



Police and Firemen's Retirement System of New Jersey

**GASB 68 Report
as of June 30, 2018**

Produced by Cheiron

February 2019

TABLE OF CONTENTS

<i>Section</i>		<i>Page</i>
Section I	Board Summary	1
Section II	Certification	3
Section III	Determination of Discount Rate	5
Section IV	Collective Employer Reporting Amounts.....	7
 <i>Appendices</i>		
Appendix A	Membership Information	17
Appendix B	Actuarial Assumptions and Methods	18
Appendix C	Summary of Plan Provisions.....	25
Appendix D	Determination of Discount Rate	30
Appendix E	Glossary of Terms.....	34

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
GASB 68 REPORTING FOR JUNE 30, 2018 MEASUREMENT DATE**

SECTION I – BOARD SUMMARY

The purpose of this report is to provide accounting and financial disclosure information under Government Accounting Standards Board Statement 68 for the Police and Firemen's Retirement System of New Jersey (PFRS). This information includes:

- Disclosure of Deferred Inflows and Outflows, and
- Calculation of the Collective Annual Pension Expense.

Highlights

The reporting date for the PFRS is June 30, 2018. Measurements as of the reporting date are based on the fair value of assets as of June 30, 2018 and the Total Pension Liability as of the valuation date, July 1, 2017, updated to June 30, 2018. There was a change in assumptions as the discount rate used to measure the Total Pension Liability was changed as of the measurement date. We are not of any other significant events between the valuation date and the measurement date so the update procedures only included the addition of service cost and interest cost offset by actual benefit payments and an adjustment to reflect the change in discount rate. Additional information about the TPL can be found in the GASB 67 report. This report contains the GASB 68 collective employer reporting amounts. The individual employer reporting amounts can be found in the GASB 67-68 Employer Schedules provided separately in Excel format.

The June 30, 2017 values shown in this report are based on the prior actuary's GASB report.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
GASB 68 REPORTING FOR JUNE 30, 2018 MEASUREMENT DATE**

SECTION I – BOARD SUMMARY

The following table provides a summary of the key results during this reporting period.

Table I-1 Summary of Collective Results		
Measurement Date	6/30/2018	6/30/2017
<u>State</u>		
Net Pension Liability	\$ 4,329,304,276	\$ 4,395,743,141
Deferred Outflows	(222,847,685)	(343,535,227)
Deferred Inflows	<u>571,047,669</u>	<u>430,937,904</u>
Net Impact on Statement of Net Position	\$ 4,677,504,260	\$ 4,483,145,818
Total Pension Expense	\$ 344,631,284	\$ 362,414,044
Pension Expense (% of Payroll)	71.37%	74.65%
<u>Local Employers</u>		
Net Pension Liability	\$ 15,369,699,278	\$ 17,167,260,198
Deferred Outflows	(1,299,176,853)	(2,298,433,198)
Deferred Inflows	<u>3,597,955,451</u>	<u>2,618,912,538</u>
Net Impact on Statement of Net Position	\$ 17,668,477,876	\$ 17,487,739,538
Total Pension Expense	\$ 1,270,762,351	\$ 1,624,455,951
Pension Expense (% of Payroll)	38.27%	50.12%
<u>Total</u>		
Net Pension Liability	\$ 19,699,003,554	\$ 21,563,003,339
Deferred Outflows	(1,522,024,538)	(2,641,968,425)
Deferred Inflows	<u>4,169,003,120</u>	<u>3,049,850,442</u>
Net Impact on Statement of Net Position	\$ 22,345,982,136	\$ 21,970,885,356
Total Pension Expense	\$ 1,615,393,635	\$ 1,986,869,995
Pension Expense (% of Payroll)	42.47%	53.31%

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
GASB 68 REPORTING FOR JUNE 30, 2018 MEASUREMENT DATE**

SECTION II – CERTIFICATION

The purpose of this report is to provide accounting and financial reporting information under GASB 68 for Police and Firemen's Retirement System of New Jersey (PFRS). This report is for the use of PFRS, the Division of Pensions and Benefits and their auditors in preparing financial reports in accordance with applicable law and accounting requirements. This report is not appropriate for other purposes, including the measurement of funding requirements for PFRS and estimating the price to settle PFRS's obligations.

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, the 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.

Future actuarial measurements may differ significantly from the current measurements due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; and changes in plan provisions or applicable law.

For purposes of this report, the calculation of the Total Pension Liability and the projection of the Plan's contributions and projected benefit payments were based on the recommended demographic assumptions of the July 1, 2010 – June 30, 2013 Experience Study prepared by the prior actuary, which was approved by the Board of Trustees on February 9, 2015. Cheiron has reviewed this experience study. While we consider these assumptions to be generally reasonable, we have not yet performed our own actuarial experience study.

Based on the State Treasurer's recommendation the following economic assumptions are used to determine the Total Pension Liability and the actuarially determined contributions:

- Effective with the July 1, 2017 valuation: 7.50% per annum,
- Effective with the July 1, 2019 valuation: 7.30% per annum,
- Effective with the July 1, 2021 valuation: 7.00% per annum,

In accordance with Paragraph 40 of GASB Statement No. 67, the projection of the Plan's fiduciary net position is based on a long-term expected rate of return of 7.00% per annum.

To the best of our knowledge, this report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices that are consistent with the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board. 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.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
GASB 68 REPORTING FOR JUNE 30, 2018 MEASUREMENT DATE**

SECTION II – CERTIFICATION

This report was prepared for PFRS for the purposes described herein and for the use by 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 any other user.



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



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Principal Consulting Actuary

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
GASB 68 REPORTING FOR JUNE 30, 2018 MEASUREMENT DATE**

SECTION III – DETERMINATION OF DISCOUNT RATE

The discount rate used to measure the Total Pension Liability was 6.14% as of June 30, 2017 and 6.51% as of June 30, 2018. As discussed with the Division of Pensions and Benefits, the projection of cash flows used to determine the discount rate as of June 30, 2018 assumed:

- In accordance with Paragraph 40 of GASB Statement No. 67, the projection of the Plan's fiduciary net position is based on a long-term expected rate of return of 7.00% per annum.
- In accordance with Paragraph 37 of GASB Statement No. 67, the projection of the Plan's contributions and projected benefit payments were based on the recommended demographic assumptions of the July 1, 2010 – June 30, 2013 Experience Study prepared by the prior actuary, which was approved by the Board of Trustees on February 9, 2015.

Based on the State Treasurer' recommendation the following economic assumptions are used to determine the actuarially determined contributions:

- Effective with the July 1, 2017 valuation: 7.50% per annum,
- Effective with the July 1, 2019 valuation: 7.30% per annum,
- Effective with the July 1, 2021 valuation: 7.00% per annum.
- It is assumed that the Local employers will contribute 100% of their actuarially determined contribution and 100% of their Non-Contributory Group Insurance Premium Fund (NCGIPF) contribution while the State will contribute 50% of its actuarially determined contribution and 100% of its NCGIPF contribution. The 50% contribution rate is the actual total State contribution rate paid in fiscal year ending June 30, 2018 with respect to the actuarially determined contribution for the fiscal year ending June 30, 2018 for all State administered retirement systems.
- Prior to FYE 2018, it is assumed the State would make pension contributions the June 30th following the 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.
- In accordance with Chapter 98, P. L. 2017, PFRS receives 1.2% of the proceeds of the Lottery Enterprise for a period of 30 years. Revenues received from lottery proceeds are assumed to be contributed to the System on a monthly basis.
- It is assumed that Local employers' contributions are expected to be received on April 1st, 21 months after the associated valuation date.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
GASB 68 REPORTING FOR JUNE 30, 2018 MEASUREMENT DATE**

SECTION III – DETERMINATION OF DISCOUNT RATE

The Fiduciary Net Position (FNP) includes Local employers' contributions receivable as reported in the financial statements provided to us by the Division of Pensions and Benefits. In determining the discount rate in Appendix D, the FNP at the beginning of each year does not reflect receivable contributions as those amounts are not available at the beginning of the year to pay benefits. The receivable contributions for the current year and prior year are shown below:

- For FYE June 30, 2017, the FNP includes receivable contributions of \$1,012,746,669 (\$849,312,733 for appropriations, \$35,809,000 for NCGIPF, \$116,220,660 for Chapter 19 and \$11,404,276 for ERI).
- For FYE June 30, 2018, the FNP includes receivable contributions of \$1,089,730,202 (\$940,592,142 for appropriations, \$37,157,368 for NCGIPF, \$102,125,815 for Chapter 19 and \$9,867,107 for ERI, offset by \$12,230 for NCGIPF adjustment).

Based on these assumptions, the pension Plan's fiduciary net position was projected to be available to make all projected future benefit payments of current Plan members through fiscal year 2062. Municipal bond rates of 3.58% as of June 30, 2017 and 3.87% as of June 30, 2018 were used in the development of the blended GASB discount rate after the Plan's fiduciary net position was no longer sufficient to make future benefit payments. As selected by the State Treasurer, the rates are based on the Bond Buyer GO 20-Bond Municipal Bond Index. Based on the long-term rate of return of 7.00% and the municipal bond rate of 3.58% as of June 30, 2017 and the long-term rate of return of 7.00% and the municipal bond rate of 3.87% as of June 30, 2018, the blended GASB discount rates are 6.14% as of June 30, 2017 and **6.51%** as of June 30, 2018. The assumed discount rates have been determined in accordance with the method prescribed by GASB Statement No. 67.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
GASB 68 REPORTING FOR JUNE 30, 2018 MEASUREMENT DATE**

SECTION IV – COLLECTIVE EMPLOYER REPORTING AMOUNTS

We understand the State and Local employers have elected to use the 2018 measurement date for its 2019 reporting date. As a result, the schedules in this section will be used by the State and Local employers for their 2019 reporting.

The impact of experience gains or losses and assumption changes on the TPL are recognized in expense over the average expected remaining service life of all active and inactive members of the System. As of the measurement date, this recognition period was 5.73 years.

The following tables summarize the current balances of deferred outflows and deferred inflows of resources along with the net recognition over the next five years.

Table IV-1A		
Schedule of Collective Deferred Inflows and Outflows of Resources		
State		
	Deferred Outflows of Resources	Deferred Inflows of Resources
Differences between expected and actual experience	\$ 0	\$ 60,585,052
Changes in assumptions	159,377,525	510,462,617
Net differences between projected and actual earnings on pension plan investments	63,470,160	0
Total	<u>\$ 222,847,685</u>	<u>\$ 571,047,669</u>
Amounts reported as deferred outflows and deferred inflows of resources will be recognized in pension expense as follows:		
Measurement year ended June 30:		
2019	\$ 307,549	
2020	(66,908,621)	
2021	(144,221,769)	
2022	(100,651,707)	
2023	(36,725,436)	
Thereafter	\$ 0	

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
GASB 68 REPORTING FOR JUNE 30, 2018 MEASUREMENT DATE**

SECTION IV – COLLECTIVE EMPLOYER REPORTING AMOUNTS

Table IV-1B		
Schedule of Collective Deferred Inflows and Outflows of Resources		
Local Employers		
	Deferred Outflows of Resources	Deferred Inflows of Resources
Differences between expected and actual experience	\$ 137,666,877	\$ 55,997,137
Changes in assumptions	1,161,509,976	3,467,927,931
Net differences between projected and actual earnings on pension plan investments	0	74,030,383
Total	<u>\$ 1,299,176,853</u>	<u>\$ 3,597,955,451</u>
Amounts reported as deferred outflows and deferred inflows of resources will be recognized in pension expense as follows:		
Measurement year ended June 30:		
2019	\$ 116,373,674	
2020	(392,289,917)	
2021	(1,097,483,063)	
2022	(704,508,897)	
2023	(220,870,395)	
Thereafter	\$ 0	

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
GASB 68 REPORTING FOR JUNE 30, 2018 MEASUREMENT DATE**

SECTION IV – COLLECTIVE EMPLOYER REPORTING AMOUNTS

Table IV-1C		
Schedule of Collective Deferred Inflows and Outflows of Resources		
Total		
	Deferred Outflows of Resources	Deferred Inflows of Resources
Differences between expected and actual experience	\$ 137,666,877	\$ 116,582,189
Changes in assumptions	1,320,887,501	3,978,390,548
Net differences between projected and actual earnings on pension plan investments	63,470,160	74,030,383
Total	<u>\$ 1,522,024,538</u>	<u>\$ 4,169,003,120</u>
Amounts reported as deferred outflows and deferred inflows of resources will be recognized in pension expense as follows:		
Measurement year ended June 30:		
	2019 \$ 116,681,223	
	2020 (459,198,538)	
	2021 (1,241,704,832)	
	2022 (805,160,604)	
	2023 (257,595,831)	
	Thereafter \$ 0	

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
GASB 68 REPORTING FOR JUNE 30, 2018 MEASUREMENT DATE**

SECTION IV – COLLECTIVE EMPLOYER REPORTING AMOUNTS

**Table IV-2A
Detailed Schedule of Collective Deferred Inflows and Outflows of Resources
State**

Recognition of differences between expected and actual experience

From Measurement Year Ending	Remaining Recognition Period	Remaining Deferred (Inflows) and Outflows*	Recognition Year						
			2018	2019	2020	2021	2022	2023	Thereafter
2018	5.73	\$ (24,201,655)	\$ (4,223,675)	\$ (4,223,675)	\$ (4,223,675)	\$ (4,223,675)	\$ (4,223,675)	\$ (3,083,280)	\$ 0
2017	4.59	(26,774,721)	(5,833,272)	(5,833,272)	(5,833,272)	(5,833,272)	(3,441,633)	0	0
2016	3.58	(12,031,373)	(3,360,718)	(3,360,718)	(3,360,718)	(1,949,219)	0	0	0
2015	2.53	(18,181,221)	(7,186,253)	(7,186,253)	(3,808,715)	0	0	0	0
2014	2.17	0	0	0	0	0	0	0	0
Total		\$ (81,188,970)	\$ (20,603,918)	\$ (20,603,918)	\$ (17,226,380)	\$ (12,006,166)	\$ (7,665,308)	\$ (3,083,280)	\$ 0

Recognition of changes in assumptions

From Measurement Year Ending	Remaining Recognition Period	Remaining Deferred (Inflows) and Outflows*	Recognition Year						
			2018	2019	2020	2021	2022	2023	Thereafter
2018	5.73	\$ (264,067,891)	\$ (46,085,147)	\$ (46,085,147)	\$ (46,085,147)	\$ (46,085,147)	\$ (46,085,147)	\$ (33,642,156)	\$ 0
2017	4.59	(373,950,589)	(81,470,716)	(81,470,716)	(81,470,716)	(81,470,716)	(48,067,725)	0	0
2016	3.58	19,406,513	5,420,814	5,420,814	5,420,814	3,144,071	0	0	0
2015	2.53	213,387,658	84,342,947	84,342,947	44,701,764	0	0	0	0
2014	2.17	30,319,008	13,971,893	13,971,893	2,375,222	0	0	0	0
Total		\$ (374,905,301)	\$ (23,820,209)	\$ (23,820,209)	\$ (75,058,063)	\$ (124,411,792)	\$ (94,152,872)	\$ (33,642,156)	\$ 0

Recognition of net differences between projected and actual earnings on pension plan investments

From Measurement Year Ending	Remaining Recognition Period	Remaining Deferred (Inflows) and Outflows*	Recognition Year						
			2018	2019	2020	2021	2022	2023	Thereafter
2018	5.00	\$ 5,832,361	\$ 1,166,472	\$ 1,166,472	\$ 1,166,472	\$ 1,166,472	\$ 1,166,473	\$ 0	\$ 0
2017	4.00	(35,881,132)	(8,970,283)	(8,970,283)	(8,970,283)	(8,970,283)	0	0	0
2016	3.00	99,538,895	33,179,631	33,179,631	33,179,633	0	0	0	0
2015	2.00	38,711,710	19,355,854	19,355,856	0	0	0	0	0
2014	1.00	(21,947,425)	(21,947,425)	0	0	0	0	0	0
Total		\$ 86,254,409	\$ 22,784,249	\$ 44,731,676	\$ 25,375,822	\$ (7,803,811)	\$ 1,166,473	\$ 0	\$ 0

Grand Total		\$ (369,839,862)	\$ (21,639,878)	\$ 307,549	\$ (66,908,621)	\$ (144,221,769)	\$ (100,651,707)	\$ (36,725,436)	\$ 0
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* As of the beginning of the measurement year

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
GASB 68 REPORTING FOR JUNE 30, 2018 MEASUREMENT DATE**

SECTION IV – COLLECTIVE EMPLOYER REPORTING AMOUNTS

**Table IV-2B
Detailed Schedule of Collective Deferred Inflows and Outflows of Resources
Local Employers**

Recognition of differences between expected and actual experience

From Measurement Year Ending	Remaining Recognition Period	Remaining Deferred (Inflows) and Outflows*	Recognition Year						
			2018	2019	2020	2021	2022	2023	Thereafter
2018	5.73	\$ 71,877,743	\$ 12,544,109	\$ 12,544,109	\$ 12,544,109	\$ 12,544,109	\$ 12,544,109	\$ 9,157,198	\$ 0
2017	4.59	100,153,088	21,819,845	21,819,845	21,819,845	21,819,845	12,873,708	0	0
2016	3.58	(10,370,342)	(2,896,743)	(2,896,743)	(2,896,743)	(1,680,113)	0	0	0
2015	2.53	(80,238,268)	(31,714,730)	(31,714,730)	(16,808,808)	0	0	0	0
2014	2.17	0	0	0	0	0	0	0	0
Total		\$ 81,422,221	\$ (247,519)	\$ (247,519)	\$ 14,658,403	\$ 32,683,841	\$ 25,417,817	\$ 9,157,198	\$ 0

Recognition of changes in assumptions

From Measurement Year Ending	Remaining Recognition Period	Remaining Deferred (Inflows) and Outflows*	Recognition Year						
			2018	2019	2020	2021	2022	2023	Thereafter
2018	5.73	\$ (1,805,559,033)	\$ (315,106,288)	\$ (315,106,288)	\$ (315,106,288)	\$ (315,106,288)	\$ (315,106,288)	\$ (230,027,593)	\$ 0
2017	4.59	(2,528,303,928)	(550,828,742)	(550,828,742)	(550,828,742)	(550,828,742)	(324,988,960)	0	0
2016	3.58	200,704,934	56,062,831	56,062,831	56,062,831	32,516,441	0	0	0
2015	2.53	1,504,758,892	594,766,360	594,766,360	315,226,172	0	0	0	0
2014	2.17	198,221,788	91,346,447	91,346,447	15,528,894	0	0	0	0
Total		\$ (2,430,177,347)	\$ (123,759,392)	\$ (123,759,392)	\$ (479,117,133)	\$ (833,418,589)	\$ (640,095,248)	\$ (230,027,593)	\$ 0

Recognition of net differences between projected and actual earnings on pension plan investments

From Measurement Year Ending	Remaining Recognition Period	Remaining Deferred (Inflows) and Outflows*	Recognition Year						
			2018	2019	2020	2021	2022	2023	Thereafter
2018	5.00	\$ (449,157,322)	\$ (89,831,464)	\$ (89,831,464)	\$ (89,831,464)	\$ (89,831,464)	\$ (89,831,466)	\$ 0	\$ 0
2017	4.00	(827,667,410)	(206,916,853)	(206,916,853)	(206,916,853)	(206,916,851)	0	0	0
2016	3.00	1,106,751,386	368,917,128	368,917,128	368,917,130	0	0	0	0
2015	2.00	336,423,549	168,211,775	168,211,774	0	0	0	0	0
2014	1.00	(320,913,029)	(320,913,029)	0	0	0	0	0	0
Total		\$ (154,562,826)	\$ (80,532,443)	\$ 240,380,585	\$ 72,168,813	\$ (296,748,315)	\$ (89,831,466)	\$ 0	\$ 0

Grand Total		\$ (2,503,317,952)	\$ (204,539,354)	\$ 116,373,674	\$ (392,289,917)	\$ (1,097,483,063)	\$ (704,508,897)	\$ (220,870,395)	\$ 0
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* As of the beginning of the measurement year

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
GASB 68 REPORTING FOR JUNE 30, 2018 MEASUREMENT DATE**

SECTION IV – COLLECTIVE EMPLOYER REPORTING AMOUNTS

The annual pension expense recognized by the State and Local employers can be calculated two different ways. First, it is the change in the amounts reported on the Statement of Net Position that relate to PFRS and are not attributable to employer contributions. That is, it is the change in NPL plus the changes in deferred outflows and inflows plus employer contributions.

Alternatively, annual pension expense can be calculated by its individual components. While GASB does not require or suggest the organization of the individual components shown in the table below, we believe it helps to understand the level and volatility of pension expense.

First, there are components referred to as operating expenses. These are items directly attributable to the operation of the plan during the measurement year. Service cost less employee contributions represents the increase in employer-provided benefits attributable to the year, and administrative expenses are the cost of operating PFRS for the year.

Second, there are the financing expenses: the interest on the Total Pension Liability less the expected return on assets.

The final category is changes. This category will drive most of the volatility in pension expense from year to year. It includes any changes in benefits made during the year and the recognized amounts due to assumption changes, gains or losses on the TPL, and investment gains or losses. In the measurement year ending 2018, it also includes the impact of the transfer of the Palisades Interstate Park Commission (Employer Number 91999) from Local Employers to State.

The following table shows the development of pension expense for the State and Local Employers through both of these methodologies.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
GASB 68 REPORTING FOR JUNE 30, 2018 MEASUREMENT DATE**

SECTION IV – COLLECTIVE EMPLOYER REPORTING AMOUNTS

Table IV-3A Calculation of Collective Pension Expense State		
Measurement Year Ending	2018	2017
Change in Net Pension Liability	\$ (66,438,865)	\$ (315,001,052)
Change in Deferred Outflows	120,687,542	170,204,847
Change in Deferred Inflows	140,109,765	390,178,339
Employer Contributions*	149,969,781	117,025,277
Other - NCGIPF adjustment	<u>0</u>	<u>0</u>
Subtotal	\$ 344,328,223	\$ 362,407,411
Employer Contribution - delayed enrollments**	7,921	4,885
Employer Contribution - delayed appropriations**	2,902	1,748
Employer Contribution - retroactive**	292,238	0
Employer Contribution - additional**	<u>0</u>	<u>0</u>
Total Pension Expense	\$ 344,631,284	\$ 362,414,044
Total Pension Expense as % of Payroll	71.37%	74.65%
Operating Expenses		
Service cost	\$ 129,608,653	\$ 147,458,649
Employee contributions	(49,052,970)	(51,759,235)
Administrative expenses	<u>673,553</u>	<u>668,776</u>
Total	\$ 81,229,236	\$ 96,368,190
Financing Expenses		
Interest cost	\$ 364,075,387	\$ 346,552,375
Expected return on assets	<u>(102,398,317)</u>	<u>(108,008,995)</u>
Total	\$ 261,677,070	\$ 238,543,380
Changes		
Benefit changes	\$ 0	\$ 0
Transfers between State and Local Employers	23,364,856	0
Recognition of assumption changes	(23,820,209)	22,264,938
Recognition of liability gains and losses	(20,603,918)	(16,380,243)
Recognition of investment gains and losses	<u>22,784,249</u>	<u>21,617,779</u>
Total	\$ 1,724,978	\$ 27,502,474
Total Pension Expense	\$ 344,631,284	\$ 362,414,044

* Includes appropriations and lottery revenue

** Pension expense related to specific liabilities of individual employers

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
GASB 68 REPORTING FOR JUNE 30, 2018 MEASUREMENT DATE**

SECTION IV – COLLECTIVE EMPLOYER REPORTING AMOUNTS

Table IV-3B Calculation of Collective Pension Expense Local Employers		
Measurement Year Ending	2018	2017
Change in Net Pension Liability	\$ (1,797,560,920)	\$ (3,539,438,858)
Change in Deferred Outflows	999,256,345	1,685,905,839
Change in Deferred Inflows	979,042,913	2,493,692,455
Employer Contributions*	1,086,504,333	971,485,457
Other - NCGIPF adjustment	(12,230)	0
Subtotal	\$ 1,267,230,441	\$ 1,611,644,893
Employer Contribution - delayed enrollments**	83,012	174,501
Employer Contribution - delayed appropriations**	447,342	890,766
Employer Contribution - retroactive**	2,828,002	11,476,881
Employer Contribution - additional**	173,554	268,910
Total Pension Expense	\$ 1,270,762,351	\$ 1,624,455,951
Total Pension Expense as % of Payroll	38.27%	50.12%
Operating Expenses		
Service cost	\$ 901,126,971	\$ 988,879,379
Employee contributions	(346,551,913)	(344,119,149)
Administrative expenses	3,832,132	3,455,681
Total	\$ 558,407,190	\$ 648,215,911
Financing Expenses		
Interest cost	\$ 2,534,017,319	\$ 2,392,045,934
Expected return on assets	(1,593,757,948)	(1,603,660,187)
Total	\$ 940,259,371	\$ 788,385,747
Changes		
Benefit changes	\$ 0	\$ 0
Transfers between State and Local Employers	(23,364,856)	0
Recognition of assumption changes	(123,759,392)	191,346,896
Recognition of liability gains and losses	(247,519)	(12,791,628)
Recognition of investment gains and losses	(80,532,443)	9,299,025
Total	\$ (227,904,210)	\$ 187,854,293
Total Pension Expense	\$ 1,270,762,351	\$ 1,624,455,951

* Includes appropriations and State contributions made on behalf of Local employers

** Pension expense related to specific liabilities of individual employers

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
GASB 68 REPORTING FOR JUNE 30, 2018 MEASUREMENT DATE**

SECTION IV – COLLECTIVE EMPLOYER REPORTING AMOUNTS

Table IV-3C Calculation of Collective Pension Expense Total		
Measurement Year Ending	2018	2017
Change in Net Pension Liability	\$ (1,863,999,785)	\$ (3,854,439,910)
Change in Deferred Outflows	1,119,943,887	1,856,110,686
Change in Deferred Inflows	1,119,152,678	2,883,870,794
Employer Contributions*	1,236,474,114	1,088,510,734
Other - NCGIPF adjustment	(12,230)	0
Subtotal	\$ 1,611,558,664	\$ 1,974,052,304
Employer Contribution - delayed enrollments**	90,933	179,386
Employer Contribution - delayed appropriations**	450,244	892,514
Employer Contribution - retroactive**	3,120,240	11,476,881
Employer Contribution - additional**	173,554	268,910
Total Pension Expense	\$ 1,615,393,635	\$ 1,986,869,995
Total Pension Expense as % of Payroll	42.47%	53.31%
Operating Expenses		
Service cost	\$ 1,030,735,624	\$ 1,136,338,028
Employee contributions	(395,604,883)	(395,878,384)
Administrative expenses	4,505,685	4,124,457
Total	\$ 639,636,426	\$ 744,584,101
Financing Expenses		
Interest cost	\$ 2,898,092,706	\$ 2,738,598,309
Expected return on assets	(1,696,156,265)	(1,711,669,182)
Total	\$ 1,201,936,441	\$ 1,026,929,127
Changes		
Benefit changes	\$ 0	\$ 0
Transfers between State and Local Employers	0	0
Recognition of assumption changes	(147,579,601)	213,611,834
Recognition of liability gains and losses	(20,851,437)	(29,171,871)
Recognition of investment gains and losses	(57,748,194)	30,916,804
Total	\$ (226,179,232)	\$ 215,356,767
Total Pension Expense	\$ 1,615,393,635	\$ 1,986,869,995

* Includes State and Local employer appropriations, lottery revenue and State contributions made on behalf of Local employers

** Pension expense related to specific liabilities of individual employers

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
GASB 68 REPORTING FOR JUNE 30, 2018 MEASUREMENT DATE**

APPENDIX A – MEMBERSHIP INFORMATION

	Plan Membership			
	July 1, 2017			July 1, 2016
	State	Local Employers	Total	Total
Contributing Actives	6,746	33,394	40,140	39,389
Non-Contributing Actives	342	1,035	1,377	1,400
Terminated Vested	7	32	39	47
Inactive Receiving Benefits	6,568	37,187	43,755	43,011
Total	13,663	71,648	85,311	83,847
Annual Compensation for Contributing Actives	\$ 482,888,837	\$ 3,320,459,492	\$ 3,803,348,329	\$ 3,726,807,562
Annual Retirement Allowances for Those Receiving Benefits	\$ 306,789,433	\$ 2,095,977,170	\$ 2,402,766,603	\$ 2,315,888,032

* QDRO recipients are excluded from the counts

The July 1, 2017 membership information shown in the table above is based on Cheiron's processed data and may not match the prior actuary's report.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
GASB 68 REPORTING FOR JUNE 30, 2018 MEASUREMENT DATE**

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

A. Actuarial Assumptions

- | | |
|--|--|
| 1. Investment Rate of Return for determining Actuarially Determined Contributions | <ul style="list-style-type: none"> • July 1, 2017 valuation: 7.50% per annum, compounded annually. • July 1, 2018 valuation: 7.50% per annum, compounded annually. • 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. |
| 2. Long-Term Expected Rate of Return | 7.00% per annum, compounded annually. |
| 3. GASB 67 Effective Discount Rate | <ul style="list-style-type: none"> • June 30, 2017: 6.14% per annum, compounded annually. • June 30, 2018: 6.51% per annum, compounded annually. |
| 4. Administrative Expenses | 0.18% of the expected benefit payments for the year. |
| 5. Cost-of-Living Adjustments (COLAs) | No future COLAs are assumed. Previously granted COLAs are included in the data. |
| 6. Salary Increases | Representative salary increase rates are as follows: |

Age	Prior to FYE 2026	FYE 2026 and thereafter
25	8.98%	9.98%
30	5.97	6.97
35	4.17	5.17
40	3.33	4.33
45	2.90	3.90
50	2.75	3.75
55	2.60	3.60
60	2.35	3.35
64	2.10	3.10

- | | |
|-------------------------------------|--|
| 7. 401(a)(17) Pay Limit | \$270,000 in 2017 increasing 3.00% per annum, compounded annually. |
| 8. Social Security Wage Base | \$127,200 in 2017 increasing 4.00% per annum, compounded annually. |

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
GASB 68 REPORTING FOR JUNE 30, 2018 MEASUREMENT DATE**

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

9. Termination

Representative termination rates are as follows:

Age	Years of Service					
	0 - 1	2	3	4	5 - 9	10+
25	6.90%	2.03%	1.18%	0.60%	0.35%	0.00%
30	9.30	2.75	1.76	1.31	0.60	0.24
35	9.80	3.17	1.76	1.57	0.77	0.24
40	13.70	2.25	1.85	1.74	0.67	0.27
45	3.50	2.25	1.85	2.32	1.35	0.28
50	0.00	2.25	1.85	2.00	1.60	0.30
55	0.00	0.00	0.00	0.00	0.00	0.00

No termination is assumed after attainment of retirement eligibility.

All members with 10 or more years of service at termination are assumed to elect a deferred retirement benefit.

10. Disability

Representative disability rates are as follows:

Age	Ordinary Disability	Accidental Disability
25	0.045%	0.029%
30	0.147	0.278
35	0.265	0.393
40	0.362	0.423
45	0.394	0.396
50	0.449	0.179
55	0.554	0.161
60	1.024	0.161
64	1.680	0.161
65+	0.000	0.000

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

Members retiring under the ordinary disability decrement with less than four years of service are assumed to receive a return of Aggregate Contributions.

No members are assumed to receive the involuntary disability retirement benefit.

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

POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
GASB 68 REPORTING FOR JUNE 30, 2018 MEASUREMENT DATE

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

11. Mortality

Pre-Retirement Ordinary Mortality: RP-2000 Combined Healthy Mortality Tables projected on a generational basis from the base year of 2000 to 2013 using Projection Scale BB and the Conduent Modified 2014 Projection Scale thereafter.

Pre-Retirement Accidental Mortality: Custom table with representative rates as follows.

Age	Rates
25	0.006%
30	0.006
35	0.008
40	0.008
45	0.009
50	0.009
55	0.014
60	0.013
64	0.008
65+	0.000

No mortality improvement is assumed for pre-retirement accidental mortality.

Post-Retirement Healthy Female Retiree and Beneficiary Mortality:

RP-2000 Combined Healthy Mortality Tables projected on a generational basis from the base year of 2000 to 2013 using Projection Scale BB and the Conduent Modified 2014 Projection Scale thereafter.

Post-Retirement Healthy Male Retiree Mortality: RP-2000 Combined Healthy Mortality Tables 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 Retiree Mortality: Custom table with representative rates as follows.

Age	Rates
35	0.598%
40	0.634
45	0.803
50	1.058
55	1.210
60	1.426
65	1.949

No mortality improvement is assumed for disabled retiree mortality.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
GASB 68 REPORTING FOR JUNE 30, 2018 MEASUREMENT DATE**

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

12. Retirement

Representative retirement rates are as follows:

Age	Years of Service			
	Less Than 21	21 - 24	25	26+
40	4.00%	0.60%	45.57%	15.40%
45	4.00	0.60	54.83	15.40
50	4.30	0.60	57.62	18.48
55	6.00	0.00	64.94	24.47
60	3.20	0.00	77.49	27.34
64	37.50	0.00	85.24	51.03

Mandatory retirement at age 65.

Retirement rates for less than 25 years of service prior to age 55 apply only to members enrolled as of January 18, 2000 upon completion of 20 years of service.

13. Family Composition Assumptions

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

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

No additional dependent children or parents are assumed.

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

For current dependents receiving a benefit other than a pre-retirement accidental death benefit, those under age 19 are assumed to receive a benefit until age 19 while those over age 19 are assumed to receive a benefit for the remainder of their lifetime.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
GASB 68 REPORTING FOR JUNE 30, 2018 MEASUREMENT DATE**

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

14. Data

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

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

Inactive participants receiving benefits according to the 2016 data but omitted from the 2017 data are assumed to have died without a beneficiary.

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

B. 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. The unfunded actuarial liability is the actuarial liability on the valuation date less the actuarial value of assets.

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

- Beginning with the July 1, 2010 actuarial valuation, the accrued liability contribution shall be computed so that if the contribution is paid annually in level dollars, it will amortize the unfunded accrued liability over an open 30 year period.
- Beginning with the July 1, 2018 actuarial valuation, the accrued liability contribution shall be computed so that if the contribution is paid annually in level dollars, it will amortize the unfunded accrued liability over a closed 30 year period (i.e., for each subsequent actuarial valuation the amortization period shall decrease by one year).
- Beginning with the July 1, 2028 actuarial valuation, when the remaining amortization period reaches 20 years, any increase or decrease in the unfunded accrued liability as a result of actuarial losses or gains for subsequent valuation years shall serve to increase or decrease, respectively, the amortization period for the unfunded accrued liability, unless an increase in the amortization period will cause it to exceed 20 years. If an increase in the amortization period as a result of actuarial losses for a valuation year would exceed 20 years, the accrued liability contribution shall be computed for the valuation year using a 20 year amortization period.

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

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

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

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

2. Asset Valuation Method

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

The actuarial value of assets is adjusted to reflect actual contributions and benefit payments, an assumed 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.

APPENDIX C – SUMMARY OF PLAN PROVISIONS

This summary of Plan provisions provides an overview of the major provisions of the PFRS used in the actuarial valuation. It is not intended to replace the more precise language of the NJ State Statutes, Title 43, Chapter 16A, and if there is any difference between the description of the plan herein and the actual language in the NJ State Statutes, the NJ State Statutes will govern.

1. Eligibility of Membership

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

2. Plan Year

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

3. Creditable Service

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

4. Compensation

Base salary upon which contributions by a Member to the Annuity Savings Fund were based in the last year of service. Chapter 113, P.L. 1997 provides that Compensation cannot exceed the compensation limitation of Section 401(a)(17) of the Internal Revenue Code. Chapter 1, P.L. 2010 provides that for members hired on or after May 22, 2010, Compensation cannot exceed the annual maximum wage contribution base for Social Security, pursuant to the Federal Insurance Contribution Act.

5. Final Compensation

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

6. Aggregate Contributions

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

7. Member Contributions

Each Member contributes 10% of base salary.

APPENDIX C – SUMMARY OF PLAN PROVISIONS

8. Benefits

a) Service and Special Retirement

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

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

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

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

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

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

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

APPENDIX C – SUMMARY OF PLAN PROVISIONS

b) Deferred Retirement

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

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

For Members who die during the deferral period, the benefit is a return of Aggregate Contributions.

c) Non-Vested Termination

Termination of service prior to age 55 and less than 10 years of service credit.

Benefit is a return of Aggregate Contributions.

d) Death Benefits

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

- a. Lump sum payment equal to 350% of Compensation, also known as the non-contributory group life insurance benefit, plus
- b. Spousal life annuity of 50% of Final Compensation payable until spouse's death or remarriage. If there is no surviving spouse or upon death or remarriage, a total of 20% (35%, 50%) of Final Compensation payable to one (two, three or more) dependent child(ren). If there is no surviving spouse or dependent child(ren), 25% (40%) of Final Compensation to one (two) dependent parent(s). If there is no surviving spouse, dependent child(ren) or parent(s), the benefit is a refund of Aggregate Contributions.

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

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

APPENDIX C – SUMMARY OF PLAN PROVISIONS

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

- a. Lump sum payment equal to 50% of Compensation for a Member retired under service, special or deferred retirement. For a Member receiving a disability benefit, lump sum payment of 350% of Compensation if death occurs prior to age 55 and 50% of final compensation if death occurs after age 55. This benefit is also known as the non-contributory group life insurance benefit, plus
- b. For Members who retired on or after January 1, 1968, spouse life annuity of 50% of Final Compensation plus 15% (25%) of Final Compensation for one (two or more) dependent child(ren). The minimum benefit is \$4,500 per year. If there is no surviving spouse or upon death or remarriage, a total of 20% (35%, 50%) of Final Compensation payable to one (two, three or more) dependent child(ren). Previously granted COLAs also apply.

e) Disability Retirement

(1) Ordinary Disability Retirement: Four years of Creditable Service and totally and permanently incapacitated from the performance of usual or available duties.

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

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

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

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

- a) For Members with 20 years of Creditable Service but less than 25 years, 50% of Final Compensation plus 3% of Final Compensation for each year of Creditable Service in excess of 20 years, to a maximum of 65% of Final Compensation.
- b) For all other members, the Ordinary Disability benefit.

(3) Accidental Disability Retirement: Totally and permanently disabled as a direct result of a traumatic event occurring during and as a result of regular or assigned duties and such member is mentally or physically incapacitated for the performance of his usual duties.

Benefit is an annual retirement allowance comprised of a member annuity plus an employer pension which together equal $\frac{2}{3}$ of annual rate of compensation at the time of the traumatic event or retirement, whichever is greater.

APPENDIX C – SUMMARY OF PLAN PROVISIONS

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

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

9. Forms of Payment

No optional forms of payment are available.

10. Cost-of-Living Adjustments

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

11. Changes in Plan Provisions Since Last Valuation

None.

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
GASB 68 REPORTING FOR JUNE 30, 2018 MEASUREMENT DATE**

APPENDIX D – DETERMINATION OF DISCOUNT RATE

Table 1 - Projection of the Pension Plan's Fiduciary Net Position
(In Thousands)
Projections Commence June 30, 2018

Year	Projected Beginning Fiduciary Net Position (a)	Projected Member Contributions (b)	Projected Employer Contributions (c)	Projected Lottery Contributions (d)	Projected Benefit Payments (e)	Projected Administrative Expenses (f)	Projected Investment Earnings (g)	Projected Ending Fiduciary Net Position (h) = (a) + (b) + (c) + (d) - (e) - (f) + (g)
1	\$ 26,008,826	\$ 362,822	\$ 1,263,982	\$ 12,451	\$ 2,617,617	\$ 4,665	\$ 1,767,193	\$ 26,792,992
2	26,792,992	352,553	1,294,371	12,859	2,734,909	4,872	1,818,297	27,531,291
3	27,531,291	340,500	1,403,225	13,037	2,859,014	5,092	1,867,287	28,291,235
4	28,291,235	329,825	1,424,425	13,190	2,969,252	5,287	1,916,797	29,000,933
5	29,000,933	318,800	1,592,416	13,343	3,077,185	5,480	1,965,538	29,808,366
6	29,808,366	306,272	1,617,527	13,505	3,188,711	5,680	2,018,336	30,569,616
7	30,569,616	293,233	1,639,090	13,670	3,298,383	5,876	2,067,894	31,279,244
8	31,279,244	278,873	1,659,632	13,836	3,411,340	6,077	2,113,675	31,927,843
9	31,927,843	263,837	1,652,863	14,005	3,523,189	6,278	2,154,733	32,483,815
10	32,483,815	251,370	1,668,411	14,165	3,629,674	6,469	2,189,961	32,971,578
11	32,971,578	238,433	1,683,243	14,275	3,733,256	6,655	2,220,491	33,388,109
12	33,388,109	225,506	1,698,455	14,419	3,831,155	6,830	2,246,250	33,734,753
13	33,734,753	210,713	1,696,259	14,565	3,935,594	7,017	2,266,459	33,980,138
14	33,980,138	194,025	1,689,496	14,712	4,045,034	7,212	2,279,265	34,105,389
15	34,105,389	177,767	1,677,862	14,860	4,144,808	7,390	2,283,923	34,107,604
16	34,107,604	161,863	1,665,565	15,011	4,235,415	7,553	2,280,286	33,987,361
17	33,987,361	147,537	1,654,874	15,162	4,308,746	7,684	2,268,753	33,757,257
18	33,757,257	136,255	1,647,612	15,315	4,356,259	7,769	2,250,588	33,442,999
19	33,442,999	125,735	1,647,082	15,470	4,392,452	7,834	2,227,075	33,058,075
20	33,058,075	113,180	1,649,550	15,626	4,432,885	7,908	2,198,449	32,594,087
21	32,594,087	98,246	1,648,866	15,784	4,479,568	7,992	2,163,933	32,033,357
22	32,033,357	81,572	1,642,914	15,943	4,529,027	8,080	2,122,399	31,359,079
23	31,359,079	64,002	1,632,426	16,104	4,576,944	8,167	2,072,861	30,559,362
24	30,559,362	45,837	1,619,237	16,267	4,621,303	8,247	2,014,594	29,625,746
25	29,625,746	31,997	1,604,117	16,431	4,633,396	8,271	1,948,173	28,584,797
26	28,584,797	24,392	1,597,113	16,597	4,605,398	8,222	1,875,979	27,485,257
27	27,485,257	18,920	1,601,793	16,764	4,560,875	8,144	1,800,546	26,354,262
28	26,354,262	14,494	1,610,217	16,933	4,506,214	8,047	1,723,369	25,205,014
29	25,205,014	10,945	1,620,504	17,104	4,442,429	7,933	1,645,296	24,048,501
30	24,048,501	8,143	1,632,402	0	4,370,432	7,805	1,566,460	22,877,269
31	22,877,269	5,968	1,646,440	0	4,291,132	7,664	1,487,503	21,718,383
32	21,718,383	4,301	1,661,580	0	4,205,487	7,511	1,409,669	20,580,935
33	20,580,935	3,026	1,677,585	0	4,114,346	7,349	1,333,557	19,473,410
34	19,473,410	2,079	1,694,231	0	4,018,242	7,177	1,259,737	18,404,038
35	18,404,038	1,382	1,711,378	0	3,917,797	6,998	1,188,758	17,380,760
36	17,380,760	887	1,414,682	0	3,813,431	6,812	1,115,769	16,091,855
37	16,091,855	543	886,360	0	3,705,539	6,620	1,020,343	14,286,942
38	14,286,942	307	875,705	0	3,594,505	6,422	897,785	12,459,813
39	12,459,813	163	891,784	0	3,480,574	6,218	774,237	10,639,203
40	10,639,203	78	909,262	0	3,364,091	6,010	651,262	8,829,704
41	8,829,704	34	926,785	0	3,245,378	5,799	529,146	7,034,493
42	7,034,493	11	944,285	0	3,124,762	5,583	408,100	5,256,543
43	5,256,543	2	961,717	0	3,002,539	5,365	288,319	3,498,677
44	3,498,677	0	979,112	0	2,879,038	5,145	169,992	1,763,597
45	1,763,597	0	996,492	0	2,754,621	4,923	53,293	53,839
46	0	0	0	0	2,629,654	4,700	0	0
47	0	0	0	0	2,504,512	4,476	0	0
48	0	0	0	0	2,379,577	4,253	0	0
49	0	0	0	0	2,255,234	4,031	0	0
50	0	0	0	0	2,131,863	3,811	0	0
51	0	0	0	0	2,009,827	3,593	0	0
52	0	0	0	0	1,889,475	3,378	0	0
53	0	0	0	0	1,771,133	3,167	0	0
54	0	0	0	0	1,655,103	2,960	0	0
55	0	0	0	0	1,541,659	2,757	0	0
56	0	0	0	0	1,431,053	2,560	0	0
57	0	0	0	0	1,323,529	2,368	0	0
58	0	0	0	0	1,219,307	2,182	0	0
59	0	0	0	0	1,118,614	2,002	0	0
60	0	0	0	0	1,021,671	1,829	0	0

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
GASB 68 REPORTING FOR JUNE 30, 2018 MEASUREMENT DATE**

APPENDIX D – DETERMINATION OF DISCOUNT RATE

Table 1 - Projection of the Pension Plan's Fiduciary Net Position
(In Thousands)
Projections Commence June 30, 2018

Year	Projected Beginning Fiduciary Net Position (a)	Projected Member Contributions (b)	Projected Employer Contributions (c)	Projected Lottery Contributions (d)	Projected Benefit Payments (e)	Projected Administrative Expenses (f)	Projected Investment Earnings (g)	Projected Ending Fiduciary Net Position (h) = (a) + (b) + (c) + (d) - (e) - (f) + (g)
61	0	0	0	0	928,699	1,663	0	0
62	0	0	0	0	839,919	1,504	0	0
63	0	0	0	0	755,544	1,354	0	0
64	0	0	0	0	675,766	1,211	0	0
65	0	0	0	0	600,762	1,077	0	0
66	0	0	0	0	530,679	952	0	0
67	0	0	0	0	465,627	835	0	0
68	0	0	0	0	405,677	728	0	0
69	0	0	0	0	350,850	630	0	0
70	0	0	0	0	301,110	541	0	0
71	0	0	0	0	256,365	461	0	0
72	0	0	0	0	216,470	389	0	0
73	0	0	0	0	181,222	326	0	0
74	0	0	0	0	150,378	271	0	0
75	0	0	0	0	123,649	223	0	0
76	0	0	0	0	100,717	181	0	0
77	0	0	0	0	81,239	146	0	0
78	0	0	0	0	64,862	117	0	0
79	0	0	0	0	51,233	92	0	0
80	0	0	0	0	40,011	72	0	0
81	0	0	0	0	30,869	56	0	0
82	0	0	0	0	23,510	42	0	0
83	0	0	0	0	17,660	32	0	0
84	0	0	0	0	13,074	24	0	0
85	0	0	0	0	9,533	17	0	0
86	0	0	0	0	6,844	12	0	0
87	0	0	0	0	4,838	9	0	0
88	0	0	0	0	3,369	6	0	0
89	0	0	0	0	2,314	4	0	0
90	0	0	0	0	1,570	3	0	0
91	0	0	0	0	1,056	2	0	0
92	0	0	0	0	707	1	0	0
93	0	0	0	0	474	1	0	0
94	0	0	0	0	320	1	0	0
95	0	0	0	0	218	0	0	0
96	0	0	0	0	151	0	0	0
97	0	0	0	0	107	0	0	0
98	0	0	0	0	77	0	0	0
99	0	0	0	0	56	0	0	0
100	0	0	0	0	42	0	0	0
101	0	0	0	0	31	0	0	0
102	0	0	0	0	24	0	0	0
103	0	0	0	0	18	0	0	0
104	0	0	0	0	13	0	0	0
105	0	0	0	0	9	0	0	0
106	0	0	0	0	7	0	0	0
107	0	0	0	0	4	0	0	0
108	0	0	0	0	3	0	0	0
109	0	0	0	0	2	0	0	0
110	0	0	0	0	1	0	0	0
111	0	0	0	0	1	0	0	0
112	0	0	0	0	0	0	0	0
113	0	0	0	0	0	0	0	0
114	0	0	0	0	0	0	0	0
115	0	0	0	0	0	0	0	0

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
GASB 68 REPORTING FOR JUNE 30, 2018 MEASUREMENT DATE**

APPENDIX D – DETERMINATION OF DISCOUNT RATE

Table 2 - Actuarial Present Values of Projected Benefit Payments
(In Thousands)

Projections Commence June 30, 2018

* From Table 1 - Projection of the Pension Plan's Fiduciary Net Position, column (a)

** From Table 1 - Projection of the Pension Plan's Fiduciary Net Position, column (e)

Year	Projected Beginning Fiduciary Net Position*	Projected Benefit Payments for current Plan participants**	"Funded" Portion of Benefit Payments (d) = (c) if (b) >= (c)	"Unfunded" Portion of Benefit Payments (e) = (c) - (d)	Present Value of "Funded" Benefit Payments (f) = (d) / (1+7.00%) ^[(a) - .5]	Present Value of "Unfunded" Benefit Payments (g) = (e) / (1+3.87%) ^[(a) - .5]	Present Value of Benefit Payments Using the Single Discount Rate (h) = (c) / (1+6.51%) ^[(a) - .5]
(a)	(b)	(c)	(d) = (c) if (b) >= (c)	(e) = (c) - (d)	(f) = (d) / (1+7.00%) ^[(a) - .5]	(g) = (e) / (1+3.87%) ^[(a) - .5]	(h) = (c) / (1+6.51%) ^[(a) - .5]
1	\$ 26,008,826	\$ 2,617,617	\$ 2,617,617	\$ 0	\$ 2,530,546	\$ 0	\$ 2,536,407
2	26,792,992	2,734,909	2,734,909	0	2,470,969	0	2,488,179
3	27,531,291	2,859,014	2,859,014	0	2,414,109	0	2,442,198
4	28,291,235	2,969,252	2,969,252	0	2,343,170	0	2,381,428
5	29,000,933	3,077,185	3,077,185	0	2,269,482	0	2,317,234
6	29,808,366	3,188,711	3,188,711	0	2,197,882	0	2,254,536
7	30,569,616	3,298,383	3,298,383	0	2,124,743	0	2,189,621
8	31,279,244	3,411,340	3,411,340	0	2,053,746	0	2,126,272
9	31,927,843	3,523,189	3,523,189	0	1,982,321	0	2,061,843
10	32,483,815	3,629,674	3,629,674	0	1,908,630	0	1,994,404
11	32,971,578	3,733,256	3,733,256	0	1,834,671	0	1,926,012
12	33,388,109	3,831,155	3,831,155	0	1,759,609	0	1,855,781
13	33,734,753	3,935,594	3,935,594	0	1,689,325	0	1,789,918
14	33,980,138	4,045,034	4,045,034	0	1,622,711	0	1,727,313
15	34,105,389	4,144,808	4,144,808	0	1,553,959	0	1,661,801
16	34,107,604	4,235,415	4,235,415	0	1,484,046	0	1,594,396
17	33,987,361	4,308,746	4,308,746	0	1,410,973	0	1,522,920
18	33,757,257	4,356,259	4,356,259	0	1,333,207	0	1,445,659
19	33,442,999	4,392,452	4,392,452	0	1,256,340	0	1,368,626
20	33,058,075	4,432,885	4,432,885	0	1,184,958	0	1,296,851
21	32,594,087	4,479,568	4,479,568	0	1,119,099	0	1,230,455
22	32,033,357	4,529,027	4,529,027	0	1,057,435	0	1,168,047
23	31,359,079	4,576,944	4,576,944	0	998,713	0	1,108,299
24	30,559,362	4,621,303	4,621,303	0	942,423	0	1,050,682
25	29,625,746	4,633,396	4,633,396	0	883,074	0	989,082
26	28,584,797	4,605,398	4,605,398	0	820,315	0	923,051
27	27,485,257	4,560,875	4,560,875	0	759,238	0	858,287
28	26,354,262	4,506,214	4,506,214	0	701,064	0	796,200
29	25,205,014	4,442,429	4,442,429	0	645,926	0	736,982
30	24,048,501	4,370,432	4,370,432	0	593,886	0	680,748
31	22,877,269	4,291,132	4,291,132	0	544,963	0	627,566
32	21,718,383	4,205,487	4,205,487	0	499,146	0	577,471
33	20,580,935	4,114,346	4,114,346	0	456,381	0	530,445
34	19,473,410	4,018,242	4,018,242	0	416,562	0	486,409
35	18,404,038	3,917,797	3,917,797	0	379,797	0	445,280
36	17,380,760	3,813,431	3,813,431	0	345,296	0	406,942
37	16,091,855	3,705,539	3,705,539	0	313,577	0	371,274
38	14,286,942	3,594,505	3,594,505	0	284,281	0	338,149
39	12,459,813	3,480,574	3,480,574	0	257,262	0	307,429
40	10,639,203	3,364,091	3,364,091	0	232,385	0	278,990
41	8,829,704	3,245,378	3,245,378	0	209,518	0	252,704
42	7,034,493	3,124,762	3,124,762	0	188,534	0	228,449
43	5,256,543	3,002,539	3,002,539	0	169,308	0	206,104
44	3,498,677	2,879,038	2,879,038	0	151,724	0	185,554
45	1,763,597	2,754,621	1,763,597	991,024	86,860	182,925	166,691
46	0	2,629,654	0	2,629,654	0	467,302	149,408
47	0	2,504,512	0	2,504,512	0	428,481	133,605
48	0	2,379,577	0	2,379,577	0	391,939	119,186
49	0	2,255,234	0	2,255,234	0	357,619	106,058
50	0	2,131,863	0	2,131,863	0	325,460	94,132
51	0	2,009,827	0	2,009,827	0	295,398	83,323
52	0	1,889,475	0	1,889,475	0	267,362	73,548
53	0	1,771,133	0	1,771,133	0	241,279	64,730
54	0	1,655,103	0	1,655,103	0	217,072	56,795
55	0	1,541,659	0	1,541,659	0	194,660	49,670
56	0	1,431,053	0	1,431,053	0	173,962	43,290
57	0	1,323,529	0	1,323,529	0	154,896	37,592
58	0	1,219,307	0	1,219,307	0	137,382	32,516
59	0	1,118,614	0	1,118,614	0	121,341	28,009
60	0	1,021,671	0	1,021,671	0	106,696	24,019

**POLICE AND FIREMEN'S RETIREMENT SYSTEM OF NEW JERSEY
GASB 68 REPORTING FOR JUNE 30, 2018 MEASUREMENT DATE**

APPENDIX D – DETERMINATION OF DISCOUNT RATE

Table 2 - Actuarial Present Values of Projected Benefit Payments

(In Thousands)

Projections Commence June 30, 2018

* From Table 1 - Projection of the Pension Plan's Fiduciary Net Position, column (a)

** From Table 1 - Projection of the Pension Plan's Fiduciary Net Position, column (e)

Year	Projected Beginning Fiduciary Net Position*	Projected Benefit Payments for current Plan participants**	"Funded" Portion of Benefit Payments (d) = (c) if (b) >= (c)	"Unfunded" Portion of Benefit Payments (e) = (c) - (d)	Present Value of "Funded" Benefit Payments (f) = (d) / (1+7.00%) ^[(a) - .5]	Present Value of "Unfunded" Benefit Payments (g) = (e) / (1+3.87%) ^[(a) - .5]	Present Value of Benefit Payments Using the Single Discount Rate (h) = (c) / (1+6.51%) ^[(a) - .5]
(a)	(b)	(c)	(d) = (c) if (b) >= (c)	(e) = (c) - (d)	(f) = (d) / (1+7.00%) ^[(a) - .5]	(g) = (e) / (1+3.87%) ^[(a) - .5]	(h) = (c) / (1+6.51%) ^[(a) - .5]
61	0	928,699	0	928,699	0	93,373	20,499
62	0	839,919	0	839,919	0	81,301	17,407
63	0	755,544	0	755,544	0	70,409	14,702
64	0	675,766	0	675,766	0	60,628	12,346
65	0	600,762	0	600,762	0	51,891	10,305
66	0	530,679	0	530,679	0	44,129	8,547
67	0	465,627	0	465,627	0	37,277	7,041
68	0	405,677	0	405,677	0	31,268	5,760
69	0	350,850	0	350,850	0	26,034	4,677
70	0	301,110	0	301,110	0	21,511	3,769
71	0	256,365	0	256,365	0	17,632	3,013
72	0	216,470	0	216,470	0	14,334	2,389
73	0	181,222	0	181,222	0	11,553	1,878
74	0	150,378	0	150,378	0	9,229	1,463
75	0	123,649	0	123,649	0	7,306	1,129
76	0	100,717	0	100,717	0	5,729	864
77	0	81,239	0	81,239	0	4,449	654
78	0	64,862	0	64,862	0	3,420	490
79	0	51,233	0	51,233	0	2,601	364
80	0	40,011	0	40,011	0	1,955	267
81	0	30,869	0	30,869	0	1,452	193
82	0	23,510	0	23,510	0	1,065	138
83	0	17,660	0	17,660	0	770	97
84	0	13,074	0	13,074	0	549	68
85	0	9,533	0	9,533	0	385	46
86	0	6,844	0	6,844	0	266	31
87	0	4,838	0	4,838	0	181	21
88	0	3,369	0	3,369	0	122	14
89	0	2,314	0	2,314	0	80	9
90	0	1,570	0	1,570	0	52	6
91	0	1,056	0	1,056	0	34	4
92	0	707	0	707	0	22	2
93	0	474	0	474	0	14	1
94	0	320	0	320	0	9	1
95	0	218	0	218	0	6	1
96	0	151	0	151	0	4	0
97	0	107	0	107	0	3	0
98	0	77	0	77	0	2	0
99	0	56	0	56	0	1	0
100	0	42	0	42	0	1	0
101	0	31	0	31	0	1	0
102	0	24	0	24	0	1	0
103	0	18	0	18	0	0	0
104	0	13	0	13	0	0	0
105	0	9	0	9	0	0	0
106	0	7	0	7	0	0	0
107	0	4	0	4	0	0	0
108	0	3	0	3	0	0	0
109	0	2	0	2	0	0	0
110	0	1	0	1	0	0	0
111	0	1	0	1	0	0	0
112	0	0	0	0	0	0	0
113	0	0	0	0	0	0	0
114	0	0	0	0	0	0	0
115	0	0	0	0	0	0	0
					\$ 50,481,943	\$ 4,664,824	\$ 55,146,767

APPENDIX E – GLOSSARY OF TERMS

1. Actuarially Determined Contribution

A target or recommended contribution for the reporting period, determined in conformity with Actuarial Standards of Practice based on the most recent measurement available when the contribution for the reporting period was adopted.

2. Actuarial Valuation Date

The date as of which an actuarial valuation is performed. This date may be up to 24 months prior to the measurement date and up to 30 months prior to the employer's reporting date.

3. Deferred Inflow of Resources

An acquisition of net assets by a government employer that is applicable to a future reporting period. In the context of GASB 68, these are experience gains on the Total Pension Liability, assumption changes reducing the Total Pension Liability, or investment gains that are recognized in future reporting periods.

4. Deferred Outflow of Resources

A consumption of net assets by a government employer that is applicable to a future reporting period. In the context of GASB 68, these are experience losses on the Total Pension Liability, assumption changes increasing the Total Pension Liability, or investment losses that are recognized in future reporting periods.

5. Entry Age Actuarial Cost Method

The actuarial cost method required for GASB 68 calculations. Under this method, the actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis over the earnings of the individual between entry age and assumed exit ages. The portion of this actuarial present value allocated to a valuation year is called the Service Cost. The portion of this actuarial present value not provided for at a valuation date by the actuarial present value of future service costs is called the Total Pension Liability.

6. Measurement Date

The date as of which the Total Pension Liability and Plan Fiduciary Net Position are measured. The Total Pension Liability may be projected from the Actuarial Valuation Date to the Measurement Date. The Measurement Date must be the same as the Reporting Date for the plan.

APPENDIX E – GLOSSARY OF TERMS

7. Net Pension Liability

The liability of employers and nonemployer contributing entities for employees for benefits provided through a defined benefit pension plan. It is calculated as the Total Pension Liability less the Plan Fiduciary Net Position.

8. Plan Fiduciary Net Position

The fair or market value of assets.

9. Reporting Date

The last day of the plan or employer's fiscal year.

10. Service Cost

The portion of the actuarial present value of projected benefit payments that is attributed to the current period of employee service in conformity with the requirements of GASB 68. The Service Cost is the normal cost calculated under the entry age actuarial cost method.

11. Total Pension Liability

The portion of the actuarial present value of projected benefit payments that is attributed to past periods of employee service in conformity with the requirements of GASB 68. The Total Pension Liability is the actuarial liability calculated under the entry age actuarial cost method. This measurement generally is not appropriate for estimating the cost to settle the Plan's liabilities.