

Public Employees' Retirement System of New Jersey

Actuarial Valuation Report as of July 1, 2018

Produced by Cheiron

April 2019

TABLE OF CONTENTS

<u>Section</u>		<u>Page</u>
Letter of Transmittal		i
Section I	Board Summary	1
Section II	Assets	34
Section III	Liabilities	41
Section IV	Contributions.....	50
 <u>Appendices</u>		
Appendix A	Membership Information	59
Appendix B	Actuarial Assumptions and Methods	70
Appendix C	Summary of Plan Provisions	80
Appendix D	Historical Data	91
Appendix E	Early Retirement Incentive Programs	94
Appendix F	Chapter 19, P. L. 2009	102
Appendix G	Glossary of Terms.....	112

LETTER OF TRANSMITTAL

April 25, 2019

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

Dear Board Members:

At your request, we have performed the July 1, 2018 Actuarial Valuation of the Public Employees' Retirement System of New Jersey (PERS 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 2020. Future results may differ significantly from the current results presented in this report due to such factors as the following: plan experience differing from that anticipated by the assumptions; changes in assumptions; and changes in plan provisions or applicable law.

The actuarial assumptions are the same as those used by the prior actuary. Cheiron has reviewed the assumptions. While we consider these assumptions to be generally reasonable, we have not yet performed our own actuarial experience study.

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 Public Employees' Retirement System of New Jersey for the purposes described herein and for the plan auditor in completing an audit related to the matters herein. Other users of this report are not intended users as defined in the Actuarial Standards of Practice, and Cheiron assumes no duty or liability to such other users.

Sincerely,

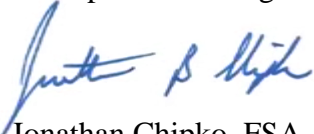
Cheiron



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



Anu Patel, FSA, MAAA, EA
Principal Consulting Actuary



Jonathan Chipko, FSA, FCA, MAAA, EA
Consulting Actuary

cc: Kenneth Kent, FSA, FCA, MAAA, EA

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 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 Public Employees Retirement System of New Jersey (the System),
- 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) 2020.

In this Section we present a summary of the principal valuation results. This includes the basis on which the July 1, 2018 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 followed by the System's projected financial outlook.

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.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

SECTION I – BOARD SUMMARY

Valuation Basis

The July 1, 2018 valuation results are based on the same actuarial methods and assumptions as used in the July 1, 2017 valuation produced by the prior actuary, with one exception described below for the actuarial cost method. The demographic assumptions were based on the July 1, 2011 – June 30, 2014 Experience Study prepared by the prior actuary, which was approved by the Board of Trustees on October 14, 2015. The valuation is based on a 7.50% interest rate, and annual salary increases that are 0.5% lower than the rates shown in the Experience Study at all ages for both the select and ultimate periods, which were recommended by the State Treasurer. Cheiron has reviewed the demographic and economic assumptions. While we consider these assumptions to be generally reasonable, we have not yet performed our own actuarial experience study.

The actuarial cost method was updated based on clarification from the Division of Pensions and Benefits. After the update, the actuarial liability is based solely on the formula benefit without any comparison to the value of the estimated member annuity. See Appendix B for a full description of the actuarial cost method.

This report was prepared using census data and financial information as of July 1, 2018 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 2018 reduced the State pension contribution of \$1,324,313,829 to \$656,907,662. This includes revenue of \$205,155,662 from the Lottery Enterprise Contribution Act. In addition, there was a Chapter 259, P.L. 2009 contribution of \$628,229, which was payable by fund transfer from the Second Injury Fund.

The potential impact of the Appropriations Act of 2019 reduces the State pension contribution for Fiscal Year 2019 from \$1,406,859,836 to \$844,211,780 (60% of the State Statutory contribution less the Lottery Enterprise Contribution Offset plus expected revenue from the Lottery Enterprise Contribution Act {60% x \$1,406,859,836 - \$218,008,632 + \$218,104,510}). The \$844,211,780 also includes expected State-paid Local contributions of \$6,829,134. In addition, there is a Chapter 259, P.L. 2009 contribution of \$622,116, which is payable by fund transfer from the Second Injury Fund. This valuation reflects the potential impact of the Appropriations Act of 2019.

Chapter 83, P.L. 2016 requires 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.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

SECTION I – BOARD SUMMARY

In accordance with Chapter 78, P.L. 2011, a pension committee is to be established for the State portion of the System and the Local portion of the System when the employer's "target funded ratio" is achieved. The "target funded ratio" is defined as the ratio of the actuarial value of assets divided by the actuarial liability expressed as a percentage that is 75% in fiscal year 2012 and increased annually by equal increments in each of the subsequent seven fiscal years, until the funded ratio equals 80% at which time it will remain at 80% for all subsequent fiscal years. The Local employers' portion of the System attained the required "target funded ratio" in Fiscal Year 2012, establishing the committee for the Local employers' portion of the System. The State portion of the System has not attained the required "target funded ratio" and thus the pension committee has not been established for the State portion of the System.

Under Chapter 98, P.L. 2017, the Lottery Enterprise Contribution Act, the Public Employees' Retirement System receives 21.02% 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, 2018 valuation, 28 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 Chapter 78, P.L. 2011 "target funded ratio" is based on the actuarial value of assets plus the allocable special asset value. The special asset value is the present value of remaining lottery contributions to the retirement systems as provided to us by the Division of Pensions and Benefits. Effective with the fiscal year 2018, the State's pension contribution shall be reduced by the product of the allocable percentage for such retirement system, the adjustment percentage for such retirement system and the special asset adjustment.

The valuation reflects Chapter 78, P.L. 2011, which increased the member contribution rate from 5.5% to 6.5% of compensation effective October 2011. Further, beginning July 2012, the member contribution rate was increased by 1/7th of 1% each July until a 7.5% member contribution rate is reached in July 2018. Chapter 78, P.L. 2011 also increased the member contribution rate for members who are eligible to retire under the Prosecutors Part of the Retirement System as provided by Chapter 366, P.L. 2001 from 8.5% to 10.0% of compensation with the increase effective October 2011.

The valuation excludes assets and liabilities under the Non-Contributory Group Insurance Premium Fund for the State. 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 Table I-1 and Table 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.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

SECTION I – BOARD SUMMARY

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

Valuation Date Fiscal Year Ending (FYE)	July 1, 2018 2020	July 1, 2017 2019	% Change
<u>Member Data</u>			
Contributing Actives ¹	68,593	68,325	0.4%
Non-Contributing Actives ¹	9,405	9,100	3.4%
Deferred Vesteds	169	174	-2.9%
Retirees and Beneficiaries ²	58,556	57,174	2.4%
Total Members	136,723	134,773	1.4%
Appropriation Payroll ³	\$ 4,333,772,974	\$ 4,325,784,579	0.2%
Annual Retirement Allowances in Pay	\$ 1,607,733,796	\$ 1,550,464,743	3.7%
<u>Assets and Liabilities</u>			
Actuarial Liability	\$ 23,745,716,631	\$ 23,324,861,385	1.8%
Actuarial Value of Assets (AVA) ⁴	8,057,092,909	8,208,333,488	-1.8%
Unfunded Actuarial Liability/(Surplus)	\$ 15,688,623,722	\$ 15,116,527,897	3.8%
Funded Ratio (AVA)	33.9%	35.2%	-1.3%
Actuarial Value of Assets ⁴ including Special Asset Value (AVA + SAV)	\$ 10,710,534,806	\$ 10,861,669,626	-1.4%
Unfunded Actuarial Liability/(Surplus)	\$ 13,035,181,825	\$ 12,463,191,759	4.6%
Funded Ratio (AVA + SAV)	45.1%	46.6%	-1.5%
Market Value of Assets (MVA) ⁴	\$ 7,533,286,615	\$ 7,520,536,539	0.2%
Unfunded Actuarial Liability/(Surplus)	\$ 16,212,430,016	\$ 15,804,324,846	2.6%
Funded Ratio (MVA)	31.7%	32.2%	-0.5%
<u>Contribution Amounts</u> ⁵			
State Normal Cost at End of Year ⁶	\$ 93,428,887	\$ 117,141,109	-20.2%
Amortization Payment of UAL ⁶	1,338,761,984	1,289,718,727	3.8%
Total Statutory Contribution for FYE	\$ 1,432,190,871	\$ 1,406,859,836	1.8%
Percent Appropriated	70.0%	60.0%	10.0%
State Appropriation for Pension	\$ 1,002,533,610	\$ 844,115,902	18.8%
Lottery Enterprise Contribution Offset	(225,008,822)	(218,008,632)	3.2%
Net State Contribution	\$ 777,524,788	\$ 626,107,270	24.2%

¹ Reflects all records for multiple members, which are members employed by more than one PERS-participating employer at the same time

² QDRO recipients are excluded from member counts

³ Limited annual compensation for contributing actives

⁴ Includes discounted State receivable contributions and Lottery proceeds as shown in Table II-2

⁵ In addition to the amounts shown, the Statutory Contributions are satisfied by funds transferred from the Second Injury Fund in amounts equal to \$595,242 and \$622,116 for FYE 2020 and 2019, respectively.

⁶ Includes \$11,781,276 and \$11,381,890 for FYE 2020 and 2019, respectively for Local obligations payable by the State in accordance with Chapter 366, P.L. 2001

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

SECTION I – BOARD SUMMARY

Table I-2 Summary of Key Valuation Results Local Employers			
Valuation Date Fiscal Year Ending (FYE)	July 1, 2018 2020	July 1, 2017 2019	% Change
<u>Member Data</u>			
Contributing Actives ¹	146,615	148,755	-1.4%
Non-Contributing Actives ¹	27,985	27,421	2.1%
Deferred Vesteds	440	409	7.6%
Retirees and Beneficiaries ²	120,192	118,457	1.5%
Total Members	295,232	295,042	0.1%
Appropriation Payroll ³	\$ 7,106,248,788	\$ 7,022,322,604	1.2%
Annual Retirement Allowances in Pay	\$ 2,157,906,233	\$ 2,081,607,680	3.7%
<u>Assets and Liabilities</u>			
Actuarial Liability	\$ 33,103,627,533	\$ 32,238,416,280	2.7%
Actuarial Value of Assets (AVA) ⁴	23,264,877,618	22,522,697,150	3.3%
Unfunded Actuarial Liability/(Surplus)	\$ 9,838,749,915	\$ 9,715,719,130	1.3%
Funded Ratio (AVA)	70.3%	69.9%	0.4%
Market Value of Assets (MVA) ⁴	\$ 22,645,367,115	\$ 21,470,284,400	5.5%
Unfunded Actuarial Liability/(Surplus)	\$ 10,458,260,418	\$ 10,768,131,880	-2.9%
Funded Ratio (MVA)	68.4%	66.6%	1.8%
<u>Contribution Amounts</u>			
Employer Normal Cost at End of Year ⁵	\$ 90,013,363	\$ 124,295,110	-27.6%
Amortization Payment of UAL ⁵	832,962,419	825,122,906	1.0%
ERI Payments	11,317,298	11,930,391	-5.1%
Chapter 19, P.L. 2009 Payments	8,840,385	8,772,260	0.8%
Total Statutory Contribution for FYE	\$ 943,133,465	\$ 970,120,667	-2.8%
Non-Contributory Group Insurance Contribution	\$ 49,734,428	\$ 45,228,000	10.0%

¹ Reflects all records for multiple members, which are members employed by more than one PERS-participating employer at the same time

² QDRO recipients are excluded from member counts

³ Limited annual compensation for contributing actives

⁴ Includes discounted State receivable contributions as shown in Table II-2

⁵ Excludes \$11,781,276 and \$11,381,890 for FYE 2020 and 2019, respectively for Local obligations payable by the State in accordance with Chapter 366, P.L. 2001

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

SECTION I – BOARD SUMMARY

The key results of the July 1, 2018 actuarial valuation **for the State** are as follows:

- The total Statutory contribution increased from \$1,407 million for fiscal year ending 2019 to \$1,432 million for fiscal year ending 2020 prior to any adjustments for the potential Appropriations Act of 2020 or the Lottery Enterprise offset.
- The unfunded actuarial liability based on the actuarial asset value plus special asset value increased from \$12.5 billion on July 1, 2017 to \$13.0 billion on July 1, 2018. The unfunded actuarial liability used in determining the Statutory contributions (excess of actuarial liability over the actuarial value of assets) increased from \$15.1 billion to \$15.7 billion.
- The funding ratio that is used to measure against the “target funded ratio” and is based on the ratio of actuarial asset value plus special asset value, decreased from 46.6% as of July 1, 2017 to 45.1% as of July 1, 2018. The funded ratio on the actuarial value of assets basis (without the special asset value) decreased from 35.2% to 33.9%. Based on the market value of assets, the funded ratio also decreased from 32.2% to 31.7%.
- During the year, there was a total actuarial experience loss of \$231 million, consisting of an asset loss of \$138 million and a liability loss of \$93 million.

The key results of the July 1, 2018 actuarial valuation **for Local employers** are as follows:

- The total Statutory contribution decreased from \$970 million for fiscal year ending 2019 to \$943 million for fiscal year ending 2020.
- The unfunded actuarial liability increased from \$9.7 billion on July 1, 2017 to \$9.8 billion July 1, 2018 on an actuarial value of assets basis.
- The funding ratio, the ratio of actuarial asset value over liabilities, increased from 69.9% as of July 1, 2017 to 70.3% as of July 1, 2018. Based on the market value of assets, the funded ratio also increased from 66.6% to 68.4%.
- During the year, there was a total actuarial experience loss of \$331 million, consisting of an asset loss of \$170 million and a liability loss of \$161 million.

PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION

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 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 grey 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, an AVA basis and an AVA+SAV basis, is shown next to the respective assets lines.

There was a decrease in the liability as of July 1, 2010 due to the benefit reforms of Chapter 1, P.L. 2010 and Chapter 78, P.L. 2011. Since July 1, 2010, the liability has been increasing over time in part due to additional benefit accruals but also due to decreases in the discount rate.

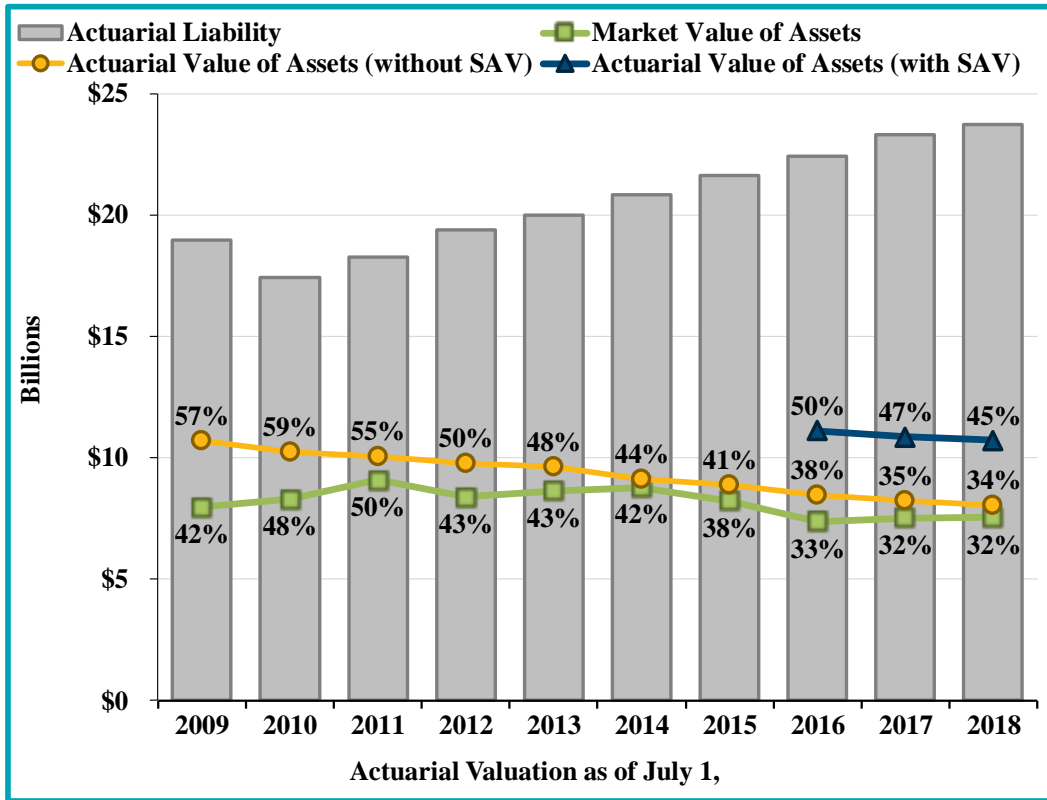
For the State, the funded ratio has been decreasing over time in part due to decreases in the discount rate, recognition of the 2008/2009 market losses reflected in the large gap between the MVA and AVA in 2009 and also because the State has not been making the full Statutory contribution for the entire period shown.

For Local employers, the funded ratio has remained relatively level over the period due to decreases in the discount rate and recognition of the 2008/2009 market losses reflected in the large gap between the MVA and AVA in 2009. 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. To date, the State-paid Local Statutory contributions have been small relative to the overall Statutory contribution. However, the State-paid Local obligations are expected to increase in the next few years with the expected depletion of the Benefit Enhancement Fund (BEF). Upon depletion, the State will be responsible for the Local employer normal cost associated with Chapter 133, P.L. 2001.

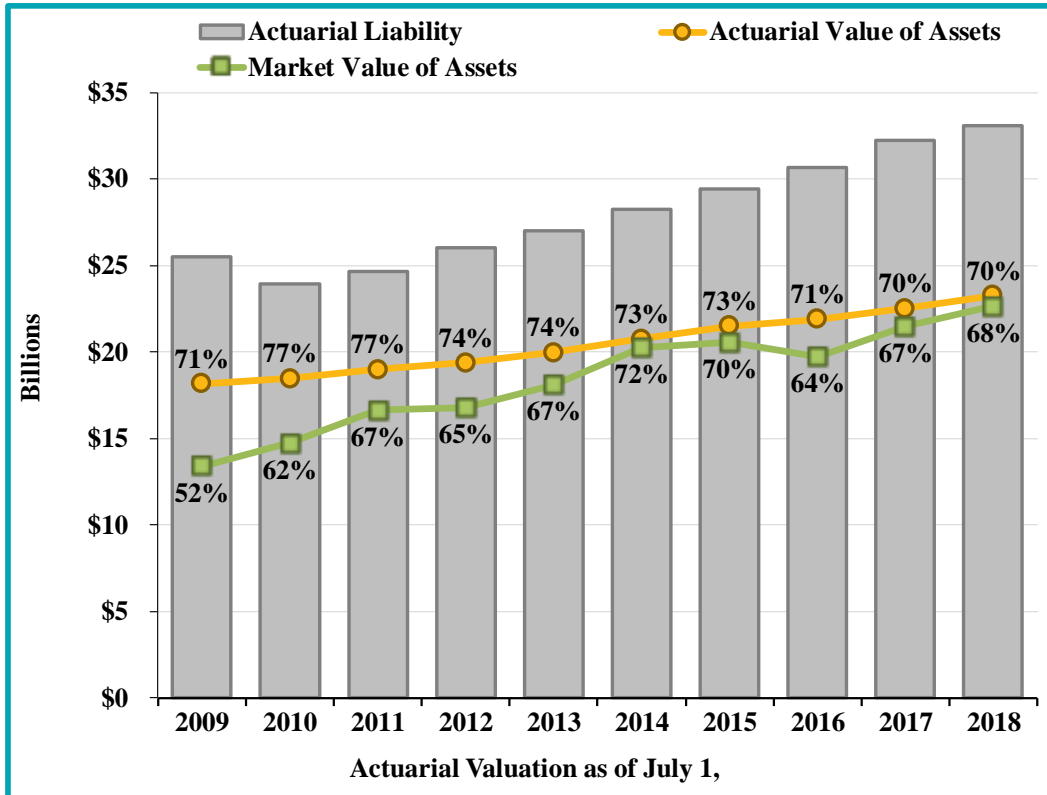
PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
 JULY 1, 2018 ACTUARIAL VALUATION

SECTION I – BOARD SUMMARY

State



Local Employers



**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

SECTION I – BOARD SUMMARY

Membership Trends

The following graphs show the membership counts of the System for the last ten valuations. The numbers which appear above each bar represent the ratio of the number of inactive and non-contributing active members to contributing active members at each valuation date, and provide a measure of the maturity of the System. The inactive-to-active ratio for both State and Local employers has increased over the period. 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, 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.

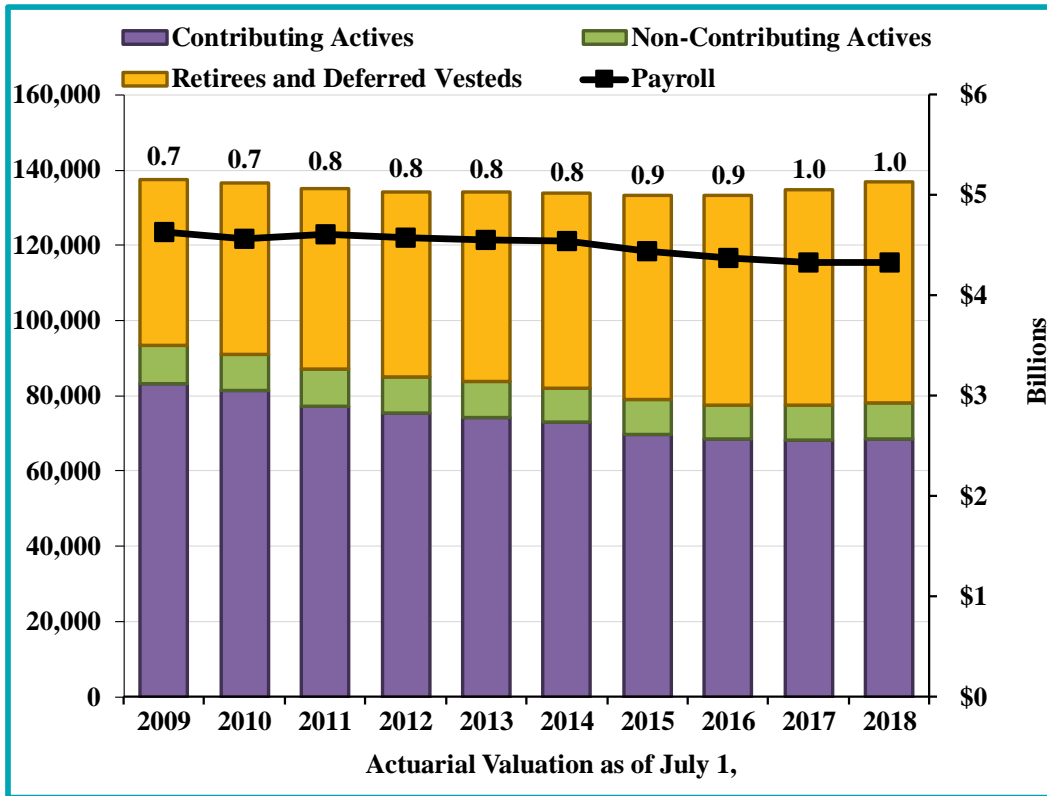
Starting with the 2017 valuation, reflects all records for multiple members, which are active members employed by more than one participating employer at the same time.

The black line represents the appropriation payroll for contributing actives over the period and corresponds with the right-hand scale.

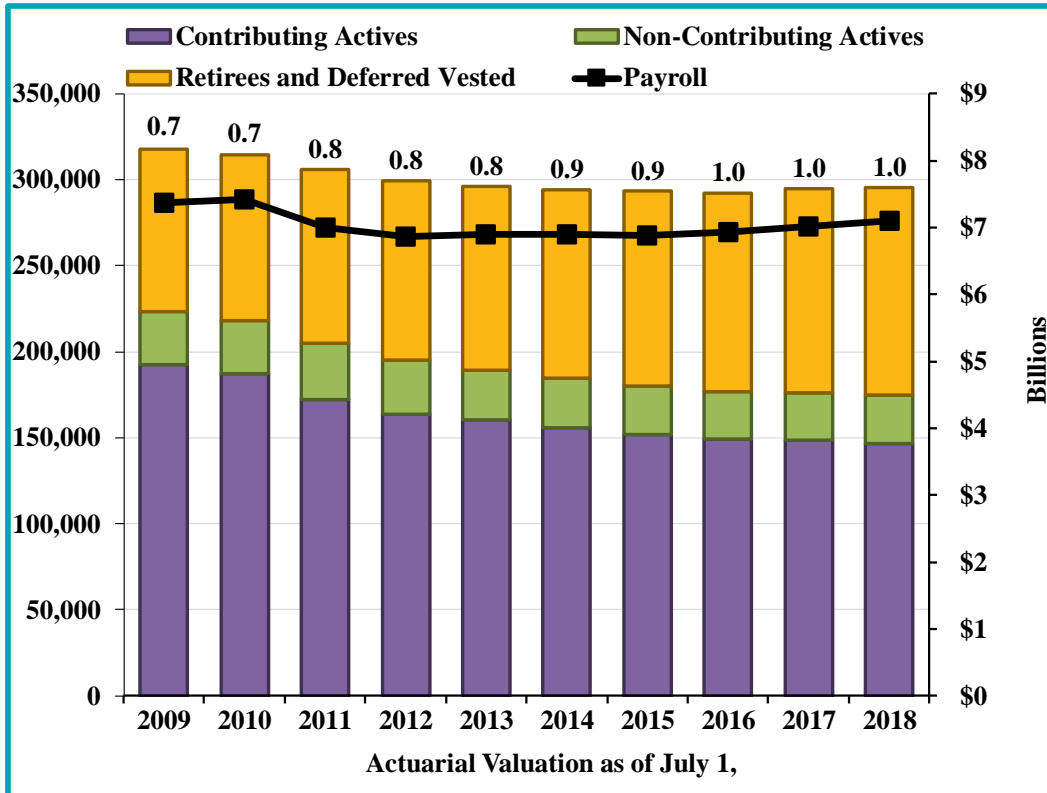
**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

SECTION I – BOARD SUMMARY

State



Local Employers



**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

SECTION I – BOARD SUMMARY

Cash Flows

The following graphs show the System net cash flow (contributions less benefit payments and expenses) at the end of each fiscal year. For the entire period shown, the net cash flow excluding investments 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.

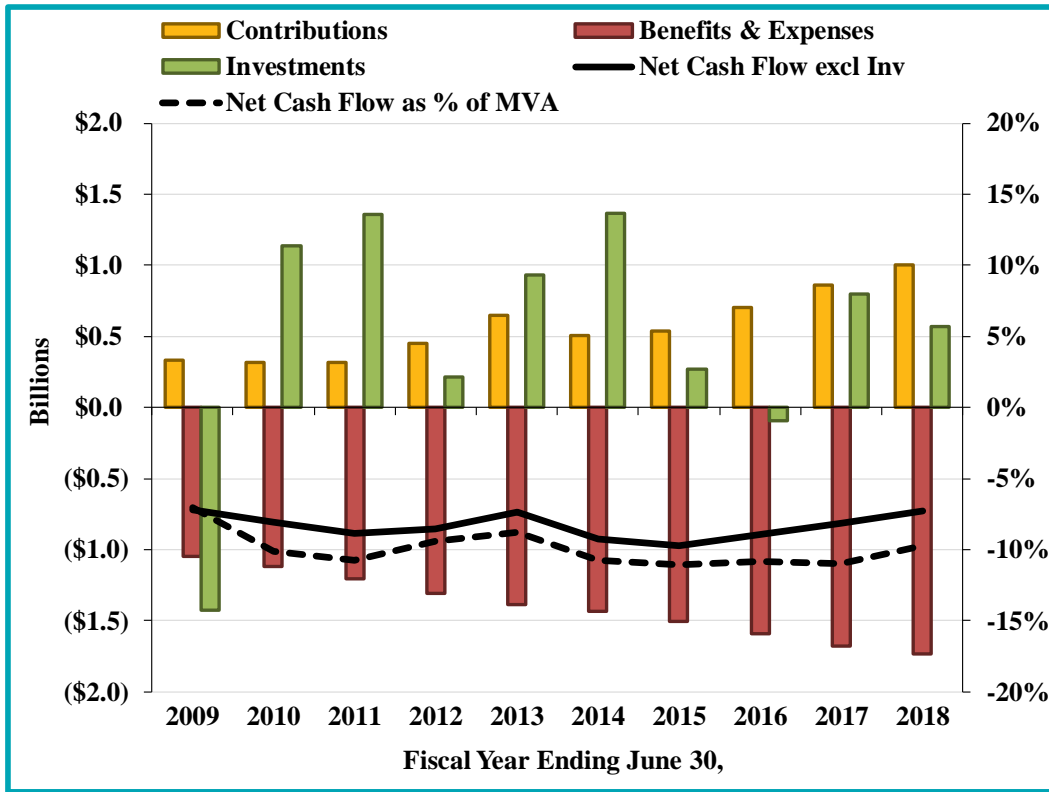
The black dotted line shows the net cash flow as a percent of the market assets and goes with the axis on the right.

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 the negative cash flow for the State is greater than the long term investment assumption. 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.

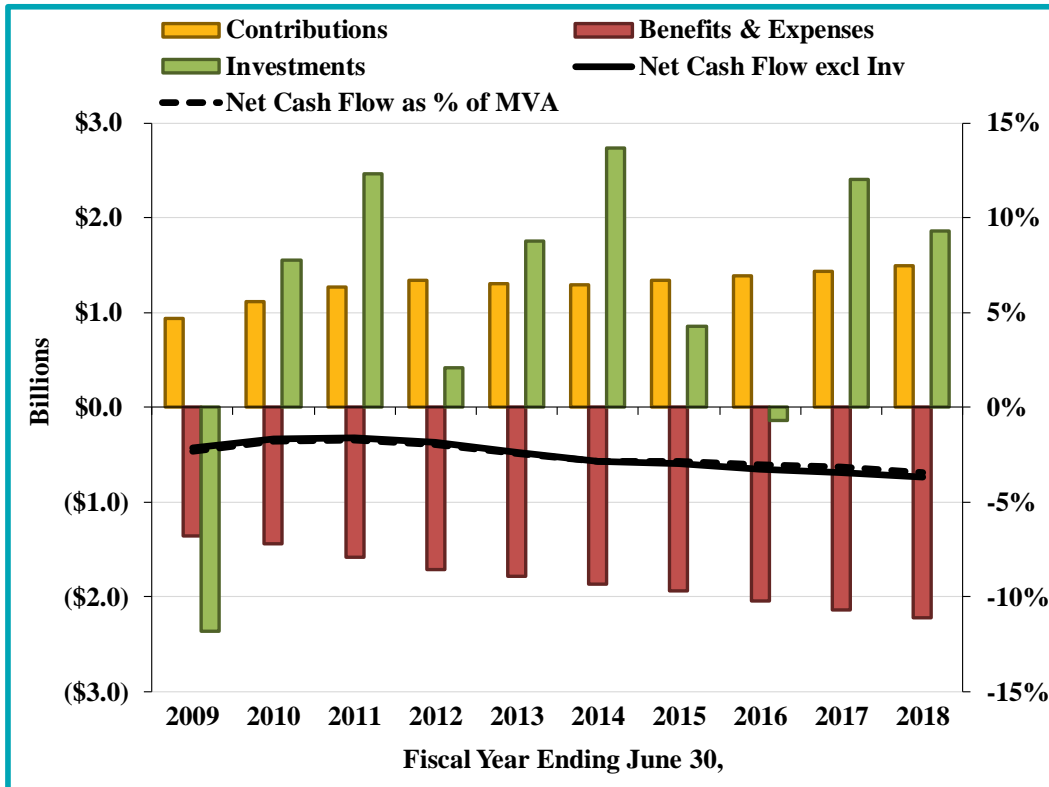
**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

SECTION I – BOARD SUMMARY

State



Local Employers



**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

SECTION I – BOARD SUMMARY

Contributions

These 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 2019 and 2020, 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 I-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.

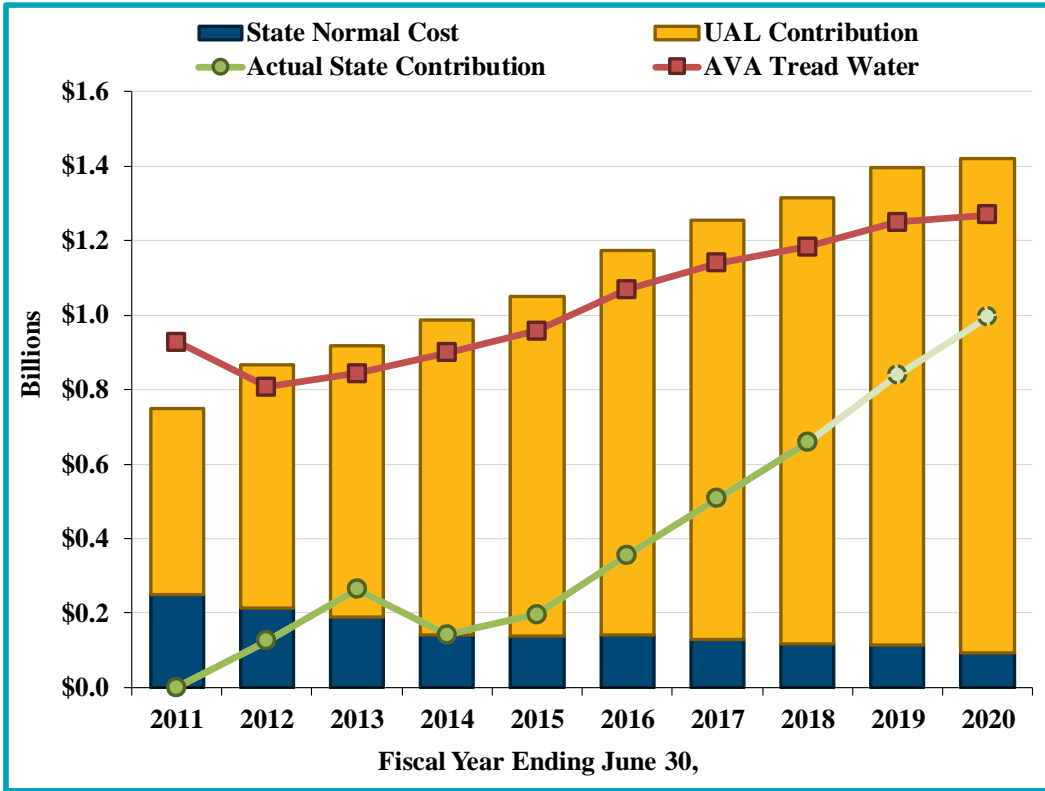
The graph for State shows that not only has the State been making contributions less than required by Statute, but that the State contributions are significantly below the tread water line. When contributions are lower than the normal cost plus interest on the UAL, the unfunded actuarial liability is expected to grow from one year to the next.

The graph for Local employers shows that the Local employers have consistently made their Statutory contributions. While the State has not been contributing the full State-paid Local obligations, the total contributions have still been greater than the tread water line since 2012.

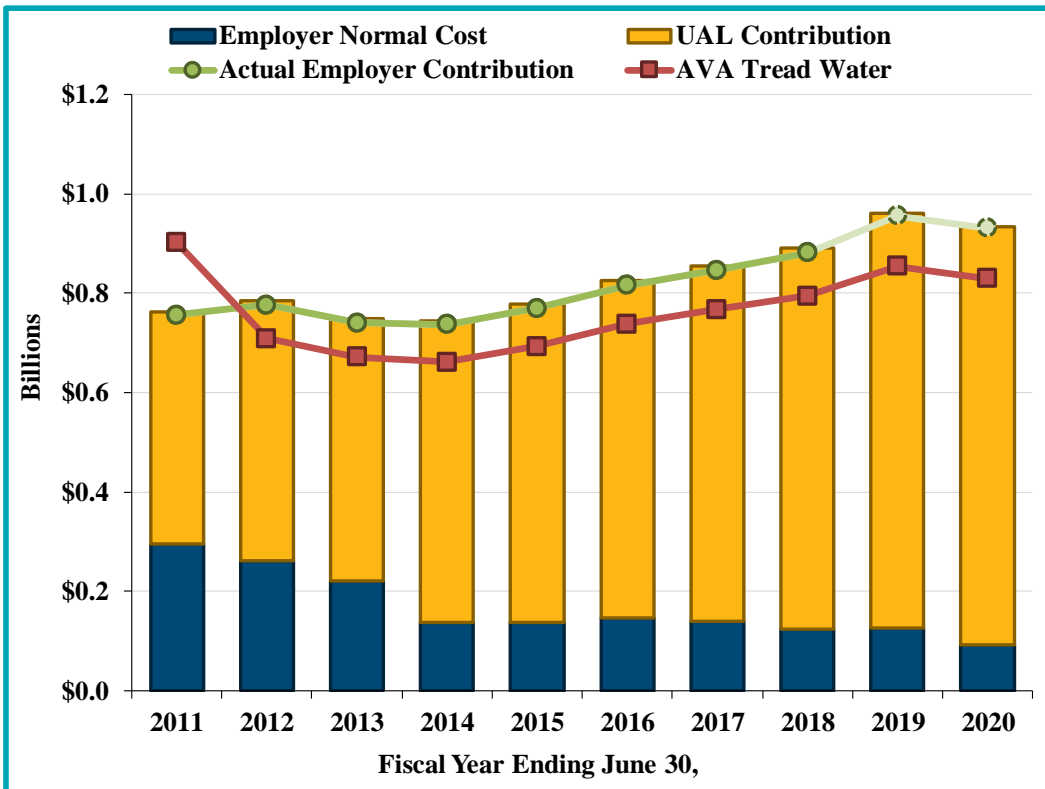
**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

SECTION I – BOARD SUMMARY

State



Local Employers



SECTION I – BOARD SUMMARY

Projected Future Outlook

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

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

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

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

Baseline Scenario

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

The top graph on the following page 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 + the Special Asset Value (blue line). In addition, at the top of the graph, we show the System's funded ratio on an Actuarial Value of Assets basis (ratio of Actuarial Value of Assets to Actuarial Liabilities). The years shown in the graph signify the valuation date as of July 1 of the labeled year.

The State's funded ratio on an Actuarial Value of Assets basis is projected to drop slightly over the next few years, as the State appropriates less than the Statutory amount and the valuation investment rate of return assumption gradually decreases from 7.50% to 7.00%, before beginning a slow but steady increase to 98% by 2048.

The Local employers' funded ratio on an Actuarial Value of Assets basis is also 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 gradually decreases from 7.50% to 7.00%, before beginning a slow but steady increase to 84% by 2048.

PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION

SECTION I – BOARD SUMMARY

The funded ratio for State increases faster than the Local employers' portion and reaches 98% compared to 84% 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 the Local employers' contributions are in green. We show the contributions values in dollars except for the State-paid Local contributions which are small compared to total contributions.

The gold and green outline shows the full Statutory contributions for the State and Local employers, respectively, with the shaded portion showing the anticipated appropriated amount.

Lottery revenue is outlined in blue. Lottery revenue amounts shaded in 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 include additional payments toward the UAL.

The projection assumes the State appropriates 70% of the Statutory contribution in FYE 2020, and increases the percent by 10% a year, until reaching 100% of the Statutory contribution beginning with FYE 2023. Local employers contribute 100% of the Statutory amount. Both the appropriated State and Local employer contributions and the member contributions are labeled. The contributions exclude amounts payable for the Non-Contributory Group Insurance.

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

The solid black line is the tread water line based on the Actuarial Value of Assets. Because the tread water metric equals the normal cost plus interest on the UAL, the difference between the solid black line and the dashed black line is the interest on the UAL. When contributions fall below the solid black line, as is the case through FYE 2021 for the 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 gradually decreases from 7.50% to 7.00%. Thereafter, the Statutory contributions remain relatively steady until lottery revenue stops. 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.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

SECTION I – BOARD SUMMARY

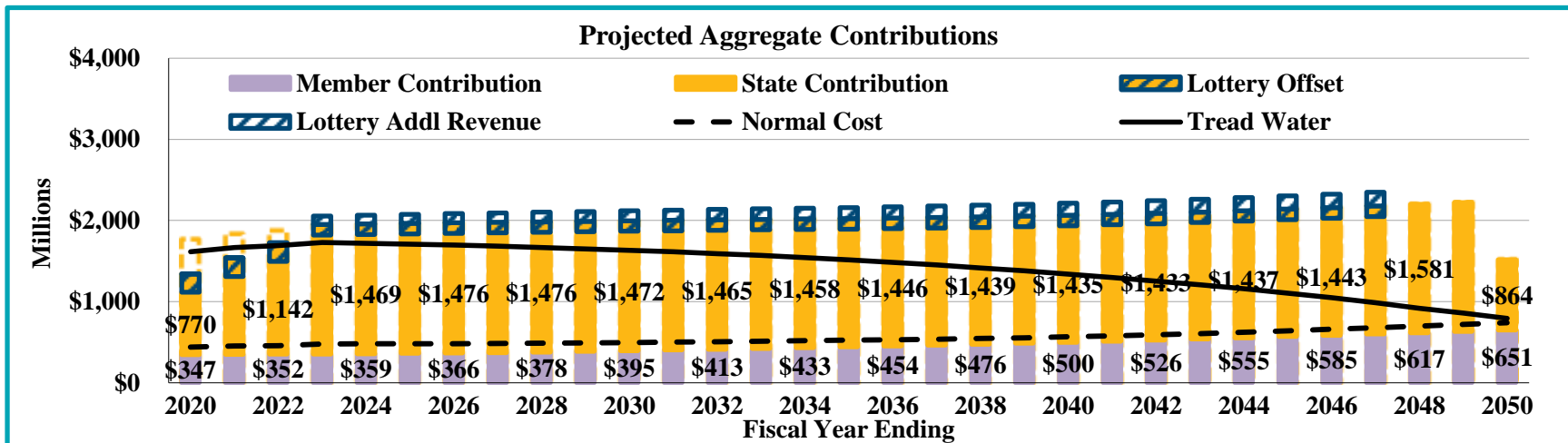
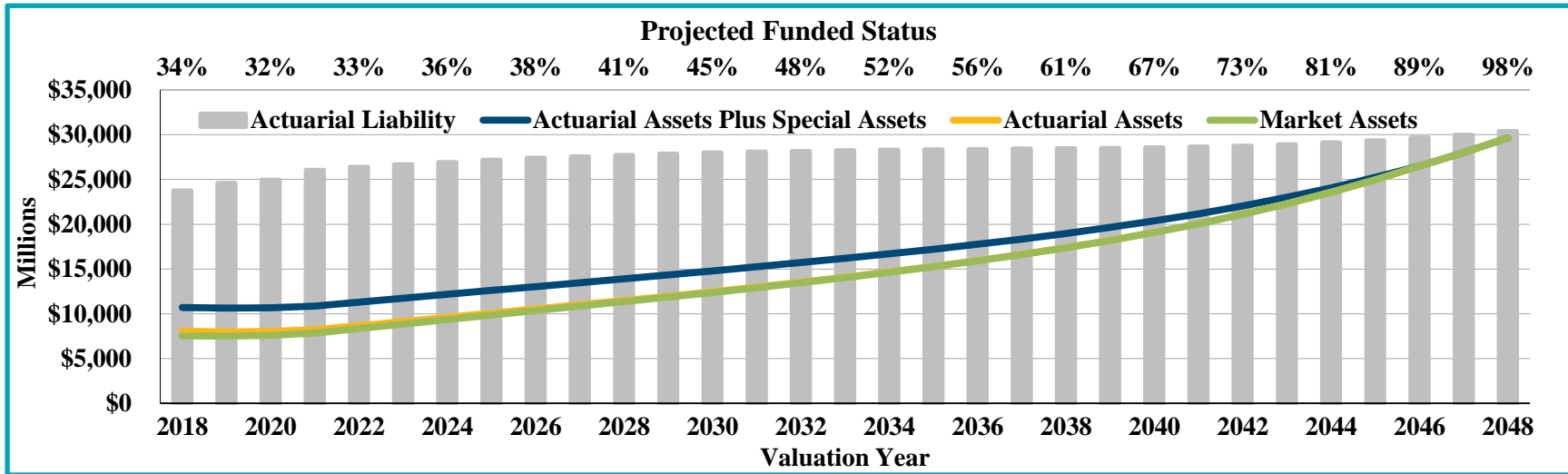
The Local employers' contributions increase steadily through FYE 2023 as the State appropriates less than the Statutory State-paid Local obligation and the valuation investment rate of return assumption gradually decreases from 7.50% to 7.00%. Thereafter, the Local employers' contributions gradually increase. The State-paid Local contributions are expected to increase starting in FYE 2022 as the Benefit Enhancement Fund becomes depleted and the State becomes responsible for the Local employers Chapter 133, P.L. 2001 normal cost. Soon after that, the State-paid Local contributions gradually decrease as the population eligible for the Chapter 133, P.L. 2001 benefit enhancements decreases.

PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
 JULY 1, 2018 ACTUARIAL VALUATION

SECTION I – BOARD SUMMARY

Baseline: 7.0% return for all years

State

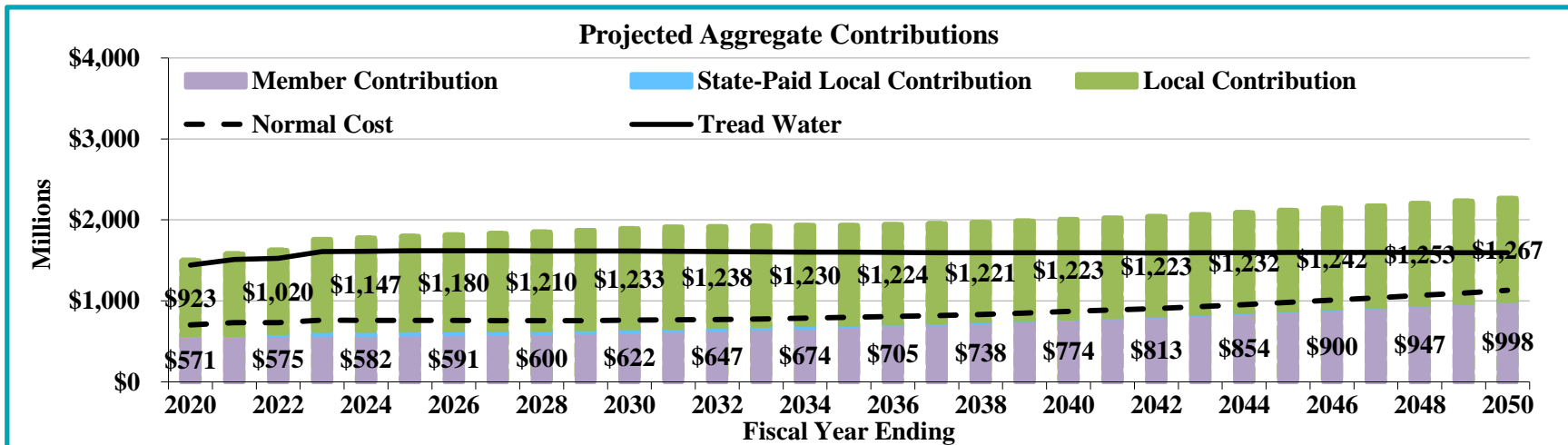
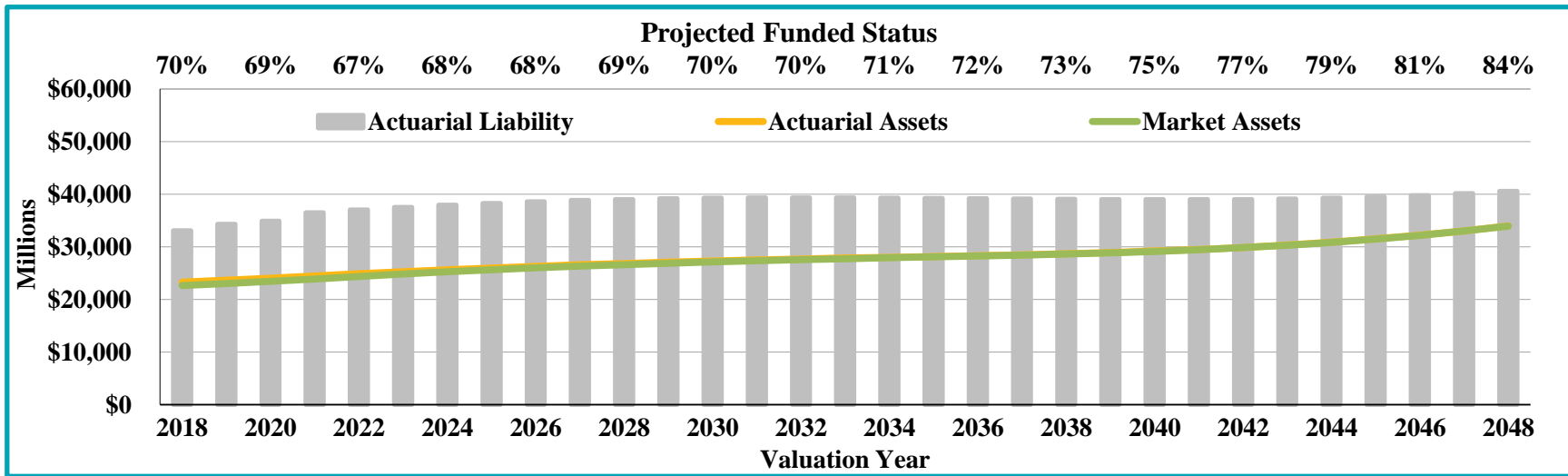


PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
 JULY 1, 2018 ACTUARIAL VALUATION

SECTION I – BOARD SUMMARY

Baseline: 7.0% return for all years

Local Employers



**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

SECTION I – BOARD SUMMARY

Stress Testing

The Baseline projections shown on the previous page assume all assumptions are met each and every year in the future. We know that will not be the case. 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 7.14%, standard deviation of 12.27%).

Distribution of Expected Average Annual Returns		
Percentile	1 Year	5 Year
5%	-11.1%	-1.4%
25%	-0.8%	3.5%
50%	7.1%	7.1%
75%	15.7%	10.9%
95%	29.1%	16.5%

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
2019	-11.1%	29.1%	3.5%	10.9%	-1.4%	16.5%
2020	7.0%	7.0%	3.5%	10.9%	-1.4%	16.5%
2021	7.0%	7.0%	3.5%	10.9%	-1.4%	16.5%
2022	7.0%	7.0%	3.5%	10.9%	-1.4%	16.5%
2023	7.0%	7.0%	3.5%	10.9%	-1.4%	16.5%
2024+	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%

In reviewing each of the 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 at least the normal cost.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

SECTION I – BOARD SUMMARY

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

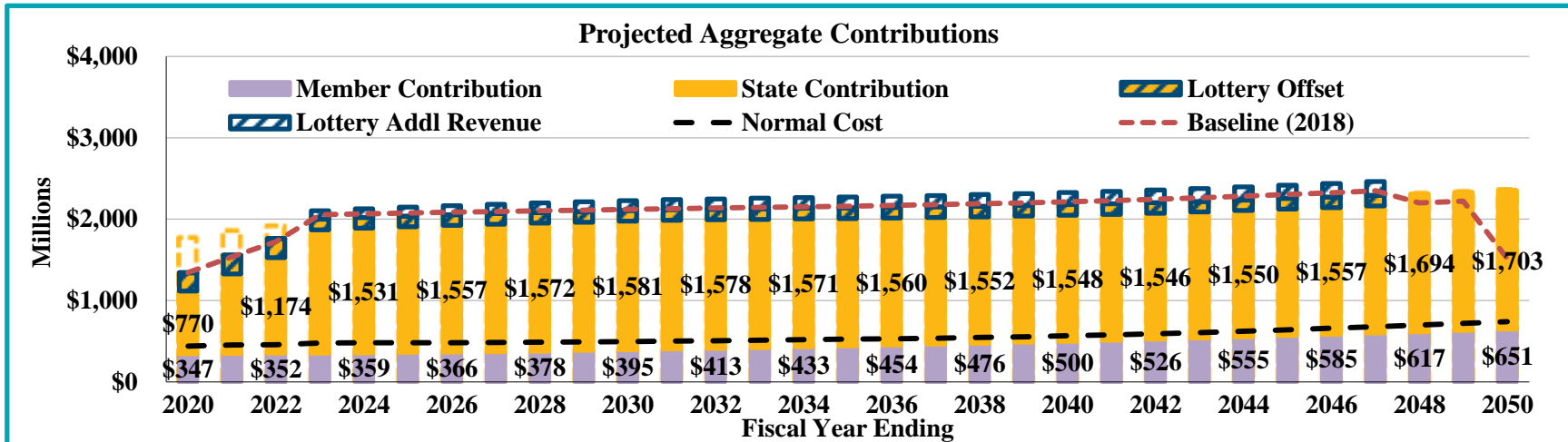
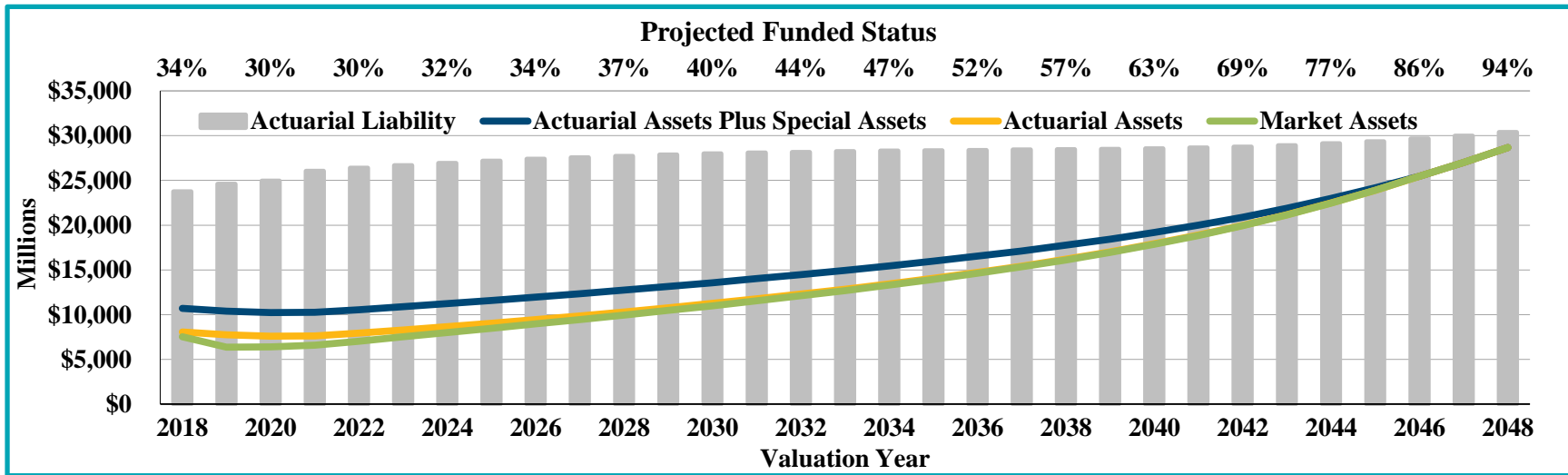
The contributions for Local employers are clearly more sensitive to the investment returns. This is caused by the funded status at the beginning of the projection period. The State is less well funded and, as a result, has less to gain or lose from positive or negative investment experience.

PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
 JULY 1, 2018 ACTUARIAL VALUATION

SECTION I – BOARD SUMMARY

One-Year Negative Shock Scenario: -11.1% return FYE 2019, 7.0% after

State

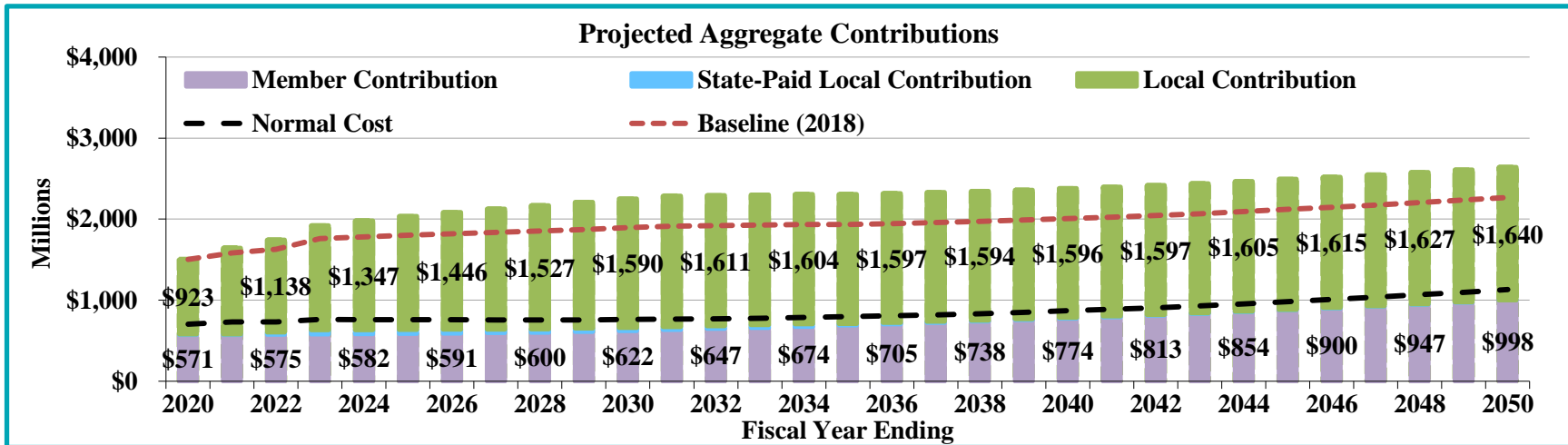
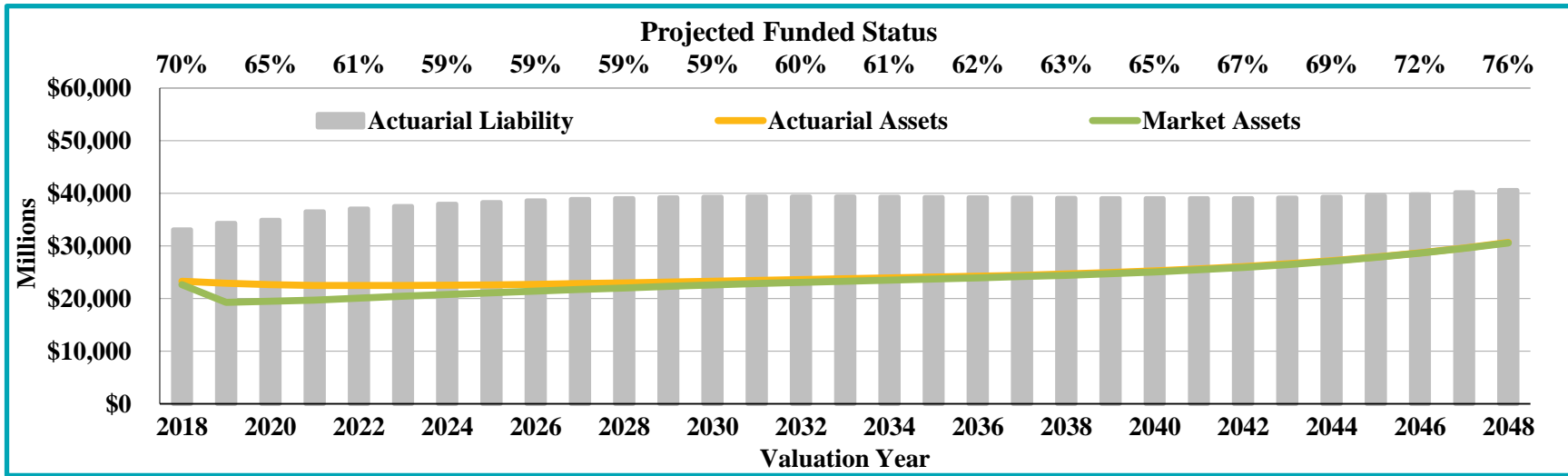


PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
 JULY 1, 2018 ACTUARIAL VALUATION

SECTION I – BOARD SUMMARY

One-Year Negative Shock Scenario: -11.1% return FYE 2019, 7.0% after

Local Employers

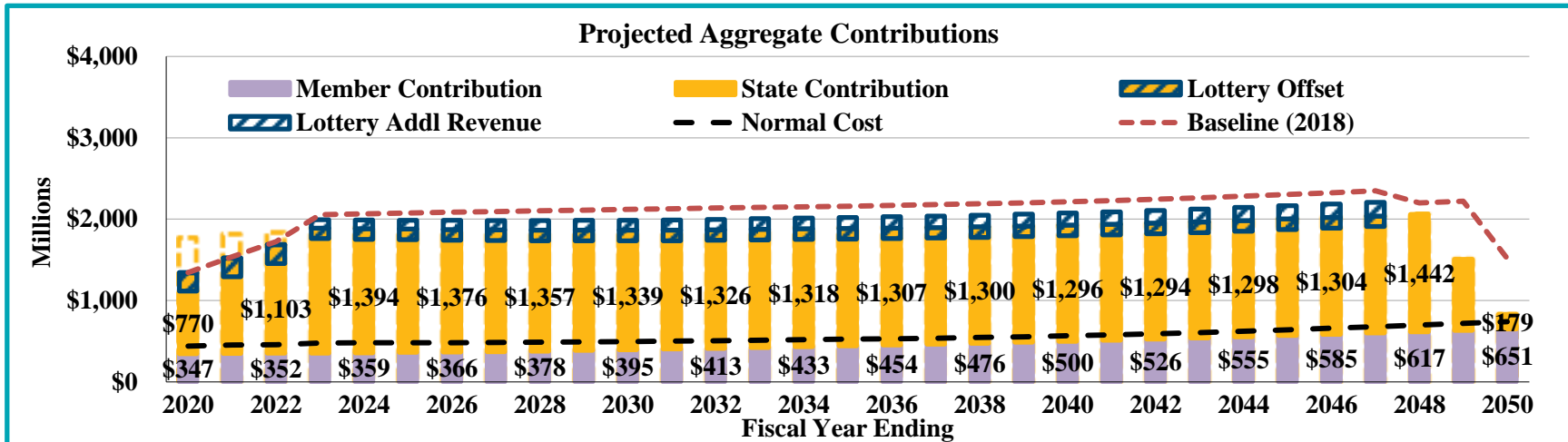
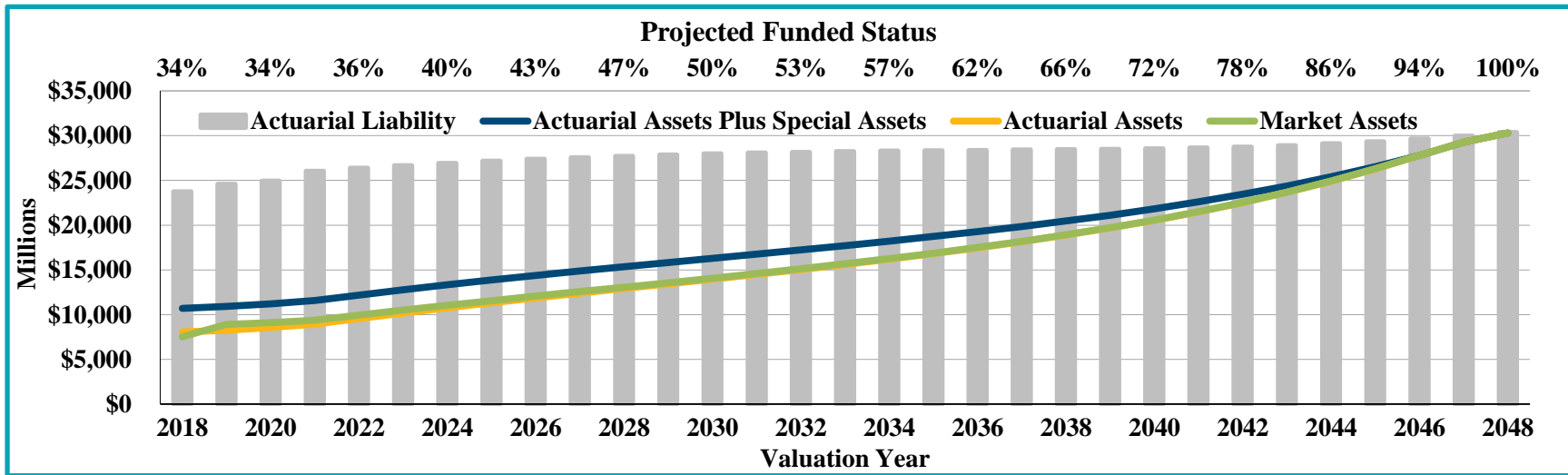


PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
 JULY 1, 2018 ACTUARIAL VALUATION

SECTION I – BOARD SUMMARY

One-Year Positive Shock Scenario: 29.1% return FYE 2019, 7.0% after

State

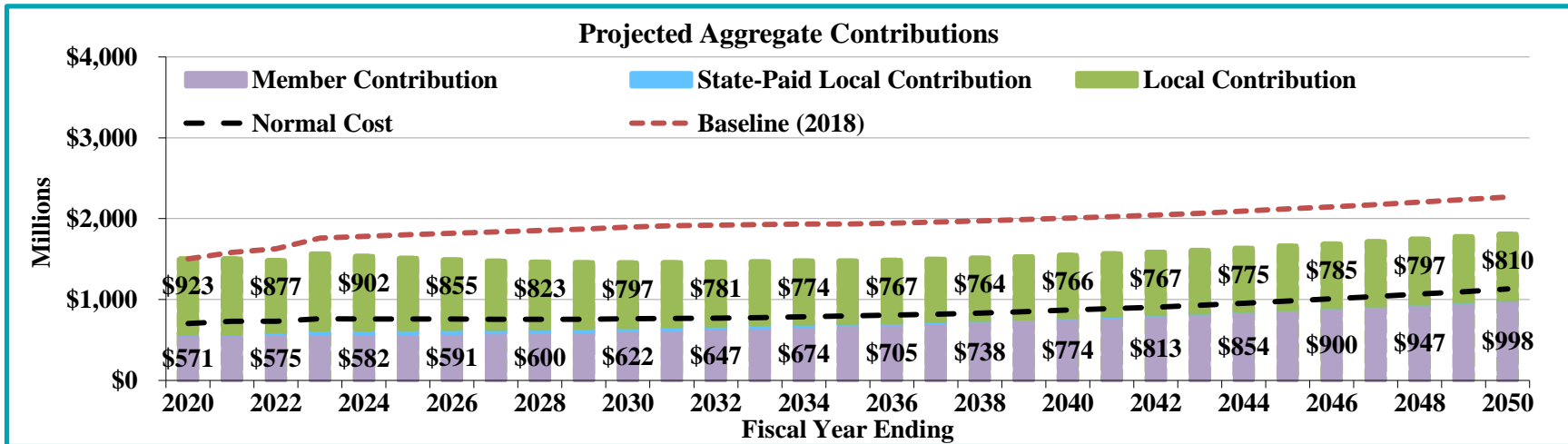
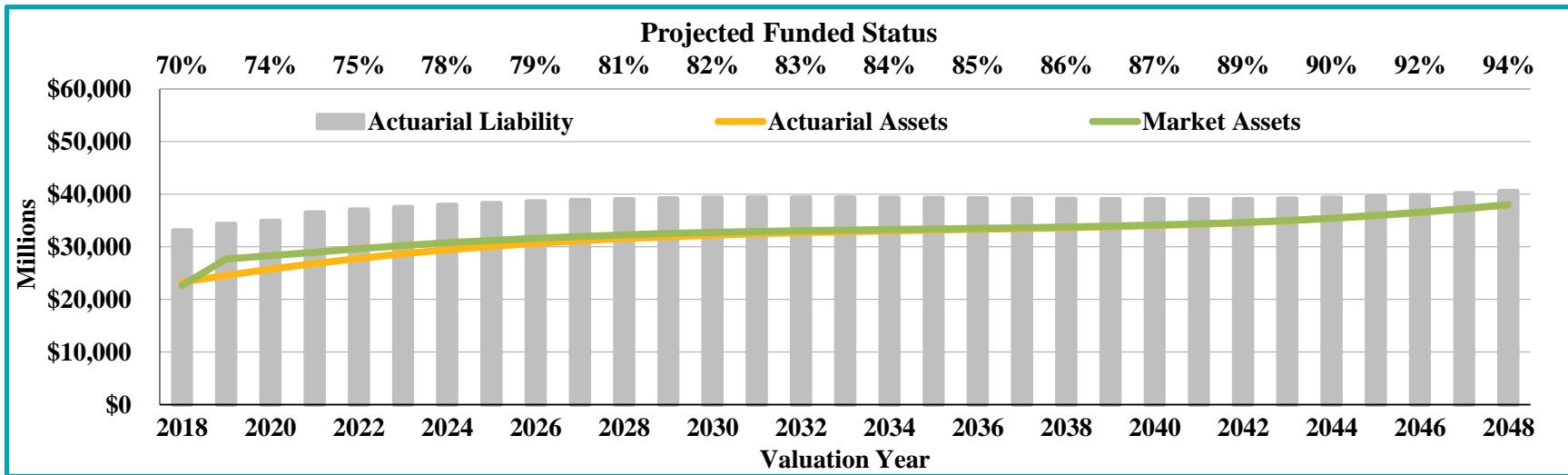


PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
 JULY 1, 2018 ACTUARIAL VALUATION

SECTION I – BOARD SUMMARY

One-Year Positive Shock Scenario: 29.1% return FYE 2019, 7.0% after

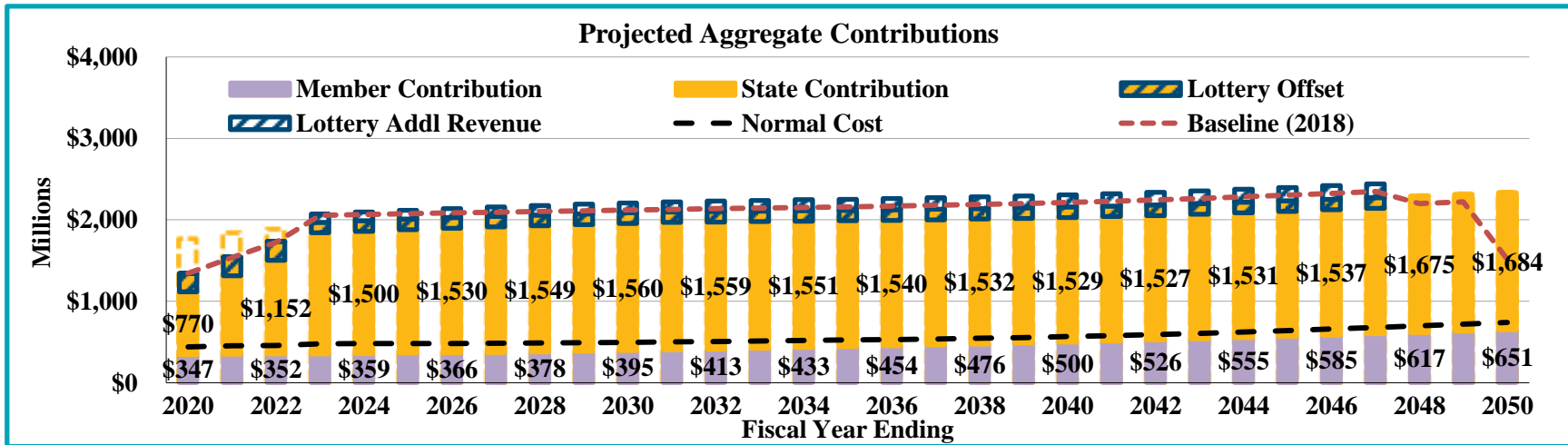
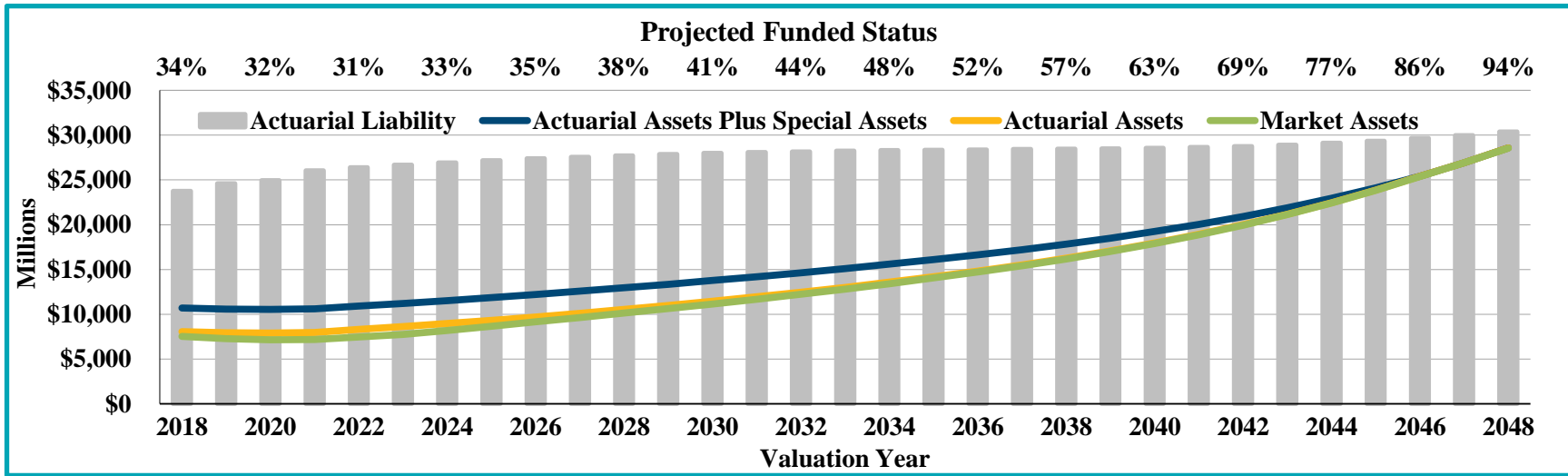
Local Employers



PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
 JULY 1, 2018 ACTUARIAL VALUATION

SECTION I – BOARD SUMMARY

Five-Year Moderate Negative Scenario: 3.5% return FYE 2019-2023, 7.0% after State

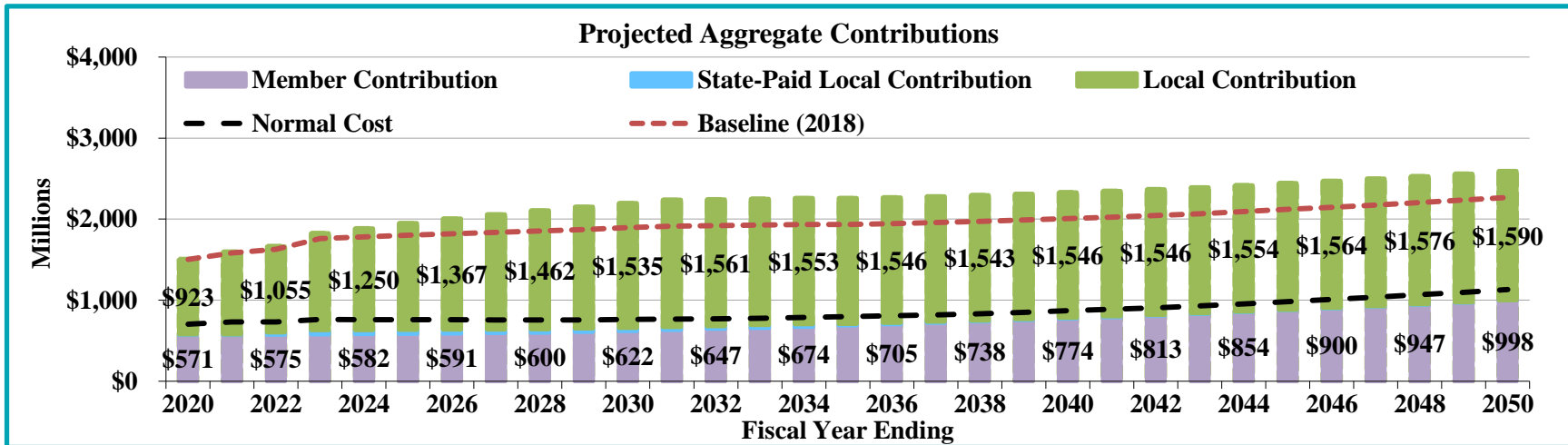
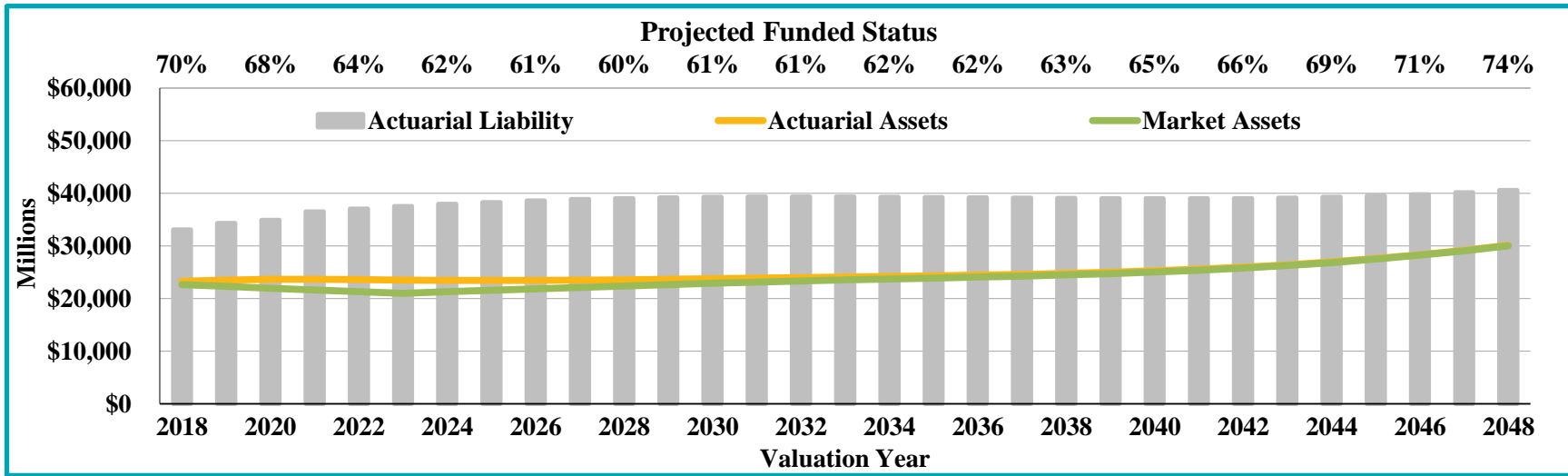


PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
 JULY 1, 2018 ACTUARIAL VALUATION

SECTION I – BOARD SUMMARY

Five-Year Moderate Negative Scenario: 3.5% return FYE 2019-2023, 7.0% after

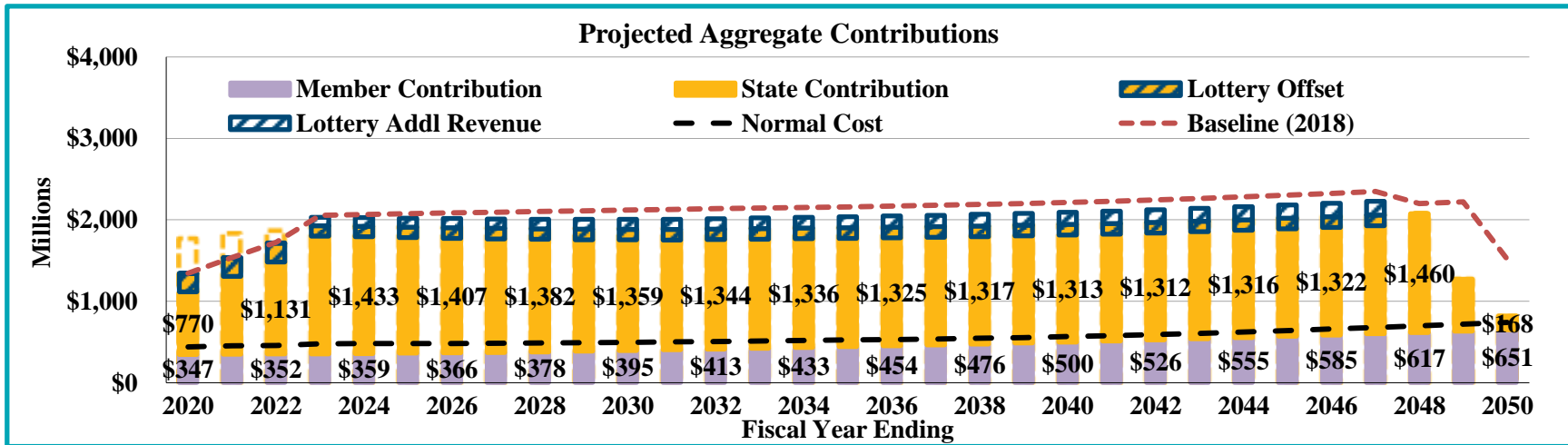
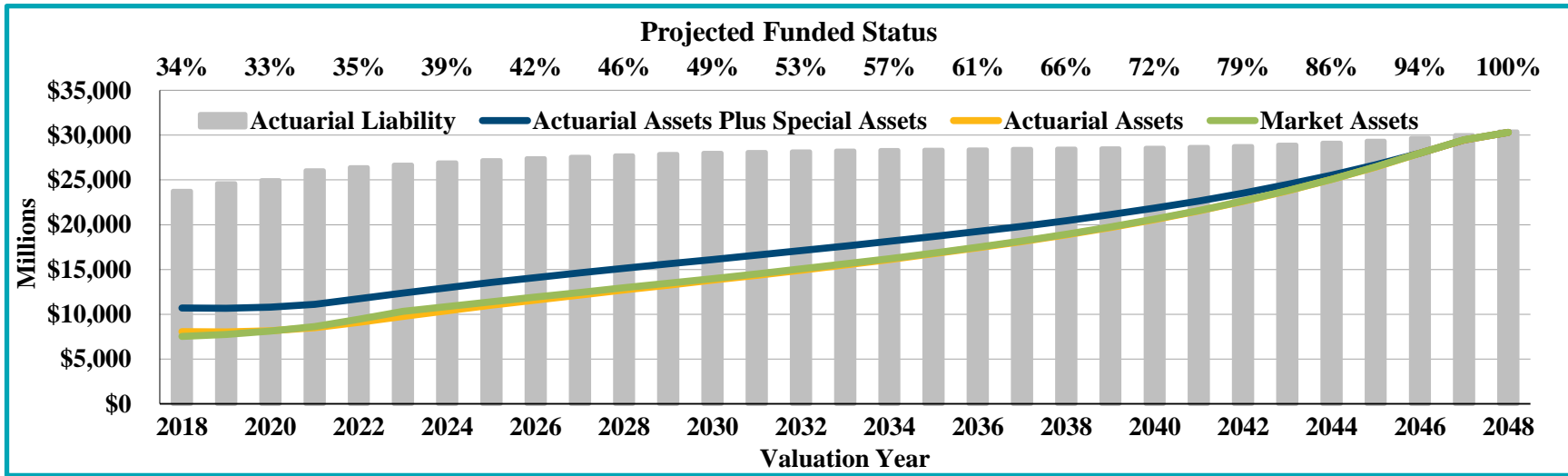
Local Employers



PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
 JULY 1, 2018 ACTUARIAL VALUATION

SECTION I – BOARD SUMMARY

Five-Year Moderate Positive Scenario: 10.9% return FYE 2019-2023, 7.0% after
State

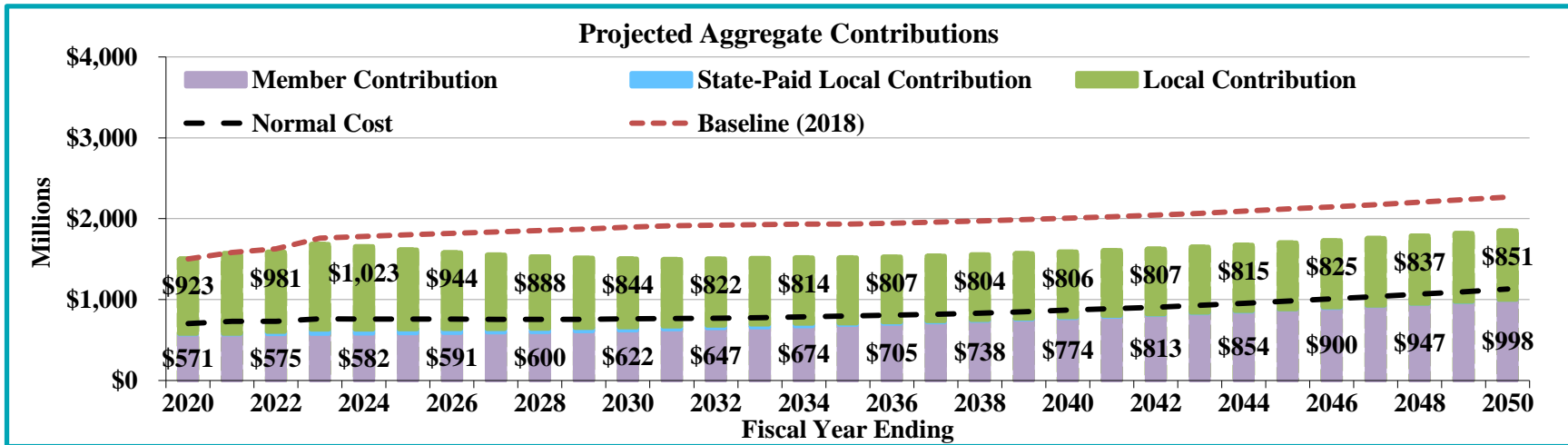
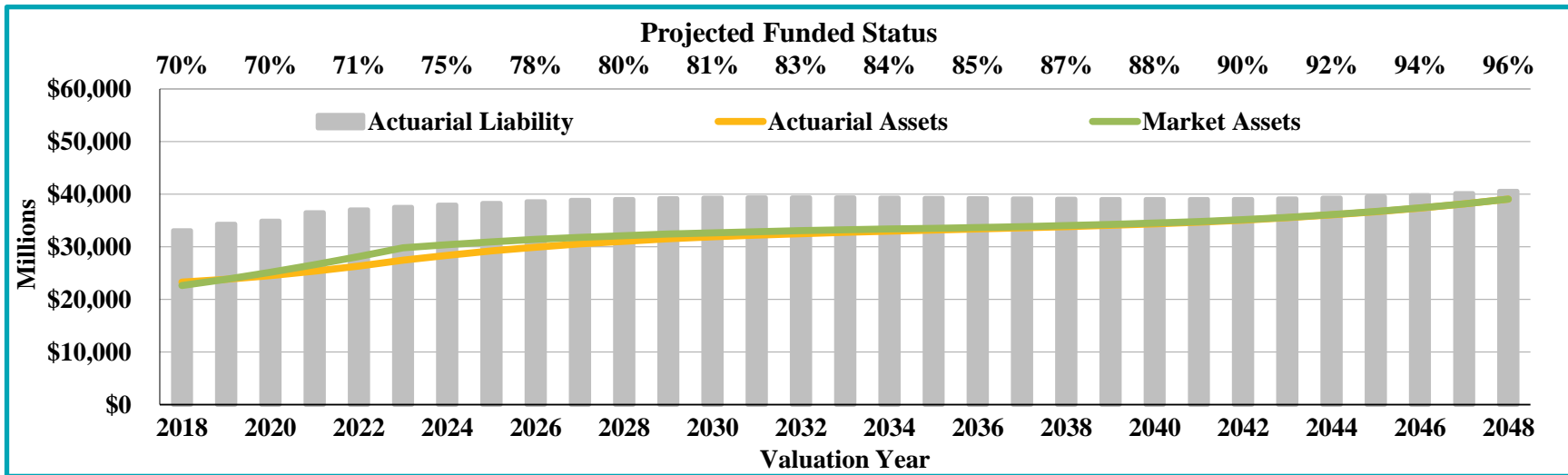


PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
 JULY 1, 2018 ACTUARIAL VALUATION

SECTION I – BOARD SUMMARY

Five-Year Moderate Positive Scenario: 10.9% return FYE 2019-2023, 7.0% after

Local Employers

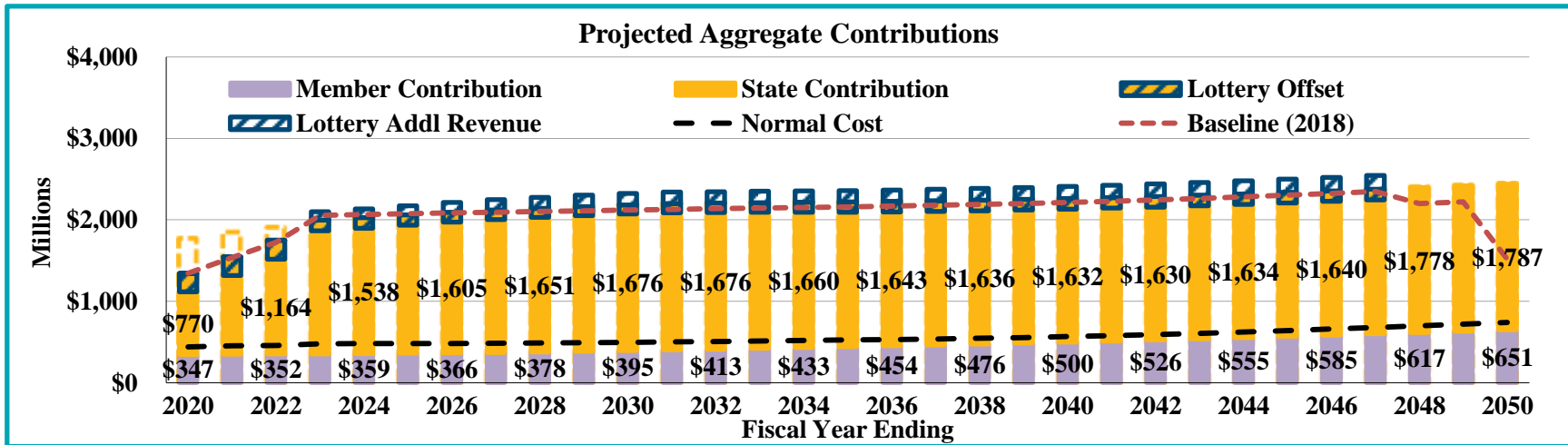
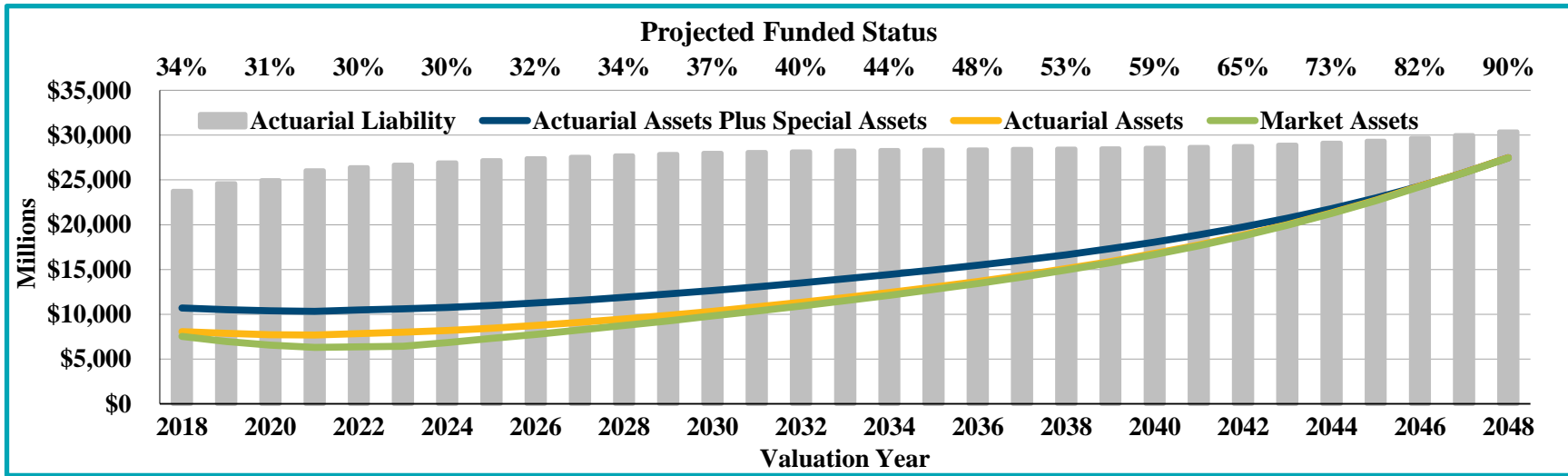


PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
 JULY 1, 2018 ACTUARIAL VALUATION

SECTION I – BOARD SUMMARY

Five-Year Significant Negative Scenario: -1.4% return FYE 2019-2023, 7.0% after

State

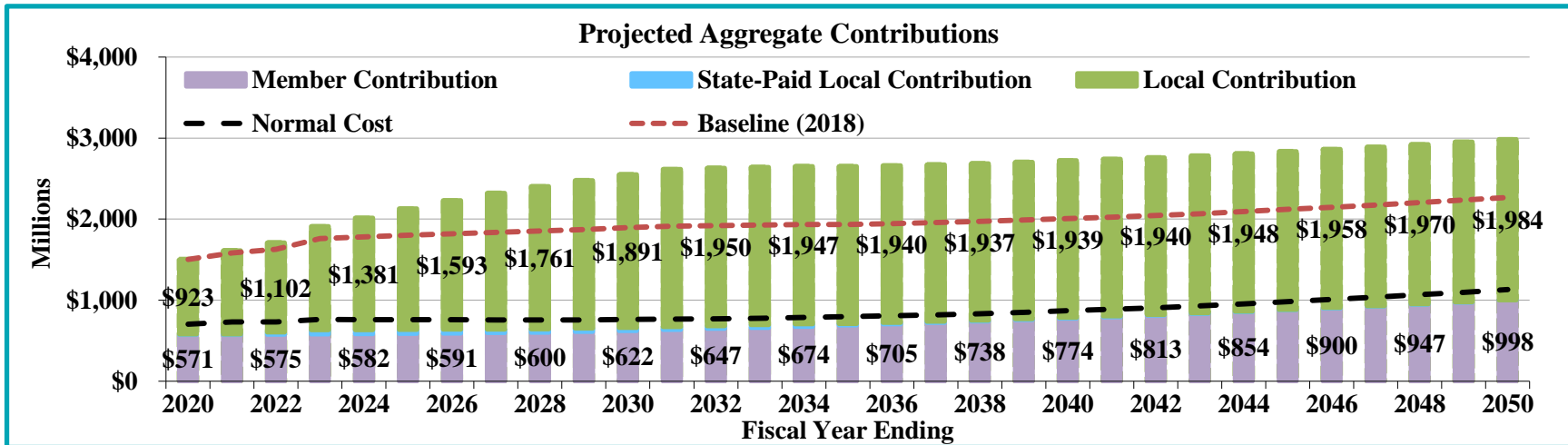
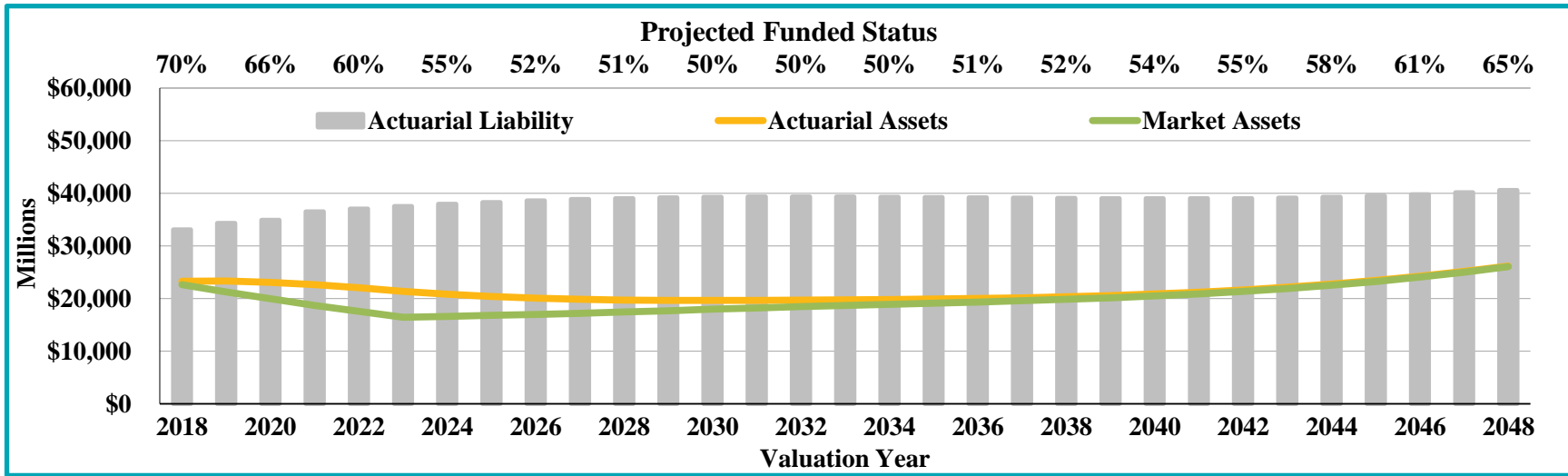


PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
 JULY 1, 2018 ACTUARIAL VALUATION

SECTION I – BOARD SUMMARY

Five-Year Significant Negative Scenario: -1.4% return FYE 2019-2023, 7.0% after

Local Employers

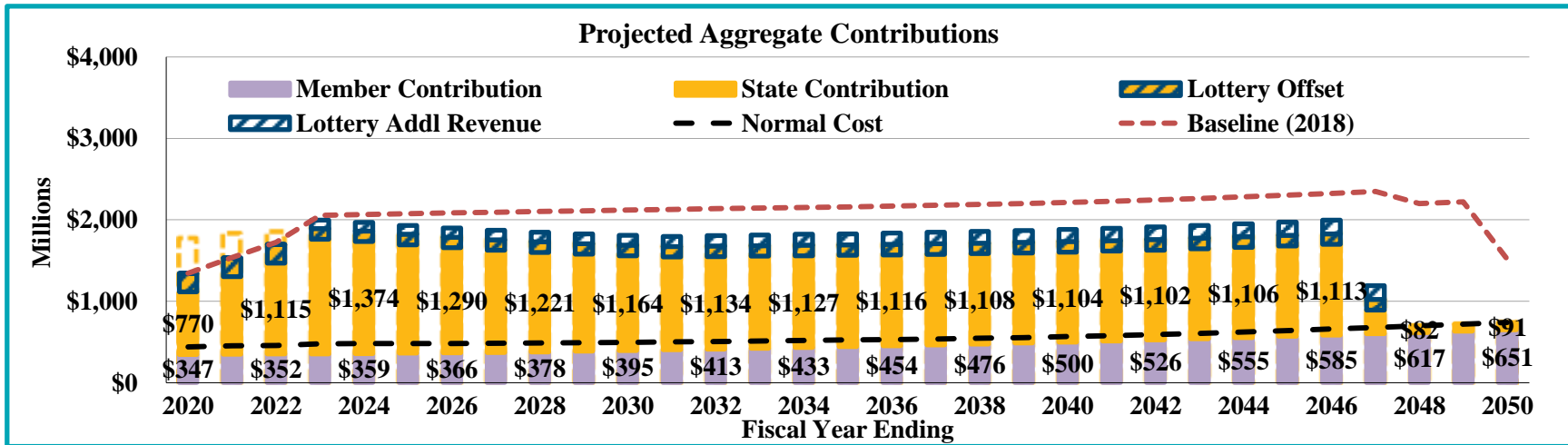
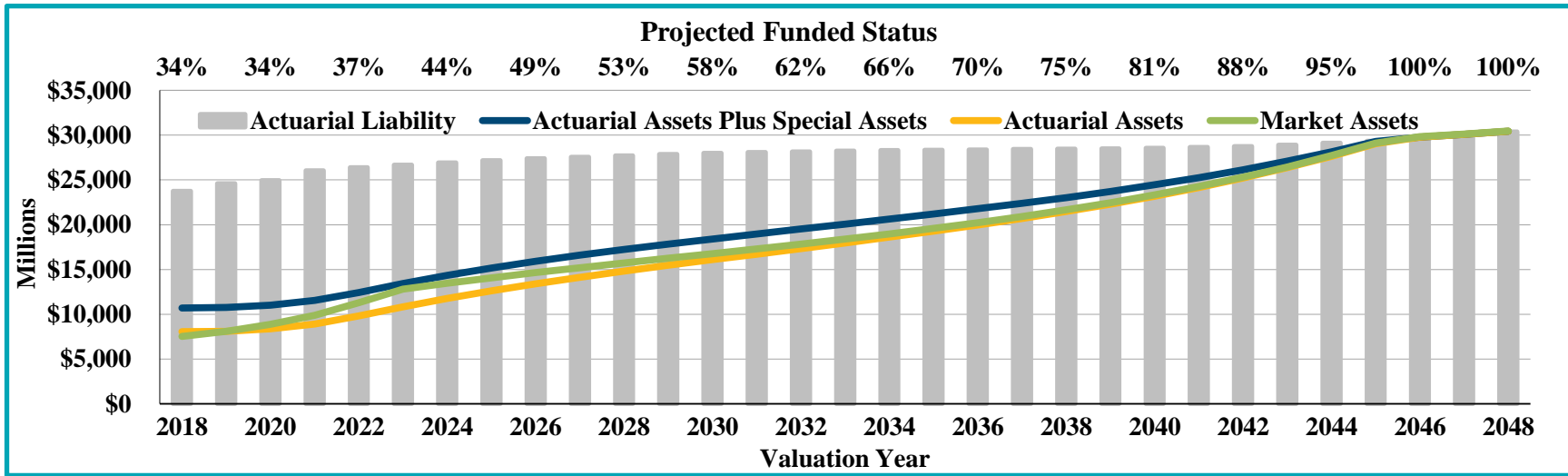


PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
 JULY 1, 2018 ACTUARIAL VALUATION

SECTION I – BOARD SUMMARY

Five-Year Significant Positive Scenario: 16.5% return FYE 2019-2023, 7.0% after

State

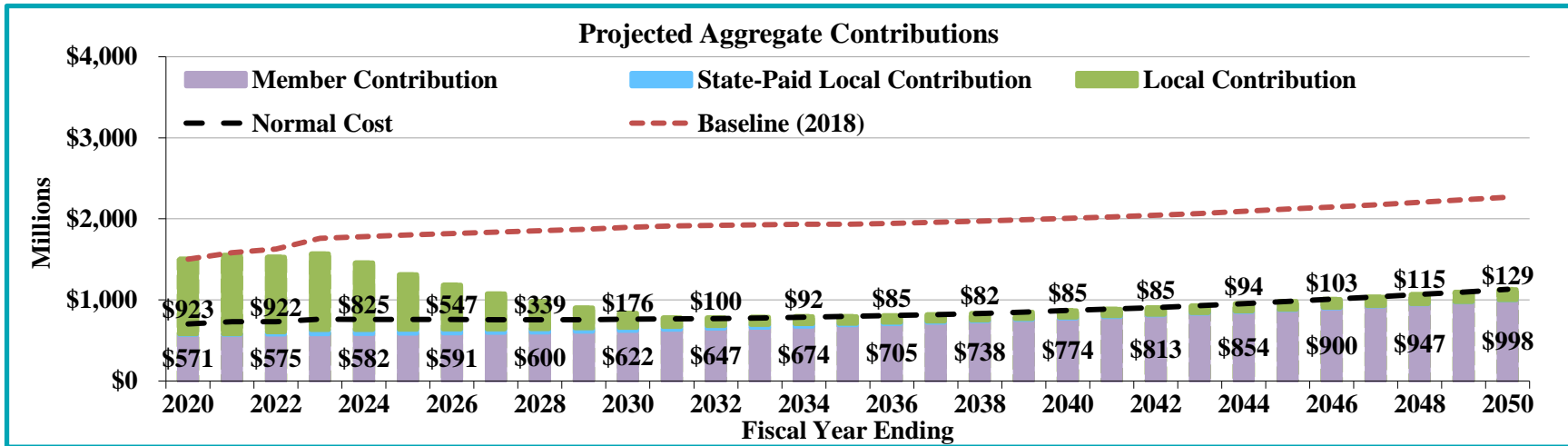
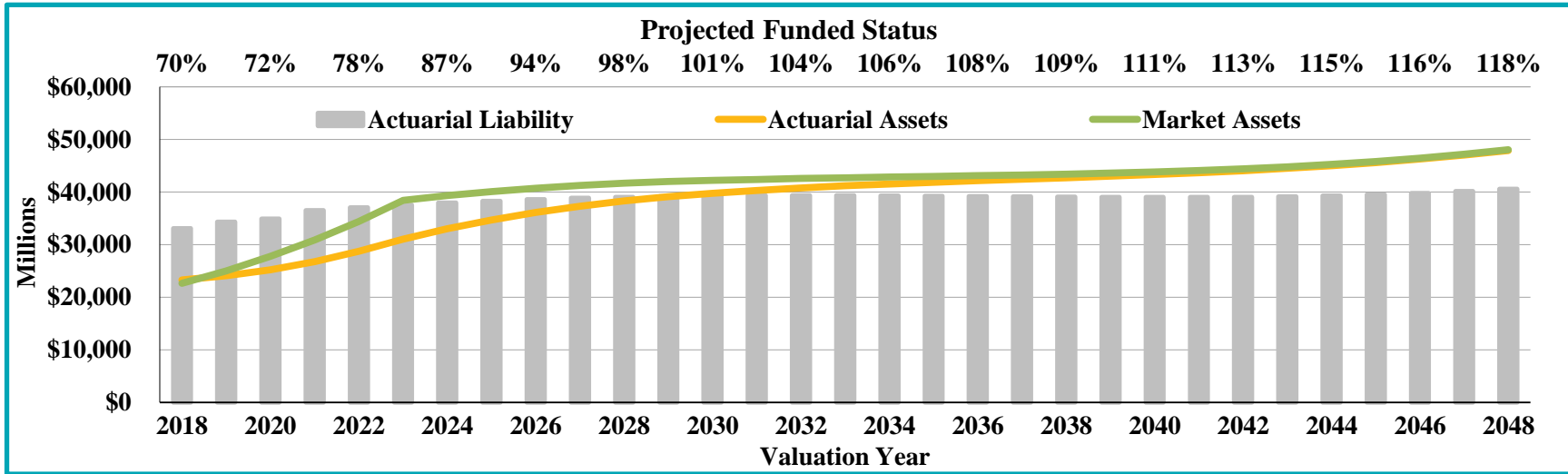


PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
 JULY 1, 2018 ACTUARIAL VALUATION

SECTION I – BOARD SUMMARY

Five-Year Significant Positive Scenario: 16.5% return FYE 2019-2023, 7.0% after

Local Employers



PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION

SECTION II – ASSETS

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

Actuarial Standards of Practice (ASOP) No. 44 states that the asset valuation method should produce an actuarial value of assets that falls within a reasonable range of market value, recognizes the difference between the market value and actuarial value of assets within a reasonably short period of time, and is likely to produce actuarial 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, 2017 and July 1, 2018,
- 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 II-1 on the following page presents the market value as of June 30, 2017 and June 30, 2018. Table II-2 presents the System's net cash flows from June 30, 2017 to June 30, 2018. Table II-3 presents the development of the Actuarial Value of Assets as of July 1, 2018.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

SECTION II – ASSETS

Table II-1 Statement of Assets at Market Value		
	June 30, 2018	June 30, 2017
Assets		
Cash	\$ 322,533,336	\$ 307,314,387
Investment Holdings	27,841,851,092	26,834,171,645
Employers' Contributions Receivable - Chapter 19	34,249,797	39,123,915
Employers' Contributions Receivable - NCGI State	3,793,857	3,459,651
Employers' Contributions Receivable - NCGI Local Employers	45,229,397	45,155,489
Employers' Contributions Receivable - Lottery	17,446,600	0
Employers' Contributions Receivable - Local Employers	955,407,386	890,758,286
Employers' Contributions Receivable - Local Employers ERI	44,128,023	52,368,757
Employers' Contributions Receivable - Retroactive Contributions	4,225,403	2,703,968
Employers' Contributions Receivable - Delayed Enrollments	1,184,991	1,112,665
Employers' Contributions Receivable - Delayed Appropriations	7,672,362	7,621,242
Members' Contributions Receivable	66,301,621	59,619,441
Accrued Interest on Investments	55,798	35,826
Accounts Receivable - Other	22,619,532	22,164,890
Loans Receivable	569,959,958	619,523,933
Securities Lending Collateral	304,075,112	342,931,177
Total Assets	\$ 30,240,734,265	\$ 29,228,065,272
Liabilities		
Pension Payroll Payable	\$ (278,846,360)	\$ (260,859,083)
Pension Adjustment Payroll Payable	(18,621,999)	(19,383,914)
Withholdings Payable	(31,492,873)	(28,960,465)
Death Benefits Payable	(10,022,922)	(7,911,760)
Securities Lending Collateral & Rebates Payable	(304,066,483)	(342,829,950)
Administrative Expenses Payable	(2,120,518)	(7,180,823)
Accounts Payable - Other	(123,188,574)	(96,699,759)
Total Liabilities	\$ (768,359,729)	\$ (763,825,754)
Preliminary Market Value of Assets	\$ 29,472,374,536	\$ 28,464,239,518
Discounted Receivables		
State Appropriations	\$ 599,154,042	\$ 432,475,634
Expected Lottery Revenue	210,358,669	202,932,929
Adjustments to June 30, 2018 Financial Report		
Discounting of Local Employers Appropriations Receivable	(50,126,765)	(46,525,579)
Discounting of Local Employers ERI Contributions Receivable ¹	(788,238)	(7,394,653)
True-up of Present Value of Chapter 19, P.L. 2009		
Contributions Receivable	18,408,351	9,545,121
Exclusion of Reserve for Non-Contributory Group Insurance	(70,726,865)	(64,452,031)
Market Value of Assets	\$ 30,178,653,730	\$ 28,990,820,939

¹ For 2017, includes amounts due to contributions receivable from certain locations for the unauthorized early retirement incentive programs each employer offered. Per the DPB, amounts owed by Local employers due to these unauthorized ERI programs will no longer be included as contributions receivable effective with the July 1, 2018 valuation.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

SECTION II – ASSETS

System Cash Flows as of June 30, 2018

Table II-2 Changes in Market Values for FYE June 30, 2018			
	State	Local Employers	Total
Additions			
Contributions			
Member Contributions	\$ 320,487,632	\$ 533,691,158	\$ 854,178,790
Member Transfer Contributions	5,910,765	83,930	5,994,695
State and Local Employers Appropriations	452,380,229	949,447,522	1,401,827,751
State Lottery	205,155,662	0	205,155,662
NCGI Premium	28,418,599	45,229,397	73,647,996
Transfers from Other Systems	434,094	742,596	1,176,690
Delayed Enrollments	205,300	726,311	931,611
Delayed Appropriations	44,183	2,643,784	2,687,967
Retroactive Employer Contributions	0	4,818,841	4,818,841
Additional Employer Contributions	0	28,566	28,566
Total Contributions	<u>\$ 1,013,036,464</u>	<u>\$ 1,537,412,105</u>	<u>\$ 2,550,448,569</u>
Net Investment Income	570,373,070	1,865,390,489	2,435,763,559
Total Additions	<u>\$ 1,583,409,534</u>	<u>\$ 3,402,802,594</u>	<u>\$ 4,986,212,128</u>
Deductions			
Withdrawal of Member Contributions	\$ 46,387,442	\$ 76,416,009	\$ 122,803,451
Transfers to Other Systems - Member Contributions	7,335,770	9,277,889	16,613,659
Transfers to Other Systems - Employer Contributions	920,156	2,854,569	3,774,725
Adjustments to Member Account Loans	(195,303)	0	(195,303)
Retirement Allowances	1,565,986,326	1,971,497,039	3,537,483,365
Pension Adjustment Benefits	87,878,798	116,143,201	204,021,999
NGCI Premium	28,418,599	43,788,465	72,207,064
Administrative Expenses	6,584,293	14,783,857	21,368,150
Total Deductions	<u>\$ 1,743,316,081</u>	<u>\$ 2,234,761,029</u>	<u>\$ 3,978,077,110</u>
Net Increase/(Decrease)	\$ (159,906,547)	\$ 1,168,041,565	\$ 1,008,135,018
Preliminary Market Value of Assets Beginning of Year	\$ 6,890,209,111	\$ 21,574,030,407	\$ 28,464,239,518
Preliminary Market Value of Assets End of Year	\$ 6,730,302,564	\$ 22,742,071,972	\$ 29,472,374,536
Discounted Receivables			
State Appropriations	\$ 592,625,382	6,528,660	\$ 599,154,042
Expected Lottery Revenue	210,358,669	0	210,358,669
Adjustments to June 30, 2018 Financial Report			
Discounting of Local Employers Appropriations Receivable	0	(50,126,765)	(50,126,765)
Discounting of Local Employers ERI Contributions Receivable	0	(788,238)	(788,238)
True-up of Present Value of Chapter 19, P.L. 2009			
Contributions Receivable	0	18,408,351	18,408,351
Exclusion of Reserve for Non-Contributory Group Insurance	0	(70,726,865)	(70,726,865)
Market Value of Assets End of Year	<u>\$ 7,533,286,615</u>	<u>\$ 22,645,367,115</u>	<u>\$ 30,178,653,730</u>
Approximate Return	8.80%	9.29%	9.17%

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

SECTION II – 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. This method is prescribed by N. J. Statute.

**Table II-3
Development of Actuarial Value of Assets as of June 30, 2018**

	State	Local Employers	Total
1. Preliminary Actuarial Value of Assets as of July 1, 2017 ¹	\$ 7,578,006,060	\$ 22,587,319,242	\$ 30,165,325,302
2. Net Cash Flow excluding Investment Income ²	(730,279,617)	(679,841,394)	(1,410,121,011)
3. Expected Investment Income ³	<u>537,333,988</u>	<u>1,582,713,460</u>	<u>2,120,047,448</u>
4. Expected Actuarial Value of Assets as of July 1, 2018: [1 + 2 + 3]	\$ 7,385,060,431	\$ 23,490,191,308	\$ 30,875,251,739
5. Preliminary Market Value of Assets as of June 30, 2018 ⁴	\$ 6,730,302,564	\$ 22,715,803,179	\$ 29,446,105,743
6. 20% of Difference from MVA [20% * (5 - 4)]	\$ (130,951,573)	\$ (154,877,626)	\$ (285,829,199)
7. Preliminary Actuarial Value of Assets as of July 1, 2018: [4 + 6]	\$ 7,254,108,858	\$ 23,335,313,682	\$ 30,589,422,540
8. Discounted Receivable Contributions			
State Appropriations	\$ 592,625,382	\$ 6,528,660	\$ 599,154,042
Expected Lottery Revenue	210,358,669	0	210,358,669
Chapter 19, P.L. 2009 Contributions for FYE 2020 and Later	<u>0</u>	<u>44,351,884</u>	<u>44,351,884</u>
Total	\$ 802,984,051	\$ 50,880,544	\$ 853,864,595
9. Adjustments			
Discounting of Local Employers Appropriations Receivable	\$ 0	\$ (50,126,765)	\$ (50,126,765)
Discounting of Chapter 19, P.L. 2009 Contributions Receivable for FYE 2019	0	(462,978)	(462,978)
Exclusion of Reserve for Non-Contributory Group Insurance	<u>0</u>	<u>(70,726,865)</u>	<u>(70,726,865)</u>
Total	\$ 0	\$ (121,316,608)	\$ (121,316,608)
10. Actuarial Value of Assets as of July 1, 2018: [7 + 8 + 9]	\$ 8,057,092,909	\$ 23,264,877,618	\$ 31,321,970,527
11. Rate of Return on Actuarial Value of Assets	5.67%	6.77%	6.49%

¹ Includes Local appropriations receivable from June 30, 2017 Financial Report but excludes discounted State appropriations receivable, present value of Chapter 19, P.L. 2009 and other adjustments.

² Amount for Local Employers includes the following Chapter 19, P.L. 2009 payments: expected contribution for FYE 2018 of \$8,723,444, lump sum payoff of present value in FYE 2018 of 14,843 and contribution receivable for FYE 2019 of 8,769,243.

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, 2018 Financial Report for discounting of Local Employers ERI contributions receivable of \$(788,238) and true-up of Chapter 19, P.L. 2009 contributions receivable for FYE 2019 of \$(25,480,555).

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

SECTION II – ASSETS

Investment Performance

In reviewing the investment performance for the System's assets in aggregate, the market value of assets rate of return was 9.17% for the year ending June 30, 2018. 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 2018 was 6.49%.

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, 2018 the market value of assets rate of return was 8.80% and 9.29% for the State and Local employers' portions, respectively. On an actuarial value of assets basis, the return for FYE 2018 was 5.67% and 6.77% for the State and Local employers' portions, respectively.

In Table II-4 below we show the historical returns on the actuarial value of asset basis for the last ten years for the System in aggregate.

Table II-4 Historical Rates of Return Total System		
Year Ended June 30	Investment Return Assumption	Actuarial Asset Value
2009	8.25%	3.24%
2010	8.25%	3.16%
2011	8.25%	5.26%
2012	7.95%	4.58%
2013	7.90%	5.52%
2014	7.90%	7.60%
2015	7.90%	5.94%
2016	7.90%	4.95%
2017	7.65%	5.99%
2018	7.50%	6.49%

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

SECTION II – ASSETS

Development of Special Asset Value (SAV)

Under Chapter 98, P.L. 2017, the Lottery Enterprise Contribution Act, PERS receives 21.02% 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, and is included in the State's actuarial value of assets used for the purpose of calculating the target funding ratio under Chapter 78, P.L. 2010. The special asset value is the present value of remaining lottery contributions to the retirement systems.

Table II-5 shows the development of the special asset value as of July 1, 2018.

Table II-5 Development of Special Asset Value as of July 1, 2018		
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, 2019 ¹	\$	13,570,171,451
3. Discounted Value as of July 1, 2018 at 7.50%	\$	12,623,415,303
4. Allocation to PERS		21.02%
5. Special Asset Value as of July 1, 2018	\$	2,653,441,897

¹ Provided by the Division of Pensions and Benefits

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

SECTION II – ASSETS

Actuarial Balance Sheet

Table II-6 Actuarial Balance Sheet as of July 1, 2018			
	State	Local Employers	Total
Assets			
<u>Retirement Fund Reserve (RFR)</u>			
Credited to Fund with Distribution of Income	\$ 13,826,233,609	\$ 18,919,788,462	\$ 32,746,022,071
Add/(Deduct) reserve transferable from/(to) ECR ¹	1,222,892,152	594,548,470	1,817,440,622
Adjusted RFR ²	\$ 15,049,125,761	\$ 19,514,336,932 ³	\$ 34,563,462,693
Members' Contributions Reserve (MCR) ²	\$ 2,946,550,582	\$ 4,734,694,497	\$ 7,681,245,079
Accumulative Interest Reserve (AIR) with Distribution of Income ²	\$ 3,064,596,554	\$ 4,447,353,832	\$ 7,511,950,386
<u>Employers' Contributions Reserve (ECR)</u>			
Credited to Fund with Distribution of Income	\$ (11,780,287,836)	\$ (4,965,728,616)	\$ (16,746,016,452)
Add/(Deduct) reserve transferable from/(to) RFR	(1,222,892,152)	(594,548,470)	(1,817,440,622)
Add/(Deduct) reserve transferable from/(to) BEF	0	40,027,239	40,027,239
Adjusted ECR ²	\$ (13,003,179,988)	\$ (5,520,249,847)	\$ (18,523,429,835)
<u>Benefit Enhancement Fund (BEF)</u>			
Credited to Fund with Distribution of Income	\$ 0	\$ 128,769,443	\$ 128,769,443
Add/(Deduct) reserve transferable from/(to) ECR	0	(40,027,239)	(40,027,239)
Adjusted BEF ²	\$ 0	\$ 88,742,204	\$ 88,742,204
Special Asset Value as of July 1, 2018	\$ 2,653,441,897	\$ 0	\$ 2,653,441,897
Present Value of Prospective Contributions by State and Local Employers to ECR	\$ 13,035,181,825	\$ 9,927,492,119	\$ 22,962,673,944
Assets Allocated to the BEF	\$ 0	\$ (88,742,204)	\$ (88,742,204)
Total Assets	\$ 23,745,716,631	\$ 33,103,627,533	\$ 56,849,344,164
Liabilities			
<u>Payable from RFR</u>			
Retirees, Disableds, and Beneficiaries currently receiving benefits	\$ 15,049,125,761	\$ 19,514,336,932 ³	\$ 34,563,462,693
<u>Payable from MCR, AIR and ECR</u>			
Actives and Deferred Vesteds due a future benefit	\$ 8,696,590,870	\$ 13,589,290,601	\$ 22,285,881,471
Total Liabilities	\$ 23,745,716,631	\$ 33,103,627,533	\$ 56,849,344,164

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 + AIR + ECR + BEF.

³ Includes the present value of ERI payments of \$35,289,565.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

SECTION III – LIABILITIES

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

- Disclosure of liabilities at July 1, 2017 and July 1, 2018,
- 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 PERS, 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.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

SECTION III – LIABILITIES

Table III-1 shows the actuarial liability as of July 1, 2018 for the System. The unfunded actuarial liability (UAL) shown in the table is based on the actuarial value of assets plus the special asset value and is different from the UAL used in determining Statutory contributions.

Table III-1 Disclosure of Liabilities			
	State	Local Employers	Total
Actuarial Liability			
Contributing Actives	\$ 8,280,741,987	\$ 12,807,077,374	\$ 21,087,819,361
Non-Contributing Actives	394,738,480	743,865,614	1,138,604,094
Deferred Vesteds	21,110,403	38,347,613	59,458,016
Retirees	13,542,594,277	17,117,117,402	30,659,711,679
Disabled	910,214,583	1,336,578,862	2,246,793,445
Beneficiaries	596,316,901	1,060,640,668	1,656,957,569
Total	\$ 23,745,716,631	\$ 33,103,627,533	\$ 56,849,344,164
Actuarial Value of Assets + Special Asset Value	\$ 10,710,534,806	\$ 23,264,877,618	\$ 33,975,412,424
Unfunded Actuarial Liability/(Surplus)	\$ 13,035,181,825	\$ 9,838,749,915	\$ 22,873,931,740
Funded Ratio	45.11%	70.28%	59.76%

¹ Includes the present value of ERI payments of \$35,289,565.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

SECTION III – LIABILITIES

Table III-2 and Table III-3 show the Actuarial Liability by Tier of contributing active members for State and Local employers as of July 1, 2018.

Table III-2 Contributing Active Liabilities by Tier State				
	Number of Members	Appropriation Payroll¹	Actuarial Liability	Gross Normal Cost
Tier 1	41,962	\$ 2,932,098,109	\$ 7,760,656,285	\$ 320,477,616
Tier 2	3,133	178,017,536	177,803,599	15,954,970
Tier 3	2,201	121,755,110	98,467,425	10,385,816
Tier 4	1,512	88,329,071	49,564,937	6,093,134
Tier 5	19,785	1,013,573,148	194,249,741	55,672,501
Total	68,593	\$ 4,333,772,974	\$ 8,280,741,987	\$ 408,584,037

Table III-3 Contributing Active Liabilities by Tier Local Employers				
	Number of Members	Appropriation Payroll¹	Actuarial Liability	Gross Normal Cost
Tier 1	84,856	\$ 4,509,830,568	\$ 11,788,114,065	\$ 483,766,785
Tier 2	8,711	353,175,877	367,442,078	32,360,698
Tier 3	5,522	242,575,203	200,096,357	21,082,482
Tier 4	2,416	122,923,756	70,225,586	8,659,770
Tier 5	45,110	1,877,743,384	381,199,288	108,386,308
Total	146,615	\$ 7,106,248,788	\$ 12,807,077,374	\$ 654,256,043

¹ Tier 1 members limited to the 401(a)(17) pay limit. Other tiers limited to the Social Security Wage Base.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

SECTION III – LIABILITIES

Table III-4 and Table III-5 show the Actuarial Liability by Tier of non-contributing active members for State and Local employers as of July 1, 2018.

Table III-4				
Non-Contributing Active Liabilities by Tier				
State				
	Number of	Actuarial	Gross	
	Members	Liability	Normal Cost	
Tier 1	5,950	\$ 357,365,625	\$	0
Tier 2	382	8,490,800		0
Tier 3	274	5,651,543		0
Tier 4	167	3,938,251		0
Tier 5	2,632	19,292,261		0
Total	9,405	\$ 394,738,480	\$	0

Table III-5				
Non-Contributing Active Liabilities by Tier				
Local Employers				
	Number of	Actuarial	Gross	
	Members	Liability	Normal Cost	
Tier 1	17,527	\$ 668,857,429	\$	0
Tier 2	1,669	19,086,168		0
Tier 3	989	11,568,516		0
Tier 4	333	5,310,392		0
Tier 5	7,467	39,043,109		0
Total	27,985	\$ 743,865,614	\$	0

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

SECTION III – LIABILITIES

Tables III-6 and III-7 presents 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.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

SECTION III – LIABILITIES

Table III-6 Development of 2018 Experience (Gain)/Loss State			
	Actuarial Liability	Actuarial Value of Assets	Unfunded Actuarial Liability/(Surplus)
1. Value as of July 1, 2017	\$ 23,324,861,385	\$ (8,208,333,488)	\$ 15,116,527,897
2. Additions			
Normal Cost	\$ 423,381,513	\$ 0	\$ 423,381,513
Statutory State Contributions	0	(1,396,100,062)	(1,396,100,062)
Expected Member Contributions	<u>0</u>	<u>(327,541,044)</u>	<u>(327,541,044)</u>
Total Additions	\$ 423,381,513	\$ (1,723,641,106)	\$ (1,300,259,593)
3. Deductions			
Benefit Payments	\$ (1,700,057,263)	\$ 1,700,057,263	\$ 0
Expected Administrative Expenses	<u>0</u>	<u>0</u>	<u>0</u>
Total Deductions	\$ (1,700,057,263)	\$ 1,700,057,263	\$ 0
4. Net Transfers from Other Systems			
State Contributions	\$ (1,425,005)	\$ 1,425,005	\$ 0
Member Contributions	<u>(486,062)</u>	<u>486,062</u>	<u>0</u>
Total Net Transfers	\$ (1,911,067)	\$ 1,911,067	\$ 0
5. Expected Interest	\$ 1,718,448,224	\$ (565,015,757)	\$ 1,153,432,467
6. Expected Value as of July 1, 2018: [1 + 2 + 3 + 4 + 5]	\$ 23,764,722,792	\$ (8,795,022,021)	\$ 14,969,700,771
7. Other Changes			
Appropriation Adjustment	\$ 0	\$ 552,728,521	\$ 552,728,521
Contribution Timing	0	35,020,711	35,020,711
Actual Lottery Revenue	0	5,347,103	5,347,103
Other Employer Contributions	0	(258,669)	(258,669)
Actual Member Contributions	0	7,313,133	7,313,133
Conversion from Prior Actuary	44,955,524	0	44,955,524
Change in Methods/Assumptions	(157,230,423)	0	(157,230,423)
Change in Benefits	<u>0</u>	<u>0</u>	<u>0</u>
Total Other Changes	\$ (112,274,899)	\$ 600,150,799	\$ 487,875,900
8. Expected value after changes: [6 + 7]	\$ 23,652,447,893	\$ (8,194,871,222)	\$ 15,457,576,671
9. Actual Value as of July 1, 2018	\$ 23,745,716,631	\$ (8,057,092,909)	\$ 15,688,623,722
10. Actuarial (Gain)/Loss: [9 - 8]	\$ 93,268,738	\$ 137,778,313	\$ 231,047,051

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

SECTION III – LIABILITIES

Table III-7 Development of 2018 Experience (Gain)/Loss Local Employers			
	Actuarial Liability	Actuarial Value of Assets	Unfunded Actuarial Liability/(Surplus)
1. Value as of July 1, 2017	\$ 32,238,416,280	\$(22,522,697,150)	\$ 9,715,719,130
2. Additions			
Normal Cost	\$ 668,345,701	\$ 0	\$ 668,345,701
Statutory Contributions	0	(960,799,906)	(960,799,906)
Expected Member Contributions	0	(532,813,175)	(532,813,175)
Total Additions	\$ 668,345,701	\$ (1,493,613,081)	\$ (825,267,380)
3. Deductions			
Benefit Payments	\$ (2,164,056,249)	\$ 2,164,056,249	\$ 0
Expected Administrative Expenses	0	0	0
Total Deductions	\$ (2,164,056,249)	\$ 2,164,056,249	\$ 0
4. Net Transfers from Other Systems			
State Contributions	\$ (9,193,959)	\$ 9,193,959	\$ 0
Member Contributions	(2,111,973)	2,111,973	0
Total Net Transfers	\$ (11,305,932)	\$ 11,305,932	\$ 0
5. Expected Interest	\$ 2,387,905,815	\$ (1,628,720,236)	\$ 759,185,579
6. Expected Value as of July 1, 2018: [1 + 2 + 3 + 4 + 5]	\$ 33,119,305,615	\$(23,469,668,286)	\$ 9,649,637,329
7. Other Changes			
Appropriation Adjustment	\$ 0	\$ 9,985,471	\$ 9,985,471
Contribution Timing	0	50,427,239	50,427,239
Other Employer Contributions	0	(8,520,087)	(8,520,087)
Actual Member Contributions	0	(910,312)	(910,312)
ERI and Ch. 19 Receivables	0	(17,186,178)	(17,186,178)
Interest on NCGI Cash Flows	0	788,680	788,680
Conversion from Prior Actuary	24,702,358	0	24,702,358
Change in Methods/Assumptions	(201,445,376)	0	(201,445,376)
Change in Benefits	0	0	0
Total Other Changes	\$ (176,743,018)	\$ 34,584,813	\$ (142,158,205)
8. Expected value after changes: [6 + 7]	\$ 32,942,562,597	\$(23,435,083,473)	\$ 9,507,479,124
9. Actual Value as of July 1, 2018	\$ 33,103,627,533	\$(23,264,877,618)	\$ 9,838,749,915
10. Actuarial (Gain)/Loss: [9 - 8]	\$ 161,064,936	\$ 170,205,855	\$ 331,270,791

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

SECTION III – LIABILITIES

Table III-8 shows the components of the Actuarial (gain)/loss for the State.

Table III-8 Actuarial (Gain)/Loss Analysis State	
Components	July 1, 2018
Actuarial Value of Assets	
Investment Return	\$ 130,951,573
Administrative Expenses	6,826,740
Total	<u>\$ 137,778,313</u>
Actuarial Liability	
Salary Increases	\$ (75,652,578)
New Entrants	14,380,345
Demographic Experience and Census Data Updates	
Contributing and Non-Contributing Actives	136,168,358
Inactives	16,391,177
Sub-Total	<u>\$ 91,287,302</u>
Impact of Net Transfers from Other Systems	1,981,436
Total	<u>\$ 93,268,738</u>
Actuarial (Gain)/Loss	\$ 231,047,051

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

SECTION III – LIABILITIES

Table III-9 shows the components of the Actuarial (gain)/loss for Local Employers.

Table III-9 Actuarial (Gain)/Loss Analysis Local Employers	
Components	July 1, 2018
Actuarial Value of Assets	
Investment Return	\$ 154,877,626
Administrative Expenses	15,328,229
Total	<u>\$ 170,205,855</u>
Actuarial Liability	
Salary Increases	\$ 83,452,413
New Entrants	24,847,836
Demographic Experience and Census Data Updates	
Contributing and Non-Contributing Actives	35,605,788
Inactives	5,436,659
Sub-Total	<u>\$ 149,342,696</u>
Impact of Net Transfers from Other Systems	11,722,240
Total	<u>\$ 161,064,936</u>
Actuarial (Gain)/Loss	\$ 331,270,791

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

SECTION IV – 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 contain 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 and are unable to evaluate whether the investment rate of return assumption includes an appropriate adjustment for administrative expenses.

For PERS, 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, the unfunded actuarial liability as of July 1, 2018 is amortized over an open 30 year period as a level dollar amount. Beginning with the July 1, 2019 valuation, the unfunded actuarial liability will be amortized over a closed 30 year period as a level dollar amount.

Under Chapter 98, P.L. 2017, the Lottery Enterprise Contribution Act, PERS receives 21.02% of the proceeds of the Lottery Enterprise for a term of 30 years. As of July 1, 2018 there are 28 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.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

SECTION IV – CONTRIBUTIONS

Table IV-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 IV-1 Development of Lottery Enterprise Contribution Offset	
<u>For Fiscal Years Through 2022</u>	
1. Special Asset Adjustment for FY 2020 ¹	\$ 1,070,451,102
2. Allocable Percentage to PERS for Fiscal Years through 2022	21.02%
3. Adjustment Percentage	100.00%
4. Lottery Enterprise Contribution Offset as of June 30, 2019: [1 x 2 x 3]	\$ 225,008,822
<u>For Fiscal Years Beginning 2023</u>	
5. Special Asset Value Allocated to PERS as of July 1, 2018	\$ 2,653,441,897
6. 28-Year Level Dollar Amortization payable June 30, 2019	\$ 229,271,176
7. Initial Special Asset Value allocable to PERS as of July 1, 2016	\$ 2,642,897,102
8. Maximum Special Asset Adjustment: 30-Year Level-Dollar Amortization at 7.65%	\$ 227,053,417
9. Special Asset Adjustment as of June 30, 2019: [lesser of 2 and 4]	\$ 227,053,417
10. Adjustment Percentage	57.29%
11. Funded Ratio based on AVA + SAV for Total System	59.76%
12. Applicable Adjustment Percentage: [If 11. < 50%, 10. - 7. x (50% - 11.), otherwise 10.]	57.29%

¹ This adjustment will be \$1,084,354,841 for FY 2021 and \$1,095,871,137 for FY 2022.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

SECTION IV – CONTRIBUTIONS

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

Table IV-2 Development of Unfunded Actuarial Liability						
	July 1, 2018 Valuation			July 1, 2017 Valuation		
	State	Local Employers ¹	Total	State	Local Employers ¹	Total
1. Actuarial Liability	\$ 23,745,716,631	\$ 33,103,627,533	\$ 56,849,344,164	\$ 23,324,861,385	\$ 32,238,416,280	\$ 55,563,277,665
2. Actuarial Value of Assets²	\$ 8,057,092,909	\$ 23,264,877,618	\$ 31,321,970,527	\$ 8,208,333,488	\$ 22,522,697,150	\$ 30,731,030,638
3. Benefit Enhancement Fund (BEF)³	\$ 0	\$ 88,742,204	\$ 88,742,204	\$ 0	\$ 119,785,528	\$ 119,785,528
4. Unfunded Actuarial Liability including BEF						
a. Basic ⁴	\$ 15,663,557,461	\$ 9,837,607,919	\$ 25,501,165,380	\$ 15,091,572,874	\$ 9,747,135,810	\$ 24,838,708,684
b. Chapter 133, P.L. 2001 ⁵	0	0	0	0	0	0
c. Chapter 366, P.L. 2001 ⁶	20,536,165	89,884,200	110,420,365	20,263,716	88,368,848	108,632,564
d. Chapter 259, P.L. 2001	4,530,096	0	4,530,096	4,691,307	0	4,691,307
e. Total	<u>\$ 15,688,623,722</u>	<u>\$ 9,927,492,119</u>	<u>\$ 25,616,115,841</u>	<u>\$ 15,116,527,897</u>	<u>\$ 9,835,504,658</u>	<u>\$ 24,952,032,555</u>
5. Adjustment to UAL including BEF for Phase-In of State-Paid Local Obligations						
a. Chapter 133, P.L. 2001	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
b. Chapter 366, P.L. 2001	89,884,200	(89,884,200)	0	88,368,848	(88,368,848)	0
d. Total	<u>\$ 89,884,200</u>	<u>\$ (89,884,200)</u>	<u>\$ 0</u>	<u>\$ 88,368,848</u>	<u>\$ (88,368,848)</u>	<u>\$ 0</u>
6. Net UAL including BEF [4 + 5]	\$ 15,778,507,922	\$ 9,837,607,919	\$ 25,616,115,841	\$ 15,204,896,745	\$ 9,747,135,810	\$ 24,952,032,555

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 Contribution.

³ BEF offsets future normal costs associated with Chapter 133, P.L. 2001.

⁴ Includes UAL amounts due to State ERI programs.

⁵ For State, the UAL related to the phase-in of Chapter 133, P.L. 2001 normal costs is not tracked and is included with the Basic UAL.

⁶ Consistent with existing methodology, Local amount calculated assuming payment of expected phased-in State-paid Local contribution. However, it is unclear whether these contributions have been credited to the Local portion of the trust. We recommend a review of historical contributions to determine whether these amounts were credited to the Local portion of the trust and, if not, transfer an appropriate amount from the State portion of the trust.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

SECTION IV – CONTRIBUTIONS

Table IV-3
Development of Unfunded Actuarial Liability Contribution

	July 1, 2018 Valuation			July 1, 2017 Valuation		
	Fiscal Year Ending 2020 Payment			Fiscal Year Ending 2019 Payment		
	State	Local Employers ¹	Total	State	Local Employers ¹	Total
1. Amortization of UAL including BEF						
a. Basic ²	\$ 1,233,723,504	\$ 774,848,762	\$ 2,008,572,266	\$ 1,188,685,363	\$ 767,556,192	\$ 1,956,241,555
b. Chapter 133, P.L. 2001 ³	0	0	0	0	0	0
c. Chapter 366, P.L. 2001	2,164,172	9,472,309	11,636,481	2,062,227	8,990,761	11,052,988
d. Chapter 259, P.L. 2001 ⁴	477,397	0	477,397	477,264	0	477,264
e. Total	<u>\$ 1,236,365,073</u>	<u>\$ 784,321,071</u>	<u>\$ 2,020,686,144</u>	<u>\$ 1,191,224,854</u>	<u>\$ 776,546,953</u>	<u>\$ 1,967,771,807</u>
2. Adjustment to UAL Contribution for State-Paid Local Obligations						
a. Chapter 133, P.L. 2001	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
b. Chapter 366, P.L. 2001	9,472,309	(9,472,309)	0	8,990,761	(8,990,761)	0
c. Total	<u>\$ 9,472,309</u>	<u>\$ (9,472,309)</u>	<u>\$ 0</u>	<u>\$ 8,990,761</u>	<u>\$ (8,990,761)</u>	<u>\$ 0</u>
3. UAL Contribution as of Valuation Date [1 + 2]	\$ 1,245,837,382	\$ 774,848,762	\$ 2,020,686,144	\$ 1,200,215,615	\$ 767,556,192	\$ 1,967,771,807
4. Interest to the Beginning of the Fiscal Year	\$ 93,437,804	\$ 58,113,657	\$ 151,551,461	\$ 90,016,171	\$ 57,566,714	\$ 147,582,885
5. UAL Contribution as of Beginning of Fiscal Year [3 + 4]	\$ 1,339,275,186	\$ 832,962,419	\$ 2,172,237,605	\$ 1,290,231,786	\$ 825,122,906	\$ 2,115,354,692

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 due to State ERI programs.

³ For State, the UAL related to the phase-in of Chapter 133, P.L. 2001 normal costs is not tracked and is included with the Basic UAL.

⁴ Payable by the Second Injury Fund (SIF).

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

SECTION IV – CONTRIBUTIONS

Table IV-4 Development of Normal Cost						
	July 1, 2018 Valuation Fiscal Year Ending 2020 Payment			July 1, 2017 Valuation Fiscal Year Ending 2019 Payment		
	State	Local Employers	Total	State	Local Employers	Total
1. Gross Normal Cost, excluding NCGI Premium						
a. Basic	\$ 383,265,567	\$ 613,195,200	\$ 996,460,767	\$ 397,789,136	\$ 628,119,068	\$ 1,025,908,204
b. Chapter 133, P.L. 2001	24,917,788	38,333,334	63,251,122	25,089,551	37,234,641	62,324,192
c. Chapter 366, P.L. 2001	324,366	2,727,509	3,051,875	401,378	2,991,992	3,393,370
d. Chapter 259, P.L. 2001 ¹	76,316	0	76,316	101,448	0	101,448
e. Total	<u>\$ 408,584,037</u>	<u>\$ 654,256,043</u>	<u>\$ 1,062,840,080</u>	<u>\$ 423,381,513</u>	<u>\$ 668,345,701</u>	<u>\$ 1,091,727,214</u>
2. Expected Member Contributions²						
a. Basic	\$ (322,894,325)	\$ (529,461,839)	\$ (852,356,164)	\$ (315,699,829)	\$ (512,495,710)	\$ (828,195,539)
b. Chapter 366, P.L. 2001 ³	(189,820)	(1,240,492)	(1,430,312)	(208,806)	(1,394,948)	(1,603,754)
c. Total	<u>\$ (323,084,145)</u>	<u>\$ (530,702,331)</u>	<u>\$ (853,786,476)</u>	<u>\$ (315,908,635)</u>	<u>\$ (513,890,658)</u>	<u>\$ (829,799,293)</u>
3. Employer Normal Cost [1 + 2]	\$ 85,499,892	\$ 123,553,712	\$ 209,053,604	\$ 107,472,878	\$ 154,455,043	\$ 261,927,921
4. BEF Offset of Chapter 133, P.L. 2001	\$ 0	\$ (38,333,334)	\$ (38,333,334)	\$ 0	\$ (37,234,641)	\$ (37,234,641)
5. Portion of Local Normal Cost Payable by State						
a. Chapter 133, P.L. 2001	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
b. Chapter 366, P.L. 2001	1,487,017	(1,487,017)	0	1,597,044	(1,597,044)	0
c. Total	<u>\$ 1,487,017</u>	<u>\$ (1,487,017)</u>	<u>\$ 0</u>	<u>\$ 1,597,044</u>	<u>\$ (1,597,044)</u>	<u>\$ 0</u>
6. Normal Cost Contribution as of Valuation Date [3 + 4 + 5]	\$ 86,986,909	\$ 83,733,361	\$ 170,720,270	\$ 109,069,922	\$ 115,623,358	\$ 224,693,280
7. Interest to the Beginning of the Fiscal Year	\$ 6,524,018	\$ 6,280,002	\$ 12,804,020	\$ 8,180,244	\$ 8,671,752	\$ 16,851,996
8. Normal Cost Contribution as of Beginning of Fiscal Year [6 + 7]	\$ 93,510,927	\$ 90,013,363	\$ 183,524,290	\$ 117,250,166	\$ 124,295,110	\$ 241,545,276
9. Non-Contributory Group Insurance Premium as of Beginning of Fiscal Year (one-year term cost)	N/A	\$ 49,734,428	\$ 49,734,428	N/A	\$ 45,228,000	\$ 45,228,000

¹ Payable by the Second Injury Fund (SIF)

² Consistent with existing methodology, expected member contributions are calculated as appropriation payroll increased with a year of general payroll inflation (3% in 2018), multiplied by the employee contribution rate and discounted from the middle of the year to the beginning of the year.

³ The member contribution rate for Prosecutors Part members is 10%, 2.5% greater than the regular member contribution rate of 7.5%.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

SECTION IV – CONTRIBUTIONS

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

As of Beginning of Fiscal Year	July 1, 2018 Valuation Fiscal Year Ending 2020 Payment			July 1, 2017 Valuation Fiscal Year Ending 2019 Payment		
	State	Local Employers	Total	State	Local Employers	Total
	1. Normal Cost Contribution¹					
a. Basic	\$ 64,899,084	\$ 90,013,363	\$ 154,912,447	\$ 88,246,005	\$ 124,295,110	\$ 212,541,115
b. Chapter 133, P.L. 2001	26,786,622	0	26,786,622	26,971,267	0	26,971,267
c. Chapter 366, P.L. 2001	1,743,181	0	1,743,181	1,923,837	0	1,923,837
d. Chapter 259, P.L. 2001 ³	82,040	0	82,040	109,057	0	109,057
e. Total	\$ 93,510,927	\$ 90,013,363	\$ 183,524,290	\$ 117,250,166	\$ 124,295,110	\$ 241,545,276
2. UAL Contribution^{1,2}						
a. Basic ⁴	\$ 1,326,252,767	\$ 832,962,419	\$ 2,159,215,186	\$ 1,277,836,765	\$ 825,122,906	\$ 2,102,959,671
b. Chapter 133, P.L. 2001	0	0	0	0	0	0
c. Chapter 366, P.L. 2001	12,509,217	0	12,509,217	11,881,962	0	11,881,962
d. Chapter 259, P.L. 2001 ³	513,202	0	513,202	513,059	0	513,059
e. Total	\$ 1,339,275,186	\$ 832,962,419	\$ 2,172,237,605	\$ 1,290,231,786	\$ 825,122,906	\$ 2,115,354,692
3. Total Statutory Pension Contribution: [1 + 2]	\$ 1,432,786,113	\$ 922,975,782	\$ 2,355,761,895	\$ 1,407,481,952	\$ 949,418,016	\$ 2,356,899,968
4. SIF Offset of Chapter 259, P.L. 2001	\$ (595,242)	\$ 0	\$ (595,242)	\$ (622,116)	\$ 0	\$ (622,116)
5. Lottery Enterprise Contribution Offset	\$ (225,008,822)	\$ 0	\$ (225,008,822)	\$ (218,008,632)	\$ 0	\$ (218,008,632)
6. Net Pension Contribution: [3 + 4 + 5]	\$ 1,207,182,049	\$ 922,975,782	\$ 2,130,157,831	\$ 1,188,851,204	\$ 949,418,016	\$ 2,138,269,220
7. Non-Contributory Group Insurance Premium	N/A	\$ 49,734,428	\$ 49,734,428	N/A	\$ 45,228,000	\$ 45,228,000

¹ State amounts for Chapter 133, P.L. 2001 and Chapter 366, P.L. 2001 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 \$11,781,276 and \$11,381,890 for the July 1, 2018 and July 1, 2017 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 on these payments.

³ Payable by the Second Injury Fund (SIF).

⁴ Includes UAL Amounts due to State ERI programs.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

SECTION IV – CONTRIBUTIONS

Table IV-6 shows the State and Local employer contributions as a percentage of appropriation payroll for FYE 2020 compared to FYE 2019.

Table IV-6				
Contributions as a Percentage of Appropriation Payroll¹				
	July 1, 2018 Valuation Fiscal Year 2020 Payment		July 1, 2017 Valuation Fiscal Year 2019 Payment	
	State	Local Employers	State	Local Employers
1. Normal Cost Rate				
a. Basic	1.498%	1.267%	2.040%	1.770%
b. Chapter 133, P.L. 2001	0.618%	0.000% ²	0.620%	0.000% ²
c. Total Normal Cost Rate	2.116%	1.267%	2.660%	1.770%
2. Unfunded Actuarial Liability (UAL) Contribution				
a. Basic	30.603%	11.722%	29.540%	11.750%
b. Chapter 133, P.L. 2001	0.000%	0.000%	0.000%	0.000%
c. Total UAL Contribution	30.603%	11.722%	29.540%	11.750%
3. Gross Contribution for Fiscal Year 2020: [1 + 2]	32.719%	12.989%	32.200%	13.520%
4. State Non-Contributory Group Insurance Premium Fund	N/A	0.700%	N/A	0.640%

¹ Rates exclude contributions required under Chapter 366, P.L. 2001 and Chapter 259, P.L. 2001 as well as ERI and Chapter 19, P.L. 2009 payments.

² Required contributions for Local employers are payable by assets from the Benefit Enhancement Fund. If BEF assets are insufficient, the State will cover any shortfall. The Local employers Chapter 133, P.L. 2001 rates would have been 0.580% and 0.570% for the July 1, 2018 and the July 1, 2017, respectively.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

SECTION IV – CONTRIBUTIONS

Table IV-7 shows the Statutory contribution payable by the State broken down by various divisions.

Table IV-7						
Fiscal Year 2020 Statutory Contributions Payable by the State						
	State	Disability Insurance Services	All Other Units of Division of Employment Security	State Colleges	Total Excluding Second Injury Fund	Second Injury Fund
Member Count	53,100	242	1,541	13,710	68,593	
Appropriation Payroll	\$ 3,498,569,911	\$ 12,968,149	\$ 100,747,787	\$ 721,487,127	\$ 4,333,772,974	
Normal Cost Contribution						
Basic	\$ 52,391,757	\$ 194,201	\$ 1,508,717	\$ 10,804,409	\$ 64,899,084	
Chapter 133, P.L. 2001	26,786,622	0	0	0	26,786,622	
Chapter 366, P.L. 2001	1,743,181	0	0	0	1,743,181	
Sub-Total	<u>\$ 80,921,560</u>	<u>\$ 194,201</u>	<u>\$ 1,508,717</u>	<u>\$ 10,804,409</u>	<u>\$ 93,428,887</u>	
Chapter 259, P.L. 2001						\$ 82,040
UAL Contribution						
Basic excluding ERI amounts	\$ 950,049,730	\$ 4,020,532	\$ 31,234,970	\$ 197,036,738	\$ 1,182,341,970	
Chapter 23, P.L. 2002	108,312,587	0	0	9,294,261	117,606,848	
Chapter 21, P.L. 2008	26,303,949	0	0	0	26,303,949	
Chapter 133, P.L. 2001	0	0	0	0	0	
Chapter 366, P.L. 2001	12,509,217	0	0	0	12,509,217	
Sub-Total	<u>\$ 1,097,175,483</u>	<u>\$ 4,020,532</u>	<u>\$ 31,234,970</u>	<u>\$ 206,330,999</u>	<u>\$ 1,338,761,984</u>	
Chapter 259, P.L. 2001						\$ 513,202
Statutory Pension Contribution	\$ 1,178,097,043	\$ 4,214,733	\$ 32,743,687	\$ 217,135,408	\$ 1,432,190,871	\$ 595,242
Lottery Contribution Offset						
Chapter 98, P.L. 2017	\$ (106,198,290)	\$ 0	\$ 0	\$ (118,810,532)	\$ (225,008,822)	\$ 0
Net Pension Contribution	\$ 1,071,898,753	\$ 4,214,733	\$ 32,743,687	\$ 98,324,876	\$ 1,207,182,049	\$ 595,242

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

SECTION IV – CONTRIBUTIONS

Table IV-8 shows the Statutory contribution attributable to various state colleges.

Table IV-8 Fiscal Year 2020 Statutory Contributions for State Colleges									
Location Number	Location Name	Member Count	Appropriation Payroll	Normal Cost Contribution	UAL Contribution		Statutory Pension Contribution	Lottery Contribution Offset ¹	Net Pension Contribution
					Basic	Chapter 23, P.L. 2002			
401	State Library Affiliated ²	75	\$ 5,382,366	\$ 80,602	\$ 1,668,702	\$ 0	\$ 1,749,304	\$ (163,380)	\$ 1,585,924
410	Rowan University	1,046	49,326,941	738,680	13,457,399	802,582	14,998,661	(8,172,688)	6,825,973
411	New Jersey City University	496	25,286,028	378,663	6,898,546	555,822	7,833,031	(4,189,492)	3,643,539
412	Kean University	412	19,942,690	298,646	5,440,774	489,959	6,229,379	(3,304,186)	2,925,193
413	William Patterson University of NJ	561	27,102,707	405,868	7,394,173	342,339	8,142,380	(4,490,487)	3,651,893
414	Monclair State University	674	32,276,609	483,348	8,805,720	217,651	9,506,719	(5,347,720)	4,158,999
415	The College of New Jersey	534	39,777,245	595,672	10,852,047	611,946	12,059,665	(6,590,456)	5,469,209
420	Ramapo College of New Jersey	304	17,086,736	255,877	4,661,611	179,206	5,096,694	(2,831,000)	2,265,694
421	Stockton University	608	33,374,480	499,789	9,105,241	470,916	10,075,946	(5,529,620)	4,546,326
430	Thomas Edison State University	99	7,246,756	108,522	1,977,063	142,136	2,227,721	(1,200,672)	1,027,049
497 & 498	Rutgers University	6,129	307,340,402	4,602,483	83,848,752	5,211,582	93,662,817	(50,921,409)	42,741,408
901	University Hospital	2,380	135,298,374	2,026,119	36,912,166	0	38,938,285	(22,416,785)	16,521,500
32700 & 55530	New Jersey Institute of Technology	392	22,045,793	330,140	6,014,544	270,122	6,614,806	(3,652,637)	2,962,169
Total		13,710	\$ 721,487,127	\$ 10,804,409	\$ 197,036,738	\$ 9,294,261	\$ 217,135,408	\$(118,810,532)	\$ 98,324,876

¹ 52.73% of the total Lottery Enterprise Contribution offset for Fiscal Year 2020 is allocated to each State College location based on the location's 2018 appropriation payroll. The percentage allocation to State Colleges was determined using 2018 contributing active and retiree headcounts for locations deemed to be eligible for funding under the Lottery Enterprise.

² The allocation of the Lottery Enterprise Contribution offset to State Library Affiliated is based on the 47.27% allocated to non-State College locations.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

APPENDIX A – MEMBERSHIP INFORMATION

The data for this valuation was provided by the New Jersey Division of Pensions and Benefits as of July 1, 2018. 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 charts contained in this section:

- A-1 to A-3: Contributing Active Member Data by Tier
- A-4: Non-Contributing Active Member Data by Tier
- A-5: Inactive Member Data by Status
- A-6: Reconciliation of Plan Membership
- A-7 through A-10: Contributing Active Member Data by Age and Service
- A-11 through A-14: Inactive Member Data by Age and Status

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

APPENDIX A – MEMBERSHIP INFORMATION

Table A-1 Contributing Active Member Data by Tier State							
	July 1, 2018	July 1, 2017	% Change		July 1, 2018	July 1, 2017	% Change
<u>Tier 1</u>				<u>Tier 2</u>			
Count	41,962	44,940	-6.6%	Count	3,133	3,251	-3.6%
Average Age	52.66	52.16	1.0%	Average Age	47.49	46.62	1.9%
Average Service	20.35	19.66	3.5%	Average Service	10.33	9.33	10.7%
Average Salary	\$ 69,875	\$ 69,190	1.0%	Average Salary	\$ 56,820	\$ 55,533	2.3%
Total Annual Salary	\$ 2,932,098,109	\$ 3,109,418,071	-5.7%	Total Annual Salary	\$ 178,017,536	\$ 180,537,491	-1.4%
<u>Tier 3</u>				<u>Tier 4</u>			
Count	2,201	2,311	-4.8%	Count	1,512	1,602	-5.6%
Average Age	46.28	45.46	1.8%	Average Age	44.88	43.92	2.2%
Average Service	8.87	7.86	12.8%	Average Service	7.53	6.53	15.3%
Average Salary	\$ 55,318	\$ 53,877	2.7%	Average Salary	\$ 58,419	\$ 57,525	1.6%
Total Annual Salary	\$ 121,755,110	\$ 124,508,836	-2.2%	Total Annual Salary	\$ 88,329,071	\$ 92,155,103	-4.2%
<u>Tier 5</u>				<u>Total</u>			
Count	19,785	16,221	22.0%	Count	68,593	68,325	0.4%
Average Age	39.30	38.94	0.9%	Average Age	48.20	48.34	-0.3%
Average Service	2.97	2.66	11.8%	Average Service	14.23	14.43	-1.4%
Average Salary	\$ 51,229	\$ 50,500	1.4%	Average Salary	\$ 63,181	\$ 63,312	-0.2%
Total Annual Salary	\$ 1,013,573,148	\$ 819,165,078	23.7%	Total Annual Salary	\$ 4,333,772,974	\$ 4,325,784,579	0.2%

All records for multiple members, which are members employed by more than one PERS-participating employer at one time, are shown.



**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

APPENDIX A – MEMBERSHIP INFORMATION

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

	July 1, 2018	July 1, 2017	% Change		July 1, 2018	July 1, 2017	% Change
<u>Tier 1</u>				<u>Tier 2</u>			
Count	84,856	91,924	-7.7%	Count	8,711	9,235	-5.7%
Average Age	55.93	55.42	0.9%	Average Age	51.49	50.72	1.5%
Average Service	19.66	18.85	4.3%	Average Service	10.35	9.31	11.2%
Average Salary	\$ 53,147	\$ 51,336	3.5%	Average Salary	\$ 40,544	\$ 38,427	5.5%
Total Annual Salary	\$ 4,509,830,568	\$ 4,718,976,652	-4.4%	Total Annual Salary	\$ 353,175,877	\$ 354,871,385	-0.5%
<u>Tier 3</u>				<u>Tier 4</u>			
Count	5,522	5,820	-5.1%	Count	2,416	2,595	-6.9%
Average Age	49.92	48.94	2.0%	Average Age	46.99	46.01	2.1%
Average Service	8.90	7.86	13.3%	Average Service	7.58	6.54	15.9%
Average Salary	\$ 43,929	\$ 41,737	5.3%	Average Salary	\$ 50,879	\$ 48,340	5.3%
Total Annual Salary	\$ 242,575,203	\$ 242,911,151	-0.1%	Total Annual Salary	\$ 122,923,756	\$ 125,442,553	-2.0%
<u>Tier 5</u>				<u>Total</u>			
Count	45,110	39,181	15.1%	Count	146,615	148,755	-1.4%
Average Age	41.75	41.12	1.5%	Average Age	50.93	50.94	0.0%
Average Service	2.99	2.56	16.9%	Average Service	13.37	13.32	0.4%
Average Salary	\$ 41,626	\$ 40,329	3.2%	Average Salary	\$ 48,469	\$ 47,207	2.7%
Total Annual Salary	\$ 1,877,743,384	\$ 1,580,120,863	18.8%	Total Annual Salary	\$ 7,106,248,788	\$ 7,022,322,604	1.2%

All records for multiple members, which are members employed by more than one PERS-participating employer at one time, are shown.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

APPENDIX A – MEMBERSHIP INFORMATION

Table A-3							
Contributing Active Member Data by Tier							
Total							
	July 1, 2018	July 1, 2017	% Change		July 1, 2018	July 1, 2017	% Change
<u>Tier 1</u>				<u>Tier 2</u>			
Count	126,818	136,864	-7.3%	Count	11,844	12,486	-5.1%
Average Age	54.85	54.35	0.9%	Average Age	50.43	49.65	1.6%
Average Service	19.88	19.12	4.0%	Average Service	10.35	9.32	11.1%
Average Salary	\$ 58,682	\$ 57,198	2.6%	Average Salary	\$ 44,849	\$ 42,881	4.6%
Total Annual Salary	\$ 7,441,928,677	\$ 7,828,394,723	-4.9%	Total Annual Salary	\$ 531,193,413	\$ 535,408,876	-0.8%
<u>Tier 3</u>				<u>Tier 4</u>			
Count	7,723	8,131	-5.0%	Count	3,928	4,197	-6.4%
Average Age	48.89	47.95	1.9%	Average Age	46.18	45.21	2.1%
Average Service	8.89	7.86	13.2%	Average Service	7.56	6.54	15.7%
Average Salary	\$ 47,175	\$ 45,188	4.4%	Average Salary	\$ 53,781	\$ 51,846	3.7%
Total Annual Salary	\$ 364,330,313	\$ 367,419,987	-0.8%	Total Annual Salary	\$ 211,252,827	\$ 217,597,656	-2.9%
<u>Tier 5</u>				<u>Total</u>			
Count	64,895	55,402	17.1%	Count	215,208	217,080	-0.9%
Average Age	41.00	40.48	1.3%	Average Age	50.06	50.12	-0.1%
Average Service	2.99	2.59	15.4%	Average Service	13.64	13.67	-0.2%
Average Salary	\$ 44,554	\$ 43,307	2.9%	Average Salary	\$ 53,158	\$ 52,276	1.7%
Total Annual Salary	\$ 2,891,316,532	\$ 2,399,285,941	20.5%	Total Annual Salary	\$ 11,440,021,762	\$ 11,348,107,183	0.8%

All records for multiple members, which are members employed by more than one PERS-participating employer at one time, are shown.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

APPENDIX A – MEMBERSHIP INFORMATION

Table A-4 Non-Contributing Active Member Data by Tier						
	State		Local Employers		Total	
	July 1, 2018	July 1, 2017	July 1, 2018	July 1, 2017	July 1, 2018	July 1, 2017
<u>Tier 1</u>						
Count	5,950	6,033	17,527	17,914	23,477	23,947
Average Age	58.5	57.6	61.8	60.9	61.0	60.0
Accumulated Deductions with Interest	\$ 357,365,625	\$ 334,911,766	\$ 668,857,429	\$ 641,967,985	\$ 1,026,223,054	\$ 976,879,751
<u>Tier 2</u>						
Count	382	414	1,669	1,821	2,051	2,235
Average Age	52.1	50.9	53.4	52.1	53.1	51.8
Accumulated Deductions with Interest	\$ 8,490,800	\$ 6,583,240	\$ 19,086,168	\$ 18,837,628	\$ 27,576,968	\$ 25,420,868
<u>Tier 3</u>						
Count	274	336	989	1,111	1,263	1,447
Average Age	47.1	46.2	49.8	48.6	49.2	48.0
Accumulated Deductions with Interest	\$ 5,651,543	\$ 5,276,110	\$ 11,568,516	\$ 10,871,361	\$ 17,220,059	\$ 16,147,471
<u>Tier 4</u>						
Count	167	183	333	354	500	537
Average Age	44.1	42.7	46.1	44.1	45.4	43.6
Accumulated Deductions with Interest	\$ 3,938,251	\$ 3,022,635	\$ 5,310,392	\$ 4,298,918	\$ 9,248,643	\$ 7,321,553
<u>Tier 5</u>						
Count	2,632	2,134	7,467	6,221	10,099	8,355
Average Age	36.1	35.8	38.1	37.6	37.5	37.1
Accumulated Deductions with Interest	\$ 19,292,261	\$ 14,514,843	\$ 39,043,109	\$ 29,462,759	\$ 58,335,370	\$ 43,977,602
<u>Total</u>						
Count	9,405	9,100	27,985	27,421	37,390	36,521
Average Age	51.4	51.5	54.2	54.2	53.5	53.5
Accumulated Deductions with Interest	\$ 394,738,480	\$ 364,308,594	\$ 743,865,614	\$ 705,438,651	\$ 1,138,604,094	\$ 1,069,747,245

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

APPENDIX A – MEMBERSHIP INFORMATION

Table A-5 Inactive Member Data by Status						
	July 1, 2018			July 1, 2017		
	State	Local Employers	Total	State	Local Employers	Total
Retirees						
Count	48,977	100,497	149,474	47,749	99,014	146,763
Annual Retirement Allowances	\$ 1,423,009,992	\$ 1,858,895,467	\$ 3,281,905,459	\$ 1,370,440,135	\$ 1,790,170,223	\$ 3,160,610,358
Average Retirement Allowance	\$ 29,055	\$ 18,497	\$ 21,956	\$ 28,701	\$ 18,080	\$ 21,535
Beneficiaries						
Count	4,437	10,739	15,176	4,313	10,491	14,804
Annual Retirement Allowances	\$ 76,247,249	\$ 137,597,453	\$ 213,844,702	\$ 73,062,782	\$ 131,408,320	\$ 204,471,102
Average Retirement Allowance	\$ 17,184	\$ 12,813	\$ 14,091	\$ 16,940	\$ 12,526	\$ 13,812
Ordinary Disability						
Count	4,631	8,103	12,734	4,597	8,115	12,712
Annual Retirement Allowances	\$ 93,021,193	\$ 137,416,595	\$ 230,437,788	\$ 91,515,020	\$ 136,558,350	\$ 228,073,370
Average Retirement Allowance	\$ 20,087	\$ 16,959	\$ 18,096	\$ 19,908	\$ 16,828	\$ 17,942
Accidental Disability						
Count	511	853	1,364	515	837	1,352
Annual Retirement Allowances	\$ 15,455,362	\$ 23,996,718	\$ 39,452,080	\$ 15,446,806	\$ 23,470,787	\$ 38,917,593
Average Retirement Allowance	\$ 30,245	\$ 28,132	\$ 28,924	\$ 29,994	\$ 28,042	\$ 28,785
In-Pay Total						
Count	58,556	120,192	178,748	57,174	118,457	175,631
Annual Retirement Allowances	\$ 1,607,733,796	\$ 2,157,906,233	\$ 3,765,640,029	\$ 1,550,464,743	\$ 2,081,607,680	\$ 3,632,072,423
Average Retirement Allowance	\$ 27,456	\$ 17,954	\$ 21,067	\$ 27,118	\$ 17,573	\$ 20,680
Deferred Vested Members						
Count	169	440	609	174	409	583
Annual Retirement Allowances	\$ 2,522,196	\$ 4,454,100	\$ 6,976,296	\$ 2,428,380	\$ 4,086,276	\$ 6,514,656
Average Retirement Allowance	\$ 14,924	\$ 10,123	\$ 11,455	\$ 13,956	\$ 9,991	\$ 11,174

QDRO benefits included with member records for valuation purposes.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

APPENDIX A – MEMBERSHIP INFORMATION

Table A-6							
Reconciliation of Plan Membership from July 1, 2017 to July 1, 2018							
	Contributing Actives	Non-Contrib. Actives	Deferred Vested	Retired	Disabled	Beneficiaries	Total
1. July 1, 2017	215,439	36,474	583	146,763	14,064	14,804	428,127
Multiple Member Adjustment	1,641	47	0	386	20	40	2,134
Conversion	255	924	6	(988)	(90)	(95)	12
Adjusted July 1, 2017	<u>217,335</u>	<u>37,445</u>	<u>589</u>	<u>146,161</u>	<u>13,994</u>	<u>14,749</u>	<u>430,273</u>
2. Additions							
a. New entrants	15,220	1,024					16,244
b. Data corrections	152	89		29	3	180	453
c. Total	<u>15,372</u>	<u>1,113</u>	<u>0</u>	<u>29</u>	<u>3</u>	<u>180</u>	<u>16,697</u>
3. Reductions							
a. Withdrawal/Certain Period End	(3,007)	(5,636)	(1)			(25)	(8,669)
b. Died without beneficiary	(345)	(162)	(3)	(4,328)	(461)	(802)	(6,101)
c. Data corrections	(138)	(4)	(18)	(1)			(161)
d. Total	<u>(3,490)</u>	<u>(5,802)</u>	<u>(22)</u>	<u>(4,329)</u>	<u>(461)</u>	<u>(827)</u>	<u>(14,931)</u>
4. Changes in Status							
a. Contributing Actives	(7,890)	7,893		(3)			0
b. Non-Contributing Actives	1,677	(1,677)					0
c. Deferred Vested	(8)	(216)	224				0
d. Retired	(7,423)	(1,004)	(182)	8,527	(1)		(83)
e. Disabled	(337)	(339)		(6)	681		(1)
f. Died with beneficiary	(28)	(23)		(905)	(118)	1,074	0
g. Total	<u>(14,009)</u>	<u>4,634</u>	<u>42</u>	<u>7,613</u>	<u>562</u>	<u>1,074</u>	<u>(84)</u>
5. July 1, 2018	215,208	37,390	609	149,474	14,098	15,176	431,955

QDRO benefits included with member records for valuation purposes.

All records for multiple members, which are members employed by more than one PERS-participating employer at one time, are shown. The decreases due to Changes in Status occur when active records for multiple members are combined into a single retiree record.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

APPENDIX A – MEMBERSHIP INFORMATION

Table A-7									
Age / Service Distribution of Contributing Active Members									
State									
Attained Age	Years of Service								Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & up	
	No.	No.	No.	No.	No.	No.	No.	No.	No.
Under 30	1,746	3,076	474	24	0	0	0	0	5,320
30 to 34	685	2,338	1,785	926	33	0	0	0	5,767
35 to 39	474	1,582	1,470	3,367	1,201	14	0	0	8,108
40 to 44	367	1,096	1,118	2,366	2,465	414	16	0	7,842
45 to 49	308	1,058	1,035	2,003	2,274	1,275	852	136	8,941
50 to 54	241	934	1,004	1,845	1,977	1,208	1,776	1,576	10,561
55 & up	306	1,441	1,925	4,237	4,531	2,717	2,426	4,471	22,054
Total	4,127	11,525	8,811	14,768	12,481	5,628	5,070	6,183	68,593

Table A-8									
Age / Service Distribution of Contributing Active Members									
State									
Attained Age	Years of Service								Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & up	
	Comp.	Comp.	Comp.	Comp.	Comp.	Comp.	Comp.	Comp.	Comp.
Under 30	\$ 44,881	\$ 47,137	\$ 47,813	\$ 43,986	\$ 0	\$ 0	\$ 0	\$ 0	\$ 46,442
30 to 34	48,967	51,013	55,833	53,628	52,889	0	0	0	52,693
35 to 39	51,281	51,688	59,230	65,042	65,529	62,560	0	0	60,646
40 to 44	50,149	52,806	55,939	64,097	72,951	68,301	66,639	0	63,713
45 to 49	47,699	52,222	56,155	62,040	71,647	77,243	71,469	75,403	65,416
50 to 54	48,999	49,910	54,872	59,615	67,775	75,236	79,844	77,352	67,427
55 & up	51,953	52,699	54,277	58,502	65,860	70,091	75,611	84,547	67,765
Total	\$ 47,738	\$ 50,474	\$ 55,570	\$ 61,179	\$ 68,552	\$ 72,665	\$ 76,370	\$ 82,512	\$ 63,181

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

APPENDIX A – MEMBERSHIP INFORMATION

Table A-9									
Age / Service Distribution of Contributing Active Members									
Local Employers									
Attained Age	Years of Service								Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & up	
	No.	No.	No.	No.	No.	No.	No.	No.	No.
Under 30	2,444	7,317	1,095	81	0	0	0	0	10,937
30 to 34	834	4,171	2,631	1,661	117	1	0	0	9,415
35 to 39	769	3,157	2,036	3,150	1,566	65	0	0	10,743
40 to 44	682	3,023	1,835	2,737	2,607	882	54	0	11,820
45 to 49	684	3,557	2,529	3,836	3,301	1,998	1,386	152	17,443
50 to 54	750	3,357	2,978	5,541	4,493	2,517	2,472	1,706	23,814
55 & up	875	4,893	5,720	13,666	14,579	9,808	6,232	6,670	62,443
Total	7,038	29,475	18,824	30,672	26,663	15,271	10,144	8,528	146,615

Table A-10									
Age / Service Distribution of Contributing Active Members									
Local Employers									
Attained Age	Years of Service								Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & up	
	Comp.	Comp.	Comp.	Comp.	Comp.	Comp.	Comp.	Comp.	Comp.
Under 30	\$ 34,739	\$ 38,722	\$ 45,102	\$ 41,076	\$ 0	\$ 0	\$ 0	\$ 0	\$ 38,488
30 to 34	38,347	42,949	49,000	49,990	52,183	71,690	0	0	45,592
35 to 39	39,330	43,013	50,997	53,872	57,481	66,904	0	0	49,700
40 to 44	37,988	42,252	48,833	51,517	60,421	63,672	70,037	0	50,906
45 to 49	37,666	40,679	45,622	47,136	57,294	66,277	69,656	72,242	51,352
50 to 54	37,237	41,309	43,045	41,444	50,544	62,476	72,030	74,926	51,006
55 & up	38,489	41,314	41,136	39,177	44,639	51,179	59,565	71,897	48,204
Total	\$ 37,000	\$ 41,103	\$ 45,188	\$ 43,783	\$ 49,531	\$ 55,806	\$ 64,037	\$ 72,509	\$ 48,469

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

APPENDIX A – MEMBERSHIP INFORMATION

Table A-11					
Counts by Age and Status of Inactive Members					
State					
Attained Age	Status				Total
	Retirees	Beneficiaries	Ordinary Disability	Accidental Disability	
Under 45	0	113	90	14	217
45 to 49	66	81	185	29	361
50 to 54	603	114	431	58	1,206
55 to 59	3,160	211	676	86	4,133
60 to 64	7,342	319	838	93	8,592
65 to 69	10,962	542	842	80	12,426
70 to 74	10,576	676	758	67	12,077
75 to 79	6,907	636	464	36	8,043
80 to 84	4,541	657	238	21	5,457
85 & up	4,820	1,088	109	27	6,044
Total	48,977	4,437	4,631	511	58,556

Table A-12					
Average Retirement Allowances by Age and Status of Inactive Members					
State					
Attained Age	Status				Total
	Retirees	Beneficiaries	Ordinary Disability	Accidental Disability	
Under 45	\$ 0	\$ 10,229	\$ 22,414	\$ 29,000	\$ 16,494
45 to 49	22,864	11,951	21,675	31,286	20,483
50 to 54	30,323	12,791	21,715	31,309	25,637
55 to 59	38,869	16,745	20,870	32,299	34,658
60 to 64	36,208	18,082	20,855	31,416	33,985
65 to 69	33,000	20,496	20,273	31,179	31,581
70 to 74	29,114	21,070	19,413	31,478	28,068
75 to 79	24,486	17,812	18,115	28,680	23,610
80 to 84	20,608	16,382	17,420	22,065	19,965
85 & up	17,053	14,633	15,725	19,539	16,605
Total	\$ 29,055	\$ 17,184	\$ 20,087	\$ 30,245	\$ 27,456

QDRO benefits included with member records for valuation purposes.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

APPENDIX A – MEMBERSHIP INFORMATION

Table A-13					
Counts by Age and Status of Inactive Members					
Local					
Attained Age	Status				Total
	Retirees	Beneficiaries	Ordinary Disability	Accidental Disability	
Under 45	0	171	78	32	281
45 to 49	114	145	256	47	562
50 to 54	756	268	575	99	1,698
55 to 59	3,502	470	1,131	116	5,219
60 to 64	11,857	812	1,494	175	14,338
65 to 69	20,213	1,108	1,484	129	22,934
70 to 74	21,536	1,512	1,308	109	24,465
75 to 79	16,722	1,763	1,028	86	19,599
80 to 84	12,160	1,749	517	35	14,461
85 & up	13,637	2,741	232	25	16,635
Total	100,497	10,739	8,103	853	120,192

Table A-14					
Average Retirement Allowances by Age and Status of Inactive Members					
Local					
Attained Age	Status				Total
	Retirees	Beneficiaries	Ordinary Disability	Accidental Disability	
Under 45	\$ 0	\$ 7,832	\$ 19,572	\$ 26,240	\$ 13,187
45 to 49	23,629	8,689	19,863	29,077	18,515
50 to 54	28,933	12,200	19,224	32,253	23,198
55 to 59	34,860	13,093	18,273	31,634	29,234
60 to 64	24,984	15,619	17,730	30,014	23,759
65 to 69	21,470	14,713	17,005	27,226	20,887
70 to 74	18,473	13,569	16,202	27,007	18,086
75 to 79	15,810	13,618	15,405	23,973	15,627
80 to 84	13,781	12,695	14,655	21,387	13,700
85 & up	11,165	10,895	11,874	16,364	11,138
Total	\$ 18,497	\$ 12,813	\$ 16,959	\$ 28,132	\$ 17,954

QDRO benefits included with member records for valuation purposes.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

A. Actuarial Assumptions

- 1. Investment Rate of Return** 7.50% per annum, compounded annually.
- 2. Administrative Expenses** No explicit assumption is made for administrative expenses for funding purposes per the funding methodology prescribed by NJ State Statute.
- 3. Interest Crediting Rate on Accumulated Deductions** 7.50% per annum, compounded annually.
- 4. Cost-of-Living Adjustments (COLAs)** No future COLAs are assumed. Previously granted COLAs are included in the data.
- 5. Salary Increases** Salary increases vary by age and time period. Representative salary increase rates are shown below.

Age	Period Ending June 30, 2026	Ultimate Period
20	4.15%	5.15%
25	3.90	4.90
30	3.65	4.65
35	3.40	4.40
40	3.15	4.15
45	2.90	3.90
50	2.65	3.65
55	2.40	3.40
60	2.15	3.15
65	1.65	2.65
69	1.65	2.65

Salary increases are assumed to occur on July 1.

- 6. 401(a)(17) Pay Limit** \$275,000 in 2018 increasing 3.00% per annum, compounded annually.
- 7. Social Security Wage Base** \$128,400 in 2018 increasing 4.00% per annum, compounded annually.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

8. Termination

Representative termination rates are as follows:

Age	First Year of Service		Second Year of Service		Third Year of Service	
	State	Local	State	Local	State	Local
20	28.90%	40.19%	13.53%	15.12%	9.52%	12.19%
25	36.12	40.19	13.53	15.12	9.52	12.19
30	36.12	38.84	13.53	14.67	9.52	13.32
35	26.14	33.51	10.83	11.74	7.99	10.77
40	21.66	32.05	8.86	10.52	6.37	10.66
45	20.41	31.01	8.26	10.08	5.79	10.36
50	20.41	28.39	7.65	9.58	5.21	9.57
55	20.41	27.96	7.65	9.40	5.21	9.08
60	20.41	22.37	7.65	9.40	5.21	6.84

Age	Ultimate Rates			
	3+ Years of Service Refund		10+ Years of Service Deferred Annuity	
	State	Local	State	Local
20	4.48%	6.31%	0.00%	0.00%
25	4.69	6.31	0.00	0.00
30	3.82	6.11	0.00	0.03
35	2.86	3.99	0.05	0.03
40	1.80	2.91	0.05	0.05
45	1.22	2.46	0.24	0.16
50	0.90	1.94	1.10	0.64
55	0.88	1.60	1.43	0.77
60	0.88	1.52	0.90	0.77

Both the refund and the deferred annuity ultimate termination rates apply until the attainment of retirement eligibility, after which no termination is assumed.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

9. Disability

Representative disability rates are as follows:

Age	Ordinary		Accidental	
	State	Local	State	Local
20	0.005%	0.000%	0.001%	0.001%
25	0.006	0.000	0.001	0.002
30	0.097	0.060	0.004	0.004
35	0.216	0.189	0.011	0.005
40	0.304	0.269	0.020	0.012
45	0.410	0.363	0.023	0.017
50	0.462	0.434	0.035	0.021
55	0.559	0.587	0.047	0.026
60	0.987	0.759	0.041	0.030
65	1.190	0.932	0.061	0.027
69	1.417	1.110	0.062	0.027

Accidental disability rates apply at all ages.

Ordinary disability rates apply upon attainment of 10 years of service and continue through the ultimate retirement age.

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

Tier 4 and Tier 5 Members are not eligible for the Ordinary or Accidental Disability benefits but the disability rates still apply. Such members terminating under the disability decrement are assumed to separate from service and elect a Deferred Retirement benefit.

10. Mortality

Pre-Retirement Ordinary Mortality: RP-2000 Employee Mortality Tables. For State, the tables are set back four years for males and females. For Local employers, the tables are set back two years for males and seven years for females. The tables are projected on a generational basis from the base year of 2013 using the Conduent Modified 2014 Projection Scale.

Pre-Retirement Accidental Mortality: 0.001% at all ages. No mortality improvement is assumed.

Post-Retirement Healthy Mortality: RP-2000 Combined Healthy Mortality Tables, set back one year for males and females, projected on a generational basis using Projection Scale AA from the base year of 2012 to 2013 and the Conduent Modified 2014 Projection Scale thereafter.

Disabled Mortality: RP-2000 Disabled Mortality Tables, set back three years for males and set forward one year for females. No mortality improvement is assumed.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

11. Retirement

Representative retirement rates are as follows:

Age	Not Eligible for Unreduced Retirement		Eligible for Unreduced Retirement Benefit	
	State	Local	State	Local
45	0.24%	0.16%	N/A	N/A
50	1.10	0.64	N/A	N/A
55	1.43	0.77	17.50%	11.70%
56	1.43	0.77	14.00	11.70
57	1.43	0.77	13.00	11.70
58	0.90	0.77	13.00	11.70
59	0.90	0.77	19.00	21.00
60	0.90	0.77	9.00	7.80
61	0.90	0.77	9.00	8.40
62	0.90	0.77	14.58	13.44
63	1.50	0.90	11.34	10.50
64	1.50	0.90	12.15	10.50
65	N/A	N/A	16.20	16.54
66	N/A	N/A	17.00	15.75
67	N/A	N/A	15.00	13.65
68	N/A	N/A	15.00	11.55
69	N/A	N/A	15.00	11.55
70	N/A	N/A	100.00	100.00

Representative retirement rates for Members of Prosecutors Part (Chapter 366, P.L. 2001) are as follows:

Age	Less than 20 Years of Service		20 Years of Service		21 to 24 Years of Service		25+ Years of Service	
	State	Local	State	Local	State	Local	State	Local
40	0.00%	0.00%	2.50%	0.00%	23.10%	19.25%		
45	0.00	0.00	2.50	0.00	23.10	19.25		
50	0.00	0.00	3.75	0.00	23.10	19.25		
55	2.59	3.06	5.00	0.00	26.22	21.85		
60	2.63	3.06	5.00	0.00	34.17	28.48		
65	2.63	3.06	37.50	0.00	100.00	100.00		
70	100.00	100.00	100.00	100.00	100.00	100.00		

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

- 12. Family Composition Assumptions** For members not currently in receipt, 100% 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 optional form of payment 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.
- No additional dependent children or parents are assumed.
- 13. Form of Payment** Current active members are assumed to elect the Maximum Option.
- 14. Non-Contributory Group Insurance Benefit Form of Payment** All benefits are assumed to be paid as lump sums.
- 15. Data** All non-contributing members are included in the valuation with a liability based on the reported ASF.
- Per discussions with DPB, the statuses for active records in Locations 4 – 7 (General Assembly and Senate) are based on changes in service instead of the contribution code.
- For current beneficiaries with incomplete information, reasonable assumptions were made based on information available in prior years.
- Inactive participants receiving benefits according to the 2017 data but omitted from the 2018 data are assumed to have died without a beneficiary.
- 16. Rationale for Assumptions** The demographic assumptions used in this report reflect the results of the July 1, 2011 – June 30, 2014 Experience Study prepared by the prior actuary, which was approved by the Board of Trustees on October 14, 2015. The valuation is based on a 7.50% interest rate, and annual salary increases that are 0.5% lower than the rates shown in the experience study at all ages for both the select and ultimate periods, which were recommended by the State Treasurer. Cheiron has reviewed the demographic and economic assumptions. While we consider these assumptions to be generally reasonable, we have not yet performed our own actuarial experience study.
- 17. Changes in Assumptions since Last Valuation** None.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

B. Projection Assumptions

- | | |
|-------------------------------------|--|
| 1. Investment Rate of Return | <ul style="list-style-type: none">• July 1, 2019 valuation: 7.30% per annum, compounded annually.• July 1, 2020 valuation: 7.30% per annum, compounded annually.• July 1, 2021 and later valuations: 7.00% per annum, compounded annually.• Accumulated deductions with interest are projected at the ultimate investment rate of return of 7.00%. |
| 2. Appropriation Percentages | <p>The State is assumed to appropriate 70% of the Statutory contribution in FYE 2020, and to increase the percent by 10% a year, until reaching 100% of the Statutory contribution beginning with FYE 2023.</p> |
| 3. Administrative Expenses | <p>0.39% of expected pension benefit payments for the year for the State and 0.68% of expected pension benefit payments for the year for Local Employers.</p> |
| 4. New Entrants | <ul style="list-style-type: none">• Contributing active population assumed to remain at 2018 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 2018 data.• New entrant salary assumed to increase with the age 65 salary increase rates. |
| 5. Demographic Assumptions | <p>Same as those used for valuation purposes.</p> |

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

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

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.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

2. Asset Valuation Method

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

The actuarial value of assets is adjusted to reflect actual contributions and benefit payments, an assumed rate of return on the previous year's assets and 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

Prior to FYE 2018, it was assumed the State would make pension contributions on June 30th, 24 months after the associated valuation date. Effective with FYE 2018, Chapter 83, P.L. 2016 requires the State to make pension contributions on a quarterly basis: at least 25 percent by September 30, at least 50 percent by December 31, at least 75 percent by March 31, and at least 100 percent 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.

Revenues from the Chapter 98, P.L. 2017 – Lottery Enterprise Contribution Act are assumed to be contributed to the trust on a monthly basis.

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.

Early Retirement Incentive Programs

Local employers which elected to participate in various early retirement incentive programs authorized by NJ Statute make contributions to cover the cost of these programs over amortization periods elected by the employer to the extent permitted by NJ Statute.

Chapter 133, P.L. 2001

Chapter 133, P.L. 2001 increased the accrual rate from 1/60 to 1/55. In addition, it lowered the age required for a veteran benefit equal to 1/55 of highest 12-month Compensation for each Year of Service from 60 to 55.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

Chapter 133, P.L. 2001 also established the Benefit Enhancement Fund (BEF) to fund the additional annual employer normal contribution due to the Statute's increased benefits. (Chapter 353, P.L. 2001 extended this coverage to this Statute's additional annual employer normal contribution.) If the assets in the BEF are insufficient to cover the normal contribution for the increased benefits for a valuation period, the State will pay such amount for both the State and Local employers.

Chapter 259, P.L. 2001

Chapter 259, P.L. 2001 established the Workers' Compensation Judges Part of the System with special retirement benefits for Workers' Compensation Judges. See Appendix C for details

In accordance with the provisions of Chapter 259, P.L. 2001, the additional contributions for these special retirement benefits will be funded by transfers from the Second Injury Fund.

Chapter 366, P.L. 2001

Chapter 366, P.L. 2001 established the Prosecutors Part of the System with special retirement benefits for Prosecutors. See Appendix C for details.

Chapter 366, P.L. 2001 also requires the State be liable for any increase in pension costs to a County that results from the enrollment of Prosecutors in the Prosecutors Part. Any increase in the unfunded actuarial liability arising from the benefits established for the Prosecutors Part are to be amortized over a closed 30 year period.

Chapter 19, P.L. 2009

Chapter 19, P.L. 2009 provided that the State Treasurer will reduce for Local employers the normal and accrued liability contributions to 50 percent of the amount certified for fiscal year 2009. The remaining 50% of the contribution (unfunded 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 percent 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 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 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 liability will be adjusted by the rate of return on the actuarial value of assets.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

4. Changes Since Last Valuation

Based on clarification from the Division of Pensions and Benefits, the actuarial liability is based solely on the formula benefit without any comparison to the value of the estimated member annuity.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

APPENDIX C – SUMMARY OF PLAN PROVISIONS

This summary of Plan provisions provides an overview of the major provisions of the PERS used in the actuarial valuation. It is not intended to replace the more precise language of the NJ State Statutes, Title 43, Chapter 15A, 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.

1. Eligibility for Membership

Employees of the State or any county, municipality, school district, or public agency employed on a regular basis in a position covered by Social Security and not required to be a member of any other State or local government retirement system. Certain exceptions apply.

- a) Class B (or Tier 1) Member: Any member hired prior to July 1, 2007.
- b) Class D (or Tier 2) Member: Any member hired on or after July 1, 2007 and before November 2, 2008.
- c) Class E (or Tier 3) Member: Any member hired after November 1, 2008 and before May 22, 2010.
- d) Class F (or Tier 4) Member: Any member hired after May 21, 2010 and before June 28, 2011.
- e) Class G (or Tier 5) Member: Any member hired on or after June 28, 2011.

2. Plan Year

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

3. Years of Service

A year of service for each year an employee is a Member of the Retirement System plus service, if any, covered by a prior service liability. Tier 4 and Tier 5 Members must be scheduled to work at least 35 hours per week for the State or 32 hours per week for a Local employer. Tier 3, 4 and 5 Members must have an annual salary of \$7,500 (indexed for inflation) and other members must have an annual salary of \$1,500.

4. Compensation

Base salary upon which contributions by a Member to the Annuity Savings Fund were based. Chapter 113, P.L. 1997 provides that Compensation cannot exceed the compensation limitation of Section 401(a)(17) of the Internal Revenue Code. Chapter 103, P.L. 2007 provides that for a Tier 2, 3, 4 or 5 Member, Compensation cannot exceed the annual maximum wage contribution base for Social Security, pursuant to the Federal Insurance Contribution Act.

APPENDIX C – SUMMARY OF PLAN PROVISIONS

5. Final Compensation

The average annual compensation upon which contributions by a Member are made for the three consecutive years of service immediately preceding retirement, or the highest three fiscal years of service, if greater. Chapter 1, P. L. 2010 provides that for a Tier 4 or Tier 5 Member, Final Compensation is the average annual compensation upon which contributions by a Member are made for the five consecutive years of service immediately preceding retirement, or the highest five fiscal years of service, if greater.

6. Final Year Compensation

The compensation upon which contributions by a Member to the Annuity Savings Fund are based in the last year of service.

7. Accumulated Deductions

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

8. Member Contributions

Each Member contributes a percentage of Compensation. Effective October 1, 2011, Chapter 78, P.L. 2011 set the member contribution rate at 6.5% and causes it to increase by 1/7th of 1 % each July thereafter until it attains an ultimate rate of 7.5% on July 1, 2018.

For members who are eligible to retire under the Prosecutors Part as provided by Chapter 366, P.L. 2001, Chapter 78, P.L. 2011 set the member contribution rate at 10.0%, effective October 1, 2011.

9. Benefits

- a) **Service Retirement:** For a Tier 1 or Tier 2 Member, age 60. For a Tier 3 or Tier 4 Member, age 62. For a Tier 5 Member, age 65.

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

- (1) For a Tier 1, 2 or 3 Member, 1/55 of Final Compensation for each Year of Service.
(2) For a Tier 4 or 5 Member, 1/60 of Final Compensation for each Year of Service.

- b) **Early Retirement:** Prior to eligibility for Service Retirement. For a Tier 1, 2, 3 or 4 Member, 25 Years of Service. For a Tier 5 Member, 30 Years of Service.

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

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

APPENDIX C – SUMMARY OF PLAN PROVISIONS

- (1) For a Tier 1 Member, the Service Retirement benefit reduced by 1/4 of one percent for each month the retirement date precedes age 55.
- (2) For a Tier 2 Member, the Service Retirement benefit reduced by 1/12 of one percent for each month the retirement date precedes age 60 through age 55 and by 1/4 of one percent for each month the retirement date precedes age 55.
- (3) For a Tier 3 or 4 Member, the Service Retirement benefit reduced by 1/12 of one percent for each month the retirement date precedes age 62 through age 55 and by 1/4 of one percent for each month the retirement date precedes age 55.
- (4) For a Tier 5 Member, the Service Retirement benefit reduced by 1/4 of one percent for each month the retirement date precedes age 65.

- c) **Veteran Retirement:** Age 55 with 25 Years of Service or Age 60 with 20 Years of Service for a qualified military veteran who retires directly from active service.

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

- (1) 54.5% of highest 12-month Compensation, or
- (2) For a member who is at least age 55 with 35 Years of Service, 1/55 of highest 12-month Compensation for each Year of Service.

Veterans may receive a Service Retirement benefit if greater.

- d) **Deferred Retirement:** Termination of service prior to eligibility for Service Retirement with 10 Years of Service.

Benefit is either:

- (1) A refund of Accumulated Deductions plus, if the member has completed three years of service, interest accumulated at 2.0% per annum; or
- (2) A deferred life annuity, commencing at age 60 for a Tier 1 or Tier 2 Member, age 62 for a Tier 3 or Tier 4 Member or age 65 for a Tier 5 Member, comprised of a member annuity plus an employer pension which together will provide a total retirement allowance of the Service Retirement benefit based on Final Compensation and Years of Service at date of termination.

For Members who die during the deferral period, the benefit is a return of Accumulated Deductions with credited interest.

- e) **Non-Vested Termination:** Termination of service prior to eligibility for Service Retirement and less than 10 Years of Service.

Benefit is a refund of Accumulated Deductions plus, if the member has completed three years of service, interest accumulated at 2.0% per annum.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

APPENDIX C – SUMMARY OF PLAN PROVISIONS

f) **Death Benefits**

- (1) Ordinary Death Before Retirement: Death of an active contributing Member. Benefit is equal to:
 - a. Lump sum payment equal to 150% of Final Year Compensation, also known as the non-contributory group life insurance benefit, plus
 - b. Accumulated Deductions with credited interest.

- (2) Accidental Death Before Retirement: Death of an active Member resulting from injuries received from an accident during performance of duty and not a result of willful negligence. Benefit is equal to:
 - a. Lump sum payment equal to 150% of Final Year Compensation, also known as the non-contributory group life insurance benefit, plus
 - b. Spouse life annuity of 50% of Final Year 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 Year 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 Year Compensation to one (two) dependent parent(s). If there is no surviving spouse, dependent child(ren) or parent(s), the benefit is a refund of Accumulated Deductions with credited interest.

- (3) Death After Retirement: Death of a retired Member. Benefit is equal to:
 - a. Lump sum payment equal to 3/16 of Final Year Compensation for a Member retired under Service, Early, Veteran or Deferred Retirement with 10 Years of Service. For a Member receiving a Disability benefit, lump sum payment of 150% of Final Year Compensation if death occurs prior to age 60 and 3/16 of Final Compensation if death occurs after age 60. This benefit is also known as the non-contributory group life insurance benefit, plus
 - b. Any survivor benefit due under the Member's optional form of payment election. Previously granted COLAs also apply to life annuities.

Members are also eligible for a voluntary, employee-paid life insurance policy, known as the contributory group life insurance policy. This benefit is not paid through the System and is not considered for valuation purposes.

g) **Disability Retirement**

- (1) Ordinary Disability Retirement: 10 years of service and totally and permanently incapacitated from the performance of normal or assigned duties. Only available to Tier 1, 2 and 3 Members.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

APPENDIX C – SUMMARY OF PLAN PROVISIONS

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

- a. 1.64% of Final Compensation for each Year of Service; or
- b. 43.6% of Final Compensation.

- (2) Accidental Disability Retirement: Total and permanent incapacitation as a direct result of a traumatic event occurring during and as a result of the performance of regular or assigned duties. Only available to Tier 1, 2 and 3 Members.

Benefit is an annual retirement allowance comprised of a member annuity plus an employer pension which together will provide a total retirement allowance of 72.7% of Compensation at the date of injury.

The pension portion of the benefit will be offset for any periodic Workers' Compensation benefits.

Tier 4 and Tier 5 Members are eligible for long-term disability coverage. This benefit is not paid through the System and is not considered for valuation purposes. Both Member and employer contributions to the System continue while on long-term disability, with the policy covering the Member portion. The long-term disability benefit equals 60% of Final Year Compensation and may be offset for other periodic benefits, such as Workers' Compensation, short-term disability or Social Security. The long-term disability benefit may continue through the earlier of age 70 or commencement of a retirement benefit under the System.

10. Benefits for Special Employee Groups

Certain members qualify for enrollment into special employee groups. Such members receive the greater of the special benefits described below or the regular PERS benefit described above. For benefit types not explicitly mentioned, the regular PERS benefit applies.

a) **Law Enforcement Officers (LEOs):**

Members employed in eligible job titles as well as individuals who do not meet the age or medical requirements for entry into the Police and Firemen's Retirement System (PFRS).

(1) Service and Special Retirement

Mandatory retirement at age 65. Veterans with less than 20 Years of Service at age 65 must retire upon attainment of 20 Years of Service or age 70, whichever is earlier. Voluntary retirement prior to those ages.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

APPENDIX C – SUMMARY OF PLAN PROVISIONS

- a. Service Retirement: Age 55 after 20 Years of LEO Service.

Benefit is an annual retirement allowance comprised of a member annuity plus an employer pension which together will provide a total retirement allowance of 2% of Final Compensation for each Year of LEO Service up to 25 years plus 1% of Final Compensation for each Year of LEO Service over 25 years.

The Member is also eligible for a regular PERS benefit based on any non-LEO service.

- b. Special Retirement: 25 Years of LEO Service.

Benefit is the Service Retirement benefit plus 5% of Final Compensation with a maximum of 70% of Final Compensation.

- (2) Ordinary Disability Retirement: 5 Years of LEO Service.

Benefit is the regular PERS Ordinary Disability benefit.

- (3) Death Benefits:

Benefit is the regular PERS Death benefit except, upon Accidental Disability Retirement, the minimum lump sum payment is \$5,000.

- b) **Legislative Retirement System (LRS)**:

Members of the State Legislature. Chapter 92, P.L. 2007 closed LRS to new members enrolled on or after July 1, 2007.

- (1) Special Legislative Retirement: Age 60.

Benefit is an annual retirement allowance comprised of a member annuity plus an employer pension which together will provide a total retirement allowance of 3% of Final Compensation for each Year of Legislative Service with a maximum of two-thirds of Final Compensation.

The Member is also eligible for a regular PERS benefit based on any non-legislative service.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

APPENDIX C – SUMMARY OF PLAN PROVISIONS

- (2) Deferred Retirement: Termination of service prior to eligibility for Service or Special Legislative Retirement with 8 Years of Legislative Service.

Benefit is either:

- a. A refund of Accumulated Deductions plus, if the Member has completed three years of service, interest accumulated at 2.0% per annum; or
- b. A deferred life annuity, commencing at age 60, comprised of a member annuity plus an employer pension which together will provide a total retirement allowance of the Service or Special Legislative Retirement benefit based on Final Compensation and Years of Service at date of termination.

c) **Prosecutors Part (Chapter 366, P.L. 2001):**

Covers prosecutors as well as members employed in certain other related job titles. Chapter 1. P.L. 2010 closed the Prosecutors Part to new members enrolled on or after May 22, 2010.

(1) Service and Special Retirement

Mandatory retirement at age 70. Voluntary retirement prior to that age.

In addition to the benefits described below, the member is eligible for a regular PERS benefit based on any non-Prosecutors Part service.

- a. Service Retirement: For a Prosecutors Part Member enrolled as of January 7, 2002, age 55 or 20 Years of Prosecutors Part Service. For a Prosecutors Part Member enrolled after January 7, 2002, age 55.

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

- i. 2% of Final Year Compensation for each Year of Prosecutors Part Service up to 30 years plus 1% of Final Year Compensation for each Year of Prosecutors Part Service over 30 years.
- ii. 50% of Final Year Compensation for Prosecutors Part Members with 20 or more Years of Prosecutors Part Service.
- iii. 1/60 of Final Year Compensation for each Year of Prosecutors Part Service.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

APPENDIX C – SUMMARY OF PLAN PROVISIONS

b. Special Retirement: 25 Years of Prosecutors Part Service.

Benefit is an annual retirement allowance comprised of a member annuity plus an employer pension which together will provide a total retirement allowance of 65% of Final Year Compensation plus 1% of Final Year Compensation for each Year of Prosecutors Part Service in excess of 25 years with a maximum of 70% of Final Compensation.

(2) Deferred Retirement: Termination of service prior to eligibility for Service or Special Retirement with 10 Years of Prosecutors Part Service.

Benefit is either:

- a. A refund of Accumulated Deductions plus, if the Member has completed three years of service, interest accumulated at 2.0% per annum; or
- b. A deferred life annuity, commencing at age 55, comprised of a member annuity plus an employer pension which together will provide a total retirement allowance of 2% of Final Year Compensation for each Year of Prosecutors Part Service.

(3) Death Benefits:

Benefit is the regular PERS Death benefit except, upon Service, Special or Deferred Prosecutors Part Retirement with 10 Years of Prosecutors Part Service, the lump sum payment equals 50% of Final Year Compensation.

d) **Workers Compensation Judges Part (WCJ) (Chapter 259, P.L. 2001):**

Member employed in an eligible job title by the Division of Workers' Compensation. Chapter 92, P.L. 2007 closed the Workers Compensation Judges Part to new members enrolled on or after July 1, 2007.

(1) Service Retirement:

Mandatory retirement age 70. Voluntary retirement prior to that age.

- a. Age 70 and 10 Years of WCJ Service; or
Age 65 and 15 Years of WCJ Service; or
Age 60 and 20 Years of WCJ Service.

Benefit is an annual retirement allowance comprised of a member annuity plus an employer pension which together will provide a total retirement allowance of 75% of contractual Compensation at the date of retirement.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

APPENDIX C – SUMMARY OF PLAN PROVISIONS

- b. Age 65, 5 consecutive Years of WCJ Service and 15 Years of Aggregate PERS Service; or
Age 60, 5 consecutive Years of WCJ Service and 20 Years of Aggregate PERS Service.

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

- c. Age 60, 5 consecutive Years of WCJ Service and 15 Years of Aggregate PERS Service.

Benefit is an annual retirement allowance comprised of a member annuity plus an employer pension which together will provide a total retirement allowance of 2% of contractual Compensation at the date of retirement for each Year of Aggregate PERS Service up to 25 years plus 1% of contractual Compensation at the date of retirement for each Year of Aggregate PERS Service over 25 years.

- d. Age 60.

Benefit is an annual retirement allowance comprised of a member annuity plus an employer pension which together will provide a total retirement allowance of 2% of contractual Compensation at the date of retirement for each Year of WCJ Service up to 25 years plus 1% of contractual Compensation at the date of retirement for each Year of Aggregate PERS Service over 25 years.

- (2) Early Retirement: Prior to eligibility for Service Retirement and 5 consecutive Years of WCJ Service and 25 Years of Aggregate PERS Service.

Benefit is an annual retirement allowance comprised of a member annuity plus an employer pension which together will provide a total retirement allowance of 2% of contractual Compensation at the date of retirement for each Year of Aggregate PERS Service up to 25 years plus 1% of contractual Compensation at the date of retirement for each Year of Aggregate PERS Service over 25 years, actuarially reduced for commencement prior to age 60.

- (3) Deferred Retirement: Termination of service prior to eligibility for Service Retirement with 5 consecutive Years of WCJ Service and 10 Years of Aggregate PERS Service.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

APPENDIX C – SUMMARY OF PLAN PROVISIONS

Benefit is either:

- a. A refund of Accumulated Deductions plus, if the Member has completed three years of service, interest accumulated at 2.0% per annum; or
- b. A deferred life annuity, commencing at age 60, comprised of a member annuity plus an employer pension which together will provide a total retirement allowance of 2% of contractual Compensation at the date of retirement for each Year of Aggregate PERS Service up to 25 years plus 1% of contractual Compensation at the date of retirement for each Year of Aggregate PERS Service over 25 years.

(4) Death Benefits

a. Before Retirement: Death of an active WCJ Member. Benefit is equal to:

- i. Lump sum equal to 150% of contractual Compensation at the date of death, plus
- ii. Spousal life annuity of 25% of contractual Compensation at the date of death payable until spouse's remarriage plus 10% (15%) to one (two or more) dependent child(ren). If there is no surviving spouse, or upon death or remarriage, a total of 15% (20%, 30%) of contractual Compensation at the date of death payable to one (two, three or more) dependent child(ren). If there is no surviving spouse or dependent child(ren), 20% (30%) of contractual Compensation at the date of death to one (two) dependent parent(s). If there is no surviving spouse, dependent child(ren) or parent(s), the benefit is a refund of Accumulated Deductions with interest.

b. After Retirement: Death of a retired WCJ Member. Benefit is equal to:

- i. Lump sum equal to 25% of contractual Compensation at the date of death for a Member retired under Service or Early WCJ Retirement with 10 Years of Aggregate PERS Service. For a Member receiving a Disability benefit, lump sum payment of 150% of contractual Compensation at the date of death if death occurs prior to age 60 and 25% of contractual Compensation at the date of death if death occurs after age 60, plus
- ii. Any survivor benefit due under the Member's optional form of payment election. Previously granted COLAs also apply to life annuities.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

APPENDIX C – SUMMARY OF PLAN PROVISIONS

11. Optional Forms of Payment

The member may elect the following forms of payment.

- a) Maximum Option: Single life annuity with a return of the balance of the Accumulated Deductions with credited interest.
- b) Option 1: Single life annuity with a return of the balance of the initial reserve.
- c) Option 2: 100% joint and survivor annuity.
- d) Option 3: 50% joint and survivor annuity.
- e) Option 4: Other percentage joint and survivor annuity.
- f) Option A: 100% pop-up joint and survivor annuity.
- g) Option B: 75% pop-up joint and survivor annuity.
- h) Option C: 50% pop-up joint and survivor annuity.
- i) Option D: 25% pop-up joint and survivor annuity.

12. 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.

13. Changes in Plan Provisions Since Last Valuation

None.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

APPENDIX D – HISTORICAL DATA

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.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

APPENDIX D – HISTORICAL DATA

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

Valuation Date July 1,	Market Value of Assets	Actuarial Value of Assets		Funded Ratio	
		with Special Asset Value ¹	Actuarial Liability	Market Value	Actuarial Value
2018	\$ 7,533,286,615	\$ 10,710,534,806	\$ 23,745,716,631	31.7%	45.1%
2017	7,520,536,539	10,861,669,626	23,324,861,385	32.2%	46.6%
2016	7,370,865,995	11,109,798,893	22,411,751,124	32.9%	49.6%
2015	8,218,735,979	8,868,254,006	21,635,507,298	38.0%	41.0%
2014	8,778,291,546	9,128,235,998	20,842,690,918	42.1%	43.8%
2013	8,639,556,532	9,614,698,050	19,993,957,432	43.2%	48.1%
2012	8,389,963,954	9,774,698,097	19,383,584,639	43.3%	50.4%
2011	9,089,849,561	10,062,648,618	18,290,829,021	49.7%	55.0%
2010	8,293,130,301	10,253,254,901	17,429,178,021	47.6%	58.8%
2009	7,973,790,423	10,713,340,747	18,947,194,579	42.1%	56.5%

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 /		Lottery Revenue	Contribution Deficiency/ (Excess)	Percentage of Contribution Covered
	Actuarially Determined Contribution	Actual State Appropriation			
2019 ²	\$ 1,406,859,836	\$ 626,107,270	\$ 218,104,510	\$ 562,648,056	60.0%
2018	1,324,313,829	451,752,000	205,155,662	667,406,167	49.6%
2017	1,263,740,460	506,499,652	0	757,240,808	40.1%
2016	1,182,038,756	355,290,348	0	826,748,408	30.1%
2015	1,058,157,699	195,153,000	0	863,004,699	18.4%
2014	993,064,820	141,154,573	0	851,910,247	14.2%
2013	924,432,941	264,123,697	0	660,309,244	28.6%
2012	874,346,428	124,906,634	0	749,439,794	14.3%
2011	754,168,635	0	0	754,168,635	0.0%
2010	580,440,969	0	0	580,440,969	0.0%

¹ Excludes contributions from NCGI and contributions payable from the Second Injury Fund for Chapter 259, P.L. 2001

² Reflects the State's planned contribution of 60% of the Statutory contribution and expected lottery revenue

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

APPENDIX D – HISTORICAL DATA

**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
2018	\$ 22,645,367,115	\$ 23,264,877,618	\$ 33,103,627,533	68.4%	70.3%
2017	21,470,284,400	22,522,697,150	32,238,416,280	66.6%	69.9%
2016	19,756,262,137	21,900,421,798	30,673,935,604	64.4%	71.4%
2015	20,557,496,076	21,495,828,937	29,431,895,200	69.8%	73.0%
2014	20,250,197,472	20,766,663,796	28,255,077,220	71.7%	73.5%
2013	18,120,795,876	19,978,598,632	27,005,782,517	67.1%	74.0%
2012	16,785,718,484	19,376,646,934	26,009,038,341	64.5%	74.5%
2011	16,636,380,039	18,997,383,783	24,679,095,575	67.4%	77.0%
2010	14,745,211,693	18,481,952,370	23,918,658,044	61.6%	77.3%
2009	13,395,099,723	18,165,835,669	25,523,208,576	52.5%	71.2%

**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 Local Appropriation		
2019	\$ 970,120,667	\$ 970,150,173	\$ (29,506)	100.0%
2018	901,781,034	901,868,890	(87,856)	100.0%
2017	866,468,492	866,468,492	0	100.0%
2016	836,545,013	836,545,013	0	100.0%
2015	789,965,173	789,965,173	0	100.0%
2014	757,369,252	757,254,449	114,803	100.0%
2013	761,229,852	761,229,852	0	100.0%
2012	797,707,909	797,707,909	0	100.0%
2011	768,479,627	768,479,676	(49)	100.0%
2010 ²	578,277,036	576,514,905	1,762,131	99.7%

¹ Excludes contributions from NCGI and includes ERIs and Chapter 19, P.L. 2009 payments

² Reflects contribution reductions due to Chapter 19, P.L. 2009

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

APPENDIX E – EARLY RETIREMENT INCENTIVE PROGRAMS

Table E-1 State ERI Contribution Schedule			
Location Number	Location Name	Fiscal Year 2020 Payment	Present Value as of 7/1/2018
Chapter 23, P.L. 2002			
410	ROWAN UNIVERSITY	\$ 802,582	\$ 9,478,803
411	NEW JERSEY CITY UNIVERSITY	555,822	6,564,468
412	KEAN UNIVERSITY	489,959	5,786,605
413	WILLIAM PATTERSON UNIVERSITY OF NJ	342,339	4,043,161
414	MONCLAIR STATE UNIVERSITY	217,651	2,570,547
415	THE COLLEGE OF NEW JERSEY	611,946	7,227,323
420	RAMAPO COLLEGE OF NEW JERSEY	179,206	2,116,491
421	STOCKTON UNIVERSITY	470,916	5,561,699
430	THOMAS EDISON STATE UNIVERSITY	142,136	1,678,676
498	RUTGERS UNIVERSITY	5,211,582	61,550,795
32700	NEW JERSEY INSTITUTE OF TECHNOLOGY	270,122	3,190,242
	ALL OTHER STATE LOCATIONS	<u>108,312,587</u>	<u>1,279,213,494</u>
	Sub-Total	\$ 117,606,848	\$ 1,388,982,304
	Chapter 21, P.L. 2008	\$ 26,303,949	\$ 310,659,803
	Total	\$ 143,910,797	\$ 1,699,642,107

Consistent with established methodology, payment amounts calculated using a payment date 12 months after the valuation date.

Present values as of July 1, 2018 exclude expected payments for fiscal year ending 2019.

State ERI amounts are not used in determining the Statutory contribution. They are used only in allocating the Statutory contribution to State locations.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

APPENDIX E – EARLY RETIREMENT INCENTIVE PROGRAMS

Table E-2 Local Employers ERI 1 Contribution Schedule				
Location Number	Location Name	Fiscal Year 2020 Payment	Present Value as of 7/1/2018	
10022	OCEAN CO MOSQUITO COMM	\$ 15,140	\$ 28,082	
10030	ATLANTIC COUNTY	151,168	280,381	
10031	ATLANTIC COUNTY WELFARE BD	46,723	86,660	
10041	MIDDLESEX CO BD OF SOCIAL SRV	23,170	42,976	
10063	MORRIS CO VOCATIONAL SCH DIST	11,518	21,362	
10070	BURLINGTON COUNTY/PAYROLL DEPT	379,558	703,989	
10071	BURLINGTON CO BD OF SOCIAL SERV	35,407	65,672	
10110	WARREN CO BD OF CHOSEN FRHLDRS	122,432	227,081	
10111	WARREN CO WELFARE BOARD	4,093	7,591	
10171	MERCER CO BD OF SOCIAL SERVICE	39,015	72,363	
20114	LINDEN CTY FREE PUBLIC LIBRARY	37,772	70,058	
20160	ASBURY PARK CITY	57,973	107,526	
20163	ASBURY PARK BD OF ED	24,772	45,946	
20220	BELLEVILLE TOWNSHIP	161,853	300,198	
20240	DOVER TOWN	9,750	18,083	
20320	PALMYRA BOROUGH	806	1,495	
20550	RIDGEFIELD PARK VILLAGE	43,377	80,454	
20570	SOUTH ORANGE VILLAGE	42,237	78,339	
20690	ROSELLE PARK BOROUGH	6,061	11,242	
20860	COLLINGSWOOD BOROUGH	18,145	33,655	
20910	HADDONFIELD BOROUGH	9,055	16,794	
20990	POINT PLEASANT BOROUGH	23,633	43,833	
21040	SPRING LAKE BOROUGH	19,419	36,017	
21090	MILLBURN TOWNSHIP	75,402	139,853	
21180	OCEANPORT BOROUGH	5,692	10,557	
21200	RUMSON BOROUGH	5,395	10,007	
21260	ABSECON CITY	19,134	35,489	
21330	CARTERET BOROUGH	28,020	51,971	
21480	EATONTOWN BOROUGH	16,346	30,318	
21590	GLASSBORO BOROUGH	14,206	26,349	
21600	HO-HO-KUS BOROUGH	9,428	17,486	
21650	SECAUCUS TOWN	4,872	9,036	
21710	RAMSEY BOROUGH	86,040	159,584	
21810	NEPTUNE CITY BOROUGH	2,271	4,212	
21930	SPARTA TOWNSHIP	17,729	32,883	
22030	VERONA TOWNSHIP	53,055	98,404	

Consistent with established methodology, payment amounts calculated using a payment date 9 months after the valuation date.

Present values as of July 1, 2018 exclude expected payments for fiscal year ending 2019.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

APPENDIX E – EARLY RETIREMENT INCENTIVE PROGRAMS

Table E-2 (cont.)				
Local Employers ERI 1 Contribution Schedule				
Location Number	Location Name	Fiscal Year 2020 Payment	Present Value as of 7/1/2018	
22050	CINNAMINSON TOWNSHIP	\$ 4,626	\$ 8,581	
22120	MENDHAM TOWNSHIP	16,335	30,298	
22290	BORDENTOWN CITY	12,569	23,312	
22350	MIDDLETOWN TOWNSHIP	65,240	121,005	
22400	CHATHAM TOWNSHIP	25,670	47,611	
22430	HARRINGTON PARK BOROUGH	27,426	50,868	
22540	BOUND BROOK BOROUGH	12,583	23,338	
22670	CHESTER TOWNSHIP	18,070	33,515	
22730	BLOOMINGDALE BOROUGH	28,796	53,410	
22760	LINCOLN PARK BOROUGH	19,298	35,794	
22800	WASHINGTON TWP (GLOUCESTER)	33,377	61,906	
22900	MILFORD BOROUGH	13,510	25,058	
23020	GLOUCESTER TOWNSHIP	27,788	51,539	
23060	CAPE MAY CITY	10,492	19,459	
23073	PLEASANTVILLE BD OF ED	4,323	8,019	
23080	SEA ISLE CITY	47,196	87,538	
23120	HOLMDEL TOWNSHIP	13,516	25,069	
23130	NORTH HALEDON BOROUGH	9,735	18,057	
23190	MIDDLE TOWNSHIP	12,455	23,101	
23200	BEDMINSTER TOWNSHIP	14,189	26,318	
23220	BERLIN TOWNSHIP	571	1,060	
23223	BERLIN TOWNSHIP BD OF ED	1,229	2,280	
23230	LITTLE SILVER BOROUGH	4,161	7,717	
23240	WESTAMPTON TOWNSHIP	12,574	23,322	
23290	PAULSBORO BOROUGH	14,088	26,130	
23370	TETERBORO BOROUGH	18,090	33,552	
23490	PINE HILL BOROUGH	10,949	20,307	
23493	PINE HILL BOROUGH BD OF ED	1,059	1,964	
23630	SOUTH AMBOY CITY	26,000	48,223	
30010	NORTH JERSEY WATER SUPPLY COMM	49,850	92,459	
30030	PASSAIC VALLEY WATER COMM	113,253	210,058	
30130	TRENTON HOUSING AUTHORITY	75,052	139,204	
30300	PASSAIC VALLEY SEWERAGE COMM	34,304	63,626	
30320	EWING LAWRENCE SEWERAGE AUTH	19,162	35,541	
30360	IRVINGTON HOUSING AUTH	8,058	14,946	
30420	BURLINGTON COUNTY BRIDGE COMM	72,402	134,289	

Consistent with established methodology, payment amounts calculated using a payment date 9 months after the valuation date.

Present values as of July 1, 2018 exclude expected payments for fiscal year ending 2019.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

APPENDIX E – EARLY RETIREMENT INCENTIVE PROGRAMS

Table E-2 (cont.)
Local Employers ERI 1 Contribution Schedule

Location Number	Location Name	Fiscal Year 2020 Payment	Present Value as of 7/1/2018
30510	PATERSON HOUSING AUTHORITY	\$ 31,269	\$ 57,996
30560	MIDDLESEX CO UTILITIES AUTH	101,567	188,383
30630	SOMERSET RARITAN VALL SEW AUTH	25,191	46,724
30680	STAFFORD MUNICIPAL UTL AUTH	15,856	29,409
30730	DELAWARE RIVER BASIN COMM	95,494	177,118
30820	HAMILTON TWP FIRE DISTRICT 3	2,653	4,920
31210	NJ HOUSING & MTG FINANCE AGENCY	32,441	60,170
31510	BRICK TWP MUN UTILITIES AUTH	33,480	62,098
31830	S MONMOUTH REG SEWERAGE AUTH	6,807	12,626
32000	MANASQUAN RIVER REG SEW AUTH	510	946
32280	MONTCLAIR REDEVELOPMENT AGENCY	14,079	26,113
32700	NJ INSTITUTE OF TECHNOLOGY	147,062	272,764
32900	NJ TRANSIT CORPORATION	55,315	102,596
34340	OLD BRIDGE MUNICIPAL UTIL AUTH	4,743	8,798
34920	SOUTH JERSEY TRANS AUTHORITY	83,024	153,989
39990	COMPENSATION RATING & INS BUR	65,111	120,765
50050	ALLENTOWN BOROUGH	26,796	49,700
50533	CHESILHURST BORO BD OF ED	188	349
50593	CLEMENTON BD OF ED	698	1,295
50740	DEPTFORD TOWNSHIP	5,150	9,553
50830	EAST HANOVER TOWNSHIP	19,249	35,703
50890	ELK TOWNSHIP	3,258	6,042
51440	HELMETTA BOROUGH	6,967	12,923
51520	HOPATCONG BOROUGH	60,307	111,855
51880	LOWER TOWNSHIP	15,929	29,545
51940	MAGNOLIA BOROUGH	5,379	9,976
51960	MANALAPAN TOWNSHIP	19,929	36,963
52630	PENNSAUKEN TOWNSHIP	6,848	12,702
52810	RARITAN TOWNSHIP	19,913	36,934
52820	HAZLET TOWNSHIP	1,589	2,947
53080	SOUTHAMPTON TOWNSHIP	8,721	16,175
53360	UNION BEACH BOROUGH	11,201	20,776
53670	WEST LONG BRANCH BOROUGH	15,479	28,711
53743	WHITE TOWNSHIP BD OF ED	18,529	34,367
53820	WOODLAND TOWNSHIP	19,144	35,508
56190	SOMERS POINT SEWERAGE AUTHORITY	2,830	5,249
Total		\$ 3,481,369	\$ 6,457,108

Consistent with established methodology, payment amounts calculated using a payment date 9 months after the valuation date.

Present values as of July 1, 2018 exclude expected payments for fiscal year ending 2019.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

APPENDIX E – EARLY RETIREMENT INCENTIVE PROGRAMS

**Table E-3
Local Employers ERI 2 Contribution Schedule**

Location Number	Location Name	Fiscal Year 2020 Payment	Present Value as of 7/1/2018
10071	BURLINGTON CO BD OF SOCIAL SERV	\$ 46,267	\$ 471,586
10171	MERCER CO BD OF SOCIAL SERVICE	99,969	1,018,960
20100	LAVALLETTE BOROUGH	13,788	140,540
20114	LINDEN CTY FREE PUBLIC LIBRARY	13,700	139,644
20264	MONTCLAIR PUBLIC LIBRARY	34,697	353,658
20320	PALMYRA BOROUGH	21,320	217,306
20720	WASHINGTON BOROUGH	8,913	90,852
21303	WEST NEW YORK BD OF ED	3,537	30,570
21480	EATONTOWN BOROUGH	21,612	220,290
21663	BEVERLY CITY BD OF ED	913	7,894
22030	VERONA TOWNSHIP	14,847	151,333
22540	BOUND BROOK BOROUGH	8,584	87,492
30130	TRENTON HOUSING AUTHORITY	94,627	964,511
30160	ATLANTIC CITY HOUSING AUTHORITY	51,039	520,231
30230	ASBURY PK HOUSING AUTHORITY	1,620	16,514
30250	NEW BRUNSWICK HOUSING AUTHORITY	3,074	31,332
30420	BURLINGTON COUNTY BRIDGE COMM	18,674	190,342
30510	PATERSON HOUSING AUTHORITY	4,651	47,405
30560	MIDDLESEX CO UTILITIES AUTH	149,548	1,524,306
30770	PATERSON PARKING AUTHORITY	3,024	30,826
30900	GLOUCESTER TWP M U A	12,425	126,650
31190	BRIDGETON CITY HOUSING AUTH	1,529	15,584
31250	JERSEY CITY MUNICIPAL UT. AUTH	3,207	32,686
31260	LINDEN CITY HOUSING AUTHORITY	17,052	182,685
31370	MERCER CO IMPROVEMENT AUTHORITY	13,638	139,008
31580	MOUNT LAUREL TWP MUN UTIL AUTH	1,620	16,514
31680	OCEAN GROVE BD OF FIRE COMM	13,598	138,599
31720	NJ SPORTS & EXPOSITION AUTH	1,574	16,040
32080	OCEAN TWP MUN UTIL AUTHORITY	3,212	32,735
32260	HUDSON CO COMMUNITY COLLEGE	4,840	49,330
32700	NJ INSTITUTE OF TECHNOLOGY	80,413	819,635
39990	COMPENSATION RATING & INS BUR	83,974	855,923
50050	ALLENTOWN BOROUGH	1,596	16,268
50130	AUDUBON BOROUGH	3,432	34,985
50830	EAST HANOVER TOWNSHIP	19,421	197,955
51750	LEBANON BOROUGH	1,543	15,732

Consistent with established methodology, payment amounts calculated using a payment date 9 months after the valuation date.

Present values as of July 1, 2018 exclude expected payments for fiscal year ending 2019.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

APPENDIX E – EARLY RETIREMENT INCENTIVE PROGRAMS

Table E-3 (cont.) Local Employers ERI 2 Contribution Schedule				
Location Number	Location Name	Fiscal Year 2020 Payment	Present Value as of 7/1/2018	
51800	LINWOOD CITY	\$ 34,625	\$ 352,924	
52630	PENNSAUKEN TOWNSHIP	7,984	81,379	
53490	WALLINGTON BOROUGH	16,616	169,365	
53670	WEST LONG BRANCH BOROUGH	8,578	87,433	
55640	FLORHAM PARK SEW AUTHORITY	4,960	50,552	
55880	WRIGHTSTOWN MUN UTIL AUTH	1,594	16,244	
60023	HUDSON CO SCHOOLS OF TECHNOLOGY	9,912	85,676	
	Total	\$ 961,747	\$ 9,789,494	

Consistent with established methodology, payment amounts calculated using a payment date 9 months after the valuation date.

Present values as of July 1, 2018 exclude expected payments for fiscal year ending 2019.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

APPENDIX E – EARLY RETIREMENT INCENTIVE PROGRAMS

Table E-4 Local Employer ERI Contribution Schedules due to Recent ERI Legislation				
Location Number	Location Name	Years and Form of Payment	Fiscal Year 2020 Payment	Present Value as of 7/1/2018
Chapter 59, P.L. 1999				
21960	WOODBRIIDGE TOWNSHIP	15 Year - Level	\$ 408,835	\$ 2,438,360
Chapter 126, P.L. 2000				
10100	UNION COUNTY	15 Year - Level	\$ 21,138	\$ 20,022
10100	UNION COUNTY	15 Year - Level	825,014	2,813,656
10101	UNION CO BD OF SOCIAL SERVICES	15 Year - Level	373,650	1,274,307
	Sub-Total		\$ 1,219,802	\$ 4,107,985
Chapter 23, P.L. 2002				
30440	SOUTH JERSEY PORT CORPORATION	30 Year - Increasing	\$ 108,531	\$ 1,162,728
31210	NJ HOUSING & MTG FINANCE AGENCY	30 Year - Increasing	131,673	1,410,646
34920	SOUTH JERSEY TRANS AUTHORITY	30 Year - Increasing	114,202	1,223,476
39990	COMPENSATION RATING & INS BUR	30 Year - Increasing	139,909	1,498,884
	Sub-Total		\$ 494,315	\$ 5,295,734
Chapter 127, P.L. 2003				
20114	LINDEN CTY FREE PUBLIC LIBRARY	15 Year - Level	\$ 44,240	\$ 80,885
20264	MONTCLAIR PUBLIC LIBRARY	15 Year - Level	24,305	44,437
21284	ELIZABETH PUBLIC LIBRARY	15 Year - Level	112,701	206,055
30070	NEWARK HOUSING AUTHORITY	15 Year - Level	609	577
30120	HARRISON TOWN HOUSING AUTHORITY	15 Year - Level	55,152	146,042
30230	ASBURY PK HOUSING AUTHORITY	15 Year - Level	8,876	16,228
30240	BERGEN CO UTILITIES AUTHORITY	15 Year - Level	176,132	166,833
30290	BAYONNE HOUSING AUTHORITY	15 Year - Level	77,032	140,840
30380	PERTH AMBOY HOUSING AUTHORITY	15 Year - Level	13,727	25,097
30510	PATERSON HOUSING AUTHORITY	15 Year - Level	38,194	69,831
30520	HACKENSACK HOUSING AUTHORITY	15 Year - Level	17,808	16,868
30550	GARFIELD HOUSING AUTHORITY	15 Year - Level	39,178	71,630
30600	EDISON TWP HOUSING AUTHORITY	15 Year - Level	1,443	2,639
30690	NEPTUNE TWP HOUSING AUTHORITY	15 Year - Level	2,111	3,860
31030	FRANKLIN TWP HOUSING AUTHORITY	15 Year - Level	23,082	21,863
31050	JERSEY CITY INCINERATOR AUTH	15 Year - Level	37,974	69,428
31190	BRIDGETON CITY HOUSING AUTH	15 Year - Level	2,248	4,111
31250	JERSEY CITY MUNICIPAL UT. AUTH	15 Year - Level	27,413	50,119
31370	MERCER CO IMPROVEMENT AUTHORITY	15 Year - Level	17,899	16,954
31870	DOVER TOWN HOUSING AUTHORITY	15 Year - Level	22,787	41,662
31960	WEEHAWKEN TWP HOUSING AUTHORITY	15 Year - Level	1,360	2,487
32010	CAMDEN CO MUN UTIL AUTHORITY	15 Year - Level	56,521	103,339
32030	MONROE TWP MUN UT AUTH (MDDLX)	15 Year - Level	4,046	7,397
32050	HILLSBOROUGH TWP MUA	15 Year - Level	3,819	3,617
32310	OCEAN CO SOIL CONSRV DISTRICT	15 Year - Level	36,646	97,036
32530	COLLINGSWOOD BORO HOUSING AUTH	15 Year - Level	2,584	2,448
34340	OLD BRIDGE MUNICIPAL UTIL AUTH	15 Year - Level	55,375	101,243
34760	CAMDEN CO POLLUTION CONTROL FIN	15 Year - Level	7,726	14,126
55130	CAPE MAY CO BRIDGE COMM	15 Year - Level	10,276	18,788
55350	WOODBRIIDGE HOUSING AUTHORITY	15 Year - Level	9,117	8,636
	Sub-Total		\$ 930,381	\$ 1,555,076

Consistent with established methodology, payment amounts calculated using a payment date 9 months after the valuation date.

Present values as of July 1, 2018 exclude expected payments for fiscal year ending 2019.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

APPENDIX E – EARLY RETIREMENT INCENTIVE PROGRAMS

Table E-4 (cont.) Local Employer ERI Contribution Schedules due to Recent ERI Legislation				
Location Number	Location Name	Years and Form of Payment	Fiscal Year 2020 Payment	Present Value as of 7/1/2018
Chapter 128, P.L. 2003				
10100	UNION COUNTY	15 Year - Level	\$ 135,188	\$ 247,168
10101	UNION CO BD OF SOCIAL SERVICES	15 Year - Level	24,690	45,142
10121	CAPE MAY CO BD SOCIAL SERVICES	15 Year - Level	211,522	386,731
10141	CUMBERLAND CO BD SOCIAL SERV	15 Year - Level	377,957	691,027
10178	MERCER COUNTY	15 Year - Level	66,343	62,840
20110	LINDEN CITY	15 Year - Level	40,220	73,535
20150	SEASIDE HEIGHTS BOROUGH	15 Year - Level	9,403	8,907
20220	BELLEVILLE TOWNSHIP	15 Year - Level	197,135	360,427
20260	MONTCLAIR TOWNSHIP	15 Year - Level	177,513	168,141
20400	NUTLEY TOWNSHIP	15 Year - Level	114,321	108,285
20830	PASSAIC CITY	15 Year - Level	189,852	179,829
21050	WOOD-RIDGE BOROUGH	15 Year - Level	25,169	23,840
21070	HAMILTON TOWNSHIP (MERCER)	15 Year - Level	459,331	435,080
21110	WEEHAWKEN TOWNSHIP	15 Year - Level	35,854	65,553
21160	HARRISON TOWN (HUDSON)	15 Year - Level	51,929	49,187
21210	FAIRFIELD TOWNSHIP (ESSEX)	15 Year - Level	21,433	20,301
21250	UNION TOWNSHIP (UNION)	15 Year - Level	93,531	88,593
21270	BAYONNE CITY	15 Year - Level	66,325	62,823
21290	UNION CITY	15 Year - Level	139,305	131,950
21430	LIVINGSTON TOWNSHIP	15 Year - Level	126,432	231,159
21740	EWING TOWNSHIP	15 Year - Level	301,103	550,513
21800	MAYWOOD BOROUGH	15 Year - Level	32,829	31,096
22670	CHESTER TOWNSHIP	15 Year - Level	48,303	88,314
23310	BLAIRSTOWN TOWNSHIP	15 Year - Level	19,388	18,364
23480	LOPATCONG TOWNSHIP	15 Year - Level	26,803	25,388
23700	LAMBERTVILLE CITY	15 Year - Level	18,038	32,980
51080	FRANKLIN TOWNSHIP (GLOUCESTER)	15 Year - Level	31,578	29,911
51210	GREEN TOWNSHIP	15 Year - Level	6,932	12,675
51640	JERSEY CITY	15 Year - Level	270,556	494,664
52210	MONROE TOWNSHIP (MIDDLESEX)	15 Year - Level	63,078	115,327
52490	OCEAN TOWNSHIP (OCEAN)	15 Year - Level	4,497	4,260
52630	PENNSAUKEN TOWNSHIP	15 Year - Level	88,107	161,088
52660	PINE BEACH BOROUGH	15 Year - Level	14,055	25,697
52810	RARITAN TOWNSHIP	15 Year - Level	36,822	67,323
52920	ROSELAND BOROUGH	15 Year - Level	15,026	27,473
53190	STANHOPE BOROUGH	15 Year - Level	5,772	5,467
	Sub-Total		\$ 3,546,340	\$ 5,131,058
Chapter 129, P.L. 2003				
20833	PASSAIC BOARD OF EDUCATION	15 Year - Level	\$ 172,618	\$ 315,602
21163	HARRISON TOWN BD OF ED(HUDSON)	15 Year - Level	4,101	7,497
22223	HOWELL TWP BD OF ED	15 Year - Level	15,690	41,546
60023	HUDSON CO SCHOOLS OF TECHNOLOGY	15 Year - Level	82,100	150,105
	Sub-Total		\$ 274,509	\$ 514,750
	Total		\$ 6,874,182	\$ 19,042,963

Consistent with established methodology, payment amounts calculated using a payment date 9 months after the valuation date.

Present values as of July 1, 2018 exclude expected payments for fiscal year ending 2019.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 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 2020 Payment	Present Value as of 7/1/2018
10042	MIDDLESEX CO MOSQ EXTERM COMM	\$ 5,279	\$ 26,485
10100	UNION COUNTY	486,825	2,442,382
10101	UNION CO BD OF SOCIAL SERVICES	156,848	786,900
10152	SALEM CO MOSQUITO COMMISSION	1,715	8,602
20050	NORTH ARLINGTON BOROUGH	15,288	76,697
20080	POINT PLEASANT BEACH BOROUGH	15,290	76,711
20090	LAKEWOOD TOWNSHIP	59,595	298,986
20093	LAKEWOOD TWP BD OF ED	31,293	156,998
20110	LINDEN CITY	103,762	520,571
20114	LINDEN CTY FREE PUBLIC LIBRARY	5,502	27,603
20130	PLAINFIELD CITY	68,033	341,318
20150	SEASIDE HEIGHTS BOROUGH	14,366	72,075
20160	ASBURY PARK CITY	39,806	199,703
20170	EAST ORANGE CITY	151,205	758,592
20180	EGG HARBOR CITY	6,584	33,034
20200	PERTH AMBOY CITY	71,824	360,337
20210	WILDWOOD CITY	35,878	180,000
20220	BELLEVILLE TOWNSHIP	35,761	179,411
20230	BLOOMFIELD TOWNSHIP	45,628	228,912
20243	DOVER BD OF ED	114	572
20250	IRVINGTON TOWNSHIP	62,008	311,092
20270	MORRISTOWN TOWN	35,984	180,531
20283	WEST ORANGE TOWNSHIP BD OF ED	73,794	370,219
20350	ORANGE CITY	42,090	211,166
20353	ORANGE CITY BD OF ED	25,765	129,264
20413	WESTFIELD TOWN BD OF ED	43,337	217,420
20440	GLEN RIDGE BOROUGH	11,199	56,183
20483	RIDGEFIELD BORO BD OF ED	25,892	129,899
20533	SOUTH HACKENSACK BD OF ED	2,843	14,262
20570	SOUTH ORANGE VILLAGE	31,233	156,696
20590	HACKENSACK CITY	62,473	313,423
20650	FAIRVIEW BOROUGH	17,007	85,325
20680	NEW MILFORD BOROUGH	15,394	77,232
20700	RUTHERFORD BOROUGH	33,239	166,757
20703	RUTHERFORD BORO BD OF ED	19,235	96,502
20710	SOMERVILLE BOROUGH	22,187	111,311

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

Present values as of July 1, 2018 exclude expected payments for fiscal year ending 2019.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 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 2020 Payment	Present Value as of 7/1/2018
20720	WASHINGTON BOROUGH	\$ 8,210	\$ 41,187
20760	MAPLEWOOD TOWNSHIP	38,563	193,468
20780	ATLANTIC CITY	167,141	838,538
20790	BRIDGETON CITY	24,186	121,338
20800	CLIFTON CITY	79,079	396,737
20810	GARFIELD CITY	27,537	138,154
20830	PASSAIC CITY	67,459	338,441
20840	RAHWAY CITY	34,608	173,627
20844	RAHWAY PUBLIC LIBRARY	4,563	22,891
20849	RAHWAY WATER COMM	1,272	6,380
20850	BRIELLE BOROUGH	7,355	36,900
20860	COLLINGSWOOD BOROUGH	15,817	79,353
20900	GARWOOD BOROUGH	6,032	30,265
20920	KEANSBURG BOROUGH	13,648	68,470
20950	MATAWAN BOROUGH	10,124	50,792
20960	MIDDLESEX BOROUGH	18,793	94,283
20980	PALISADES PARK BOROUGH	16,044	80,494
21003	ROCKAWAY BOROUGH BD OF ED	4,873	24,446
21010	ROSELLE BOROUGH	19,237	96,511
21080	HILLSIDE TOWNSHIP	27,700	138,969
21093	MILLBURN TWP PUBLIC SCHOOLS	37,742	189,352
21110	WEEHAWKEN TOWNSHIP	27,328	137,101
21120	HOBOKEN CITY	75,044	376,491
21130	LONG BRANCH CITY	47,339	237,499
21160	HARRISON TOWN (HUDSON)	39,801	199,681
21180	OCEANPORT BOROUGH	5,574	27,967
21190	ORADELL BOROUGH	10,517	52,763
21210	FAIRFIELD TOWNSHIP (ESSEX)	19,199	96,323
21250	UNION TOWNSHIP (UNION)	56,430	283,108
21254	UNION TOWNSHIP LIBRARY	5,725	28,722
21270	BAYONNE CITY	91,351	458,302
21280	ELIZABETH CITY	155,522	780,248
21284	ELIZABETH PUBLIC LIBRARY	8,573	43,009
21290	UNION CITY	67,129	336,782
21300	WEST NEW YORK TOWN	47,337	237,487
21373	MONMOUTH BEACH BD OF ED	1,279	6,418

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

Present values as of July 1, 2018 exclude expected payments for fiscal year ending 2019.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 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 2020 Payment	Present Value as of 7/1/2018
21470	BOGOTA BOROUGH	\$ 5,176	\$ 25,966
21500	MOUNTAINSIDE BOROUGH	8,296	41,620
21560	GLOUCESTER CITY	18,522	92,923
21650	SECAUCUS TOWN	42,602	213,734
21653	SECAUCUS TOWN BD OF ED	22,195	111,351
21690	FREEHOLD BOROUGH	17,872	89,664
21700	MANVILLE BOROUGH	13,934	69,907
21740	EWING TOWNSHIP	38,199	191,645
21760	SALEM CITY	11,683	58,612
21780	TRENTON CITY	237,264	1,190,345
21800	MAYWOOD BOROUGH	11,036	55,370
21850	CAMDEN CITY	145,731	731,128
21853	CAMDEN CITY BD OF ED	241,537	1,211,783
21910	PATERSON CITY	130,975	657,096
22030	VERONA TOWNSHIP	25,031	125,581
22050	CINNAMINSON TOWNSHIP	13,003	65,235
22113	HAWTHORNE BD OF ED	20,612	103,407
22150	HAWORTH BOROUGH	7,092	35,578
22180	CEDAR GROVE TOWNSHIP	16,557	83,067
22190	EMERSON BOROUGH	9,019	45,250
22220	HOWELL TOWNSHIP	54,662	274,236
22230	MILLTOWN BOROUGH	13,958	70,024
22310	FANWOOD BOROUGH	8,220	41,241
22350	MIDDLETOWN TOWNSHIP	72,552	363,992
22380	WALL TOWNSHIP	48,335	242,493
22440	SOMERDALE BOROUGH	5,744	28,815
22500	WILLINGBORO TOWNSHIP	37,077	186,013
22520	JEFFERSON TOWNSHIP	28,908	145,032
22533	PENNSVILLE TWP BD OF ED	15,543	77,981
22540	BOUND BROOK BOROUGH	10,164	50,992
22580	LYNDHURST TOWNSHIP	30,022	150,620
22583	LYNDHURST TWP BD OF ED	14,444	72,463
22620	PISCATAWAY TOWNSHIP	63,108	316,613
22710	WEST MILFORD TOWNSHIP	60,029	301,162
22720	RINGWOOD BOROUGH	15,870	79,621
22730	BLOOMINGDALE BOROUGH	10,604	53,200

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

Present values as of July 1, 2018 exclude expected payments for fiscal year ending 2019.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 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 2020 Payment	Present Value as of 7/1/2018
22770	PARAMUS BOROUGH	\$ 65,871	\$ 330,472
22780	METUCHEN BOROUGH	15,057	75,538
22810	MOUNT ARLINGTON BOROUGH	7,122	35,731
22850	WINFIELD TOWNSHIP	1,436	7,204
22930	LITTLE FALLS TWP	11,510	57,744
22990	BERLIN BOROUGH	9,446	47,389
23020	GLOUCESTER TOWNSHIP	36,791	184,581
23030	SOUTH BRUNSWICK TOWNSHIP	79,363	398,161
23040	BARNEGAT TOWNSHIP	19,260	96,627
23070	PLEASANTVILLE CITY	21,984	110,292
23120	HOLMDEL TOWNSHIP	20,662	103,660
23130	NORTH HALEDON BOROUGH	10,158	50,964
23170	RUNNEMEDE BOROUGH	7,901	39,641
23273	LITTLE FERRY BD OF ED	5,547	27,830
23300	BUENA VISTA TOWNSHIP	5,515	27,667
23323	MINE HILL TWP BD OF ED	2,348	11,778
23340	WEST PATERSON BOROUGH	12,454	62,480
23343	WOODLAND PARK BD OF ED	7,968	39,974
23350	NORWOOD BOROUGH	6,307	31,640
23360	MARLBORO TOWNSHIP	43,713	219,305
23400	WINSLOW TOWNSHIP	32,152	161,305
23490	PINE HILL BOROUGH	5,074	25,457
23510	LEBANON TOWNSHIP	5,152	25,849
23560	WEST AMWELL TOWNSHIP	3,482	17,467
23570	EGG HARBOR TOWNSHIP	34,258	171,873
23630	SOUTH AMBOY CITY	16,321	81,880
23660	WEST DEPTFORD TOWNSHIP	35,263	176,913
23700	LAMBERTVILLE CITY	4,598	23,068
23823	MILLSTONE TOWNSHIP BD OF ED	16,926	84,916
30070	NEWARK HOUSING AUTHORITY	161,517	810,326
30130	TRENTON HOUSING AUTHORITY	17,826	89,435
30160	ATLANTIC CITY HOUSING AUTHORITY	20,561	103,156
30200	ORANGE CITY HOUSING AUTHORITY	5,515	27,667
30220	HOBOKEN HOUSING AUTHORITY	15,251	76,514
30250	NEW BRUNSWICK HOUSING AUTHORITY	8,862	44,460
30360	IRVINGTON HOUSING AUTH	9,730	48,815

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

Present values as of July 1, 2018 exclude expected payments for fiscal year ending 2019.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 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 2020 Payment	Present Value as of 7/1/2018
30400	UNION CITY HOUSING AUTHORITY	\$ 9,790	\$ 49,114
30430	NEW BRUNSWICK PARKING AUTHORITY	13,796	69,214
30450	MORRISTOWN HOUSING AUTHORITY	5,778	28,987
30460	PASSAIC CITY HOUSING AUTHORITY	9,415	47,236
30480	WEST NEW YORK HOUSING AUTHORITY	7,479	37,520
30490	NORTH BERGEN HOUSING AUTHORITY	8,212	41,198
30510	PATERSON HOUSING AUTHORITY	16,256	81,556
30520	HACKENSACK HOUSING AUTHORITY	4,709	23,627
30550	GARFIELD HOUSING AUTHORITY	5,784	29,020
30570	CAMDEN CITY HOUSING AUTHORITY	20,496	102,827
30580	TRENTON PARKING AUTHORITY	1,474	7,394
30590	PLAINFIELD HOUSING AUTHORITY	9,530	47,812
30600	EDISON TWP HOUSING AUTHORITY	2,494	12,514
30660	UNION CITY PARKING AUTHORITY	3,997	20,055
30710	HADDON TWP FIRE DISTRICT 1	114	570
30770	PATERSON PARKING AUTHORITY	7,342	36,837
30790	FRANKLIN TWP SEWERAGE AUTH	6,100	30,601
30830	HAMILTON TWP FIRE DISTRICT 2	126	630
30900	GLOUCESTER TWP M U A	9,878	49,556
30970	GUTTENBERG HOUSING AUTHORITY	3,499	17,552
31000	OCEAN CITY HOUSING AUTHORITY	1,132	5,681
31030	FRANKLIN TWP HOUSING AUTHORITY	617	3,096
31050	JERSEY CITY INCINERATOR AUTH	41,435	207,877
31070	MILLVILLE HOUSING AUTHORITY	8,953	44,917
31170	RARITAN VALL COMMUNITY COLLEGE	37,392	187,594
31190	BRIDGETON CITY HOUSING AUTH	5,004	25,107
31250	JERSEY CITY MUNICIPAL UT. AUTH	26,512	133,011
31350	CLEMENTON HOUSING AUTHORITY	972	4,879
31360	BERGEN CO HOUSING AUTHORITY	17,071	85,644
31370	MERCER CO IMPROVEMENT AUTHORITY	10,265	51,497
31520	CARLSTADT SEWERAGE AUTHORITY	586	2,941
31560	WOODBINE MUNICIPAL UTIL AUTH	397	1,994
31600	WILDWOOD CITY HOUSING AUTHORITY	2,357	11,823
31640	RARITAN TWP MUN UTIL AUTHORITY	8,319	41,738
31680	OCEAN GROVE BD OF FIRE COMM	146	733
31710	WEYMOUTH TWP MUN UTIL AUTHORITY	79	396

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

Present values as of July 1, 2018 exclude expected payments for fiscal year ending 2019.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 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 2020 Payment	Present Value as of 7/1/2018
31720	NJ SPORTS & EXPOSITION AUTH	\$ 106,780	\$ 535,713
31730	EDGEWATER HOUSING AUTHORITY	1,458	7,313
31870	DOVER TOWN HOUSING AUTHORITY	712	3,573
31890	BURLINGTON CO AVA COMM	1,429	7,168
31970	NEPTUNE TWP SEWERAGE AUTHORITY	7,438	37,316
32250	NEWTON TOWN HOUSING AUTHORITY	752	3,771
32300	DOVER TWP PARKING AUTHORITY	1,390	6,975
32350	GLOUCESTER TWP FIRE DISTRICT 2	468	2,346
32360	HUNTERDON CO SOIL CONSERV DIST	3,104	15,575
32420	CAPE ATL SOIL CONSRVTN DIST	2,191	10,992
32440	TOMS RIVER FIRE DISTRICT # 2	726	3,642
32460	BERGEN COUNTY SOIL CONSER DIST	1,747	8,763
32530	COLLINGSWOOD BORO HOUSING AUTH	791	3,968
32660	MID BERGEN REG HEALTH COMM	1,198	6,008
32720	BURLINGTON CO SOIL CON DIST	1,738	8,721
32870	MADISON BORO HOUSING AUTHORITY	3,243	16,270
32900	NJ TRANSIT CORPORATION	19,295	96,802
32950	NEPTUNE CITY HOUSING AUTHORITY	329	1,651
33000	CAMDEN CO SOIL CONSERVATN DIST	1,572	7,887
33020	MONMOUTH OCEAN ED SERV COMM	23,918	119,997
34120	GLOUCESTER TWP FIRE DISTRICT 3	139	695
34240	WARREN CO AUDIO VISUAL AIDS	182	914
34260	OCEAN TWP FIRE DISTRICT 2	833	4,179
34270	CAMDEN CO IMPROVEMENT AUTHORITY	4,818	24,170
34380	SALEM CITY MUNICIPAL PORT AUTH	146	735
34400	BRICK TWP JOINT BD OF FIRE COMM	2,907	14,583
34420	UNION CO UTILITIES AUTHORITY	6,129	30,748
34500	SOUTH TOMS RIVER SEWERAGE AUTH	173	867
34560	LAKESWOOD TWP FIRE DISTRICT 1	629	3,154
34630	CAMDEN CO HEALTH SERVICES CTR	122,370	613,928
34640	NJ SCHOOL BD ASSOC INS GROUP	15,845	79,493
34680	DELAWARE RIVER JT TOLL BRG COM	1,712	8,590
34690	DELRAN TWP FIRE DISTRICT #1	771	3,867
34710	NORTH BERGEN M.U.A.	16,421	82,384
34770	HOWELL TWP FIRE DISTRICT 3	226	1,135
34840	EAST BRUNSWICK TWP FIRE DIST #2	1,216	6,101

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

Present values as of July 1, 2018 exclude expected payments for fiscal year ending 2019.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 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 2020 Payment	Present Value as of 7/1/2018
34880	BURLINGTON TWP FIRE DISTRICT 1	\$ 679	\$ 3,407
34940	WILDWOODS JOINT CONSTRUCTION	318	1,596
34990	TRENTON DOWNTOWN ASSOCIATION	1,198	6,008
35130	WESTVILLE FIRE DISTRICT # 1	486	2,440
35200	VINELAND-MILLVILLE URB. ENT.ZON	570	2,860
35210	NORTH HUDSON REG. COMM CENTER	3,838	19,257
35250	NJ REDEVELOPMENT AUTHORITY	5,048	25,324
35290	HAZLET TWP FIRE DIST	598	3,001
35370	OLD BRIDGE TWP DISTRICT 1	33	164
35400	SOARING HEIGHTS CHARTER SCHOOL	1,430	7,177
35420	JERSEY CITY COMM CHARTER SCHOOL	8,367	41,977
35530	EMILY FISHER CHARTER SCHOOL	8,522	42,755
35620	EAST ORANGE COMMUNITY CHART SCH	8,182	41,047
35670	RED BANK CHARTER SCHOOL	1,241	6,225
35690	INTERNATIONAL CHARTER SCHOOL	622	3,118
35900	CLASSICAL ACAD. CHARTER SCHOOL	283	1,420
36500	CAMDEN CITY REDEVELOPMENT AGENCY	6,798	34,106
37800	ENGLEWOOD ON THE PALISADES CHAR	1,137	5,704
38400	HUDSON CO ECONOMIC DEVELOP CORP	975	4,891
38500	HOWELL TWP FIRE DISTRICT 4	132	662
39100	BRICK TWP FIRE DISTRICT 1	137	687
39200	QUEEN CITY ACADEMY CHARTER SCH	2,366	11,869
39800	WALL TOWNSHIP FIRE DISTRICT 3	1,021	5,121
40150	BORDENTOWN REG SCH DISTRICT	21,874	109,740
40340	TOMS RIVER SCHOOL DIST	152,629	765,736
40380	WOODSTOWN-PILES GROVE REG SCH	12,588	63,152
41000	RAHWAY CITY REDEVELOPMENT AG	943	4,730
41100	UNIVERSITY ACADEMY CHARTER HS	1,145	5,745
41400	BAYSHORE JOINTURE COMMISSION	2,731	13,703
41600	TEAM ACADEMY CHARTER SCHOOL	3,947	19,803
42000	CARTERET REDEVELOPMENT AGENCY	209	1,049
42400	PATERSON CHART SCH-SCIENCE/TECH	2,860	14,346
43800	SECAUCUS MUNICIPAL UTIL. AUTH.	5,432	27,254
43900	MONTCLAIR PARKING AUTHORITY	759	3,808

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

Present values as of July 1, 2018 exclude expected payments for fiscal year ending 2019.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 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 2020 Payment	Present Value as of 7/1/2018
44600	MIDDLE TOWNSHIP FIRE DIST #1	\$ 972	\$ 4,876
45000	CUMBERLAND-SALEM CONSERV. DIST.	1,371	6,879
45100	BRICK TOWNSHIP FIRE DIST 2	143	716
45300	FREEDOM ACADEMY CHARTER SCHOOL	952	4,778
45800	BLOOMFIELD PARKING AUTHORITY	596	2,989
50033	ALLAMUCHY BD OF ED	3,349	16,801
50050	ALLENTOWN BOROUGH	1,839	9,227
50130	AUDUBON BOROUGH	8,919	44,746
50250	BERKELEY TOWNSHIP MUNICIPAL BLD	42,687	214,161
50410	BROOKLAWN BOROUGH	3,474	17,431
50413	BROOKLAWN BORO BD OF ED	2,220	11,137
50420	BUENA BOROUGH	4,532	22,736
50530	CHESILHURST BOROUGH	1,554	7,799
50733	DENNIS TWP BD OF ED	6,909	34,663
50770	DUNELLEN BOROUGH	6,710	33,661
50790	EASTAMPTON TOWNSHIP	2,953	14,815
50830	EAST HANOVER TOWNSHIP	27,632	138,628
50840	EAST NEWARK BOROUGH	868	4,357
50930	ENGLEWOOD CLIFFS BOROUGH	8,283	41,555
50940	ENGLISHTOWN BOROUGH	2,694	13,517
50973	FAIRFIELD TWP BD ED (CUMBERLND)	2,324	11,661
51080	FRANKLIN TOWNSHIP (GLOUCESTER)	12,627	63,350
51093	FRANKLIN TWP BD OF ED (HUNTRDN)	2,089	10,480
51140	FRELINGHUYSEN TWP	1,231	6,174
51260	GUTTENBERG TOWN	6,708	33,653
51283	HAINESPORT TOWNSHIP BD OF ED	4,267	21,405
51290	HALEDON BOROUGH	9,436	47,342
51333	HAMPTON BOROUGH BD OF ED	1,172	5,881
51360	HARDWICK TOWNSHIP	1,554	7,798
51400	HARRISON TOWNSHIP (GLOUCESTER)	7,144	35,839
51470	HIGHTSTOWN BOROUGH	11,714	58,771
51520	HOPATCONG BOROUGH	21,424	107,484
51640	JERSEY CITY	111,135	557,559
51670	KNOWLTON TOWNSHIP	3,005	15,076
51730	LAWNSIDE BOROUGH	5,561	27,901
51790	LINDENWOLD BOROUGH	13,098	65,714

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

Present values as of July 1, 2018 exclude expected payments for fiscal year ending 2019.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 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 2020 Payment	Present Value as of 7/1/2018
51970	MANCHESTER TOWNSHIP	\$ 28,621	\$ 143,590
52000	MANSFIELD TOWNSHIP (WARREN)	5,048	25,324
52050	ABERDEEN TOWNSHIP	16,707	83,819
52060	MAURICE RIVER TOWNSHIP	4,090	20,521
52203	MONROE TWP BD OF ED (GLOUCESTR)	25,845	129,661
52340	NATIONAL PARK BOROUGH	2,474	12,410
52360	NEWARK CITY	527,866	2,648,283
52363	NEWARK PUBLIC SCHOOLS	598,152	3,000,907
52620	PENNS GROVE BOROUGH	4,554	22,845
52720	PLAINSBORO TOWNSHIP	27,210	136,510
52770	PROSPECT PARK BOROUGH	3,417	17,142
52920	ROSELAND BOROUGH	14,544	72,969
52960	SADDLE BROOK TOWNSHIP	17,913	89,871
53100	LAKE COMO BOROUGH	4,524	22,696
53110	SOUTH BOUND BROOK BOROUGH	4,398	22,067
53140	SOUTH TOMS RIVER BOROUGH	2,374	11,913
53260	SUSSEX BOROUGH	2,145	10,762
53360	UNION BEACH BOROUGH	6,686	33,545
53420	UPPER SADDLE RIVER BORO	9,665	48,491
53510	WANAQUE BOROUGH	12,801	64,224
53800	WOODBURY HEIGHTS BOROUGH	4,874	24,450
53823	WOODLAND TWP BD OF ED	1,735	8,706
55130	CAPE MAY CO BRIDGE COMM	6,228	31,248
55450	BERKELEY TWP SEWERAGE AUTHORITY	4,803	24,097
55510	HADDON TOWNSHIP HOUSING AUTH	922	4,627
55520	PRINCETON HOUSING AUTHORITY	2,102	10,546
55950	HIGHLANDS HOUSING AUTH	1,029	5,164
55970	PLEASANTVILLE HOUSING AUTH	3,884	19,487
56120	RED BANK BORO HOUSING AUTH	2,348	11,779
56140	CARTERET HOUSING AUTHORITY	4,713	23,646
56170	EDGEWATER PARK SEWERAGE AUTH	317	1,590
56300	KEANSBURG BORO HOUSING AUTH	1,269	6,365
56320	NEWARK PARKING AUTHORITY	733	3,676
56370	BEVERLY CITY HOUSING AUTHORITY	654	3,282
56400	HIGHLAND PARK HOUSING AUTHORITY	1,478	7,415
56440	FLORENCE TWP HOUSING AUTHORITY	365	1,830

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

Present values as of July 1, 2018 exclude expected payments for fiscal year ending 2019.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 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 2020 Payment	Present Value as of 7/1/2018
56480	BOONTON HOUSING AUTHORITY	\$ 1,321	\$ 6,626
57270	SHORE REGIONAL H S DISTRICT	5,706	28,628
57530	NEW HANOVER TWP BD OF ED	1,459	7,321
60023	HUDSON CO SCHOOLS OF TECHNOLOGY	60,765	304,856
60030	PASSAIC COUNTY	472,552	2,370,778
60031	PASSAIC CO BD OF SOCIAL SERVICE	187,099	938,671
60050	WATERFRONT COMM OF NY HARBOR	1,544	7,745
70023	GUTTENBERG BORO BD OF ED	3,992	20,028
79100	NJ FIREMENS HOME	14,029	70,382
	Total	\$ 8,840,385	\$ 44,351,884

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

Present values as of July 1, 2018 exclude expected payments for fiscal year ending 2019.

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:

$$\begin{array}{ccccccc} \text{Amount} & & \text{Probability of} & & \text{1/(1+Investment Return)} & & \\ & & \text{Payment} & & & & \\ \$100 & \times & (1 - .01) & \times & 1/(1+.1) & = & \$90 \end{array}$$

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.

**PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF NEW JERSEY
JULY 1, 2018 ACTUARIAL VALUATION**

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.