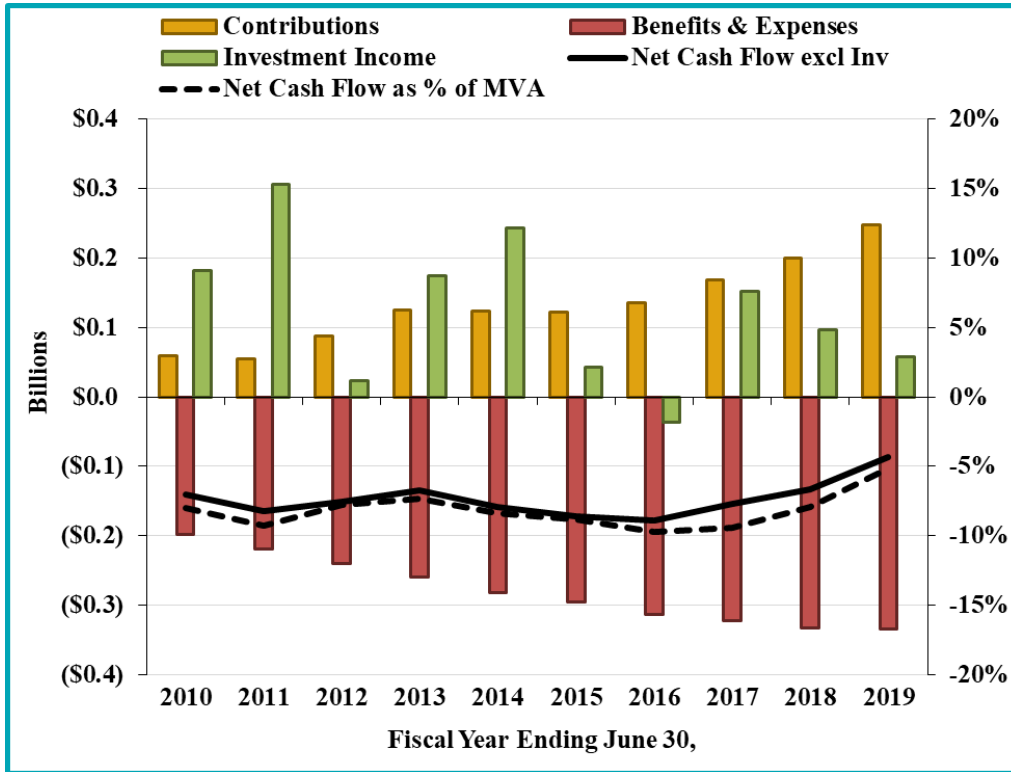
The black dotted line shows the net cash flow as a percent of the market assets and goes with the axis on the right.

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 2019 the negative cash flow improved with a net -5.1% which implies the assumed investment return if achieved at 7.30% will cover this difference.

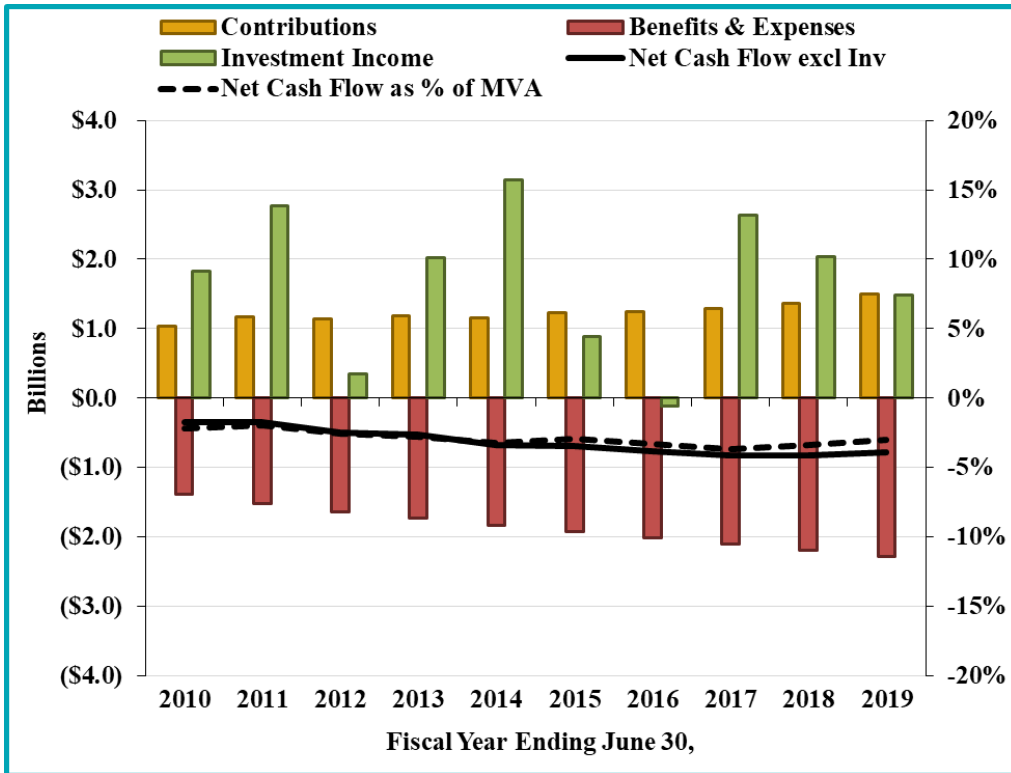
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State



Local Employers



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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 2020 and 2021, 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.

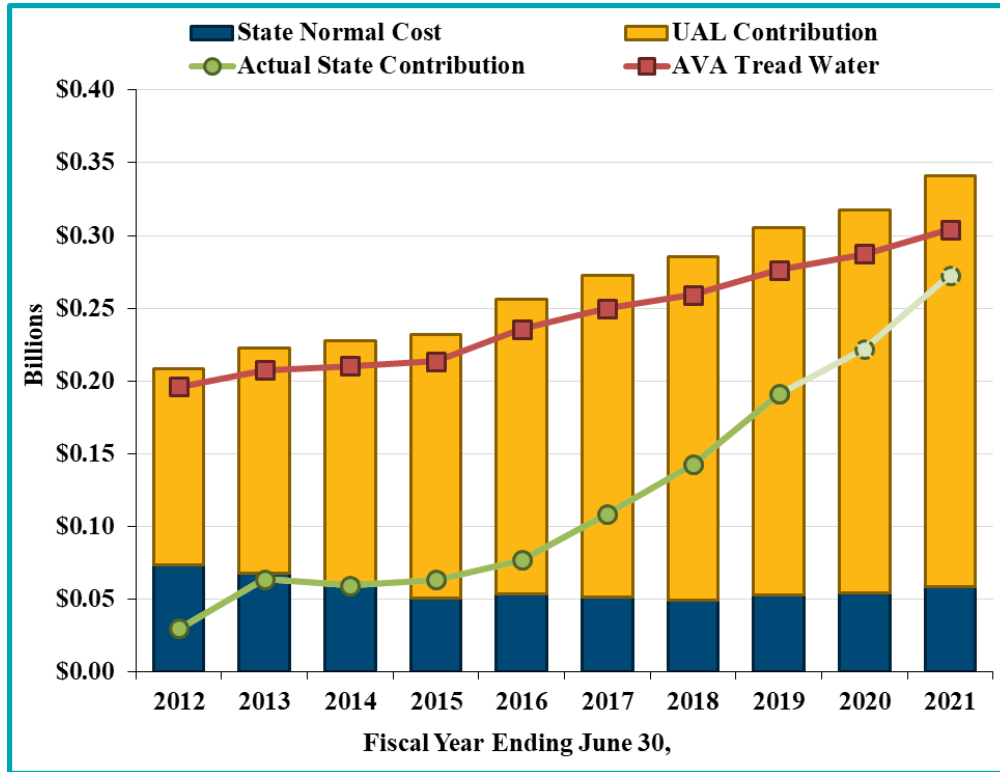
The graph for State shows that not only has the State been making contributions less than required by Statute, but that the State contributions are significantly below the tread water line. When contributions are lower than the normal cost plus interest on the UAL, the unfunded actuarial liability is expected to grow from one year to the next. For FYE 2020 and 2021, the State is expected to appropriate 70% and 80% of the Statutory contribution, respectively.

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. In FYE 2020, the actual contribution for the first time is expected to exceed the AVA tread water level.

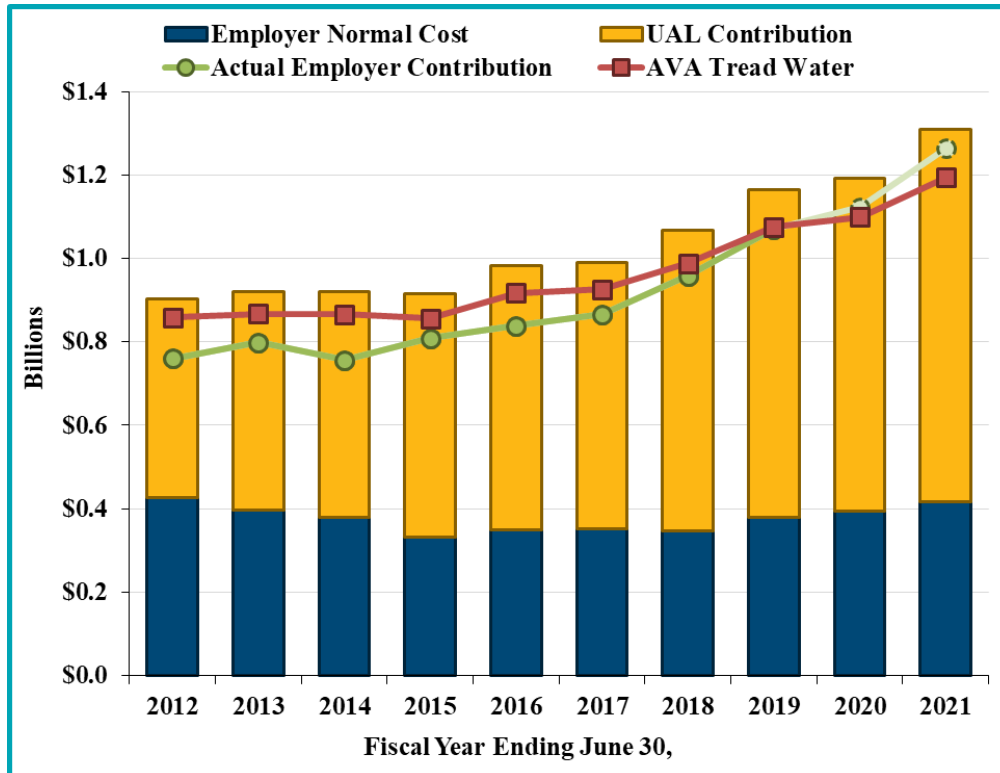
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State



Local Employers



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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 charts 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 remain level over the next few years, as the State appropriates less than the Statutory amount and the valuation investment rate of return assumption decreases from 7.30% to 7.00%, before beginning a slow but steady increase to 98% by 2049.

The Local employers' funded ratio on an Actuarial Value of Assets basis is projected to drop slightly over the next few years, as the State appropriates less than the Statutory State-paid Local obligation and the valuation investment rate of return assumption decreases from 7.30% to 7.00%, before beginning a slow but steady increase to 94% by 2049.

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The funded ratio for the State increases faster than the Local employers' portion and reaches 98% compared to 94% for Local employers by the end of the projection period because of the 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 gold and green outlines show the full Statutory contributions for the State and Local employers, respectively, with the shaded portion showing the anticipated appropriated amount.

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 80% of the Statutory contribution in FYE 2021, and increases the percent by 10% a year, until reaching 100% of the Statutory contribution beginning with FYE 2023. The appropriated State and Local employer contributions and the member contributions are shown in dollar amounts.

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 contributions fall below the solid black line, as is the case for FYE 2021 for State, the UAL grows and the funded ratio falls. When the contributions exceed the solid line, as is the case beginning in FYE 2022 for State and in all years for Local employers, the UAL decreases and the funded ratio increases.

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

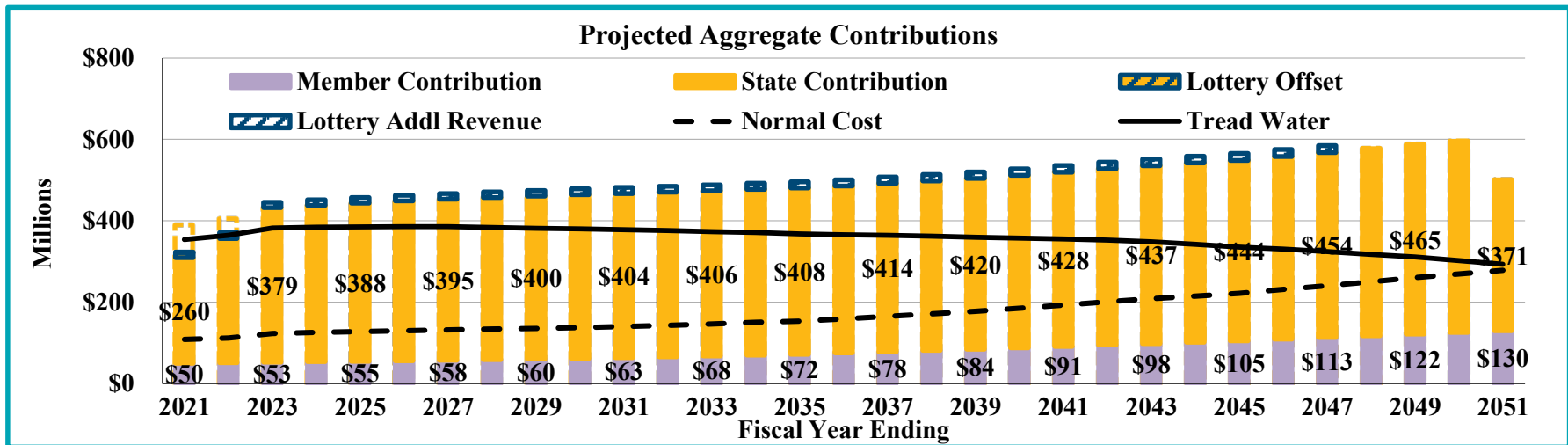
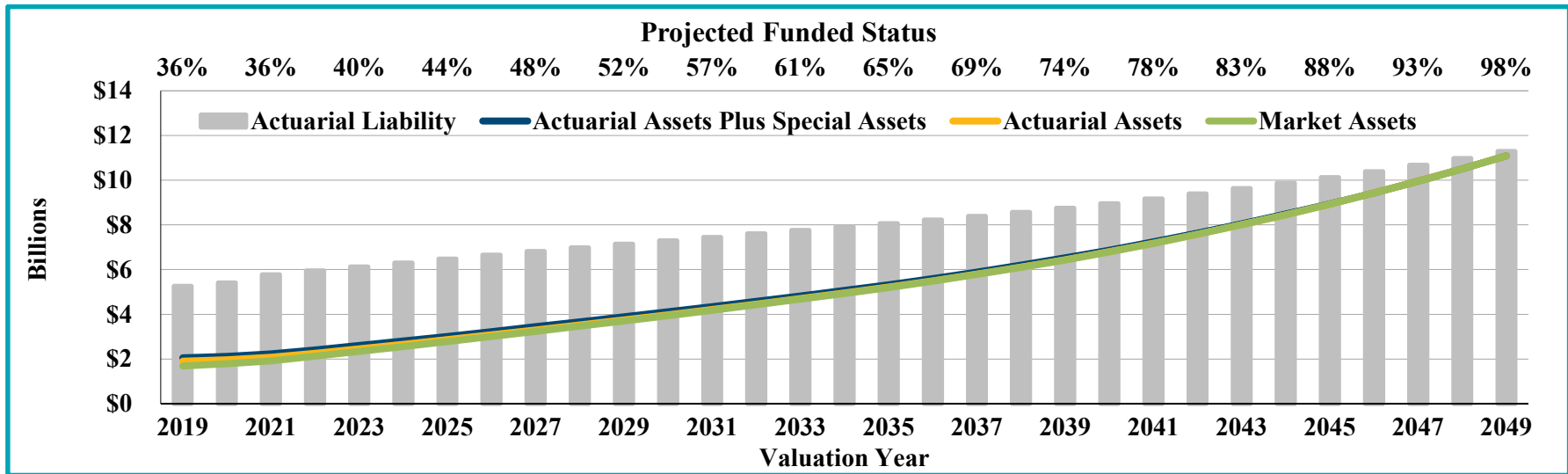
The Local employers' contributions increase steadily through FYE 2023 as the State appropriates less than the Statutory State-paid Local obligation and the valuation investment rate of return assumption decreases from 7.30% to 7.00%. Thereafter, the Local employers' and the State-paid Local contributions gradually increase.

POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
 JULY 1, 2019 ACTUARIAL VALUATION

SECTION I – BOARD SUMMARY

Baseline: 7.0% return for all years

State

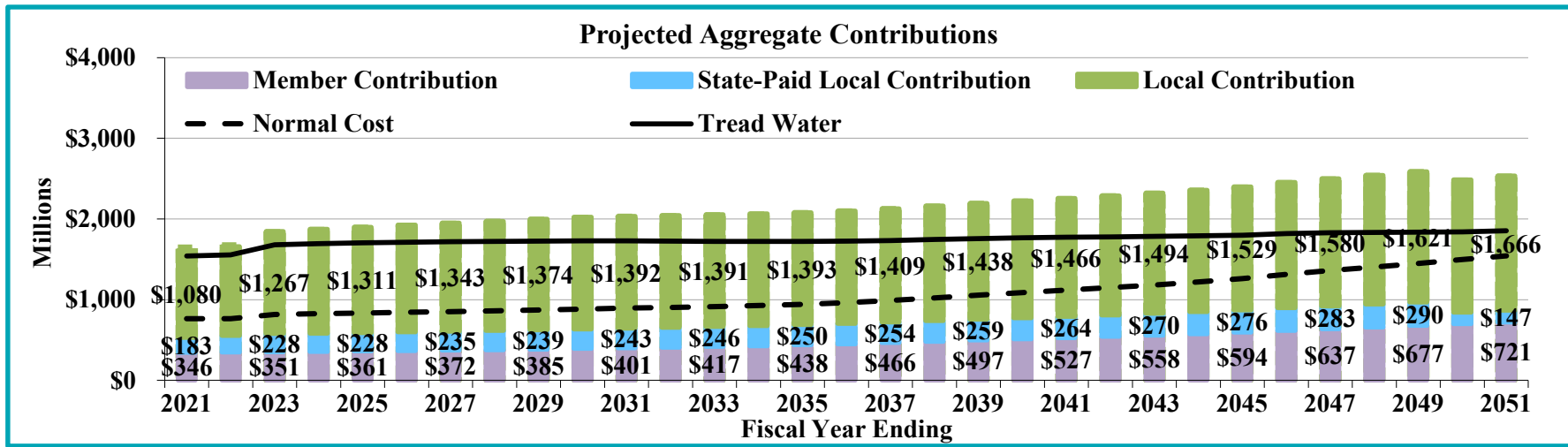
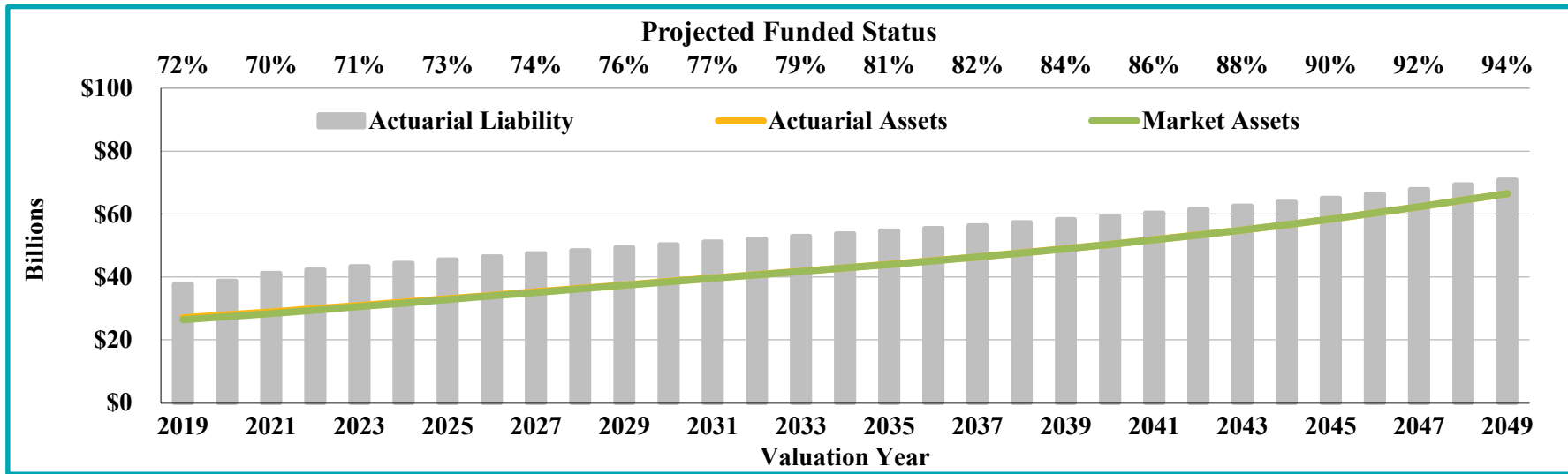


POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
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SECTION I – BOARD SUMMARY

Baseline: 7.0% return for all years

Local Employers



POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
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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.

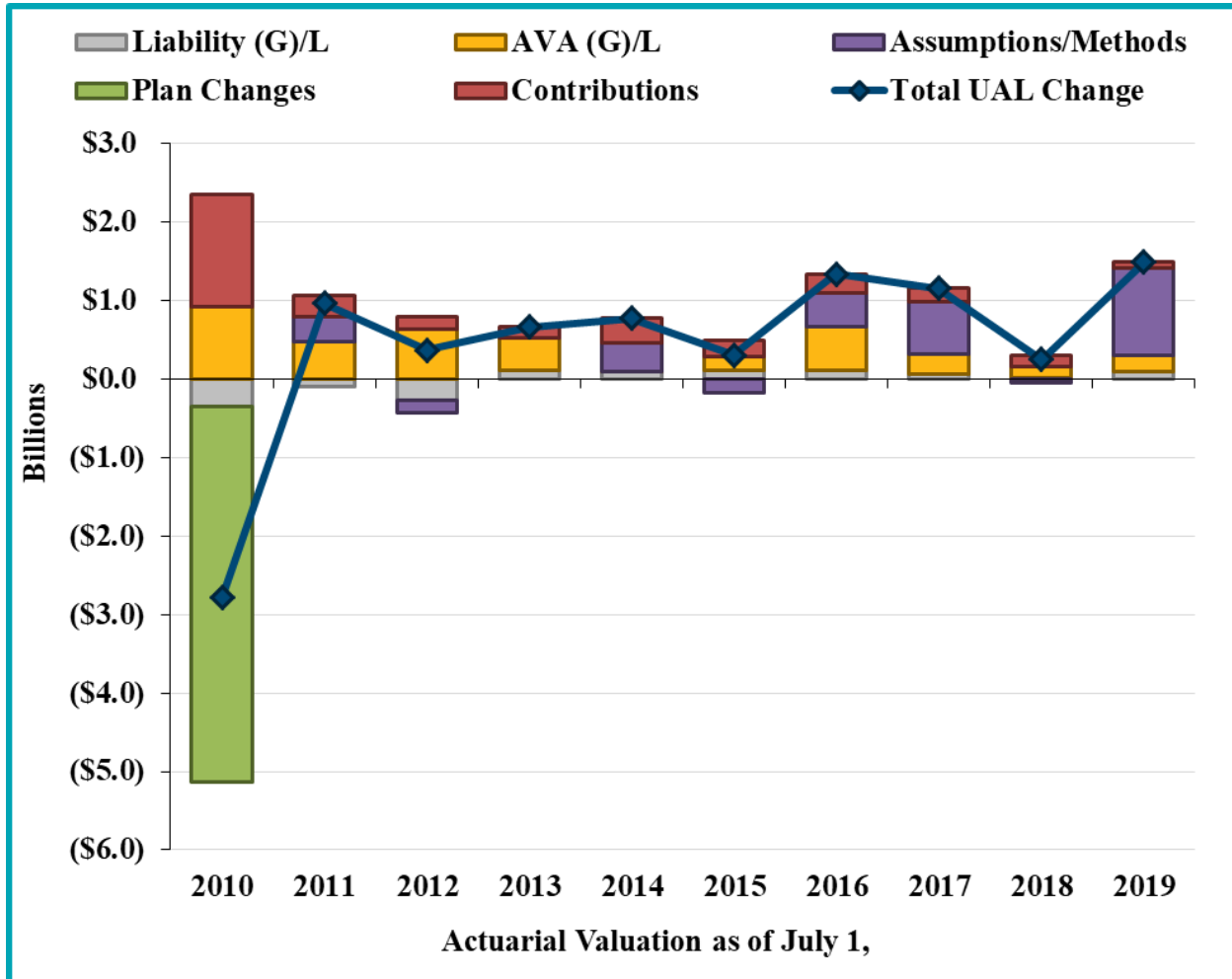
The chart below shows the components of changes in the Unfunded Actuarial Liability (UAL) for the total System (State and Local employers combined) over the last 10 years, including investment gains and losses on the Actuarial Value of Assets, liability gains and losses, assumption and plan changes, 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 10 years.

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SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

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 2010-2019 for the Total System



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Discount Rate	8.25%	7.95%	7.90%	7.90%	7.90%	7.90%	7.65%	7.50%	7.50%	7.30%	
Source											
AVA Investment (G)/L	\$ 919.7	\$ 468.7	\$ 640.4	\$ 416.7	\$ 8.6	\$ 187.1	\$ 558.2	\$ 259.9	\$ 154.3	\$ 204.7	\$3,818.4
Liability (G)/L	(347.6)	(90.1)	(279.1)	102.0	85.4	101.6	110.7	59.0	7.0	90.9	(160.1)
Assumptions/Methods	0.0	317.7	(150.6)	0.0	359.9	(179.5)	432.2	657.6	(53.9)	1,121.5	2,505.0
Plan Changes	(4,789.9)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(4,789.9)
Contributions ¹	1,429.3	268.0	154.3	138.8	319.8	197.3	237.6	177.9	142.5	69.9	3,135.4
Net UAL Change	\$ (2,788.4)	\$ 964.4	\$ 364.8	\$ 657.4	\$ 773.7	\$ 306.6	\$1,338.7	\$1,154.5	\$ 250.0	\$1,487.1	\$4,508.7

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

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SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

On a smoothed asset basis, the investment gains and losses (gold bars) from 2010 to 2019 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 \$3.8 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, decreasing the UAL by approximately \$0.2 billion over the 10-year period.

Assumption and method changes (purple bars) over the last 10 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.

Plan changes (green bars) over the last 10 years have decreased the UAL by approximately \$4.8 billion. The significant plan change that occurred in 2010 was the suspension of future COLAs.

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 \$3.1 billion over the last 10 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.

Plan Maturity Measures

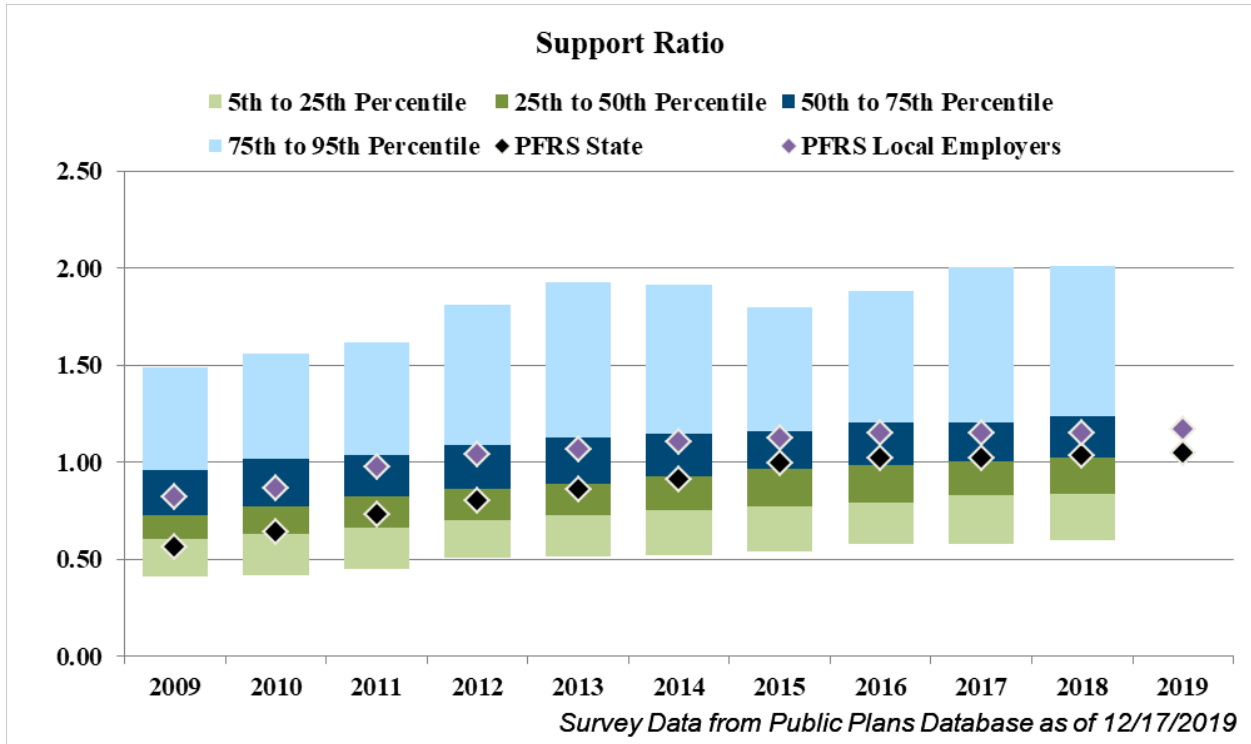
The future financial condition of a mature pension plan is more sensitive to each of the risks identified above than a less mature plan. Before assessing each of these risks, it is important to understand the maturity of the plan compared to other plans and how the maturity has changed over time.

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

SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

Inactives per Active (Support Ratio)

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



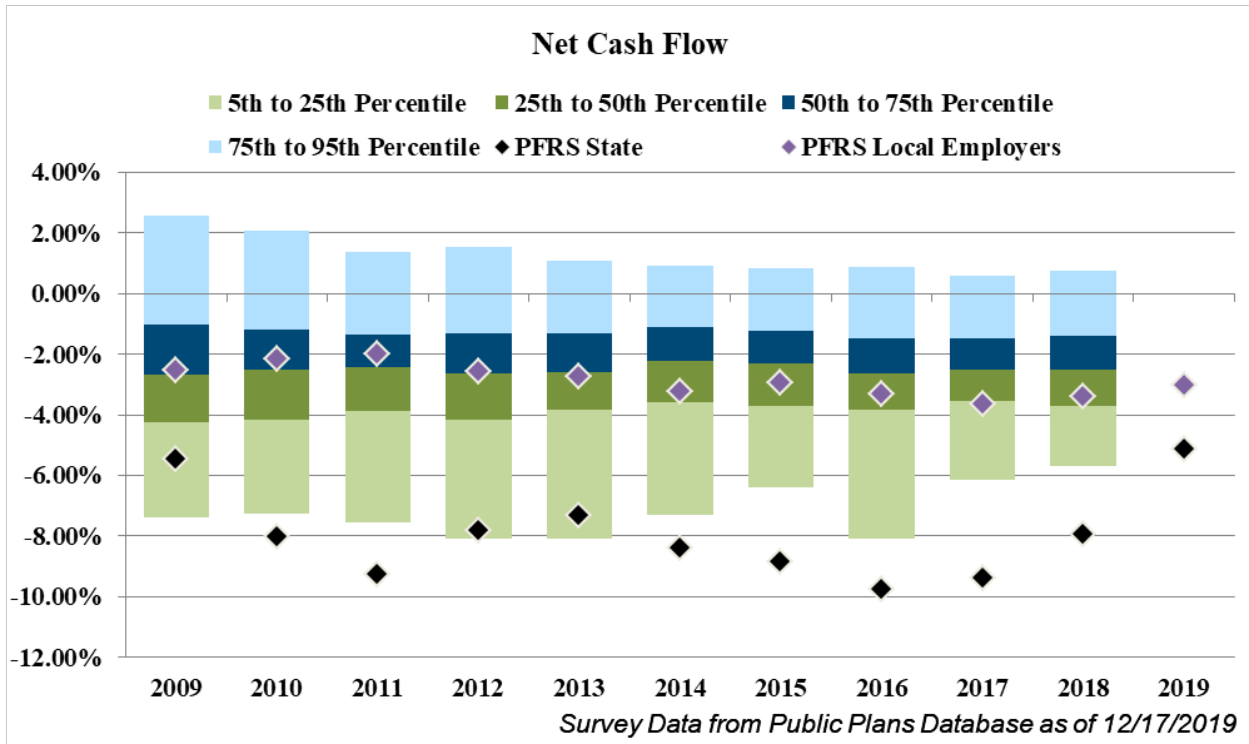
The chart above shows the distribution from the 5th to 95th percentile of support ratios for the plans in the Public Plans Database. The diamonds show how State (black) and Local employers (purple) compare dating back to 2009. The support ratio increased following the Great Recession, but has since stabilized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



The charts above show the distribution from the 5th to 95th 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. Since the Great Recession, the State has been at or below the 5th percentile compared to the database of other public plans in terms of negative cash flow as a percentage of assets. Since 2012, the net cash flow for PFRS Local employers has declined from the 50th percentile of plans to the 25th percentile.

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, 2019.

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SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

For stress testing purposes, we developed six hypothetical scenarios to illustrate the impact actual investment returns may have on future funded status and contribution amounts. The scenarios are balanced between positive and negative scenarios and are based on a lognormal distribution of one and five year expected returns as shown in the table below using the capital market assumptions from the New Jersey Division of Investments (Geometric return of 7.07%, standard deviation of 11.89%).

Distribution of Expected Average Annual Returns		
Percentile	1 Year	5 Year
5%	-10.7%	-1.3%
25%	-0.6%	3.6%
50%	7.1%	7.1%
75%	15.3%	10.7%
95%	28.3%	16.1%

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.

FYE	Theoretical Scenarios					
	1-Yr Shock		5-Yr Moderate		5-Yr Significant	
	Neg	Pos	Neg	Pos	Neg	Pos
2020	-10.7%	28.3%	3.6%	10.7%	-1.3%	16.1%
2021	7.0%	7.0%	3.6%	10.7%	-1.3%	16.1%
2022	7.0%	7.0%	3.6%	10.7%	-1.3%	16.1%
2023	7.0%	7.0%	3.6%	10.7%	-1.3%	16.1%
2024	7.0%	7.0%	3.6%	10.7%	-1.3%	16.1%
2025+	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.

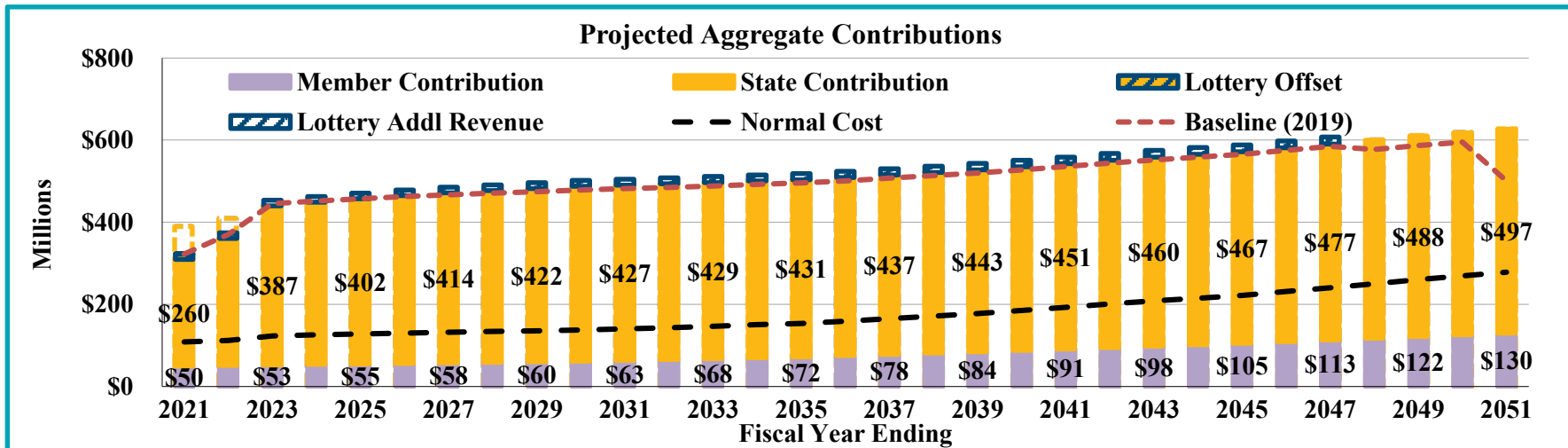
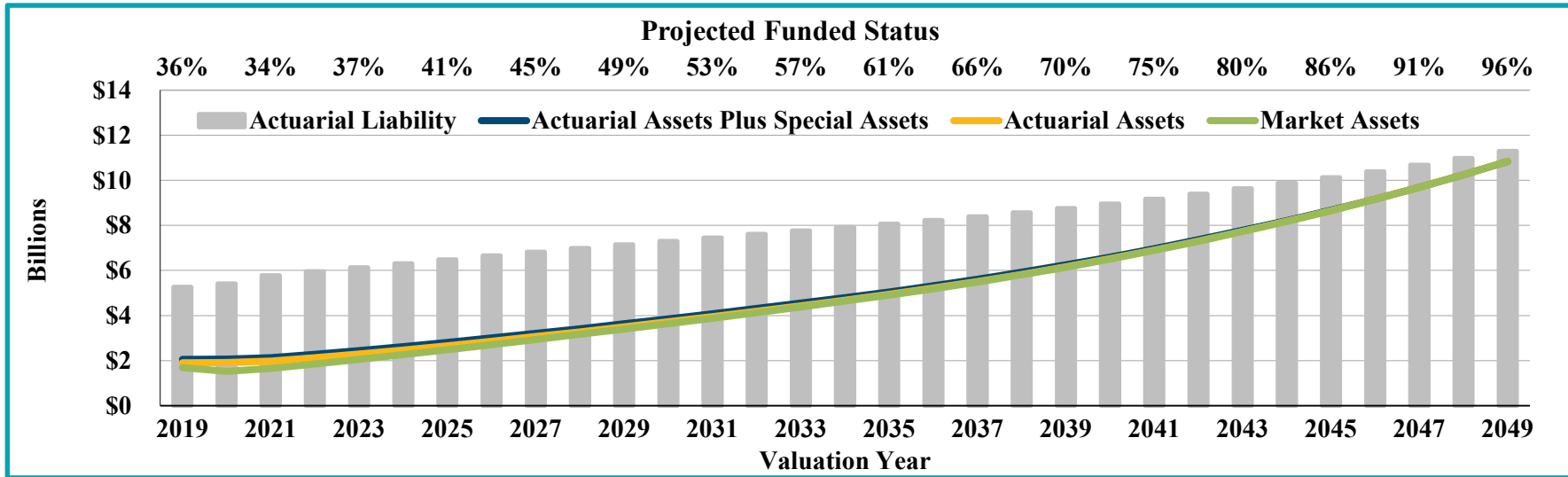
We note that when asset returns are high, excess assets may be used to offset employer costs. We have not shown the implications of a surplus and assume that the State and Local employers will always contribute the normal cost.

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.

POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
 JULY 1, 2019 ACTUARIAL VALUATION

SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

One-Year Negative Shock Scenario: -10.7% return FYE 2020, 7.0% after
 State

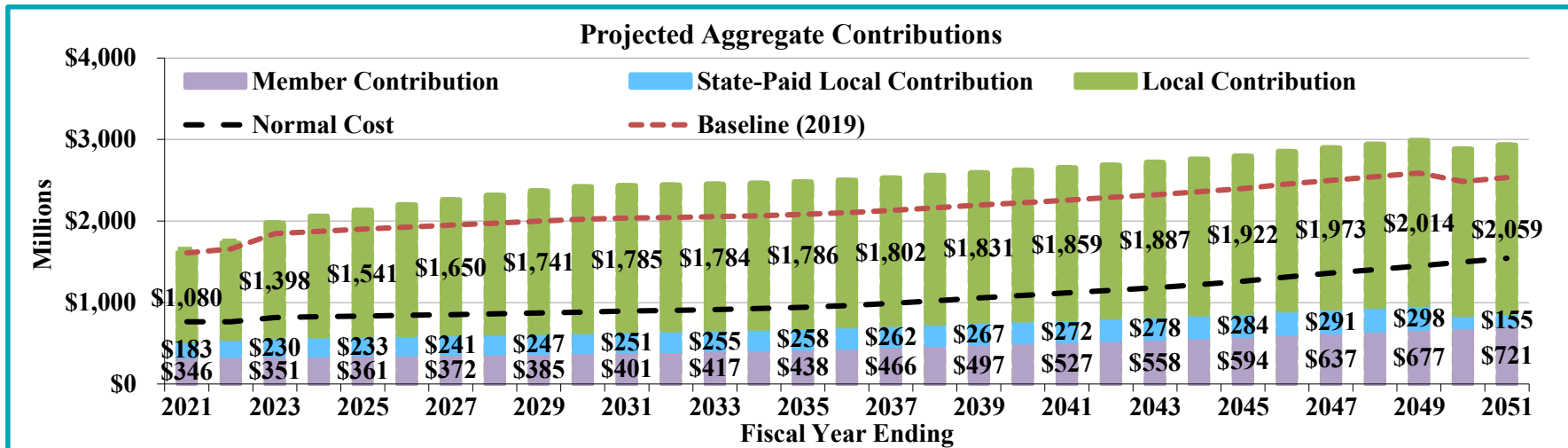
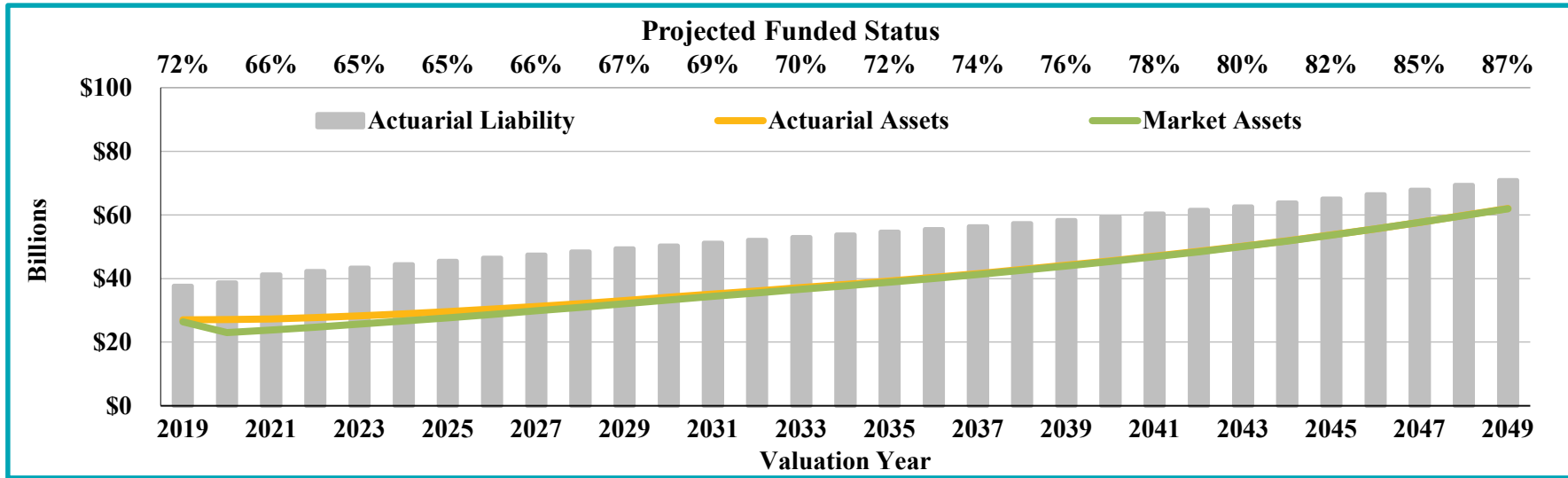


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SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

One-Year Negative Shock Scenario: -10.7% return FYE 2020, 7.0% after

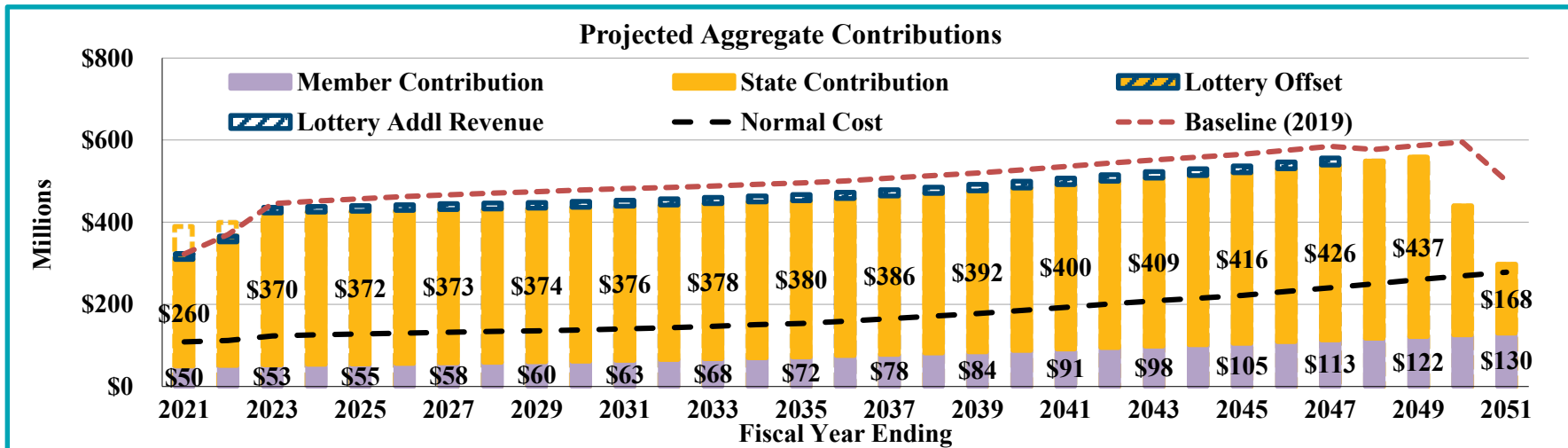
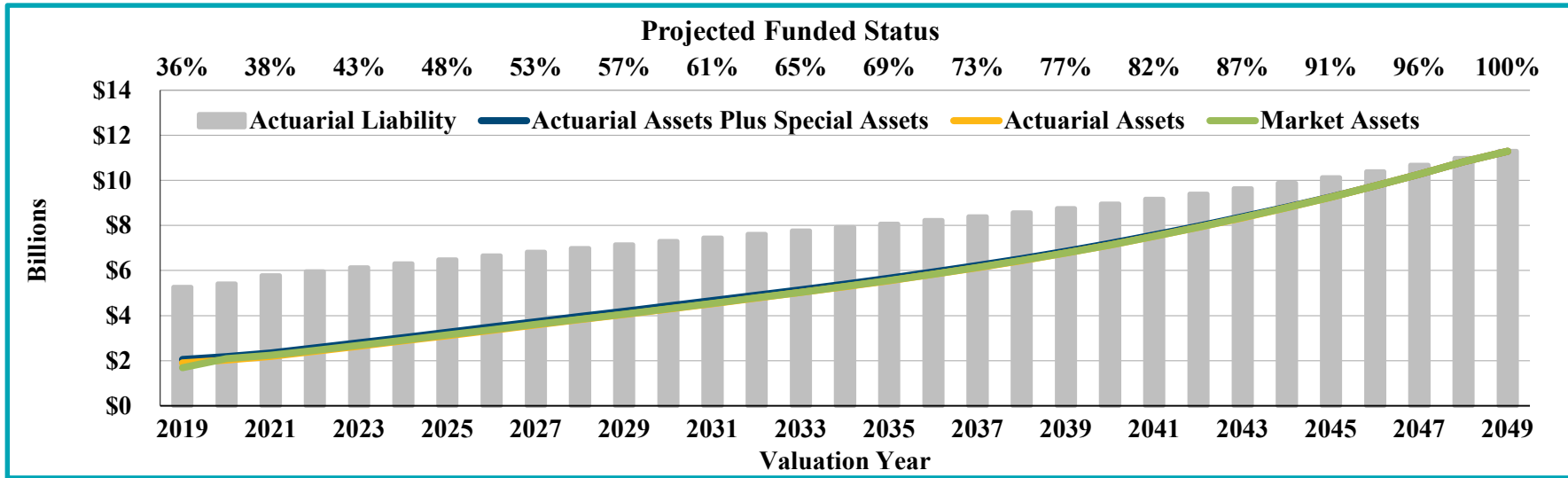
Local Employers



POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
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SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

One-Year Positive Shock Scenario: 28.3% return FYE 2020, 7.0% after
 State

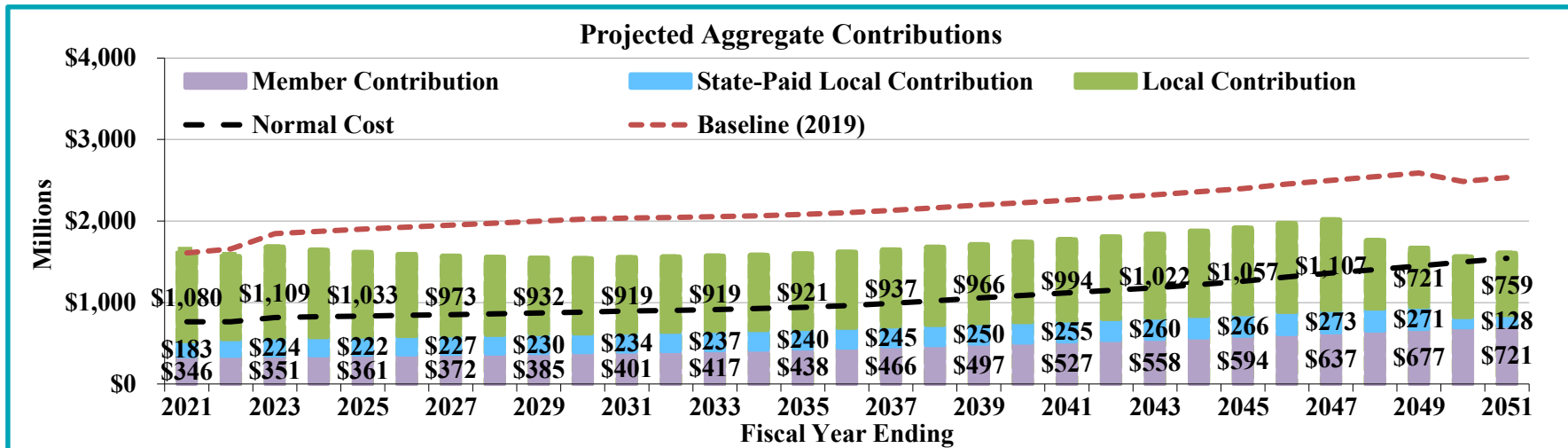
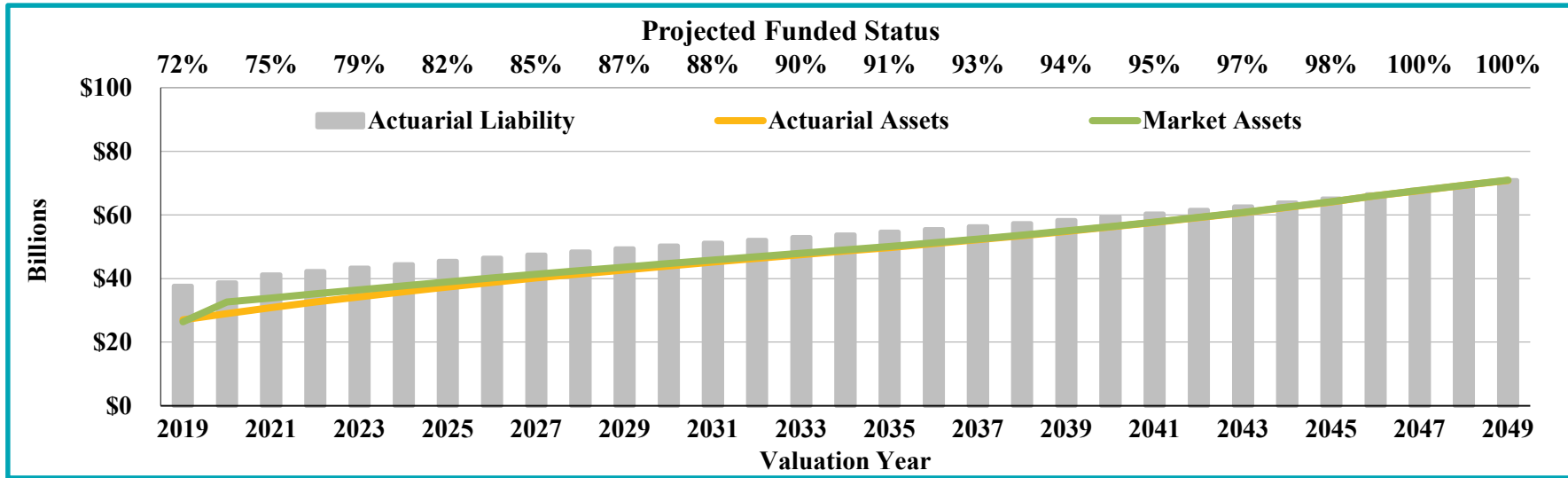


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SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

One-Year Positive Shock Scenario: 28.3% return FYE 2020, 7.0% after

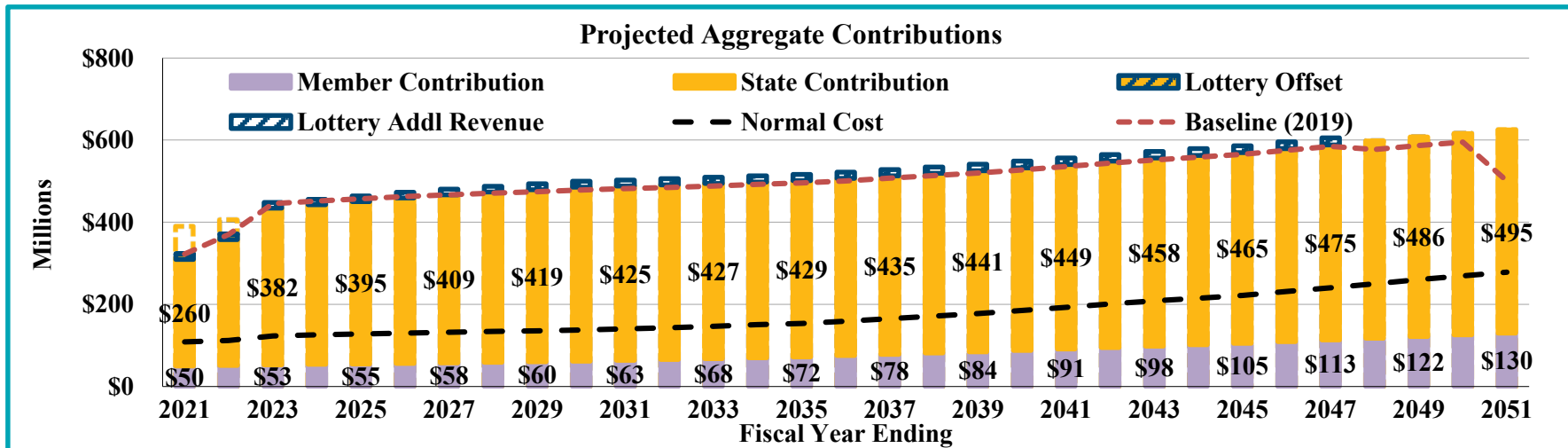
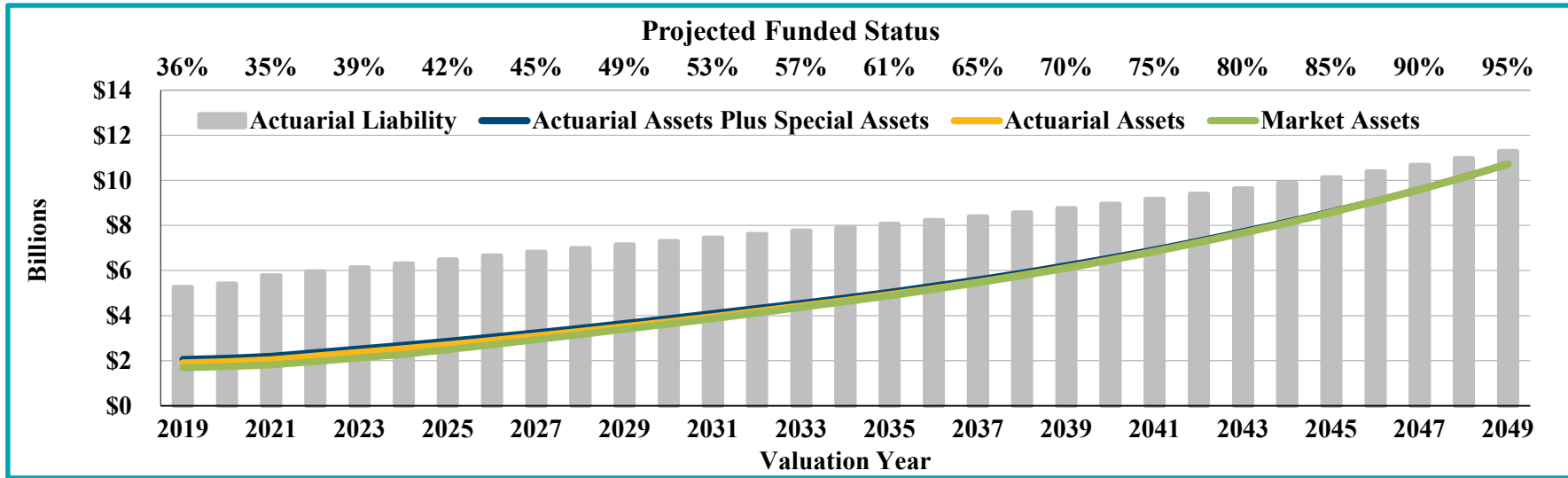
Local Employers



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SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

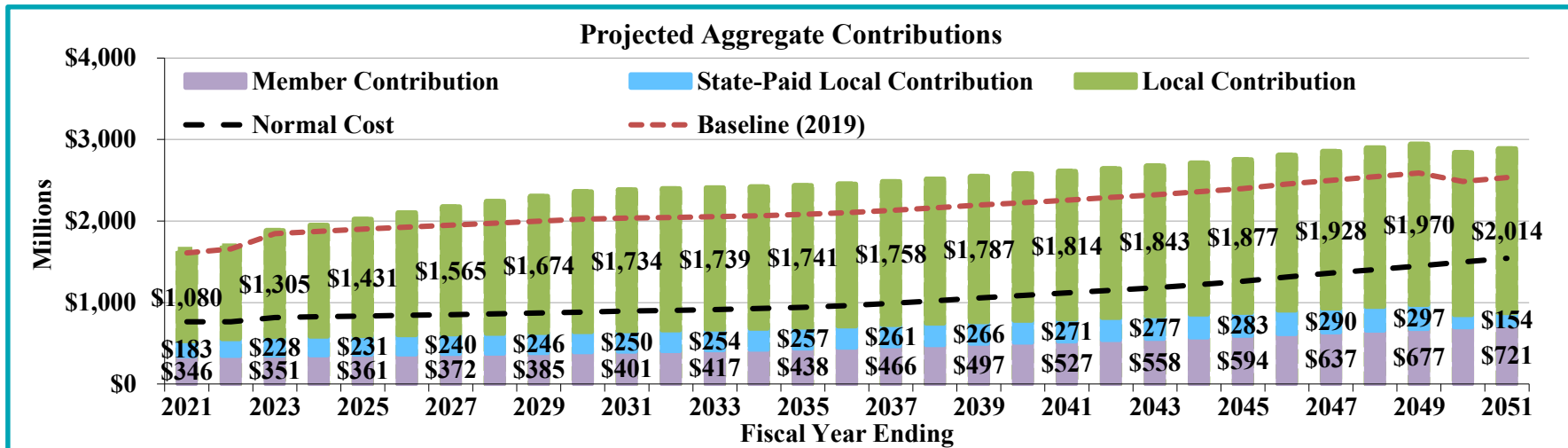
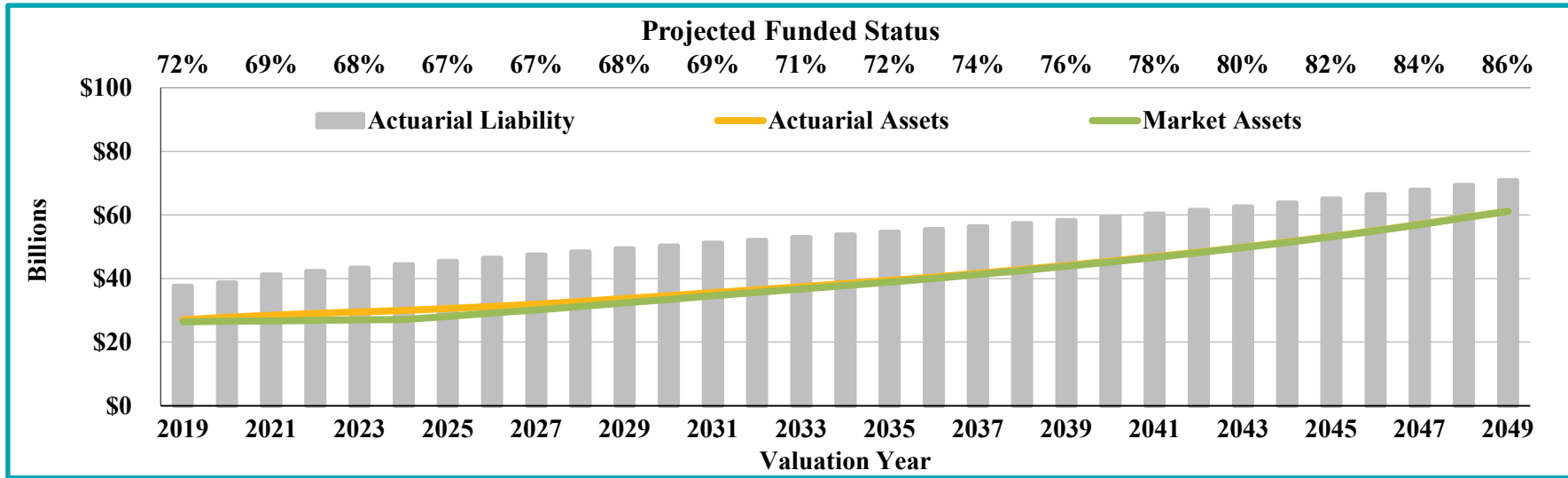
Five-Year Moderate Negative Scenario: 3.6% return FYE 2020-2024, 7.0% after
 State



POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
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SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

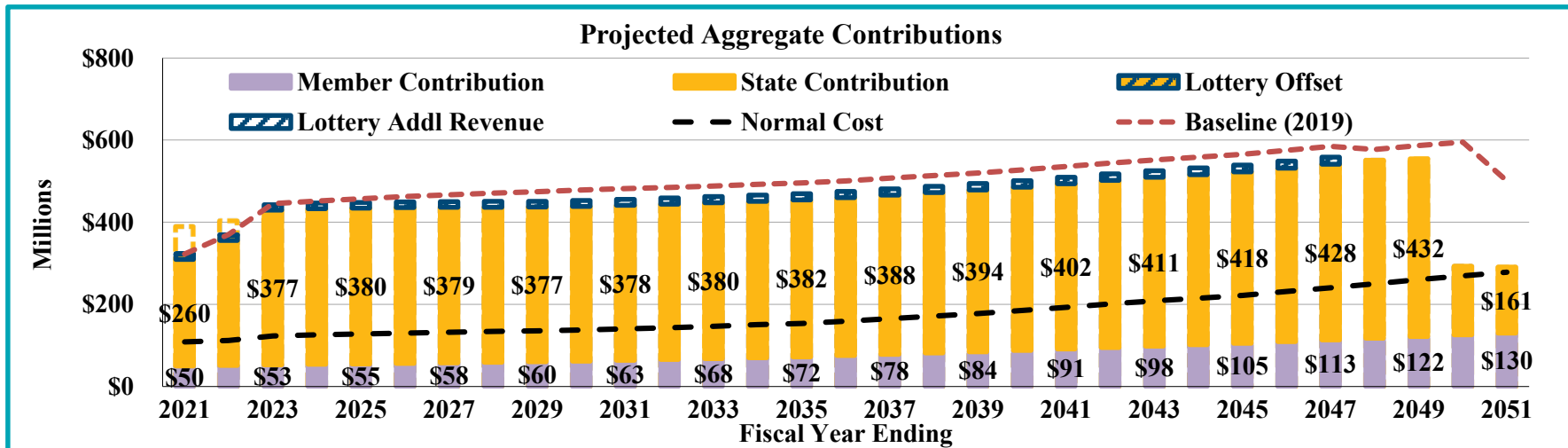
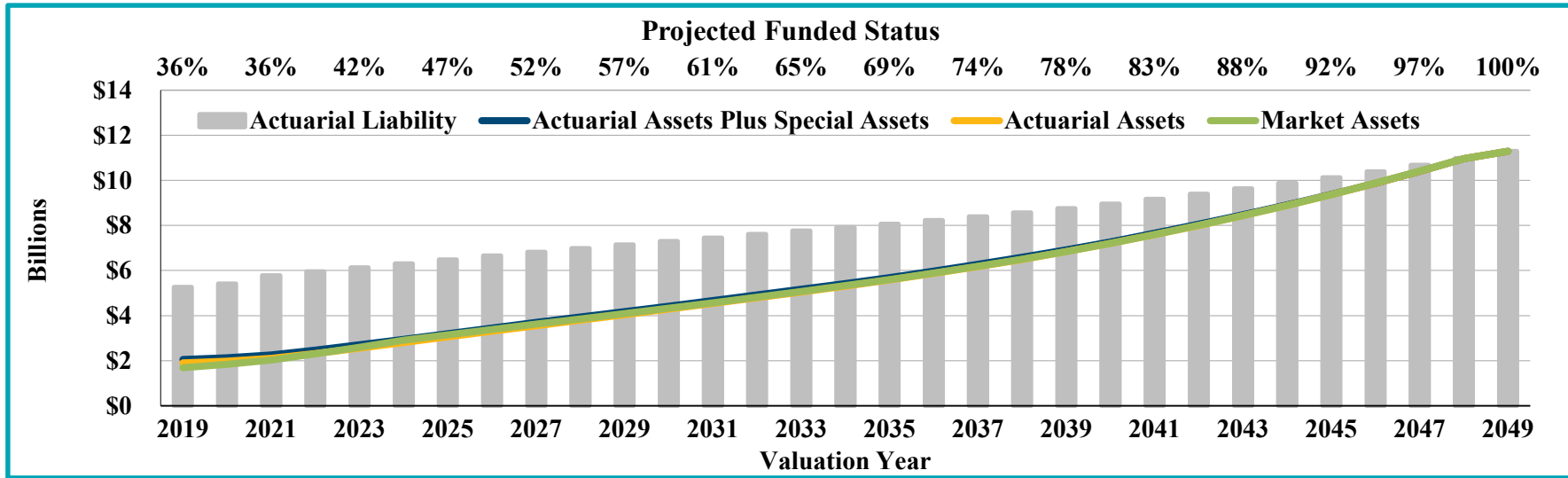
Five-Year Moderate Negative Scenario: 3.6% return FYE 2020-2024, 7.0% after
 Local Employers



POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
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SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

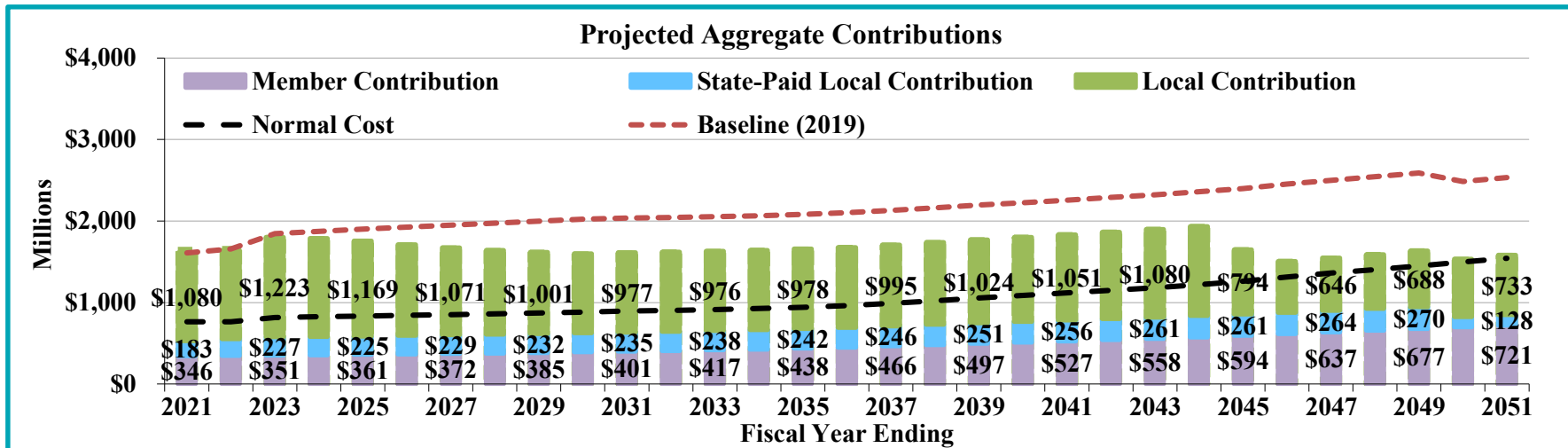
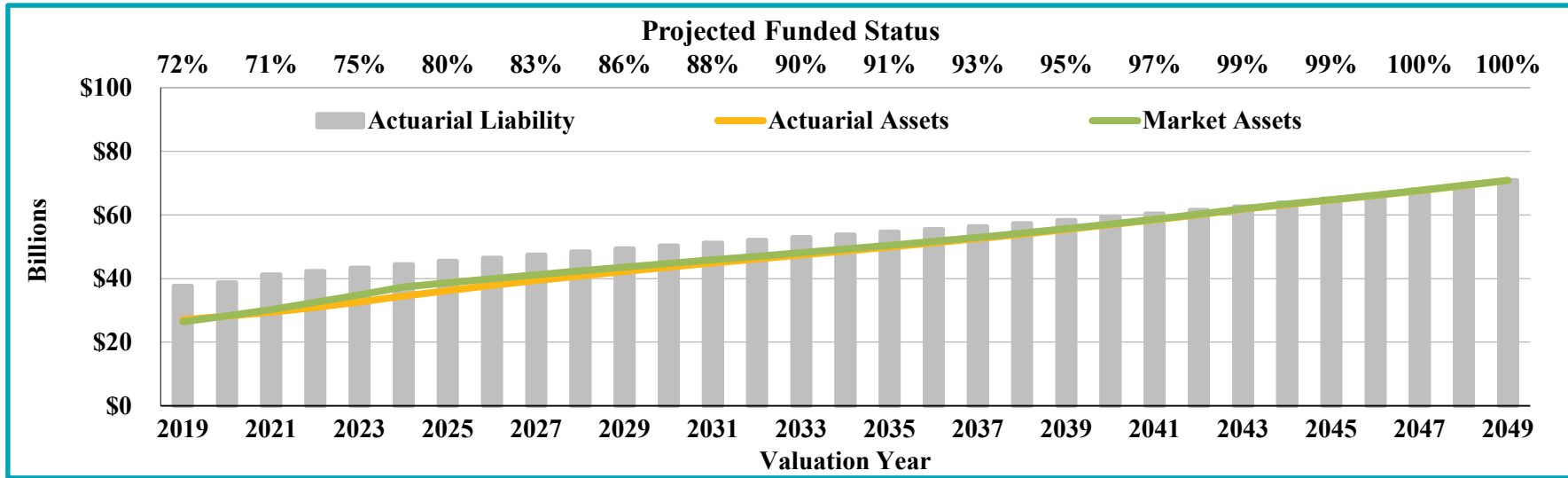
Five-Year Moderate Positive Scenario: 10.7% return FYE 2020-2024, 7.0% after
 State



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SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

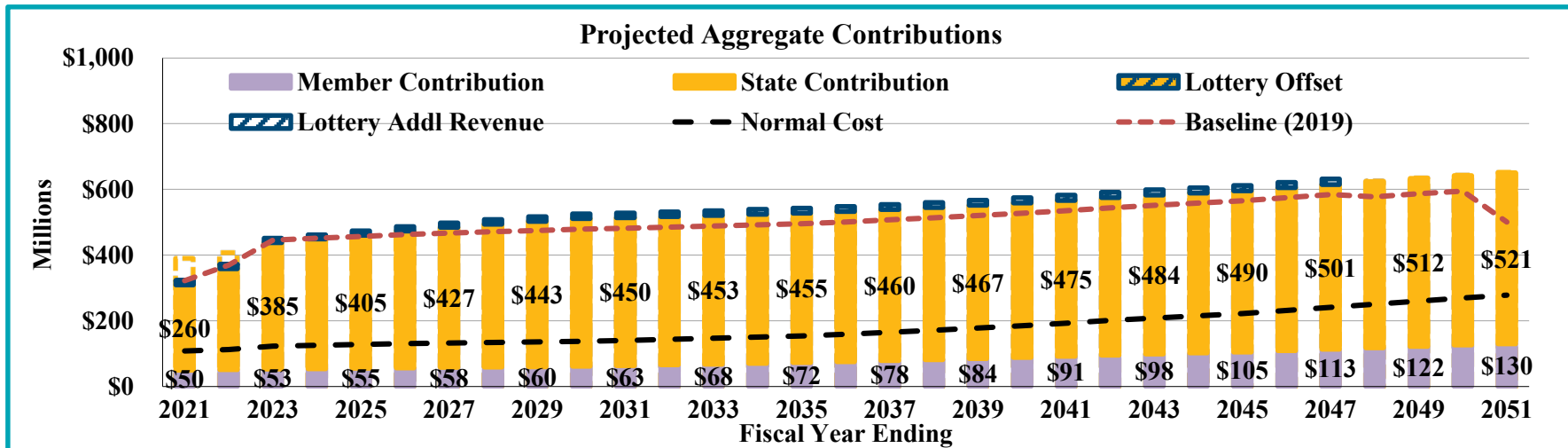
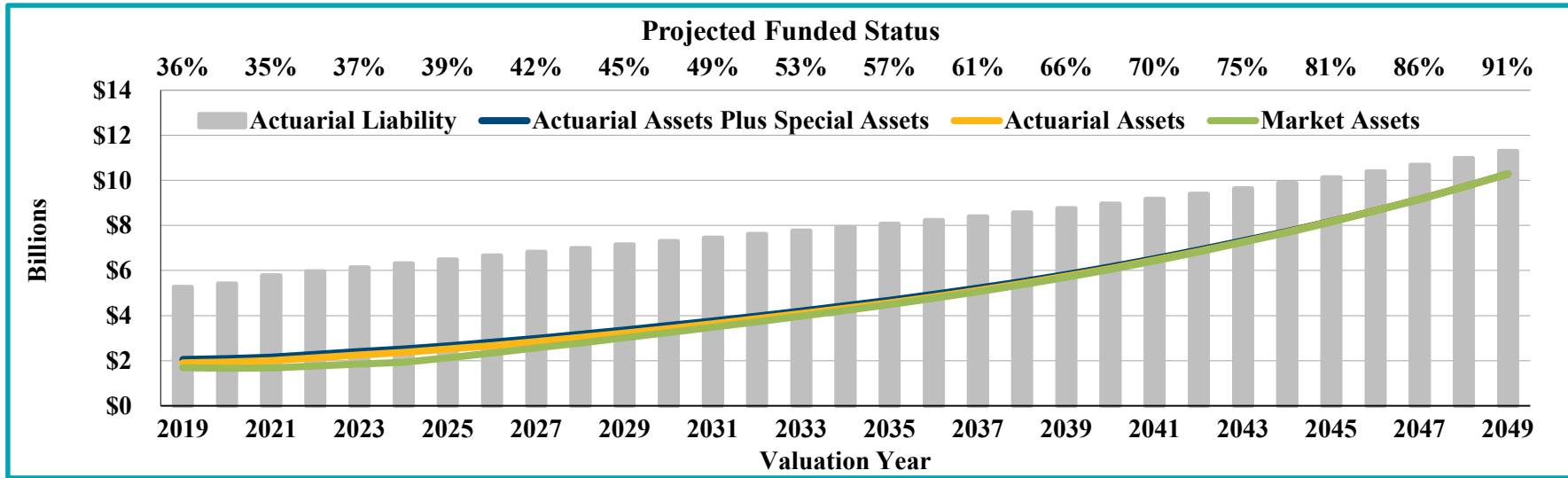
Five-Year Moderate Positive Scenario: 10.7% return FYE 2020-2024, 7.0% after
 Local Employers



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SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

Five-Year Significant Negative Scenario: -1.3% return FYE 2020-2024, 7.0% after
 State

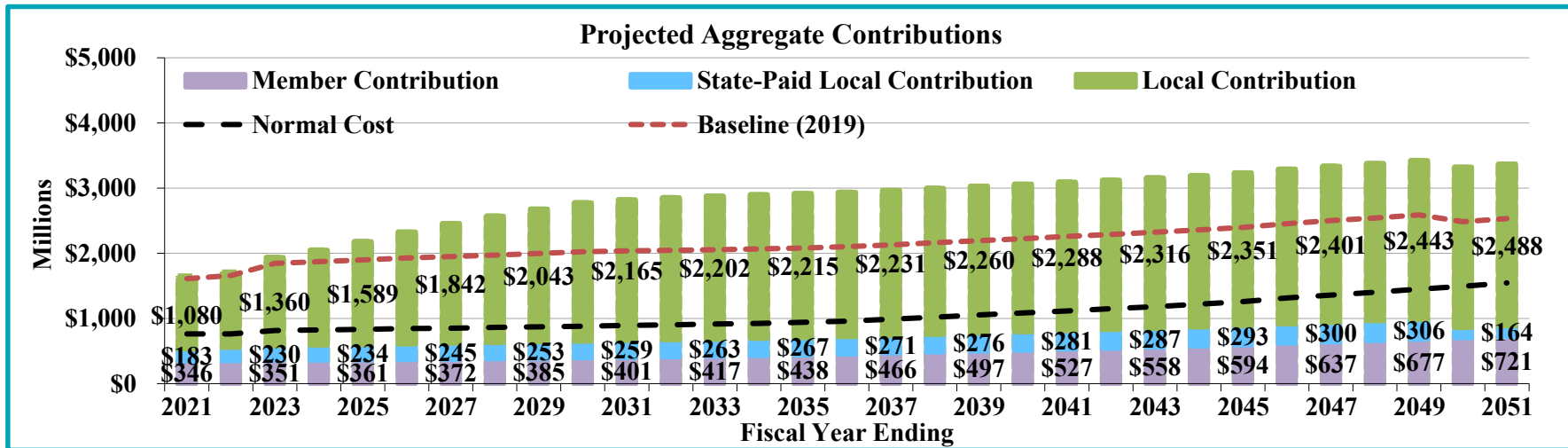
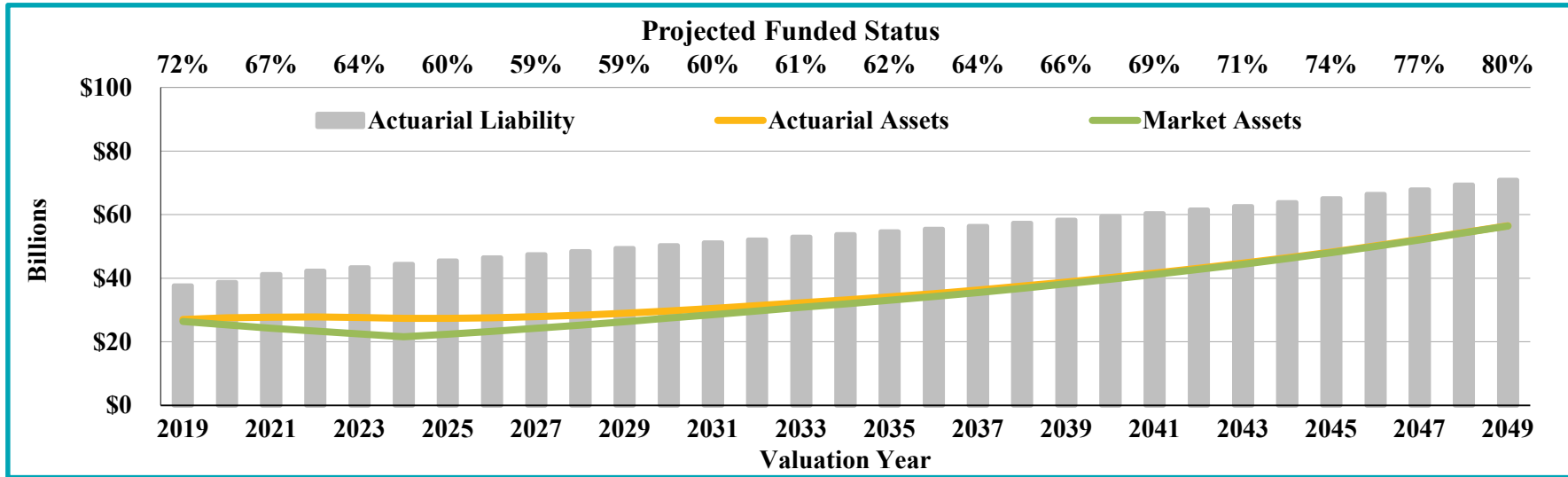


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SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

Five-Year Significant Negative Scenario: -1.3% return FYE 2020-2024, 7.0% after

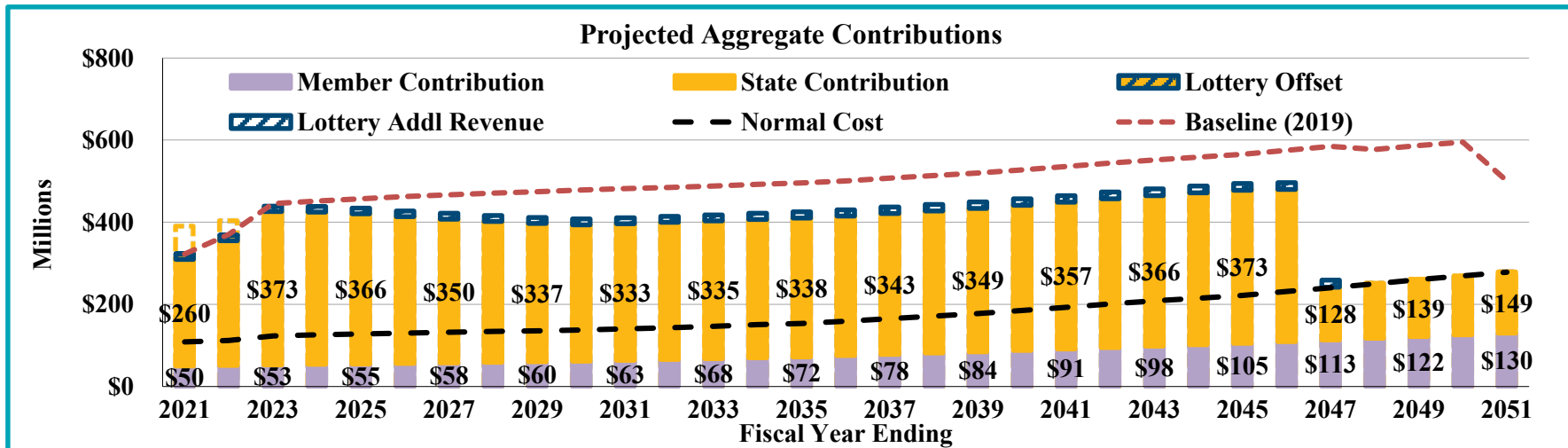
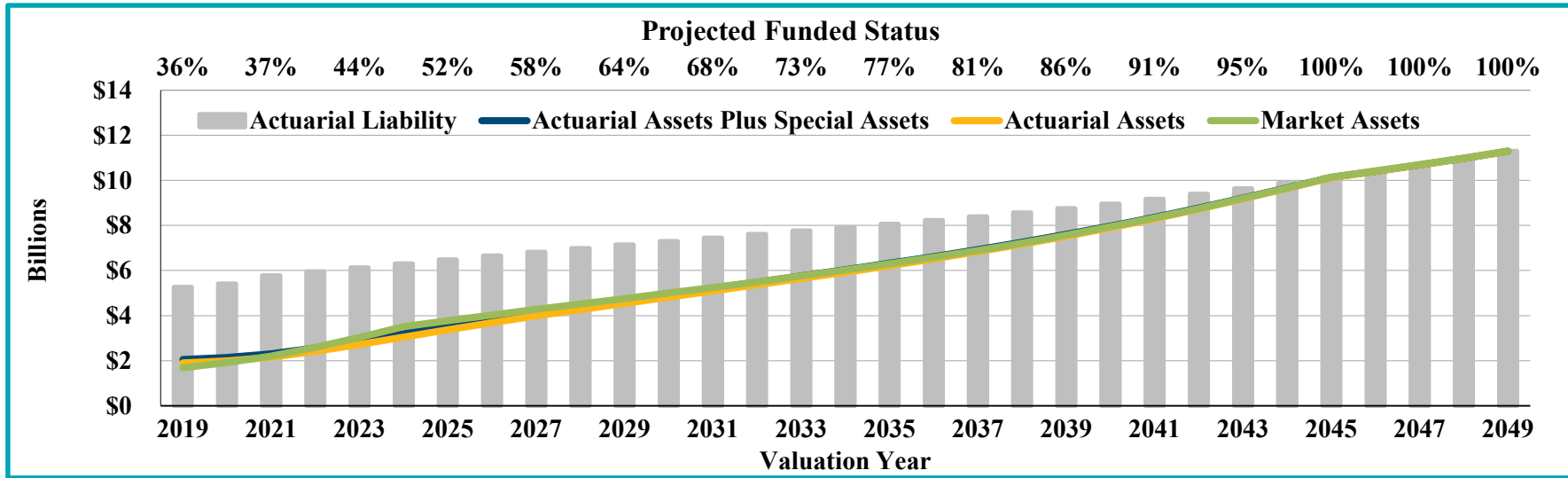
Local Employers



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SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

Five-Year Significant Positive Scenario: 16.1% return FYE 2020-2024, 7.0% after
 State

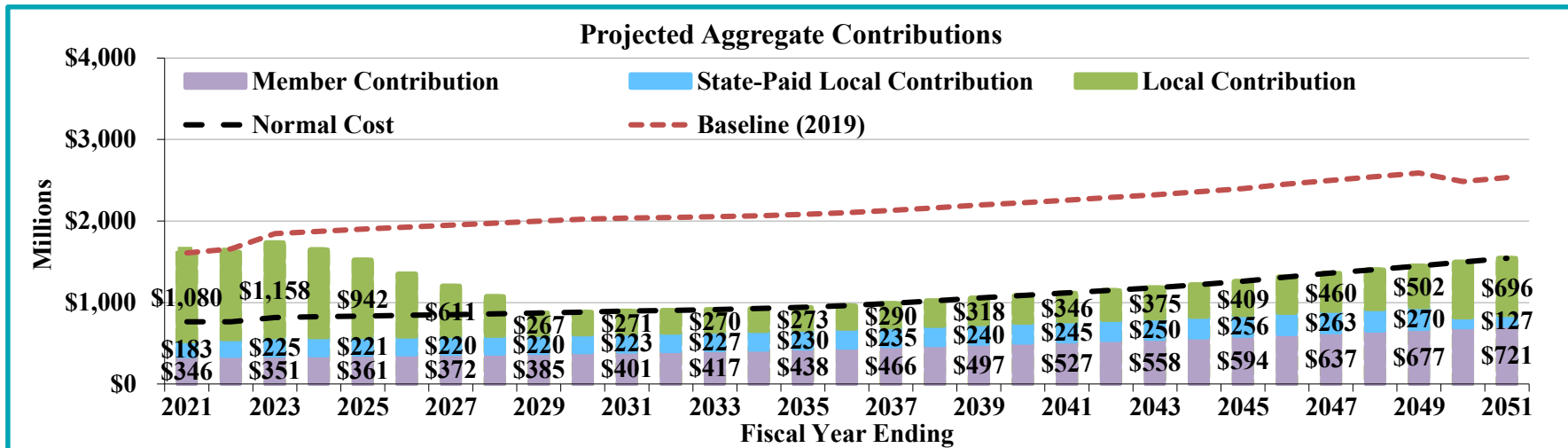
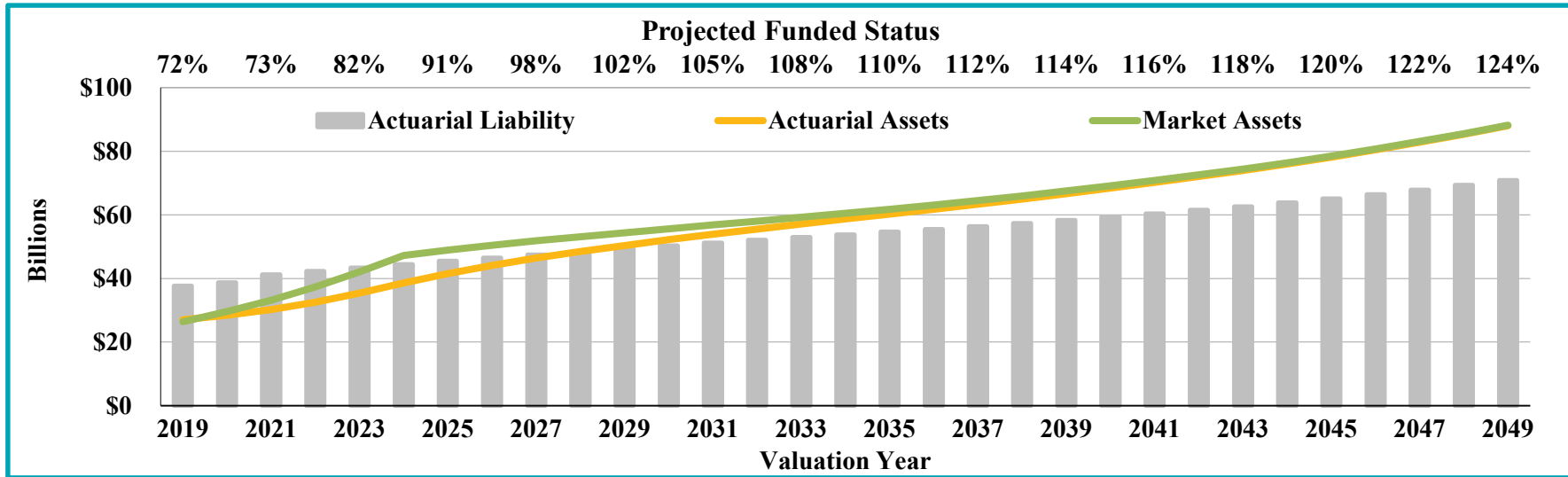


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Five-Year Significant Positive Scenario: 16.1% return FYE 2020-2024, 7.0% after

Local Employers



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SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

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 contribution amounts gradually increase through FYE 2023 as the State is assumed to appropriate an increasing percentage of the Statutory amount and 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 slightly 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 10 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 shows 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 2033 for the various investment return scenarios.

Table II-2 FYE 2033 Contribution Impact (dollar amounts in millions)						
	1-Yr Shock		5-Yr Moderate		5-Yr Significant	
	Neg	Pos	Neg	Pos	Neg	Pos
<u>State</u>						
Amount	\$23	(\$28)	\$21	(\$26)	\$47	(\$71)
Percent	6%	-7%	5%	-6%	12%	-17%
<u>Local Employers</u>						
Amount	\$393	(\$472)	\$348	(\$415)	\$811	(\$1,121)
Percent	28%	-34%	25%	-30%	58%	-81%

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 charts 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, 2020 valuation.

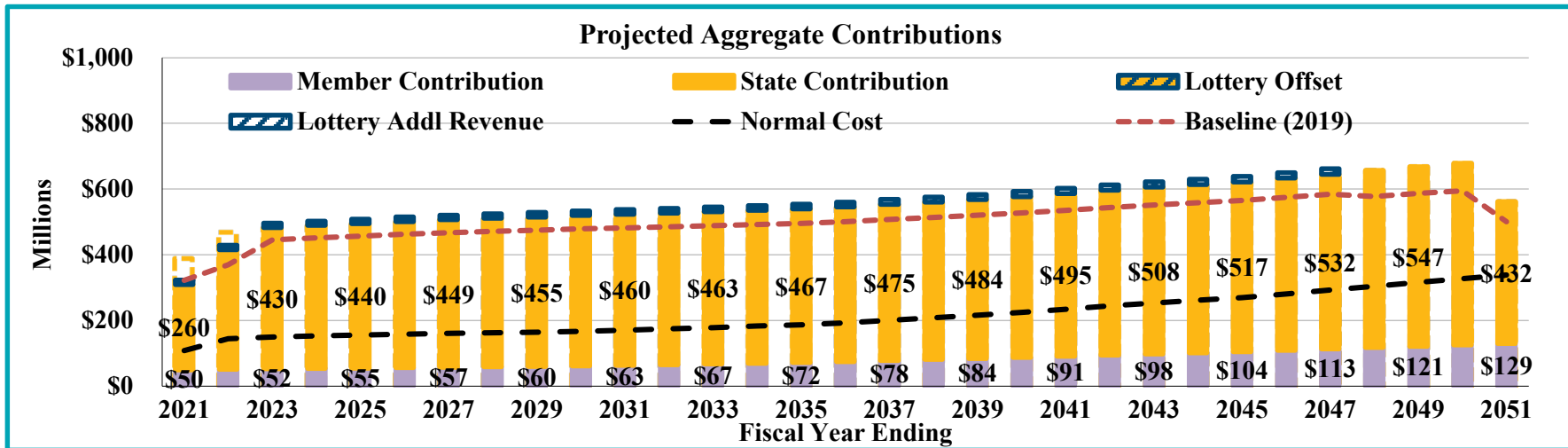
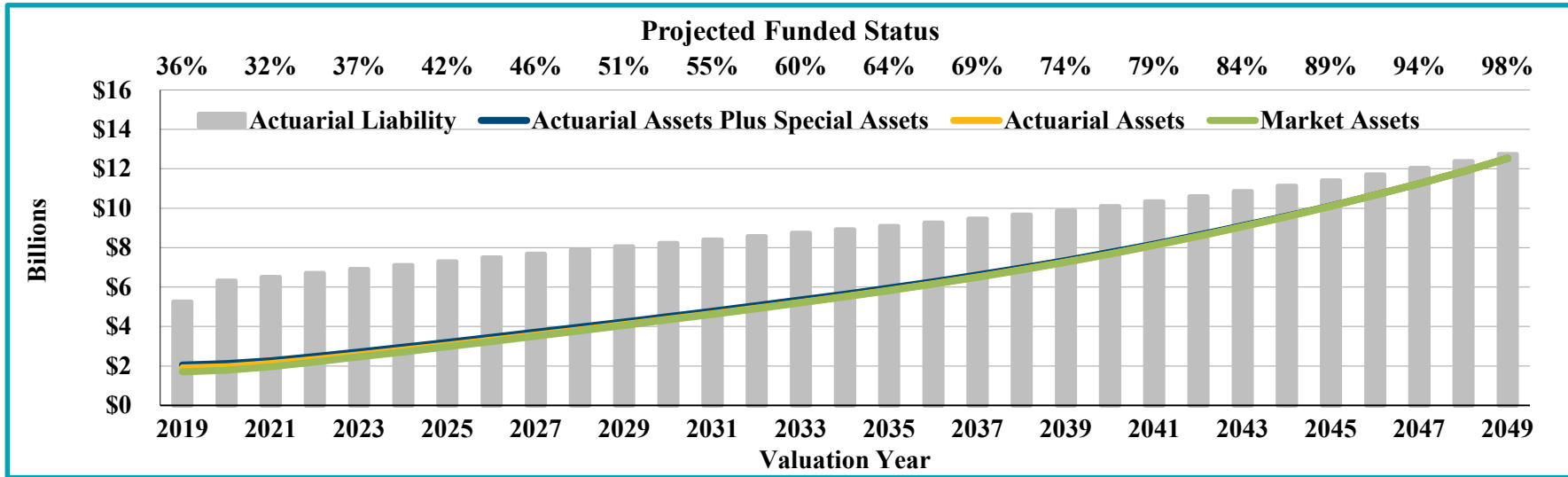
This scenario results in Statutory contributions that are about 14% higher for State and 35% higher for Local employers in FYE 2033. Again, the contributions for Local employers are more sensitive to assumption changes because of the funded status at the time of the change.

POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
 JULY 1, 2019 ACTUARIAL VALUATION

SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

6.00% Discount Rate and Investment Return Assumption Effective July 1, 2020

State

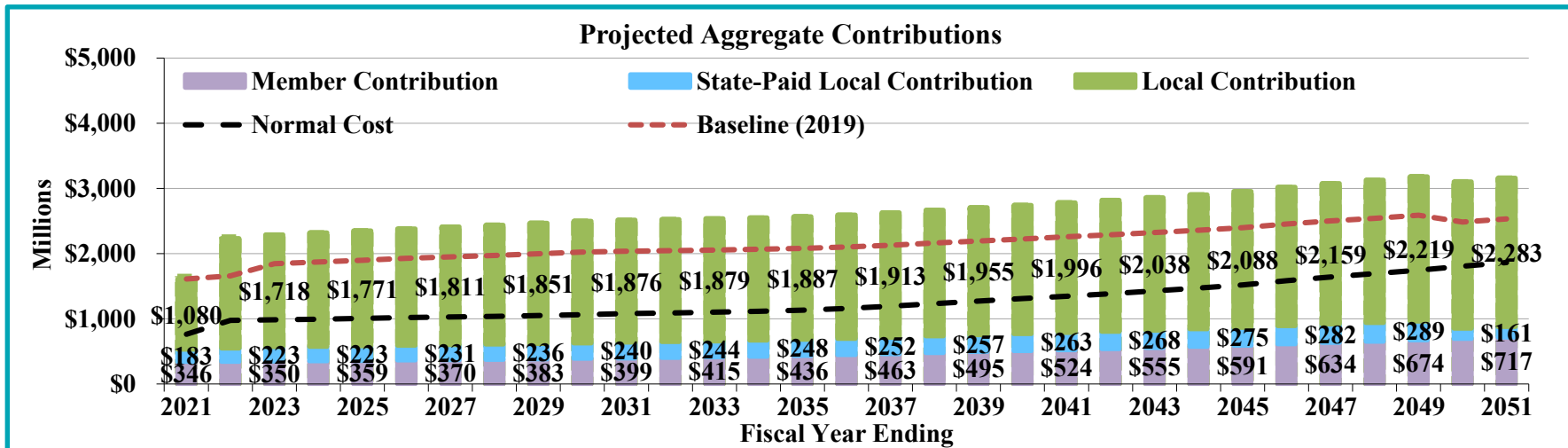
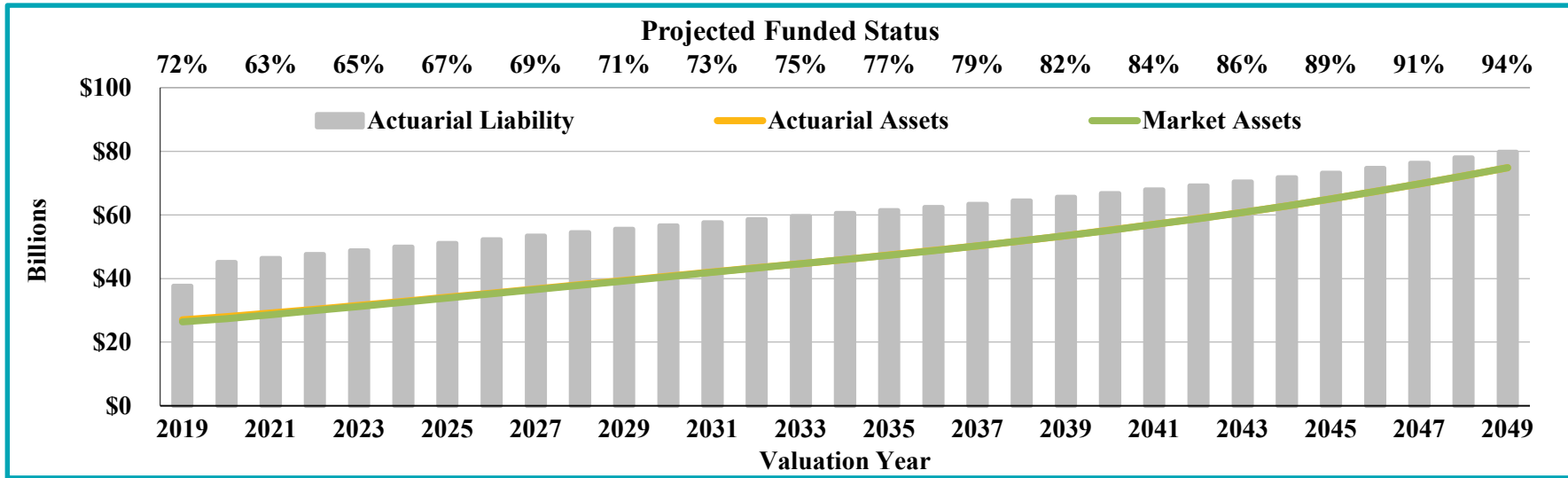


POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
 JULY 1, 2019 ACTUARIAL VALUATION

SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

6.00% Discount Rate and Investment Return Assumption Effective July 1, 2020

Local Employers



SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

Contribution Risk – Sensitivity Testing

The amortization method used to determine the Statutory contributions is designed to collect more than the tread water level and, therefore, gradually pay down the UAL. However, State appropriated contributions have consistently been less than the Statutory contributions and the tread water level, causing an increase in the UAL of about \$3.1 billion over the last 10 years. The baseline projections assume the State appropriates 80% of the Statutory contribution in FYE 2021, and increases the percent by 10% a year, until reaching 100% of the Statutory contribution beginning with FYE 2023, at which time contributions are projected to be greater than the tread water level.

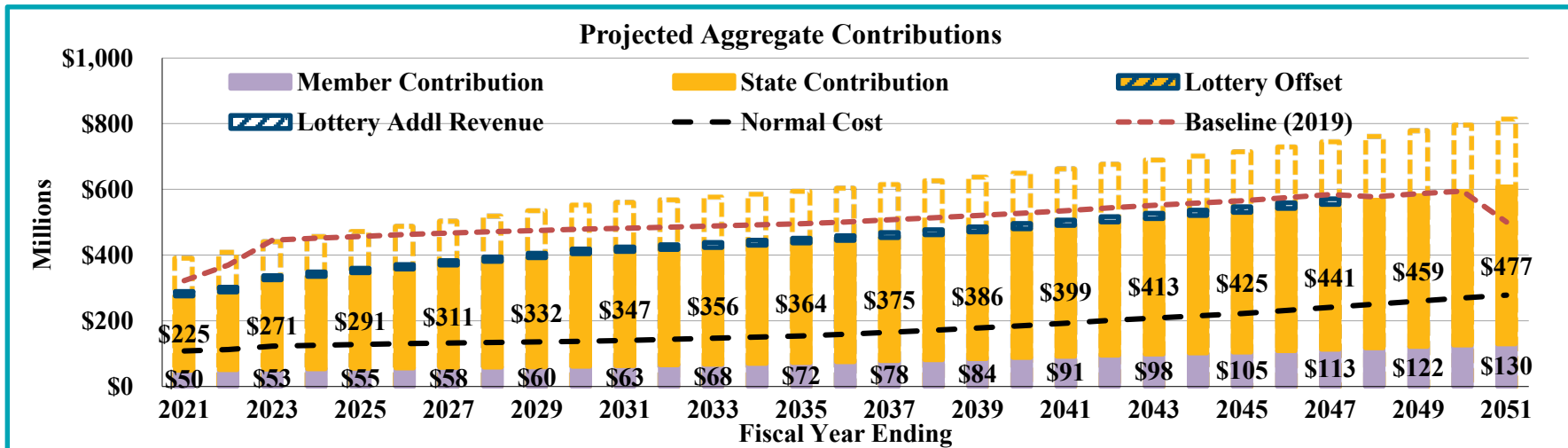
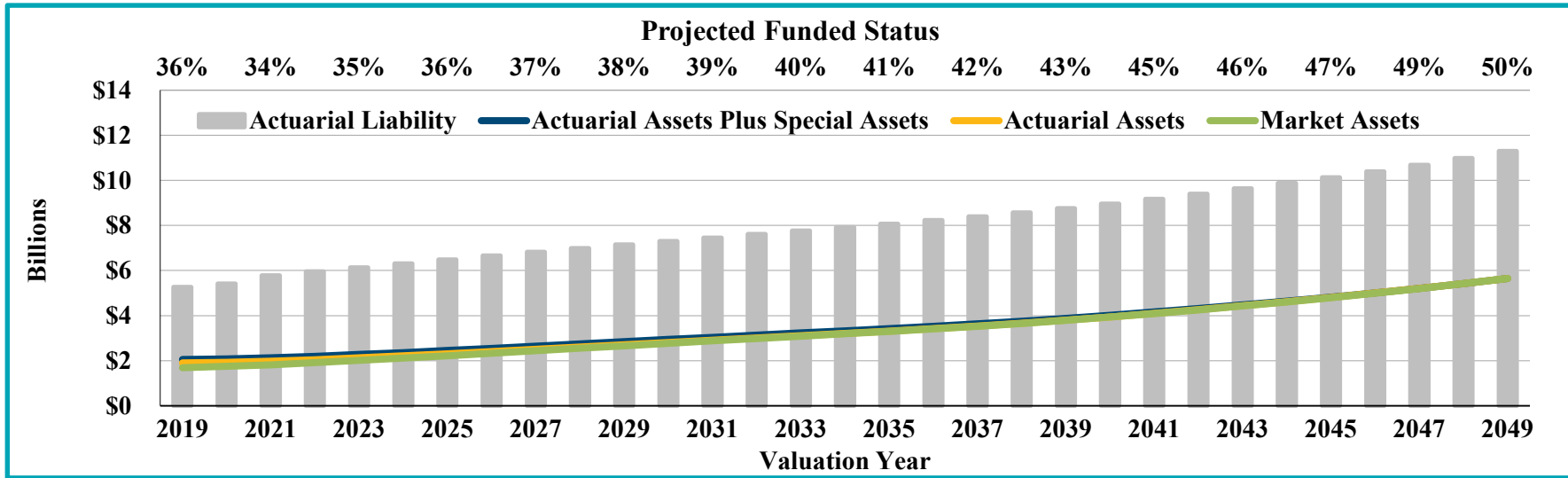
Contribution risk is the potential for actual future contributions to deviate from expected future contributions. The charts on the following pages illustrate the impact on projected future funded status and contribution amounts if the State appropriation remains at 70% of the Statutory contribution for each year in the future, rather than gradually increasing to 100% of the Statutory contribution. In illustrating contribution risk sensitivity, we assume the State appropriation percent remains at the current level of 70%, but for Local employers we assume they will continue to contribute 100% of the Statutory contribution as they have done historically.

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 but eventually grow to reach the same level, but with a lower funded ratio. The funded ratio at the end of the projection period is 50% compared to 98% under the baseline projections for the State portion and 89% compared to 94% under the baseline projections for the Local employers' portion.

POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
 JULY 1, 2019 ACTUARIAL VALUATION

SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

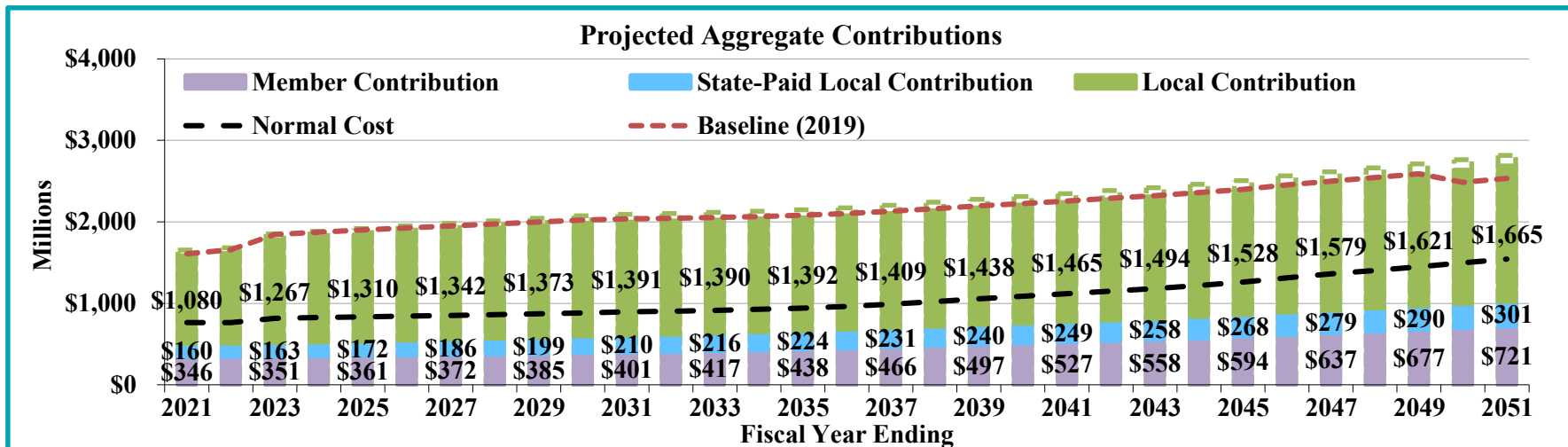
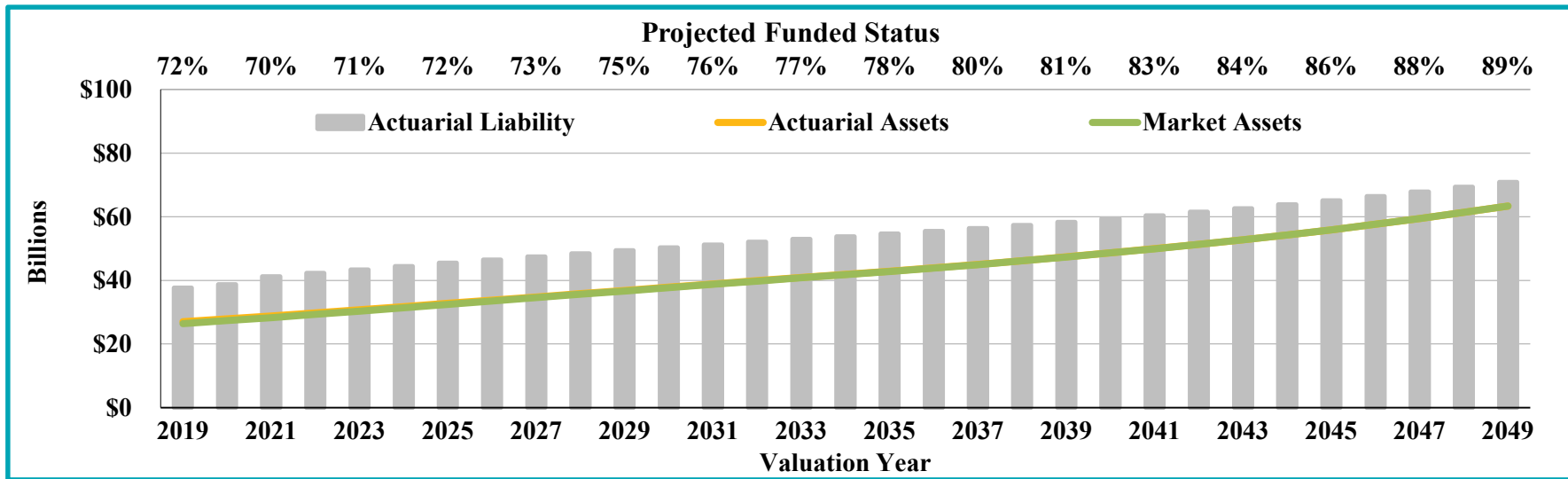
State Appropriates 70% of Statutory Contribution for Fiscal Year Ending June 30, 2021 and Thereafter
 State



POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
 JULY 1, 2019 ACTUARIAL VALUATION

SECTION II – ASSESSMENT AND DISCLOSURE OF RISK

State Appropriates 70% of Statutory Contribution for Fiscal Year Ending June 30, 2021 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.

POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2019 ACTUARIAL VALUATION

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 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, 2018 and July 1, 2019,
- 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, 2018 and June 30, 2019. Table III-2 presents the System's net cash flows from June 30, 2018 to June 30, 2019. Table III-3 presents the development of the Actuarial Value of Assets as of July 1, 2019.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2019 ACTUARIAL VALUATION**

SECTION III – ASSETS

Table III-1 Statement of Assets at Market Value		
	June 30, 2019	June 30, 2018
Assets		
Cash	\$ 3,616,695	\$ 205,366,800
Investment Holdings	25,311,934,008	24,504,008,331
Employers' Contributions Receivable - Chapter 19	86,902,860	102,125,815
Employers' Contributions Receivable - NCGI State	271,735	402,917
Employers' Contributions Receivable - NCGI Local Employers	46,564,731	37,169,598
Employers' Contributions Receivable - Common L	1,572,000	996,000
Employers' Contributions Receivable - Local Employers	964,916,947	941,418,361
Employers' Contributions Receivable - Local Employers ERI	8,759,216	9,867,107
Employers' Contributions Receivable - Retroactive Contributions	6,787,639	2,931,470
Employers' Contributions Receivable - Delayed Enrollments	84,802	81,498
Employers' Contributions Receivable - Delayed Appropriations	393,635	451,667
Members' Contributions Receivable	58,868,315	51,866,967
Accrued Interest on Investments	3,727,503	3,874,133
Accounts Receivable - Other	3,949,920	9,387,201
New Jersey Mortgage Receivable	1,280,877,241	1,180,450,049
Loans Receivable	245,121,318	264,425,125
Interest Receivable on Loans	1,114,165	3,765,857
Securities Lending Collateral	326,879,274	267,551,678
Total Assets	\$ 28,352,342,004	\$ 27,586,140,574
Liabilities		
Pension Payroll Payable	\$ (174,533,233)	\$ (165,093,868)
Pension Adjustment Payroll Payable	(15,809,400)	(16,359,011)
Withholdings Payable	(27,400,661)	(26,951,157)
Death Benefits Payable	(3,591,393)	(4,499,140)
Securities Lending Collateral & Rebates Payable	(326,484,125)	(267,544,086)
Administrative Expenses Payable	(5,261,359)	(437,834)
Accounts Payable - Other	(6,840,888)	(6,699,378)
Total Liabilities	\$ (559,921,059)	\$ (487,584,474)
Preliminary Market Value of Assets	\$ 27,792,420,945	\$ 27,098,556,100
Discounted Receivables		
Expected Lottery Revenue	\$ 12,413,784	\$ 12,009,059
State Appropriations	352,559,110	291,951,169
Adjustments to June 30, 2019 Financial Report		
Discounting of Local Employers Appropriations Receivable	(49,600,780)	(49,659,239)
Discounting of Local Employers ERI Contributions Receivable	(644,271)	(41,249)
True-up of Present Value of Chapter 19, P.L. 2009 Contributions Receivable	51,452,176	49,646,687
Exclusion of Reserve for Non-Contributory Group Insurance	(57,556,933)	(38,672,685)
Market Value of Assets	\$ 28,101,044,031	\$ 27,363,789,842

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2019 ACTUARIAL VALUATION**

SECTION III – ASSETS

System Cash Flows as of June 30, 2019

Table III-2 Changes in Market Values for FYE June 30, 2019			
	State	Local Employers	Total
Additions			
Contributions			
Member Contributions	\$ 52,202,489	\$ 358,740,753	\$ 410,943,242
Member Transfer Contributions	951,912	2,024,764	2,976,676
State and Local Appropriations	177,797,000	963,648,042	1,141,445,042
State Contributions on Behalf of Locals	0	130,202,000	130,202,000
State Lottery	13,260,000	0	13,260,000
NCGI Contributions	5,265,771	46,564,731	51,830,502
Transfers from Other Systems	169,354	619,605	788,959
Other Contributions - Delayed Enrollments	26,634	69,969	96,603
Other Contributions - Delayed Appropriations	10,520	412,370	422,890
Other Contributions - Retroactive	(292,238)	6,793,415	6,501,177
Other Contributions - Additional	0	847,716	847,716
Other - NCGI Adjustment	0	0	0
Total Contributions	\$ 249,391,442	\$ 1,509,923,365	\$ 1,759,314,807
Net Investment Income	57,950,981	1,491,187,852	1,549,138,833
Total Additions	\$ 307,342,423	\$ 3,001,111,217	\$ 3,308,453,640
Deductions			
Withdrawal of Member Contributions	\$ 1,730,285	\$ 5,563,925	\$ 7,294,210
Withdrawal of Member Transfer Contributions	53,562	353,536	407,098
Adjustment for Member Loans	111,500	(5,534)	105,966
Withdrawal of Transfer Contributions	32,178	86,590	118,768
Retirement Allowances	302,911,790	2,070,977,063	2,373,888,853
Pension Adjustment Benefits	22,788,036	167,017,286	189,805,322
Death Benefit Claims	5,265,771	30,503,589	35,769,360
Administrative Expenses	1,568,716	5,630,502	7,199,218
Total Deductions	\$ 334,461,838	\$ 2,280,126,957	\$ 2,614,588,795
Net Increase/(Decrease)	\$ (27,119,415)	\$ 720,984,260	\$ 693,864,845
Preliminary Market Value of Assets Beginning of Year	\$ 1,508,100,052	\$ 25,590,456,048	\$ 27,098,556,100
Preliminary Market Value of Assets End of Year	\$ 1,480,980,637	\$ 26,311,440,308	\$ 27,792,420,945
Discounted Receivables			
Expected Lottery Revenue	\$ 12,413,784	\$ 0	\$ 12,413,784
State Appropriations	200,298,324	152,260,786	352,559,110
Adjustments to June 30, 2019 Financial Report			
Discounting of Local Employers Appropriations Receivable	0	(49,600,780)	(49,600,780)
Discounting of Local Employers ERI Contributions Receivable	0	(644,271)	(644,271)
True-up of Present Value of Chapter 19, P.L. 2009 Contributions Receivable	0	51,452,176	51,452,176
Exclusion of Reserve for Non-Contributory Group Insurance	0	(57,556,933)	(57,556,933)
Market Value of Assets End of Year	\$ 1,693,692,745	\$ 26,407,351,286	\$ 28,101,044,031
Approximate Return	4.01%	6.22%	6.10%

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2019 ACTUARIAL VALUATION**

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.

Table III-3 Development of Actuarial Value of Assets for July 1, 2019			
	State	Local Employers	Total
1. Preliminary Actuarial Value of Assets as of July 1, 2018 ¹	\$ 1,696,876,892	\$ 25,942,239,597	\$ 27,639,116,489
2. Net Cash Flow excluding Investment Income ²	(85,070,396)	(744,735,915)	(829,806,311)
3. Expected Investment Income ³	122,511,652	1,821,991,075	1,944,502,727
4. Expected Actuarial Value of Assets as of July 1, 2019: [1 + 2 + 3]	\$ 1,734,318,148	\$ 27,019,494,757	\$ 28,753,812,905
5. Preliminary Market Value of Assets as of June 30, 2019 ⁴	\$ 1,480,980,637	\$ 26,249,360,854	\$ 27,730,341,491
6. 20% of Difference from MVA [20% * (5 - 4)]	\$ (50,667,502)	\$ (154,026,781)	\$ (204,694,283)
7. Preliminary Actuarial Value of Assets as of July 1, 2019: [4 + 6]	\$ 1,683,650,646	\$ 26,865,467,976	\$ 28,549,118,622
8. Discounted Receivables			
State Appropriations	\$ 200,298,324	\$ 152,260,786	\$ 352,559,110
Expected Lottery Revenue	12,413,784	0	12,413,784
Chapter 19, P.L. 2009 Contributions for FYE 2021 and Later	0	114,198,228	114,198,228
Total	\$ 212,712,108	\$ 266,459,014	\$ 479,171,122
9. Adjustments			
Discounting of Local Employers Appropriations Receivable	\$ 0	\$ (49,600,780)	\$ (49,600,780)
Discounting of Chapter 19, P.L. 2009 Contributions for FYE 2020	0	(1,310,869)	(1,310,869)
Exclusion of Reserve for Non-Contributory Group Insurance	0	(57,556,933)	(57,556,933)
Total	\$ 0	\$ (108,468,582)	\$ (108,468,582)
10. Actuarial Value of Assets as of July 1, 2019: [7 + 8 + 9]	\$ 1,896,362,754	\$ 27,023,458,408	\$ 28,919,821,162
11. Rate of Return on Actuarial Value of Assets	4.40%	6.87%	6.71%
12. Ratio of Actuarial Value of Assets to Market Value of Assets	112.0%	102.3%	102.9%

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

² Amount for Local employers includes Chapter 19, P.L. 2009 contribution receivable for FYE 2020 of 25,467,677.

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

⁴ Amount for Local employers includes adjustments to June 30, 2019 Financial Report for the interest portion of Local employers ERI contributions receivable of \$(644,271) and true-up of Chapter 19, P.L. 2009 contributions for FYE 2020 of \$(61,435,183).

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2019 ACTUARIAL VALUATION**

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 6.10% for the year ending June 30, 2019. This is compared to an assumed return of 7.50% for the same period. On an actuarial value of assets basis, the return for FYE 2019 was 6.71%.

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 and the timing of contributions. For the year ending June 30, 2019 the market value of assets rate of return was 4.01% and 6.22% for the State and Local employers' portions, respectively. On an actuarial value of assets basis, the return for FYE 2019 was 4.40% and 6.87% for the State and Local employers' portions, respectively.

In Table III-4 below we show the historical asset returns and the investment return assumption for the last ten years for the System in aggregate.

We do not show a market value return prior to 2017 as the prior actuary did not include it in their reports.

Table III-4 Historical Rates of Return Total System			
Year Ended June 30	Investment Return Assumption	Market Value	Actuarial Asset Value
2010	8.25%		3.44%
2011	8.25%		5.55%
2012	7.95%		4.71%
2013	7.90%		5.67%
2014	7.90%		7.48%
2015	7.90%		6.74%
2016	7.90%		5.35%
2017	7.65%	11.90%	6.30%
2018	7.50%	8.83%	6.89%
2019	7.50%	6.10%	6.71%
10-Year Compound Average		N/A	5.88%
5-Year Compound Average		N/A	6.40%

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2019 ACTUARIAL VALUATION**

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-5 shows the development of the special asset value as of July 1, 2019. The depreciated value is a roll forward of the Lottery Enterprise Value from the appraisal date.

Table III-5 Development of Special Asset Value as of July 1, 2019		
1.	Lottery Enterprise Value as of Appraisal Date of June 30, 2017 ¹	\$ 13,535,103,380
2.	Depreciated Value as of end of Valuation Year at June 30, 2020 ¹	\$ 13,536,782,838
3.	Discounted Value as of July 1, 2019 at 7.30%	\$ 12,615,827,435
4.	Allocation to PFRS	1.20%
5.	Special Asset Value as of July 1, 2019	\$ 151,389,929

¹ Provided by the Division of Pensions and Benefits

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2019 ACTUARIAL VALUATION**

SECTION III – ASSETS

Actuarial Balance Sheet

Table III-6 Actuarial Balance Sheet as of July 1, 2019			
	State	Local Employers	Total
Assets			
<u>Retirement Fund Reserve (RFR)</u>			
Credited to Fund with Distribution of Income	\$ 3,330,929,435	\$ 23,919,184,649	\$ 27,250,114,084
Add/(Deduct) reserve transferable from/(to) ECR ¹	313,094,382	1,001,931,577	1,315,025,959
Adjusted RFR ²	\$ 3,644,023,817	\$ 24,921,116,226 ³	\$ 28,565,140,043
Members' Contributions Reserve (MCR) ²	\$ 474,285,809	\$ 3,549,688,185	\$ 4,023,973,994
<u>Employers' Contributions Reserve (ECR)</u>			
Credited to Fund with Distribution of Income	\$ (1,908,852,490)	\$ (445,414,426)	\$ (2,354,266,916)
Add/(Deduct) reserve transferable from/(to) RFR	(313,094,382)	(1,001,931,577)	(1,315,025,959)
Adjusted ECR ²	\$ (2,221,946,872)	\$ (1,447,346,003)	\$ (3,669,292,875)
Special Asset Value as of July 1, 2019	\$ 151,389,929	\$ 0	\$ 151,389,929
Present Value of Prospective Contributions by State and Local Employers to ECR	3,213,354,773	10,648,252,777	13,861,607,550
Total Assets	\$ 5,261,107,456	\$ 37,671,711,185	\$ 42,932,818,641
Liabilities			
<u>Payable from RFR</u>			
Retirees, Disableds, and Beneficiaries currently receiving benefits	\$ 3,644,023,817	\$ 24,921,116,226 ³	\$ 28,565,140,043
<u>Payable from MCR and ECR</u>			
Active and Terminated Vested Members due a future benefit	\$ 1,617,083,639	\$ 12,750,594,959	\$ 14,367,678,598
Total Liabilities	\$ 5,261,107,456	\$ 37,671,711,185	\$ 42,932,818,641

¹ 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.

² Actuarial Value of Assets equals RFR + MCR + ECR.

³ Includes the present value of ERI payments of \$6,226,002.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2019 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, 2018 and July 1, 2019,
- 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, 2019 ACTUARIAL VALUATION**

SECTION IV – LIABILITIES

Table IV-1 shows the actuarial liability, unfunded actuarial liability and funded ratio as of July 1, 2019 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).

Table IV-1 Disclosure of Liabilities			
	State	Local Employers	Total
Actuarial Liability			
Contributing Actives	\$ 1,562,871,662	\$ 12,522,098,082	\$ 14,084,969,744
Non-Contributing Actives	51,456,304	217,615,342	269,071,646
Deferred Vested	2,755,673	10,881,535	13,637,208
Retirees	2,932,139,644	20,431,972,839	23,364,112,483
Disabled	445,862,154	2,567,215,698	3,013,077,852
Beneficiaries	266,022,019	1,921,927,689	2,187,949,708
Total Actuarial Liability	\$ 5,261,107,456	\$ 37,671,711,185 ¹	\$ 42,932,818,641
Actuarial Value of Assets	<u>\$ 1,896,362,754</u>	<u>\$ 27,023,458,408</u>	<u>\$ 28,919,821,162</u>
Unfunded Actuarial Liability/(Surplus)	\$ 3,364,744,702	\$ 10,648,252,777	\$ 14,012,997,479
Funded Ratio (AVA)	36.04%	71.73%	67.36%
Actuarial Value of Assets + Special Asset Value	<u>\$ 2,047,752,683</u>	<u>\$ 27,023,458,408</u>	<u>\$ 29,071,211,091</u>
Unfunded Actuarial Liability/(Surplus)	\$ 3,213,354,773	\$ 10,648,252,777	\$ 13,861,607,550
Funded Ratio (AVA + SAV)	38.92%	71.73%	67.71%

¹ Includes the present value of ERI payments of \$6,226,002.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2019 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, 2019.

Table IV-2 Contributing Active Liabilities by Tier				
	Number of Members	Appropriation Payroll¹	Actuarial Liability	Gross Normal Cost
State				
Tier 1	4,143	\$ 351,194,541	\$ 1,455,967,482	\$ 75,724,136
Tier 2	229	15,063,572	22,538,801	2,590,214
Tier 3	2,503	120,767,349	84,365,379	22,431,035
Total	6,875	\$ 487,025,462	\$ 1,562,871,662	\$ 100,745,385
Local Employers				
Tier 1	22,064	\$ 2,630,694,324	\$ 11,825,150,161	\$ 562,725,960
Tier 2	504	46,964,478	72,312,777	8,070,778
Tier 3	11,596	773,292,945	624,635,144	139,634,217
Total	34,164	\$ 3,450,951,747	\$ 12,522,098,082	\$ 710,430,955

¹ 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.

Table IV-3 Non-Contributing Active Liabilities by Tier				
	Number of Members	Last Reported Payroll	Actuarial Liability	Gross Normal Cost
State				
Tier 1	210	\$ 15,035,446	\$ 47,608,685	\$ 0
Tier 2	7	449,914	552,710	0
Tier 3	147	6,493,837	3,294,909	0
Total	364	\$ 21,979,197	\$ 51,456,304	\$ 0
Local Employers				
Tier 1	717	\$ 62,830,908	\$ 204,248,859	\$ 0
Tier 2	12	1,065,134	1,533,355	0
Tier 3	388	20,476,685	11,833,128	0
Total	1,117	\$ 84,372,727	\$ 217,615,342	\$ 0

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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.

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Table IV-4 Development of 2019 Experience (Gain)/Loss State			
	Actuarial Liability	Actuarial Value of Assets	Unfunded Actuarial Liability/(Surplus)
1. Value as of July 1, 2018	\$ 4,983,733,970	\$ (1,872,048,766)	\$ 3,111,685,204
2. Additions			
Normal Cost	\$ 95,488,914	\$ 0	\$ 95,488,914
Statutory State Contributions	0	(317,315,271)	(317,315,271)
Expected Member Contributions	0	(47,091,849)	(47,091,849)
Total Additions	<u>\$ 95,488,914</u>	<u>\$ (364,407,120)</u>	<u>\$ (268,918,206)</u>
3. Deductions			
Benefit Payments	\$ (327,541,611)	\$ 327,541,611	\$ 0
Expected Administrative Expenses	0	0	0
Total Deductions	<u>\$ (327,541,611)</u>	<u>\$ 327,541,611</u>	<u>\$ 0</u>
4. Net Transfers from Other Systems			
State Contributions	\$ 137,176	\$ (137,176)	\$ 0
Member Contributions	898,350	(898,350)	0
Total Net Transfers	<u>\$ 1,035,526</u>	<u>\$ (1,035,526)</u>	<u>\$ 0</u>
5. Expected Interest	\$ 368,919,087	\$ (130,115,048)	\$ 238,804,039
6. Expected Value as of July 1, 2019: [1 + 2 + 3 + 4 + 5]	\$ 5,121,635,886	\$ (2,040,064,849)	\$ 3,081,571,037
7. Other Changes			
Appropriation Adjustment	\$ 0	\$ 87,872,402	\$ 87,872,402
Contribution Timing	0	9,422,076	9,422,076
Actual Lottery Revenue	0	(852,017)	(852,017)
Other Employer Contributions	0	264,477	264,477
Actual Member Contributions	0	(5,298,824)	(5,298,824)
Change in Assumptions			
Experience Study	21,485,046	0	21,485,046
Investment Rate of Return	119,740,501	0	119,740,501
Change in Benefits	0	0	0
Total Other Changes	<u>\$ 141,225,547</u>	<u>\$ 91,408,114</u>	<u>\$ 232,633,661</u>
8. Expected value after changes: [6 + 7]	\$ 5,262,861,433	\$ (1,948,656,735)	\$ 3,314,204,698
9. Actual Value as of July 1, 2019	\$ 5,261,107,456	\$ (1,896,362,754)	\$ 3,364,744,702
10. Actuarial (Gain)/Loss: [9 - 8]	\$ (1,753,977)	\$ 52,293,981	\$ 50,540,004

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Table IV-5 Development of 2019 Experience Gain/(Loss) Local Employers			
	Actuarial Liability	Actuarial Value of Assets	Unfunded Actuarial Liability/(Surplus)
1. Value as of July 1, 2018	\$ 35,523,376,524	\$ (26,109,128,660)	\$ 9,414,247,864
2. Additions			
Normal Cost	\$ 683,711,263	\$ 0	\$ 683,711,263
Statutory Contributions	0	(1,190,912,037)	(1,190,912,037)
Expected Member Contributions	0	(329,247,559)	(329,247,559)
Total Additions	<u>\$ 683,711,263</u>	<u>\$ (1,520,159,596)</u>	<u>\$ (836,448,333)</u>
3. Deductions			
Benefit Payments	\$ (2,243,552,740)	\$ 2,243,552,740	\$ 0
Expected Administrative Expenses	0	0	0
Total Deductions	<u>\$ (2,243,552,740)</u>	<u>\$ 2,243,552,740</u>	<u>\$ 0</u>
4. Net Transfers from Other Systems			
Employer Contributions	\$ 533,015	\$ (533,015)	\$ 0
Member Contributions	1,671,228	(1,671,228)	0
Total Net Transfers	<u>\$ 2,204,243</u>	<u>\$ (2,204,243)</u>	<u>\$ 0</u>
5. Expected Interest	\$ 2,633,000,498	\$ (1,887,777,139)	\$ 745,223,359
6. Expected Value as of July 1, 2019: [1 + 2 + 3 + 4 + 5]	\$ 36,598,739,788	\$ (27,275,716,898)	\$ 9,323,022,890
7. Other Changes			
Appropriation Adjustment	\$ 0	\$ 72,817,916	\$ 72,817,916
Contribution Timing	0	56,424,791	56,424,791
Other Employer Contributions	0	(8,422,593)	(8,422,593)
Actual Member Contributions	0	(30,579,194)	(30,579,194)
ERI and Ch. 19 Receivables	0	(1,001,781)	(1,001,781)
Interest on NCGI Cash Flows	0	3,154,741	3,154,741
Change in Assumptions			
Experience Study	134,736,855	0	134,736,855
Investment Rate of Return	845,541,647	0	845,541,647
Change in Benefits	0	0	0
Total Other Changes	<u>\$ 980,278,502</u>	<u>\$ 92,393,880</u>	<u>\$ 1,072,672,382</u>
8. Expected value after changes: [6 + 7]	\$ 37,579,018,290	\$ (27,183,323,018)	\$ 10,395,695,272
9. Actual Value as of July 1, 2019	\$ 37,671,711,185	\$ (27,023,458,408)	\$ 10,648,252,777
10. Actuarial (Gain)/Loss: [9 - 8]	\$ 92,692,895	\$ 159,864,610	\$ 252,557,505

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Table IV-6 shows the components of the Actuarial (gain)/loss for the State as of July 1, 2019 and July 1, 2018.

Table IV-6 Actuarial (Gain)/Loss Analysis State		
Components	July 1, 2019	July 1, 2018
Actuarial Value of Assets		
Investment Return	\$ 50,667,502	\$ 47,194,210
Administrative Expenses	1,626,479	698,356
Total	<u>\$ 52,293,981</u>	<u>\$ 47,892,566</u>
Actuarial Liability		
Salary Increases	\$ (2,559,810)	\$ (43,987,686)
New Entrants	4,599,240	4,253,897
Demographic Experience and Census Data Updates		
Contributing and Non-Contributing Actives	1,437,933	6,600,725
Inactives	<u>(4,157,684)</u>	<u>12,856,437</u>
Sub-Total	\$ (680,321)	\$ (20,276,627)
Impact of Net Transfers from Other Systems	<u>(1,073,656)</u>	<u>(1,040,465)</u>
Total	\$ (1,753,977)	\$ (21,317,092)
Actuarial (Gain)/Loss	\$ 50,540,004	\$ 26,575,474

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Table IV-7 shows the components of the Actuarial (gain)/loss for Local employers as of July 1, 2019 and July 1, 2018.

Table IV-7 Actuarial (Gain)/Loss Analysis Local Employers		
Components	July 1, 2019	July 1, 2018
Actuarial Value of Assets		
Investment Return	\$ 154,026,781	\$ 107,152,686
Administrative Expenses	<u>5,837,829</u>	<u>3,973,239</u>
Total	\$ 159,864,610	\$ 111,125,925
Actuarial Liability		
Salary Increases	\$ 71,398,780	\$ 40,248,379
New Entrants	21,615,106	22,171,860
Demographic Experience and Census Data Updates		
Contributing and Non-Contributing Actives	3,610,078	(12,531,355)
Inactives	<u>(1,645,661)</u>	<u>(19,043,429)</u>
Sub-Total	\$ 94,978,303	\$ 30,845,455
Impact of Net Transfers from Other Systems	<u>(2,285,408)</u>	<u>(2,508,460)</u>
Total	\$ 92,692,895	\$ 28,336,995
Actuarial (Gain)/Loss	\$ 252,557,505	\$ 139,462,920

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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 July 1, 2018, the unfunded actuarial liability is amortized over a closed 30 year period as a level dollar amount. As of July 1, 2019 there are 29 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, 2019 there are 27 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.

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SECTION V – CONTRIBUTIONS

Table V-1 shows the development of the Lottery Enterprise contribution offset. Per 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.

Table V-1 Development of Lottery Enterprise Contribution Offset for Fiscal Year Ending 2021	
<u>For Fiscal Years Through 2022</u>	
1. Special Asset Adjustment for FYE 2021 ¹	\$ 1,084,354,841
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, 2020 [1 x 2 x 3]	13,012,258
<u>For Fiscal Years Beginning 2023</u>	
5. Special Asset Value Allocated to PFRS as of July 1, 2019	\$ 151,389,929
6. 27-Year Level Dollar Amortization payable June 30, 2020	12,989,701
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, 2020 [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	67.71%
12. Applicable Adjustment Percentage [if 11 < 50%, 10 - 7 x (50% - 11), otherwise 11]	0.00%

¹ This adjustment will be \$1,095,871,137 for FYE 2022.

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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, 2019			July 1, 2018		
	State	Local Employers ¹	Total	State	Local Employers ¹	Total
1. Actuarial Liability	\$ 5,261,107,456	\$ 37,671,711,185	\$ 42,932,818,641	\$ 4,983,733,970	\$ 35,523,376,524	\$ 40,507,110,494
2. Actuarial Value of Assets²	\$ 1,896,362,754	\$ 27,023,458,408	\$ 28,919,821,162	\$ 1,872,048,766	\$ 26,109,128,660	\$ 27,981,177,426
3. Unfunded Actuarial Liability						
a. Basic	\$ 3,216,749,453	\$ 8,687,187,621	\$ 11,903,937,074	\$ 2,973,978,440	\$ 7,530,101,123	\$ 10,504,079,563
b. Chapter 204, P.L. 1989	607,335	5,130,764	5,738,099	613,645	5,360,164	5,973,809
c. Chapter 247, P.L. 1993	0	126,826,727	126,826,727	0	127,299,156	127,299,156
d. Chapter 428, P.L. 1999 ³	147,387,914	788,958,193	936,346,107	137,093,119	746,575,606	883,668,725
e. Chapter 109, P.L. 1979	0	674,624,145	674,624,145	0	650,382,330	650,382,330
f. Chapter 511, P.L. 1991	0	365,525,327	365,525,327	0	354,529,485	354,529,485
g. Total	\$ 3,364,744,702	\$ 10,648,252,777	\$ 14,012,997,479	\$ 3,111,685,204	\$ 9,414,247,864	\$ 12,525,933,068
4. Adjustment to Unfunded Actuarial Liability for Phase-In of State-Paid Local Obligations						
a. Chapter 247, P.L. 1993	\$ 117,498,362	\$ (117,498,362)	\$ 0	\$ 115,099,730	\$ (115,099,730)	\$ 0
b. Chapter 428, P.L. 1999 ³	611,373,565	(611,373,565)	0	592,541,714	(592,541,714)	0
c. Chapter 109, P.L. 1979	674,624,145	(674,624,145)	0	650,382,330	(650,382,330)	0
d. Chapter 511, P.L. 1991	365,525,327	(365,525,327)	0	354,529,485	(354,529,485)	0
e. Total	\$ 1,769,021,399	\$ (1,769,021,399)	\$ 0	\$ 1,712,553,259	\$ (1,712,553,259)	\$ 0
5. Net Unfunded Actuarial Liability [3 + 4]	\$ 5,133,766,101	\$ 8,879,231,378	\$ 14,012,997,479	\$ 4,824,238,463	\$ 7,701,694,605	\$ 12,525,933,068

¹ 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.

² AVA without Special Asset Value used to calculate the Statutory Contributions.

³ 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.

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SECTION V – CONTRIBUTIONS

**Table V-3
Development of Unfunded Actuarial Liability Contribution**

	July 1, 2019 Valuation Fiscal Year Ending 2021 Payment			July 1, 2018 Valuation Fiscal Year Ending 2020 Payment		
	State	Local Employers ¹	Total	State	Local Employers ¹	Total
	1. Amortization of UAL					
a. Basic	\$ 251,432,809	\$ 679,022,105	\$ 930,454,914	\$ 234,242,260	\$ 593,100,435	\$ 827,342,695
b. Chapter 204, P.L. 1989	68,881	581,902	650,783	67,242	587,360	654,602
c. Chapter 247, P.L. 1993	0	9,913,237	9,913,237	0	10,026,583	10,026,583
d. Chapter 428, P.L. 1999 ²	11,520,374	61,667,836	73,188,210	10,797,994	58,803,237	69,601,231
e. Chapter 109, P.L. 1979	0	52,731,071	52,731,071	0	51,226,675	51,226,675
f. Chapter 511, P.L. 1991	0	28,570,786	28,570,786	0	27,924,139	27,924,139
g. Total	<u>\$ 263,022,064</u>	<u>\$ 832,486,937</u>	<u>\$ 1,095,509,001</u>	<u>\$ 245,107,496</u>	<u>\$ 741,668,429</u>	<u>\$ 986,775,925</u>
2. Adjustment to UAL Contribution for State-Paid Local Obligations						
a. Chapter 247, P.L. 1993	\$ 9,913,237	\$ (9,913,237)	\$ 0	\$ 10,026,583	\$ (10,026,583)	\$ 0
b. Chapter 428, P.L. 1999 ²	61,667,836	(61,667,836)	0	58,803,237	(58,803,237)	0
c. Chapter 109, P.L. 1979	52,731,071	(52,731,071)	0	51,226,675	(51,226,675)	0
d. Chapter 511, P.L. 1991	28,570,786	(28,570,786)	0	27,924,139	(27,924,139)	0
e. Total	<u>\$ 152,882,930</u>	<u>\$ (152,882,930)</u>	<u>\$ 0</u>	<u>\$ 147,980,634</u>	<u>\$ (147,980,634)</u>	<u>\$ 0</u>
3. UAL Contribution as of Valuation Date [1 + 2]	\$ 415,904,994	\$ 679,604,007	\$ 1,095,509,001	\$ 393,088,130	\$ 593,687,795	\$ 986,775,925
4. Interest to Beginning of Fiscal Year	\$ 30,361,064	\$ 49,611,093	\$ 79,972,157	\$ 29,481,610	\$ 44,526,586	\$ 74,008,196
5. UAL Contribution as of Beginning of Fiscal Year [3 + 4]	<u>\$ 446,266,058</u>	<u>\$ 729,215,100</u>	<u>\$ 1,175,481,158</u>	<u>\$ 422,569,740</u>	<u>\$ 638,214,381</u>	<u>\$ 1,060,784,121</u>

¹ 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.

² Includes UAL amounts for Chapter 86, P.L. 2001 and Chapter 318, P.L. 2001.

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Table V-4 Development of Normal Cost							
	July 1, 2019 Valuation Fiscal Year Ending 2021 Payment			July 1, 2018 Valuation Fiscal Year Ending 2020 Payment			
	State	Local Employers	Total	State	Local Employers	Total	
1. Gross Normal Cost, excluding NCGI Premium							
a. Basic	\$ 91,993,313	\$ 649,945,075	\$ 741,938,388	\$ 86,280,668	\$ 620,283,531	\$ 706,564,199	
b. Chapter 247, P.L. 1993	0	80,932	80,932	0	111,263	111,263	
c. Chapter 428, P.L. 1999	1,522,304	8,812,509	10,334,813	2,018,584	12,107,115	14,125,699	
d. Chapter 109, P.L. 1979 ¹	5,357,280	37,960,469	43,317,749	5,279,357	37,298,549	42,577,906	
e. Chapter 511, P.L. 1991	1,872,488	13,631,970	15,504,458	1,910,305	13,910,805	15,821,110	
f. Total	<u>\$ 100,745,385</u>	<u>\$ 710,430,955</u>	<u>\$ 811,176,340</u>	<u>\$ 95,488,914</u>	<u>\$ 683,711,263</u>	<u>\$ 779,200,177</u>	
2. Expected Member Contributions	\$ (46,230,283)	\$ (322,738,464)	\$ (368,968,747)	\$ (45,419,412)	\$ (317,554,544)	\$ (362,973,956)	
3. Employer Normal Cost [1 + 2]	\$ 54,515,102	\$ 387,692,491	\$ 442,207,593	\$ 50,069,502	\$ 366,156,719	\$ 416,226,221	
4. Portion of Local Normal Cost Payable by State							
a. Chapter 247, P.L. 1993	\$ 80,932	\$ (80,932)	\$ 0	\$ 111,263	\$ (111,263)	\$ 0	
b. Chapter 428, P.L. 1999	8,812,509	(8,812,509)	0	12,107,115	(12,107,115)	0	
c. Chapter 109, P.L. 1979	37,960,469	(37,960,469)	0	37,298,549	(37,298,549)	0	
d. Chapter 511, P.L. 1991	13,631,970	(13,631,970)	0	13,910,805	(13,910,805)	0	
e. Total	<u>\$ 60,485,880</u>	<u>\$ (60,485,880)</u>	<u>\$ 0</u>	<u>\$ 63,427,732</u>	<u>\$ (63,427,732)</u>	<u>\$ 0</u>	
5. Normal Cost Contribution as of Valuation Date [3 + 4]	\$ 115,000,982	\$ 327,206,611	\$ 442,207,593	\$ 113,497,234	\$ 302,728,987	\$ 416,226,221	
6. Interest to Beginning of Fiscal Year	\$ 8,395,074	\$ 23,886,083	\$ 32,281,157	\$ 8,512,292	\$ 22,704,674	\$ 31,216,966	
7. Normal Cost Contribution as of Beginning of Fiscal Year [5 + 6]	\$ 123,396,056	\$ 351,092,694	\$ 474,488,750	\$ 122,009,526	\$ 325,433,661	\$ 447,443,187	
8. Non-Contributory Group Insurance Premium of Beginning of Fiscal Year (one-year term cost)	N/A	\$ 36,964,099	\$ 36,964,099	N/A	\$ 46,564,731	\$ 46,564,731	

¹ Per statute, 1.1% of appropriation payroll

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

As of Beginning of Fiscal Year	July 1, 2019 Valuation Fiscal Year Ending 2021 Payment			July 1, 2018 Valuation Fiscal Year Ending 2020 Payment		
	State	Local Employers	Total	State	Local Employers	Total
	1. Normal Cost Contribution¹					
a. Basic	\$ 49,103,731	\$ 351,092,694	\$ 400,196,425	\$ 43,925,850	\$ 325,433,661	\$ 369,359,511
b. Chapter 247, P.L. 1993	86,840	0	86,840	119,608	0	119,608
c. Chapter 428, P.L. 1999	11,089,256	0	11,089,256	15,185,126	0	15,185,126
d. Chapter 109, P.L. 1979	46,479,944	0	46,479,944	45,771,249	0	45,771,249
e. Chapter 511, P.L. 1991	16,636,285	0	16,636,285	17,007,693	0	17,007,693
f. Total	\$ 123,396,056	\$ 351,092,694	\$ 474,488,750	\$ 122,009,526	\$ 325,433,661	\$ 447,443,187
2. UAL Contribution^{1,2}						
a. Basic	\$ 269,787,404	\$ 728,590,719	\$ 998,378,123	\$ 251,810,430	\$ 637,582,968	\$ 889,393,398
b. Chapter 204, P.L. 1989	73,910	624,381	698,291	72,285	631,413	703,698
c. Chapter 247, P.L. 1993	10,636,903	0	10,636,903	10,778,577	0	10,778,577
d. Chapter 428, P.L. 1999	78,530,949	0	78,530,949	74,821,323	0	74,821,323
e. Chapter 109, P.L. 1979	56,580,439	0	56,580,439	55,068,676	0	55,068,676
f. Chapter 511, P.L. 1991	30,656,453	0	30,656,453	30,018,449	0	30,018,449
g. Total	\$ 446,266,058	\$ 729,215,100	\$ 1,175,481,158	\$ 422,569,740	\$ 638,214,381	\$ 1,060,784,121
3. Total Statutory Pension Contribution: [1 + 2]	\$ 569,662,114	\$ 1,080,307,794	\$ 1,649,969,908	\$ 544,579,266	\$ 963,648,042	\$ 1,508,227,308
4. Lottery Enterprise Contribution Offset	\$ (13,012,258)	\$ 0	\$ (13,012,258)	\$ (12,845,413)	\$ 0	\$ (12,845,413)
5. Net Pension Contribution: [3 + 4]	\$ 556,649,856	\$ 1,080,307,794	\$ 1,636,957,650	\$ 531,733,853	\$ 963,648,042	\$ 1,495,381,895
6. Non-Contributory Group Insurance Premium	N/A	\$ 36,964,099	\$ 36,964,099	N/A	\$ 46,564,731	\$ 46,564,731

¹ 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 \$228,944,734 and \$227,263,995 for the July 1, 2019 and July 1, 2018 valuations, respectively.

² 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.

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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 2021 compared to FYE 2020. 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.

Table V-6 Pension Contributions as a Percent of Appropriation Payroll¹						
As of Beginning of Fiscal Year	July 1, 2019 Valuation Fiscal Year Ending 2021 Payment			July 1, 2018 Valuation Fiscal Year Ending 2020 Payment		
	State	Local Employers	Total	State	Local Employers	Total
<u>Prior to Statutory State-Paid Local Adjustments and Prior to Lottery Enterprise Contribution Offset</u>						
Normal Cost Contribution Rate	12.011%	12.054%	12.049%	11.215%	11.609%	11.560%
UAL Contribution Rate ²	<u>57.948%</u>	<u>25.884%</u>	<u>29.850%</u>	<u>54.901%</u>	<u>23.514%</u>	<u>27.405%</u>
Total Pension Contribution Rate	69.959%	37.938%	41.899%	66.116%	35.123%	38.965%
Non-Contributory Group Insurance Premium Rate	N/A	1.071%	N/A	N/A	1.373%	N/A
<u>After Statutory State-Paid Local Adjustments and Prior to Lottery Enterprise Contribution Offset</u>						
Normal Cost Contribution Rate	25.337%	10.174%	12.049%	25.422%	9.598%	11.560%
UAL Contribution Rate ²	<u>91.631%</u>	<u>21.131%</u>	<u>29.850%</u>	<u>88.046%</u>	<u>18.822%</u>	<u>27.405%</u>
Total Statutory Pension Contribution Rate	116.968%	31.305%	41.899%	113.468%	28.420%	38.965%
Non-Contributory Group Insurance Premium Rate	N/A	1.071%	N/A	N/A	1.373%	N/A

¹ 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.

² 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 2021 compared to FYE 2020. 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, 2019 Valuation		July 1, 2018 Valuation	
	Fiscal Year Ending 2021 Payment		Fiscal Year Ending 2020 Payment	
	State	Local Employers	State	Local Employers
1. Normal Cost Contribution Rate¹				
Basic Allowances	10.082%	10.171%	9.152%	9.596%
Chapter 247, P.L. 1993				
PERS Local normal rate for individuals without past service	N/A	15.448%	N/A	12.988%
PERS Local normal rate for individuals with past service	N/A	2.226%	N/A	1.267%
Portion of Municipalities & Local Groups costs payable by the State	0.018%	N/A	0.025%	N/A
Chapter 428, P.L. 1999	2.277%	N/A	3.164%	N/A
Chapter 109, P.L. 1979	9.544%	N/A	9.537%	N/A
Chapter 511, P.L. 1991	3.416%	N/A	3.544%	N/A
2. UAL Contribution Rate^{1,2}				
Basic Allowances	55.395%	21.135%	52.467%	18.834%
Chapter 204, P.L. 1989 ³	-	-	-	-
Chapter 247, P.L. 1993	2.184%	N/A	2.246%	N/A
Chapter 428, P.L. 1999 ⁴	16.125%	N/A	15.590%	N/A
Chapter 109, P.L. 1979	11.618%	N/A	11.474%	N/A
Chapter 511, P.L. 1991	6.295%	N/A	6.255%	N/A
3. Non-Contributory Group Insurance Premium Rate				
	N/A	1.071%	N/A	1.373%

¹ 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.

² 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.

³ Refer to Table V-8 for employer-specific costs under Chapter 204.

⁴ Includes UAL contribution rates for Chapter 86, P.L. 2001 and Chapter 318, P.L. 2001.

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SECTION V – CONTRIBUTIONS

Table V-8 determines the recommended FYE 2021 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, 2019 Valuation Fiscal Year Ending 2021		July 1, 2018 Valuation Fiscal Year Ending 2020	
		Payment as of Beginning of Fiscal Year	Years Remaining	Payment as of Beginning of Fiscal Year	Years Remaining
State Locations					
00053	Juvenile Justice Comm/Community Prog.	\$ 2,125	13	\$ 2,078	14
00323	Dept. Div. Of Human Resources	68,216	13	66,718	14
00498	Rutgers Biomedical	3,569	13	3,489	14
	Total	\$ 73,910		\$ 72,285	
Municipalities and Local Groups					
21202	Camden City	\$ 90,895	13	\$ 91,919	14
39300	Belmar Borough	12,159	13	12,296	14
46800	Roxbury Township	23,010	13	23,271	14
49700	West Windsor Township	34,132	13	34,516	14
57700	Sea Isle City	6,175	13	6,245	14
62400	NJ Institute of Technology	98,471	13	99,580	14
62500	Brookdale Community College	107,002	13	108,207	14
62700	Essex County College	32,157	13	32,519	14
75000	Lakewood Twp Fire District #1	17,077	13	17,269	14
75700	Middlesex County College	118,939	13	120,277	14
76200	Lower Camden Co Reg HS Dist #1	2,568	13	2,597	14
77500	Hopewell Twp Fire District #1	10,583	13	10,702	14
78600	South Jersey Transit Authority	51,941	13	52,526	14
78700	Washington Twp Bd of Fire Comm	18,168	13	18,373	14
79600	Upper Freehold Township	1,104	13	1,116	14
	Total	\$ 624,381		\$ 631,413	

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SECTION V – CONTRIBUTIONS

Table V-9 determines the FYE 2021 pension contribution for certain State colleges.

Table V-9 Fiscal Year Ending 2021 Pension Contributions for State College Locations							
Location	Location Name	Number of Members	2019 Appropriation Payroll	Normal Cost Contribution	UAL Contribution	Lottery Enterprise Offset ¹	Net FYE 2021 Pension Contribution
00410	Rowan University	28	\$ 2,110,115	\$ 534,633	\$ 1,933,198	\$ (913,024)	\$ 1,554,807
00412	Kean University	16	982,715	248,987	900,322	(425,210)	724,099
00413	William Paterson University of NJ	22	1,891,888	479,342	1,733,268	(818,599)	1,394,011
00414	Montclair State University	32	2,493,187	631,691	2,284,153	(1,078,775)	1,837,069
00415	The College of New Jersey	10	679,748	172,226	622,756	(294,119)	500,863
00421	Stockton University	22	1,328,875	336,693	1,217,459	(574,990)	979,162
00498	Rutgers University	130	10,050,514	2,546,466	9,211,425	(4,348,747)	7,409,144
62400	NJ Institute of Technology	29	2,277,916	577,148	2,185,401	(985,629)	1,776,920
Total		289	\$ 21,814,958	\$ 5,527,186	\$ 20,087,982	\$ (9,439,092)	\$ 16,176,075

¹ 72.54% of the total Lottery Enterprise contribution offset for FYE 2021 is allocated to each State college location based on the location's 2019 appropriation payroll. The percentage allocation to State colleges was determined using 2019 contributing active, non-contributing active and retiree headcounts for locations deemed to be eligible for funding under the Lottery Enterprise.

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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, 2019. 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

Note that the average service shown for July 1, 2019 and July 1, 2018 in Exhibits A-1 to A-6 is based on number of months of service provided in the census data. The average service shown for July 1, 2018 does not match last year's report because for these member data exhibits in the prior year, service was calculated based on elapsed time from date of enrollment.

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

Table A-1 Contributing Active Member Data by Tier State			
	July 1, 2019	July 1, 2018	% Change
<u>Tier 1</u>			
Count	4,143	4,327	-4.3%
Average Age	45.1	44.3	1.7%
Average Service	17.8	17.0	4.2%
Total Annual Salary	\$ 351,194,541	\$ 356,943,257	-1.6%
Average Salary	\$ 84,768	\$ 82,492	2.8%
<u>Tier 2</u>			
Count	229	232	-1.3%
Average Age	35.8	34.7	3.1%
Average Service	8.6	7.6	13.3%
Total Annual Salary	\$ 15,063,572	\$ 14,911,997	1.0%
Average Salary	\$ 65,780	\$ 64,276	2.3%
<u>Tier 3</u>			
Count	2,503	2,248	11.3%
Average Age	30.5	29.9	2.0%
Average Service	3.7	3.2	16.4%
Total Annual Salary	\$ 120,767,349	\$ 108,086,260	11.7%
Average Salary	\$ 48,249	\$ 48,081	0.3%
<u>Total</u>			
Count	6,875	6,807	1.0%
Average Age	39.4	39.2	0.6%
Average Service	12.3	12.1	1.5%
Total Annual Salary	\$ 487,025,462	\$ 479,941,514	1.5%
Average Salary	\$ 70,840	\$ 70,507	0.5%

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

**Table A-2
Contributing Active Member Data by Tier
Local Employers**

	July 1, 2019	July 1, 2018	% Change
<u>Tier 1</u>			
Count	22,064	23,484	-6.0%
Average Age	44.9	44.3	1.2%
Average Service	18.7	18.2	3.0%
Total Annual Salary	\$ 2,630,694,324	\$ 2,722,102,422	-3.4%
Average Salary	\$ 119,230	\$ 115,913	2.9%
<u>Tier 2</u>			
Count	504	504	0.0%
Average Age	35.1	34.1	2.8%
Average Service	8.8	7.8	12.5%
Total Annual Salary	\$ 46,964,478	\$ 44,376,652	5.8%
Average Salary	\$ 93,183	\$ 88,049	5.8%
<u>Tier 3</u>			
Count	11,596	10,025	15.7%
Average Age	30.9	30.4	1.5%
Average Service	4.1	3.6	15.6%
Total Annual Salary	\$ 773,292,945	\$ 624,298,119	23.9%
Average Salary	\$ 66,686	\$ 62,274	7.1%
<u>Total</u>			
Count	34,164	34,013	0.4%
Average Age	40.0	40.1	-0.3%
Average Service	13.6	13.7	-0.7%
Total Annual Salary	\$ 3,450,951,747	\$ 3,390,777,193	1.8%
Average Salary	\$ 101,011	\$ 99,691	1.3%

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

Table A-3 Contributing Active Member Data by Tier Total			
	July 1, 2019	July 1, 2018	% Change
<u>Tier 1</u>			
Count	26,207	27,811	-5.8%
Average Age	44.9	44.3	1.3%
Average Service	18.6	18.0	3.2%
Total Annual Salary	\$ 2,981,888,865	\$ 3,079,045,679	-3.2%
Average Salary	\$ 113,782	\$ 110,713	2.8%
<u>Tier 2</u>			
Count	733	736	-0.4%
Average Age	35.3	34.3	2.9%
Average Service	8.7	7.8	12.7%
Total Annual Salary	\$ 62,028,050	\$ 59,288,649	4.6%
Average Salary	\$ 84,622	\$ 80,555	5.0%
<u>Tier 3</u>			
Count	14,099	12,273	14.9%
Average Age	30.8	30.3	1.6%
Average Service	4.1	3.5	15.8%
Total Annual Salary	\$ 894,060,294	\$ 732,384,379	22.1%
Average Salary	\$ 63,413	\$ 59,674	6.3%
<u>Total</u>			
Count	41,039	40,820	0.5%
Average Age	39.9	39.9	-0.1%
Average Service	13.4	13.5	-0.3%
Total Annual Salary	\$ 3,937,977,209	\$ 3,870,718,707	1.7%
Average Salary	\$ 95,957	\$ 94,824	1.2%

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

Table A-4 Non-Contributing Active Member Data by Tier State			
	July 1, 2019	July 1, 2018	% Change
<u>Tier 1</u>			
Count	210	234	-10.3%
Average Age	49.2	48.2	2.0%
Average Service	13.9	13.4	4.1%
Total Last Reported Pay	\$ 15,035,446	\$ 16,692,846	-9.9%
Average Last Reported Pay	\$ 71,597	\$ 71,337	0.4%
<u>Tier 2</u>			
Count	7	7	0.0%
Average Age	32.9	33.0	-0.4%
Average Service	7.0	6.9	1.9%
Total Last Reported Pay	\$ 449,914	\$ 452,669	-0.6%
Average Last Reported Pay	\$ 64,273	\$ 64,667	-0.6%
<u>Tier 3</u>			
Count	147	121	21.5%
Average Age	30.4	30.6	-0.9%
Average Service	2.5	2.4	5.2%
Total Last Reported Pay	\$ 6,493,837	\$ 5,463,160	18.9%
Average Last Reported Pay	\$ 44,176	\$ 45,150	-2.2%
<u>Total</u>			
Count	364	362	0.6%
Average Age	41.3	42.0	-1.8%
Average Service	9.2	9.6	-4.0%
Total Last Reported Pay	\$ 21,979,197	\$ 22,608,675	-2.8%
Average Last Reported Pay	\$ 60,382	\$ 62,455	-3.3%

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APPENDIX A – MEMBERSHIP INFORMATION

Table A-5 Non-Contributing Active Member Data by Tier Local Employers			
	July 1, 2019	July 1, 2018	% Change
<u>Tier 1</u>			
Count	717	770	-6.9%
Average Age	48.0	47.4	1.4%
Average Service	14.4	14.3	1.1%
Total Last Reported Pay	\$ 62,830,908	\$ 66,403,425	-5.4%
Average Last Reported Pay	\$ 87,630	\$ 86,238	1.6%
<u>Tier 2</u>			
Count	12	15	-20.0%
Average Age	34.8	35.3	-1.5%
Average Service	7.7	6.5	19.4%
Total Last Reported Pay	\$ 1,065,134	\$ 1,128,035	-5.6%
Average Last Reported Pay	\$ 88,761	\$ 75,202	18.0%
<u>Tier 3</u>			
Count	388	328	18.3%
Average Age	30.2	30.2	0.3%
Average Service	2.7	2.4	15.5%
Total Last Reported Pay	\$ 20,476,685	\$ 16,301,994	25.6%
Average Last Reported Pay	\$ 52,775	\$ 49,701	6.2%
<u>Total</u>			
Count	1,117	1,113	0.4%
Average Age	41.7	42.1	-1.0%
Average Service	10.3	10.6	-3.4%
Total Last Reported Pay	\$ 84,372,727	\$ 83,833,454	0.6%
Average Last Reported Pay	\$ 75,535	\$ 75,322	0.3%

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

Table A-6			
Non-Contributing Active Member Data by Tier			
Total			
	July 1, 2019	July 1, 2018	% Change
<u>Tier 1</u>			
Count	927	1,004	-7.7%
Average Age	48.3	47.6	1.5%
Average Service	14.3	14.1	1.8%
Total Last Reported Pay	\$ 77,866,354	\$ 83,096,271	-6.3%
Average Last Reported Pay	\$ 83,998	\$ 82,765	1.5%
<u>Tier 2</u>			
Count	19	22	-13.6%
Average Age	34.1	34.6	-1.4%
Average Service	7.5	6.6	13.1%
Total Last Reported Pay	\$ 1,515,048	\$ 1,580,704	-4.2%
Average Last Reported Pay	\$ 79,739	\$ 71,850	11.0%
<u>Tier 3</u>			
Count	535	449	19.2%
Average Age	30.3	30.3	-0.1%
Average Service	2.7	2.4	12.6%
Total Last Reported Pay	\$ 26,970,522	\$ 21,765,154	23.9%
Average Last Reported Pay	\$ 50,412	\$ 48,475	4.0%
<u>Total</u>			
Count	1,481	1,475	0.4%
Average Age	41.6	42.1	-1.2%
Average Service	10.0	10.4	-3.5%
Total Last Reported Pay	\$ 106,351,924	\$ 106,442,129	-0.1%
Average Last Reported Pay	\$ 71,811	\$ 72,164	-0.5%

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

**Table A-7
Inactive Member Data by Status**

	July 1, 2019			July 1, 2018		
	State	Local Employers	Total	State	Local Employers	Total
Retirees						
Count	4,827	27,150	31,977	4,733	26,494	31,227
Annual Retirement Allowances	\$ 255,828,311	\$ 1,832,903,564	\$ 2,088,731,875	\$ 249,573,316	\$ 1,756,246,563	\$ 2,005,819,879
Average Retirement Allowance	\$ 52,999	\$ 67,510	\$ 65,320	\$ 52,730	\$ 66,288	\$ 64,234
Beneficiaries						
Count	871	6,676	7,547	847	6,589	7,436
Annual Retirement Allowances	\$ 28,019,651	\$ 224,601,091	\$ 252,620,742	\$ 26,921,871	\$ 217,121,737	\$ 244,043,608
Average Retirement Allowance	\$ 32,170	\$ 33,643	\$ 33,473	\$ 31,785	\$ 32,952	\$ 32,819
Ordinary Disability						
Count	737	2,249	2,986	728	2,212	2,940
Annual Retirement Allowances	\$ 20,460,920	\$ 68,527,402	\$ 88,988,322	\$ 20,150,423	\$ 66,327,842	\$ 86,478,265
Average Retirement Allowance	\$ 27,762	\$ 30,470	\$ 29,802	\$ 27,679	\$ 29,985	\$ 29,414
Accidental Disability						
Count	368	2,659	3,027	365	2,599	2,964
Annual Retirement Allowances	\$ 16,838,336	\$ 143,626,501	\$ 160,464,837	\$ 16,631,546	\$ 137,315,370	\$ 153,946,916
Average Retirement Allowance	\$ 45,756	\$ 54,015	\$ 53,011	\$ 45,566	\$ 52,834	\$ 51,939
In-Pay Total						
Count	6,803	38,734	45,537	6,673	37,894	44,567
Annual Retirement Allowances	\$ 321,147,218	\$ 2,269,658,558	\$ 2,590,805,776	\$ 313,277,156	\$ 2,177,011,512	\$ 2,490,288,668
Average Retirement Allowance	\$ 47,207	\$ 58,596	\$ 56,895	\$ 46,947	\$ 57,450	\$ 55,877
Deferred Vested Members						
Count	13	52	65	6	36	42
Annual Retirement Allowances	\$ 273,984	\$ 1,240,212	\$ 1,514,196	\$ 103,452	\$ 667,188	\$ 770,640
Average Retirement Allowance	\$ 21,076	\$ 23,850	\$ 23,295	\$ 17,242	\$ 18,533	\$ 18,349

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-8

Reconciliation of Plan Membership from July 1, 2018 to July 1, 2019

	Contributing Actives	Non-Contrib. Actives	Deferred Vested	Retired	Disabled	Beneficiaries	Total
1. July 1, 2018	40,820	1,475	42	31,227	5,904	7,436	86,904
2. Additions							
a. New Entrants	2,152	39					2,191
b. New Beneficiaries						110	110
c. Data Corrections				4			4
d. Total	<u>2,152</u>	<u>39</u>	<u>0</u>	<u>4</u>	<u>0</u>	<u>110</u>	<u>2,305</u>
3. Reductions							
a. Withdrawal/Certain Period End	(115)	(164)				(30)	(309)
b. Died without Beneficiary	(10)	(4)		(349)	(56)	(358)	(777)
c. Data Corrections			(1)				(1)
d. Total	<u>(125)</u>	<u>(168)</u>	<u>(1)</u>	<u>(349)</u>	<u>(56)</u>	<u>(388)</u>	<u>(1,087)</u>
4. Changes in Status							
a. Contributing Actives	231	(231)					0
b. Non-Contributing Actives	(522)	522					0
c. Deferred Vested	(1)	(27)	28				0
e. Retired	(1,384)	(37)	(4)	1,425			0
f. Disabled	(123)	(88)		(1)	212		0
g. Died with Beneficiary	(9)	(4)		(329)	(47)	389	0
h. Total	<u>(1,808)</u>	<u>135</u>	<u>24</u>	<u>1,095</u>	<u>165</u>	<u>389</u>	<u>0</u>
5. July 1, 2019	41,039	1,481	65	31,977	6,013	7,547	88,122

QDRO benefits included with member records for valuation purposes.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2019 ACTUARIAL VALUATION**

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	246	817	186	0	0	0	0	0	1,249
30 to 34	66	411	480	174	4	0	0	0	1,135
35 to 39	14	145	267	533	185	8	0	0	1,152
40 to 44	0	11	108	344	557	216	0	0	1,236
45 to 49	0	0	6	166	497	521	38	0	1,228
50 to 54	0	0	0	20	228	319	76	9	652
55 & up	0	0	0	0	9	151	37	26	223
Total	326	1,384	1,047	1,237	1,480	1,215	151	35	6,875

**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	\$ 40,900	\$ 45,464	\$ 51,979	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 45,535
30 to 34	42,168	47,210	58,433	70,128	63,065	0	0	0	55,232
35 to 39	41,600	47,003	59,135	75,702	82,967	86,384	0	0	69,076
40 to 44	0	46,741	60,509	76,311	87,466	92,002	0	0	82,436
45 to 49	0	0	69,102	76,769	85,375	93,826	96,206	0	88,053
50 to 54	0	0	0	78,908	85,581	90,944	93,923	92,648	89,070
55 & up	0	0	0	0	87,079	86,433	94,539	94,670	88,764
Total	\$ 41,187	\$ 46,154	\$ 57,741	\$ 75,282	\$ 85,843	\$ 91,777	\$ 94,648	\$ 94,150	\$ 70,840

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2019 ACTUARIAL VALUATION**

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	752	3,816	854	16	0	0	0	0	5,438
30 to 34	152	1,911	2,645	1,276	35	1	0	0	6,020
35 to 39	20	629	1,116	2,881	1,422	14	0	0	6,082
40 to 44	2	101	390	1,416	2,646	1,080	19	0	5,654
45 to 49	0	2	35	680	1,581	3,051	628	11	5,988
50 to 54	0	1	0	74	581	1,632	901	221	3,410
55 & up	0	0	2	3	41	637	415	474	1,572
Total	926	6,460	5,042	6,346	6,306	6,415	1,963	706	34,164

**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	\$ 45,953	\$ 57,942	\$ 75,845	\$ 77,569	\$ 0	\$ 0	\$ 0	\$ 0	\$ 59,153
30 to 34	46,591	61,934	84,670	99,982	106,873	83,124	0	0	79,866
35 to 39	42,398	63,906	87,157	106,551	114,567	125,438	0	0	100,289
40 to 44	66,956	65,619	91,164	107,878	118,161	129,423	124,967	0	114,941
45 to 49	0	85,236	96,833	105,128	115,439	129,403	139,822	150,828	123,886
50 to 54	0	52,544	0	108,362	113,445	125,699	139,311	152,395	128,540
55 & up	0	0	111,490	98,292	113,908	121,706	130,952	150,717	132,633
Total	\$ 46,026	\$ 59,831	\$ 84,323	\$ 105,318	\$ 116,143	\$ 127,684	\$ 137,568	\$ 151,244	\$ 101,011

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2019 ACTUARIAL VALUATION**

APPENDIX A – MEMBERSHIP INFORMATION

Table A-13 Counts by Age and Status of Inactive Members State					
Attained Age	Status				Total
	Retiree	Beneficiary	Ordinary Disability	Accidental Disability	
Under 45	11	94	75	77	257
45 to 49	206	37	100	73	416
50 to 54	819	39	119	81	1,058
55 to 59	1,060	67	109	51	1,287
60 to 64	977	115	111	46	1,249
65 to 69	738	109	100	17	964
70 to 74	527	129	69	17	742
75 to 79	283	113	41	1	438
80 to 84	141	86	11	3	241
85 & up	65	82	2	2	151
Total	4,827	871	737	368	6,803

Table A-14 Average Retirement Allowances by Age and Status of Inactive Members State					
Attained Age	Status				Total
	Retiree	Beneficiary	Ordinary Disability	Accidental Disability	
Under 45	\$ 46,472	\$ 18,786	\$ 27,858	\$ 45,278	\$ 30,556
45 to 49	57,387	37,740	29,145	47,972	47,198
50 to 54	58,208	35,313	28,803	48,268	53,296
55 to 59	55,356	37,336	26,891	44,981	51,596
60 to 64	54,087	37,284	29,944	43,870	50,018
65 to 69	52,709	36,559	25,956	43,368	47,943
70 to 74	49,230	34,715	27,071	41,572	44,471
75 to 79	42,685	31,035	24,085	46,534	37,947
80 to 84	37,712	29,800	26,935	34,585	34,358
85 & up	31,716	26,321	13,732	17,003	28,353
Total	\$ 52,999	\$ 32,170	\$ 27,762	\$ 45,756	\$ 47,207

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-15					
Counts by Age and Status of Inactive Members					
Local Employers					
Attained Age	Status				Total
	Retiree	Beneficiary	Ordinary Disability	Accidental Disability	
Under 45	55	248	270	409	982
45 to 49	1,039	120	323	518	2,000
50 to 54	3,684	216	402	560	4,862
55 to 59	4,549	344	361	378	5,632
60 to 64	4,641	565	273	243	5,722
65 to 69	4,090	719	231	177	5,217
70 to 74	3,876	962	189	184	5,211
75 to 79	2,693	1,064	127	105	3,989
80 to 84	1,468	956	48	48	2,520
85 & up	1,055	1,482	25	37	2,599
Total	27,150	6,676	2,249	2,659	38,734

Table A-16					
Average Retirement Allowances by Age and Status of Inactive Members					
Local Employers					
Attained Age	Status				Total
	Retiree	Beneficiary	Ordinary Disability	Accidental Disability	
Under 45	\$ 58,996	\$ 23,942	\$ 35,411	\$ 63,098	\$ 45,367
45 to 49	74,529	45,805	33,664	61,291	62,778
50 to 54	77,764	45,808	33,930	60,404	70,720
55 to 59	75,946	42,863	32,969	57,079	69,905
60 to 64	73,475	41,914	31,753	49,322	67,342
65 to 69	68,492	39,324	27,500	42,820	61,786
70 to 74	61,270	36,018	21,552	33,465	54,186
75 to 79	54,623	34,214	17,582	28,090	47,302
80 to 84	49,217	29,351	18,130	24,061	40,609
85 & up	40,094	25,276	14,131	22,755	31,148
Total	\$ 67,510	\$ 33,643	\$ 30,470	\$ 54,015	\$ 58,596

QDRO benefits included with member records for valuation purposes.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2019 ACTUARIAL VALUATION**

APPENDIX A – MEMBERSHIP INFORMATION

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

	Male			Female		
	State	Local Employers	Total	State	Local Employers	Total
Contributing Actives						
Count	5,637	31,099	36,736	1,238	3,065	4,303
Total Annual Salary	\$ 399,078,594	\$ 3,166,208,301	\$ 3,565,286,895	\$ 87,946,868	\$ 284,743,446	\$ 372,690,314
Average Annual Salary	\$ 70,796	\$ 101,811	\$ 97,052	\$ 71,039	\$ 92,902	\$ 86,612
Non-Contributing Actives						
Count	268	954	1,222	96	163	259
Total Last Reported Pay	\$ 16,031,232	\$ 73,101,536	\$ 89,132,768	\$ 5,947,965	\$ 11,271,191	\$ 17,219,156
Average Last Reported Pay	\$ 59,818	\$ 76,626	\$ 72,940	\$ 61,958	\$ 69,148	\$ 66,483

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

	Male			Female		
	State	Local Employers	Total	State	Local Employers	Total
Retirees and Beneficiaries						
Count	5,053	30,485	35,538	1,750	8,249	9,999
Annual Retirement Allowances	\$ 252,518,572	\$ 1,955,661,304	\$ 2,208,179,876	\$ 68,628,646	\$ 313,997,254	\$ 382,625,900
Average Retirement Allowance	\$ 49,974	\$ 64,152	\$ 62,136	\$ 39,216	\$ 38,065	\$ 38,266
Deferred Vested						
Count	12	43	55	1	9	10
Annual Retirement Allowances	\$ 236,844	\$ 1,009,860	\$ 1,246,704	\$ 37,140	\$ 230,352	\$ 267,492
Average Retirement Allowance	\$ 19,737	\$ 23,485	\$ 22,667	\$ 37,140	\$ 25,595	\$ 26,749

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

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

	Police Officers			Firefighters		
	State	Local Employers	Total	State	Local Employers	Total
Contributing Actives						
Count	6,829	27,676	34,505	46	6,488	6,534
Total Annual Salary	\$ 483,911,403	\$ 2,795,999,178	\$ 3,279,910,581	\$ 3,114,059	\$ 654,952,569	\$ 658,066,628
Average Annual Salary	\$ 70,861	\$ 101,026	\$ 95,056	\$ 67,697	\$ 100,948	\$ 100,714
Non-Contributing Actives						
Count	362	997	1,359	2	120	122
Total Annual Salary	\$ 21,872,529	\$ 75,277,780	\$ 97,150,309	\$ 106,668	\$ 9,094,947	\$ 9,201,615
Average Annual Salary	\$ 60,421	\$ 75,504	\$ 71,487	\$ 53,334	\$ 75,791	\$ 75,423

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
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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
Retirees and Beneficiaries						
Count	6,487	27,705	34,192	68	6,726	6,794
Annual Retirement Allowances	\$ 311,567,916	\$ 1,720,669,448	\$ 2,032,237,364	\$ 2,694,568	\$ 433,939,263	\$ 436,633,831
Average Retirement Allowance	\$ 48,030	\$ 62,107	\$ 59,436	\$ 39,626	\$ 64,517	\$ 64,268
Deferred Vested						
Count	13	49	62	0	3	3
Annual Retirement Allowances	\$ 273,984	\$ 1,158,024	\$ 1,432,008	\$ 0	\$ 82,188	\$ 82,188
Average Retirement Allowance	\$ 21,076	\$ 23,633	\$ 23,097	\$ 0	\$ 27,396	\$ 27,396

Table A-20 (cont.) Inactive Member Data by Employer Group			
	Unknown		
	State	Local Employers	Total
Retirees and Beneficiaries			
Count	248	4,303	4,551
Annual Retirement Allowances	\$ 6,884,734	\$ 115,049,847	\$ 121,934,581
Average Retirement Allowance	\$ 27,761	\$ 26,737	\$ 26,793
Deferred Vested			
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, 2019 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:

Age	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** \$280,000 in 2019 increasing 2.75% per annum, compounded annually.
- 6. Social Security Wage Base** \$132,900 in 2019 increasing 3.25% per annum, compounded annually.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2019 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
JULY 1, 2019 ACTUARIAL VALUATION

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 2018 data but omitted from the 2019 data are assumed to have died without a beneficiary.

**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**

The assumed rates of termination, disability, retirement, mortality, salary increase, and inflation were updated based on the July 1, 2013 – June 30, 2018 Experience Study, which was approved by the Board of Trustees on January 13, 2020. For a detailed description of each of the assumptions before and after the changes reflected in this valuation, please reference the Experience Study.

The assumed rate of investment return was decreased from 7.50% to 7.30% per annum, compounded annually.

POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2019 ACTUARIAL VALUATION

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

B. Projection Assumptions

1. **Investment Rate of Return**
 - July 1, 2020 valuation: 7.30% per annum, compounded annually.
 - July 1, 2021 and later valuations: 7.00% per annum, compounded annually.

2. **Appropriation Percentages**

The State is assumed to appropriate 80% of the Statutory contribution in FYE 2021 and to increase the percent by 10% a year until reaching 100% of the Statutory contribution beginning with FYE 2023.

3. **Administrative Expenses**

0.48% of expected pension benefit payments for the year for the State and 0.25% of expected pension benefit payments for the year for Local employers.

4. **New Entrants**
 - Contributing active population assumed to remain at 2019 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 2019 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.

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.

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 1st, 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.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
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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 2020 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 2020 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.

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 2020 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
JULY 1, 2019 ACTUARIAL VALUATION**

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. 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, 2019 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, a total of 20% (35%, 50%) of Final Compensation payable to one (two, three or more) dependent child(ren). 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.

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.

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.

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APPENDIX C – SUMMARY OF PLAN PROVISIONS

- (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

None.

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

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
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APPENDIX D – HISTORICAL DATA AND REQUIRED CAFR 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 ¹	Actuarial Liability	Funded Ratio	
				Market Value	Actuarial Value
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%
2010	1,771,575,807	2,190,654,958	3,672,361,258	48.2%	59.7%

¹ Includes Special Asset Value beginning with July 1, 2016 valuation

**Table D-2
Historical Summary of Employer Contributions¹
State**

Fiscal Year Ending June 30,	Statutory Contribution / Actuarially Determined Contribution	Actual Pension Contribution	Lottery Revenue	Contribution Deficiency/ (Excess)	Percentage of Contribution Covered
2020 ²	\$ 544,579,266	\$ 368,360,073	\$ 12,858,907	\$ 163,360,286	70.0%
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%
2011	339,480,900	0	0	339,480,900	0.0%

¹ Excludes contributions for NCGI and includes Local obligations payable by the State

² Reflects the State's planned contribution of 70% of the Statutory contribution and expected Lottery revenue

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
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APPENDIX D – HISTORICAL DATA AND REQUIRED CAFR 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
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%
2010	17,108,014,883	20,367,865,987	25,601,998,126	66.8%	79.6%

**Table D-4
Historical Summary of Employer Contributions¹
Local Employers**

Fiscal Year Ending June 30,	Statutory Contribution /		Contribution Deficiency/ (Excess)	Percentage of Contribution Covered
	Actuarially Determined Contribution	Actual Pension Contribution		
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%
2011	857,072,909	857,072,909	0	100.0%

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

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2019 ACTUARIAL VALUATION**

APPENDIX D – HISTORICAL DATA AND REQUIRED CAFR EXHIBITS

In accordance with the Government Finance Officers Association (GFOA) and their recommended checklist for Comprehensive Annual Financial Reports (CAFRs), 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 ^{1,2,3}	% Increase in Average Annual Allowance ^{1,2}
	Number ³	Annual Allowance	Number ^{1,2}	Annual Allowance	Number ^{1,2,3}	Annual Allowance		
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%
2010	466	20,752,289	85	2,577,204	4,562	178,146,637	39,050	2.36%

¹ 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.

² 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.

³ 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 ^{1,2,3}	% Increase in Average Annual Allowance ^{1,2}
	Number ²	Annual Allowance	Number ^{1,3}	Annual Allowance	Number ^{1,2,3}	Annual Allowance		
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%
2010	2,088	117,656,689	856	26,753,568	31,354	1,413,047,858	45,068	2.65%

¹ 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.

² 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.

³ 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 CAFR 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 ^{1,2,3}	% Increase in Average Annual Allowance ^{1,2,3}
	Number ^{2,3}	Annual Allowance	Number ^{1,2,3}	Annual Allowance	Number ^{1,2,3}	Annual Allowance		
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%
2010	2,554	138,408,978	941	29,330,772	35,916	1,591,194,495	44,303	2.55%

¹ 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.

² 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.

³ 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 CAFR EXHIBITS

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

Valuation Date July 1,	Number of Contributing Active Members ¹	Annual Compensation ¹	Annual Average Compensation ¹	% Increase in Average Annual Compensation ¹	Number of Participating Employers ²
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
2010	7,572	550,731,084	72,733	5.81%	N/A

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

² 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 ¹	Annual Compensation ¹	Annual Average Compensation ¹	% Increase in Average Annual Compensation ¹	Number of Participating Employers ²
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
2010	36,632	3,247,452,128	88,651	3.04%	N/A

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

² Number of locations reporting contributing active members.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2019 ACTUARIAL VALUATION**

APPENDIX D – HISTORICAL DATA AND REQUIRED CAFR EXHIBITS

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

Valuation Date July 1,	Number of Contributing Active Members¹	Annual Compensation¹	Annual Average Compensation¹	% Increase in Average Annual Compensation¹	Number of Participating Employers²
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
2010	44,204	3,798,183,212	85,924	3.52%	N/A

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

² 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 CAFR EXHIBITS

Table D-11 Schedule of Funding Progress State						
Valuation Date July 1,	Actuarial Value of Assets ¹ (a)	Actuarial Accrued Liability (b)	(Surplus)/Unfunded Actuarial Liability (c) = (b) - (a)	Funded Ratio (a) / (b)	Covered Payroll ² (d)	(Surplus)/Unfunded Actuarial Liability as % of Covered Payroll (c) / (d)
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%
2010	2,190,654,958	3,672,361,258	1,481,706,300	59.65%	550,731,084	269.04%

¹ Includes receivable amounts

² 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 ¹ (a)	Actuarial Accrued Liability (b)	(Surplus)/Unfunded Actuarial Liability (c) = (b) - (a)	Funded Ratio (a) / (b)	Covered Payroll ² (d)	(Surplus)/Unfunded Actuarial Liability as % of Covered Payroll (c) / (d)
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%
2010	20,367,865,987	25,601,998,126	5,234,132,139	79.56%	3,247,452,128	161.18%

¹ Includes receivable amounts

² Prior to July 1, 2018, includes non-contributing active members

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

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

Valuation Date July 1,	Actuarial Value of Assets ¹ (a)	Actuarial Accrued Liability (b)	(Surplus)/Unfunded		Covered Payroll ² (d)	(Surplus)/Unfunded Actuarial Accrued Liability as % of Covered Payroll (c) / (d)
			Actuarial Accrued Liability (c) = (b) - (a)	Funded Ratio (a) / (b)		
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%
2010	22,558,520,945	29,274,359,384	6,715,838,439	77.06%	3,798,183,212	176.82%

¹ Includes receivable amounts

² Prior to July 1, 2018, includes non-contributing active members

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
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APPENDIX D – HISTORICAL DATA AND REQUIRED CAFR 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 ^c	Portion of Actuarial Liabilities Covered by Actuarial Value of Assets		
	Contributing & Non-Contributing Active Member Contributions	Retirees, Beneficiaries & Deferred Vested ¹	Contributing & Non-Contributing Active Member Benefits Financed by Employer ¹		(1)	(2)	(3)
	(1)	(2)	(3)				
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%
2010	439,239,135	1,914,386,462	1,318,735,661	2,190,654,958	100.00%	91.49%	0.00%

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

² 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 ^c	Portion of Actuarial Liabilities Covered by Actuarial Value of Assets		
	Contributing & Non-Contributing Active Member Contributions	Retirees, Beneficiaries & Deferred Vested ¹	Contributing & Non-Contributing Active Member Benefits Financed by Employer ¹		(1)	(2)	(3)
	(1)	(2)	(3)				
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%
2010	2,610,141,488	14,279,203,074	8,712,653,564	20,367,865,987	100.00%	100.00%	39.92%

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

² Includes receivable amounts

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
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APPENDIX D – HISTORICAL DATA AND REQUIRED CAFR 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 ²	Portion of Actuarial Liabilities Covered by Actuarial Value of Assets		
	Contributing & Non-Contributing Active Member Contributions (1)	Retirees, Beneficiaries & Deferred Vested ¹ (2)	Contributing & Non-Contributing Active Member Benefits Financed by Employer ¹ (3)		(1)	(2)	(3)
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%
2010	3,049,380,623	16,193,589,536	10,031,389,225	22,558,520,945	100.00%	100.00%	33.05%

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

² Includes receivable amounts

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

**Table D-17
Analysis of Financial Experience
Change in Unfunded Actuarial Accrued Liability
State¹**

Valuation Date July 1,	Actuarial Value Of Asset Investment (Gain)/Loss	Actuarial Accrued Liability (Gain)/Loss	Assumption & Method Changes	Plan Changes	Contributions ²	Change in Unfunded Actuarial Accrued Liability
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
2010	N/A	N/A	N/A	N/A	N/A	(243,281,124)

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

² 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
Local¹**

Valuation Date July 1,	Actuarial Value Of Asset Investment (Gain)/Loss	Actuarial Accrued Liability (Gain)/Loss	Assumption & Method Changes	Plan Changes	Contributions ²	Change in Unfunded Actuarial Accrued Liability
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
2010	N/A	N/A	N/A	N/A	N/A	(2,545,143,925)

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

² 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
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APPENDIX D – HISTORICAL DATA AND REQUIRED CAFR 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 ¹	Change in Unfunded Actuarial Accrued Liability
2019	\$ 204,694,283	\$ 90,938,917	\$ 1,121,504,049	\$ 0	\$ 69,927,162	\$ 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
2010	919,732,564	(347,555,446)	0	(4,789,914,256)	1,429,312,089	(2,788,425,049)

¹ 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
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APPENDIX E – EARLY RETIREMENT INCENTIVE PROGRAMS

Table E-1 Local Employers ERI 1 Contribution Schedule			
Location Number	Location Name	Fiscal Year 2021 Payment	Present Value as of 7/1/2019
22100	East Rutherford Borough	\$ 85,462	\$ 767,276
25500	Glen Ridge Borough	61,452	551,712
34600	Wallington Borough	40,177	360,712
38800	Phillipsburg Town	12,027	107,977
43400	Bound Brook Borough	35,711	320,609
54400	Linwood City	55,995	502,719
57100	Mine Hill Township	19,521	175,261
61200	Raritan Township	58,848	528,337
	Total	\$ 369,193	\$ 3,314,603

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

Present values as of July 1, 2019 exclude expected payments for fiscal year ending 2020.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
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APPENDIX E – EARLY RETIREMENT INCENTIVE PROGRAMS

Table E-2 Local Employers ERI Contribution Schedules due to Recent ERI Legislation				
Location Number	Location Name	Years and Form of Payment	ERI Information Fiscal Year 2021 Payment	Present Value as of 7/1/2019
Chapter 126, P.L. 2000				
72000	Union County	15 Year - Level	\$ 49,151	\$ 156,853
72001	Union County	15 Year - Level	17,575	56,086
72003	Union County	15 Year - Level	54,378	48,070
72003	Union County (Effective 2006)	15 Year - Level	197,542	630,402
	Sub-Total		\$ 318,646	\$ 891,411
Chapter 130, P.L. 2003				
20300	Bayonne City	15 Year - Increasing	\$ 333,012	\$ 294,381
22100	East Rutherford Borough	15 Year - Increasing	54,910	95,022
22400	Union City	15 Year - Increasing	38,946	34,428
28300	Montclair Township	15 Year - Increasing	308,427	272,648
31800	Harrison Town	15 Year - Increasing	223,588	197,651
32500	Nutley Township	15 Year - Increasing	121,979	107,829
33300	Wood-Ridge Borough	15 Year - Increasing	37,819	65,447
35400	Belleville Township	15 Year - Increasing	52,583	90,995
36000	Livingston Township	15 Year - Increasing	82,960	143,564
43100	Ewing Township	15 Year - Increasing	178,655	157,930
43600	Roseland Borough	15 Year - Increasing	44,145	76,394
49300	Berkeley Heights Township	15 Year - Increasing	43,256	74,854
56500	Franklin Township	15 Year - Increasing	39,425	68,226
61200	Raritan Township	15 Year - Increasing	27,334	47,301
62600	Monroe Township	15 Year - Increasing	22,153	38,335
71100	Mercer County	15 Year - Increasing	172,237	152,257
72000	Union County	15 Year - Increasing	1,277	2,209
72003	Union County	15 Year - Increasing	58,085	100,517
	Sub-Total		\$ 1,840,791	\$ 2,019,988
	Total		\$ 2,159,437	\$ 2,911,399

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

Present values as of July 1, 2019 exclude expected payments for fiscal year ending 2020.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2019 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 2021 Payment	Present Value as of 7/1/2019
20300	Bayonne City	\$ 619,998	\$ 2,777,359
20400	Salem City	24,470	109,618
20600	Plainfield City	354,599	1,588,469
21001	Elizabeth City	495,344	2,218,957
21002	Elizabeth City	354,588	1,588,423
21101	Newark City	1,850,466	8,289,395
21102	Newark City	903,533	4,047,492
21202	Camden City	307,685	1,378,316
21300	North Plainfield Borough	110,509	495,037
21600	Somerville Borough	43,733	195,908
21800	Roselle Borough	142,314	637,512
22000	Freehold Borough	52,782	236,443
22400	Union City	301,015	1,348,434
22501	Passaic City	268,552	1,203,012
22502	Passaic City	178,183	798,192
22800	Metuchen Borough	38,699	173,359
23000	West New York Town	174,736	782,751
23200	Oradell Borough	34,684	155,369
23301	Hoboken City	218,568	979,103
23302	Hoboken City	210,225	941,728
23400	Audubon Borough	25,291	113,295
23800	East Orange City	544,957	2,441,203
23900	Maplewood Township	157,386	705,032
24100	Hightstown Borough	19,888	89,092
24200	West Milford Township	79,663	356,859
24400	Saddle Brook Township	67,045	300,337
24500	Perth Amboy City	271,427	1,215,891
24600	Secaucus Town	103,477	463,540
24800	Lyndhurst Township	89,436	400,641
24900	Orange City	250,486	1,122,083
25500	Glen Ridge Borough	36,937	165,465
25600	Guttenberg Town	30,496	136,613
25801	Collingswood Borough	43,559	195,128
25802	Collingswood Borough	18,669	83,630
26100	Dunellen Borough	18,659	83,587

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

Present values as of July 1, 2019 exclude expected payments for fiscal year ending 2020.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2019 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 2021 Payment	Present Value as of 7/1/2019
26600	Fairview Borough	\$ 53,150	\$ 238,092
26700	Keansburg Borough	44,418	198,977
27300	New Milford Borough	57,425	257,243
27400	Paramus Borough	185,773	832,195
27600	South Amboy City	37,590	168,387
27700	Weehawken Township	91,303	409,005
28000	Hackensack City	385,717	1,727,868
28500	Penns Grove Borough	18,642	83,510
28600	Matawan Borough	33,434	149,773
28700	Cedar Grove Township	50,725	227,229
28900	Bogota Borough	21,562	96,589
29100	Irvington Township	448,438	2,008,835
29200	Cinnaminson Township	64,111	287,194
29500	Little Ferry Borough	28,748	128,779
29700	Garwood Borough	23,157	103,735
30701	Paterson City	485,471	2,174,727
30702	Paterson City	384,171	1,720,944
30801	Atlantic City	476,017	2,132,380
30802	Atlantic City	352,848	1,580,629
31100	Fanwood Borough	28,188	126,270
31300	East Hanover Township	61,785	276,774
31600	Rutherford Borough	70,728	316,836
31800	Harrison Township	161,898	725,243
32200	Gloucester City	73,058	327,271
32600	Union Township	355,286	1,591,550
32700	Bloomfield Township	334,553	1,498,671
32900	Morristown Town	124,441	557,449
33200	Asbury Park City	186,292	834,519
33401	Trenton City	472,417	2,116,253
33402	Trenton City	352,763	1,580,246
33800	Lakewood Township	191,890	859,594
34000	North Arlington Borough	58,771	263,271
34100	Rahway City	206,220	923,787
34200	Verona Township	48,870	218,921
34301	Hillside Township	109,673	491,296

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

Present values as of July 1, 2019 exclude expected payments for fiscal year ending 2020.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2019 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 2021 Payment	Present Value as of 7/1/2019
34302	Hillside Township	\$ 75,872	\$ 339,878
34600	Wallington Borough	39,707	177,873
34700	East Newark Borough	6,971	31,225
34800	Clifton City	471,066	2,110,202
34900	Wildwood City	79,507	356,162
35000	Palisades Park Borough	53,979	241,804
35100	Pleasantville City	160,413	718,590
35400	Belleville Township	286,441	1,283,150
35500	Dover Town	62,680	280,784
35600	South Orange Village	148,594	665,647
35800	Garfield City	107,890	483,309
35900	Linden City	391,545	1,753,975
36200	Bridgeton City	87,081	390,088
36400	Washington Borough	17,498	78,383
36700	Fairfield Township	58,406	261,637
36900	Middlesex Borough	46,740	209,377
37000	Middletown Township	167,685	751,167
37400	Maywood Borough	45,137	202,197
37700	Piscataway Township	135,395	606,519
38101	Jersey City	1,247,112	5,586,598
38102	Jersey City Fire Dept.	945,496	4,235,470
38500	Runnemede Borough	28,209	126,364
39500	Mountainside Borough	36,089	161,665
39900	Long Branch City	168,192	753,436
40400	Wanaque Borough	36,457	163,315
41000	Manville Borough	36,425	163,172
41400	Oceanport Borough	24,016	107,583
41500	Haworth Borough	19,381	86,819
41600	Little Falls Twp	32,626	146,153
41900	North Haledon Borough	25,983	116,395
42000	Haledon Borough	26,792	120,019
42500	Wharton Borough	30,626	137,193
43000	West Paterson Borough	39,087	175,093
43100	Ewing Township	141,356	633,220
43400	Bound Brook Borough	34,522	154,644

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

Present values as of July 1, 2019 exclude expected payments for fiscal year ending 2020.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2019 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 2021 Payment	Present Value as of 7/1/2019
43500	Emerson Borough	\$ 34,111	\$ 152,807
43600	Roseland Borough	41,239	184,734
43700	Norwood Borough	23,530	105,404
43800	Prospect Park Borough	22,813	102,194
44100	Englewood Cliffs Borough	59,629	267,117
44800	Englishtown Borough	5,488	24,583
44900	Ringwood Borough	33,919	151,945
46300	Borough of Lake Como	13,883	62,189
46400	Aberdeen Township	46,883	210,017
46600	West Long Branch Borough	26,826	120,170
46700	Pt Pleasant Beach Borough	39,151	175,382
47300	Brooklawn Borough	6,092	27,290
47800	Hopatcong Borough	40,436	181,138
47900	West Deptford Township	54,429	243,821
48200	South Bound Brook Borough	19,662	88,078
48600	Gloucester Township	151,747	679,769
48800	Upper Saddle River Boro	33,078	148,179
49100	Willingboro Township	114,387	512,411
50000	Brielle Borough	25,274	113,220
50700	South Brunswick Township	126,330	565,911
51100	Jefferson Township	58,826	263,518
51600	Wall Township	128,072	573,713
52800	Berlin Borough	23,618	105,799
53500	Winslow Township	109,913	492,368
53900	Berkeley Township Municipal Bld	122,904	550,564
54100	Mansfield Township	17,183	76,972
54300	Lebanon Township	11,609	52,004
54700	Seaside Heights Borough	32,136	143,958
54800	Manchester Township	89,452	400,713
55100	Pine Hill Borough	26,625	119,268
55300	Lindenwold Borough	56,446	252,857
55700	Bloomingtondale Borough	25,002	111,998
56000	Howell Township	156,492	701,027
56200	Plainsboro Township	58,218	260,796
56300	Marlboro Township	131,356	588,426

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

Present values as of July 1, 2019 exclude expected payments for fiscal year ending 2020.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2019 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 2021 Payment	Present Value as of 7/1/2019
56500	Franklin Township	\$ 34,663	\$ 155,277
58200	Egg Harbor Township	121,784	545,547
58400	Holmdel Township	71,259	319,213
58500	Milltown Borough	22,636	101,401
58900	Buena Borough	7,039	31,534
59000	Eastampton Township	22,433	100,490
59800	Chesilhurst Borough	8,363	37,463
59900	Egg Harbor City	14,780	66,209
60000	Harrison Township	16,993	76,123
60100	Woodbury Heights Borough	7,758	34,754
60600	Waterfront Comm of NY Harbor	1,915	8,579
61000	Somerdale Borough	14,749	66,070
61200	Raritan Township	55,084	246,754
62300	NJ Transit Corporation	265,914	1,191,197
63100	Allentown Borough	7,078	31,709
63300	Barnegat Township	39,116	175,226
67700	Lambertville City	9,928	44,473
68000	Lawnside Borough	7,807	34,974
68800	Mount Arlington Borough	13,764	61,658
69000	National Park Borough	4,451	19,940
70404	Camden County Regional	540,812	2,422,635
71600	Passaic County	896,220	4,014,729
71603	Passaic County	128,156	574,092
72000	Union County	418,346	1,874,036
72001	Union County	68,840	308,379
72003	Union County	322,257	1,443,589
72700	South Toms River Borough	7,404	33,168
73500	Union Beach Borough	12,573	56,323
74000	West Amwell Township	3,374	15,113
74100	Winfield Township	5,979	26,783
74400	Hamilton Twp Fire Comm Dist	10,303	46,154
75000	Lakewood Twp Fire District #1	5,036	22,559
75900	Gloucester Twp Fire District #2	3,422	15,331
79000	North Hudson Reg Fire & Rescue	519,236	2,325,985
Total		\$ 25,492,799	\$ 114,198,228

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

Present values as of July 1, 2019 exclude expected payments for fiscal year ending 2020.

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:

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

6. Actuarial Valuation

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

APPENDIX 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.