Conduent Human Resource Services
Retirement Consulting

The Police and Firemen's Retirement System of New Jersey

Information Required Under Governmental Accounting Standards Board Statement No. 68 as of June 30, 2017

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CONDUENT
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April 24, 2018

Director of the Division of Pension and Benefits
Division of Pension and Benefits
50 West State Street
One State Street Square
CN 295
Trenton, New Jersey 08625-0295

Director:

This valuation provides information concerning the Police and Firemen's Retirement System of New Jersey (PFRS) in accordance with the Governmental Accounting Standards Board (GASB) Statement No. 68. This Statement is an amendment of Statement No. 27, Accounting for Pensions by State and Local Government Employers effective for the fiscal year ending June 30, 2015, and thereafter.

This valuation reflects Chapter 26, P.L. 2016. This law increases the accidental death benefit payable to children if there is no surviving spouse to 70% of final compensation.

This valuation also reflects Chapter 83, P.L. 2016 which 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.

Finally, the valuation reflects Chapter 98, P.L. 2017 - Lottery Enterprise Contribution Act. Under the legislation, the Police and Firemen's Retirement System receives 1.2% of the proceeds of the Lottery Enterprise, based upon their members' past or present employment in schools and institutions in the State for a term of 30 years.

We certify that the information contained in this Actuarial Report has been prepared in accordance with generally accepted actuarial principles and practices. To the best of our knowledge, the information fairly presents the actuarial position of the PFRS in accordance with the requirements of GASB Statement No. 68 as of June 30, 2017. Information necessary to comply with the reporting requirements of GASB Statement No. 67 was provided in a separate Actuarial Report, which is available on the Division of Pensions and Benefits website. Please refer to that separate Actuarial Report for supplementary information documentation and support for the actuarial analysis and information presented herein.

The Board of Trustees, staff of the Division of Pensions and Benefits and its auditors may use this report for the review of the operation of the Plan. The report may also be used in the preparation of the audited financial statements of the State of New Jersey.

Use of this report for any other purpose or by anyone other than the Board of Trustees or the staff of the Division of Pensions and Benefits may not be appropriate and may result in mistaken conclusions because of failure to understand applicable assumptions, methods, or inapplicability of the report for that purpose. You should ask Conduent HR Consulting to review any statement you wish to make on the results contained in this report. Conduent HR Consulting will accept no liability for any such statement made without prior review by Conduent HR Consulting.

Future actuarial measurements may differ significantly from current measurements due to Plan experience differing from that anticipated by the economic and demographic assumptions, increases or decreases expected as part of the natural operation of the methodology used for these measurements, and changes in Plan provisions or applicable law. An analysis of the potential range of such future differences is beyond the scope of this valuation.

In preparing the actuarial results, we have relied upon information provided by the Division of Pensions and Benefits regarding Plan provisions, Plan participants, Plan assets, contribution rates and other matters used in the actuarial valuation. Although we did not audit the data, we reviewed the data for reasonableness and consistency with the prior year's information. The accuracy of the results presented herein is dependent on the accuracy of the data.

As required under Chapter 255, P.L. 1944, experience studies are performed once in every three year period. The valuation was prepared using the demographic assumptions recommended on the basis of the July 1, 2010 – June 30, 2013 Experience Study and approved by the Board of Trustees at the February 9, 2015 Board meeting. The Treasurer has recommended a change in the economic assumptions to be used to determine the actuarially determined contribution from 7.65% per annum to:

- 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, this valuation is based on a long-term expected rate of return of 7.00% per annum. However, the actuarially determined contribution is based on the above stated Treasurer recommended rate of investment return assumptions.

In my opinion, the actuarial assumptions used are appropriate for purposes of the valuation and are reasonably related to the experience of the System and to reasonable long-term expectations. The mortality improvement assumption was selected in accordance with Actuarial Standard of Practice No. 35.

This report was prepared under my supervision. I am a Fellow of the Society of Actuaries and a Member of the American Academy of Actuaries. I meet the Academy's qualification Standards to issue this Statement of Actuarial Opinion. This report has been prepared in accordance with all applicable Actuarial Standards of Practice. I am available to answer questions and supply any additional information.

Respectfully submitted,

Aaron Shapiro

Aaron Shapiro, FSA, EA, MAAA
Principal, Consulting Actuary
Conduent HR Consulting, LLC

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Section I – GASB 68 Information

Plan Description

Plan Administration. The State of New Jersey Division of Pensions and Benefits administers the Police and Firemen's Retirement System of New Jersey (Plan), a governmental cost sharing multiple-employer defined benefit pension plan that provides pensions for all individuals who become full-time policemen and firemen and who at the time of enrollment are no older than age 35.

The general responsibility for the proper operation of the Plan is vested in the Board of Trustees (Board), and the pension committees established pursuant to Chapter 78 P.L. 2011.

The Board of Trustees consists of 11 members, two policeman and two firemen who are active members of the System, one retiree of the System, five members appointed by the Governor and the State Treasurer. The Director of the Division of Pensions and Benefits of the State Department of the Treasury shall appoint a qualified employee of the division who shall be the secretary of the Board.

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 "target funded ratio" is achieved. The "target funded ratio" is defined as the ratio of the actuarial value of assets over the actuarially determined accrued liabilities expressed as a percentage that will be 75% in State fiscal year 2012, and increased annually by equal increments in each of the subsequent seven fiscal years, until the ratio reaches 80% at which time it is to remain for all subsequent fiscal years. The Local portion of the System has attained the required "target funded ratio" in Fiscal Year 2012, thus a pension committee has been established for the Local Employer portion of the System. The State portion of the System has not attained the required "target funded ratio" and thus a pension committee has not yet been established for the State portion of the System.

The pension committees consist of ten members; five members appointed by the Governor as representatives of the public employer whose employees are enrolled in the retirement system, two members who shall be appointed by the head of the union representing the greatest number of police officer members, one member who shall be appointed by the head of the union representing the second greatest number of police officer members, one member appointed by the head of the union representing the greatest number of firefighter members and one member who shall be appointed by the head of the union representing the second greatest number of firefighter members.

Chapter 78, P.L. 2011 grants the authority to amend the benefit terms of the Plan to the pension committees. The pension committees will have the discretionary authority to modify the member contribution rate, formula for calculation of final compensation, age at which a member may be eligible and the benefits for service and special retirement and benefits provided for disability benefit. The pension committees will have the authority to reactivate the cost of living adjustment and set the duration and extent of the activation. The pension committees must give priority consideration to the reactivation of the cost of living adjustment. No decision of the pension committees shall be implemented if the direct or indirect result of the decision will be that the Plan's funded ratio falls below the target funded ratio in any valuation period during the 30 years following the implementation of the decision.

Measurement Date. The net pension liability for fiscal year ending June 30, 2018 is determined at a measurement date of June 30, 2017. The total pension liability as of June 30, 2017 was determined by rolling forward the Plan's total pension liability as of July 1, 2016 to June 30, 2017. The plan fiduciary net position is the market value of plan assets as of June 30, 2017.

Data for Valuation. In preparing the actuarial valuation as of June 30, 2016, the actuary has relied on data and assets provided by the Division of Pensions and Benefits. While not verifying the data at their source, the actuary has performed tests for consistency and reasonableness.

The following is a summary of Plan participants and the development of the average expected remaining service lives of active and inactive members as of June 30, 2016:

	Number	Expected Remaining Years of Service
Inactive Plan members or beneficiaries currently receiving	43,011	0.00
Inactive Plan members entitled to but not yet receiving	47	0.00
Active Plan members	40,789	468,882.58
Total	83,847	468,882.58

Average expected remaining service lives of active and inactive members as of June 30, 2016: 5.59 years

Benefits Provided. Please see Section III of the report for a summary of Plan provisions.

Contributions. The Board establishes contributions based on an actuarially determined contribution recommended by an independent actuary and a contribution for the Non-Contributory Group Insurance Premium Fund (NCGIPF). The actuarially determined contribution is the estimated amount necessary to finance the costs of benefits earned by Plan members during the year, with an additional amount to finance a portion of any unfunded accrued liability. For the year ended June 30, 2017, the State and Local Employers contributed $1,088,510,734 to the Plan, per the financial statement. This amount excludes delayed enrollments, delayed appropriations, additional employer contributions, retroactive employer contributions, and transfer from other Systems. In addition, the administrative loan fee revenue is not included and has been used as an offset to administrative expenses.

Net Pension Liability

The Net Pension Liability excludes separately financed liabilities to the pension plan which are attributable to Chapter 19, P.L. 2009 and various Local employers' early retirement incentive programs (see Section III).

a. The components of the net pension liability at June 30, 2016, were as follows:

	State	Local	Total
NCGIPF			
Total pension liability	$ 129,350,706	$ 876,782,907	$ 1,006,133,613
Plan fiduciary net position	0	27,544,768	27,544,768
Plan net pension liability	$ 129,350,706	$ 849,238,139	$ 978,588,845
Pension			
Total pension liability	$ 6,126,268,976	$ 42,269,767,324	$ 48,396,036,300
Plan fiduciary net position	1,544,875,489	22,412,306,407	23,957,181,896
Plan net pension liability	$ 4,581,393,487	$ 19,857,460,917	$ 24,438,854,404
Total			
Total pension liability	$ 6,255,619,682	$ 43,146,550,231	$ 49,402,169,913
Plan fiduciary net position	1,544,875,489	22,439,851,175	23,984,726,664
Plan net pension liability	$ 4,710,744,193	$ 20,706,699,056	$ 25,417,443,249

b. The components of the net pension liability at June 30, 2017, were as follows:

	State	Local	Total
NCGIPF			
Total pension liability	$ 120,691,020	$ 837,769,519	$ 958,460,539
Plan fiduciary net position	0	34,659,280	34,659,280
Plan net pension liability	$ 120,691,020	$ 803,110,239	$ 923,801,259
Pension			
Total pension liability	$ 5,818,840,261	$ 40,633,420,938	$ 46,452,261,199
Plan fiduciary net position	1,543,788,140	24,269,270,979	25,813,059,119
Plan net pension liability	$ 4,275,052,121	$ 16,364,149,959	$ 20,639,202,080
Total			
Total pension liability	$ 5,939,531,281	$ 41,471,190,457	$ 47,410,721,738
Plan fiduciary net position	1,543,788,140	24,303,930,259	25,847,718,399
Plan net pension liability	$ 4,395,743,141	$ 17,167,260,198	$ 21,563,003,339

c. Sensitivity to Discount Rate: The following presents the net pension liability calculated using a discount rate that is 1-percentage-point lower or 1-percentage-point higher than the current rate.

June 30, 2016

	1% Decrease (4.55%)	Current (5.55%)	1% Increase (6.55%)
State	$ 5,612,325,178	$ 4,710,744,193	$ 3,977,817,225
Local	26,699,770,118	20,706,699,056	15,819,710,095
Total	$ 32,312,095,296	$ 25,417,443,249	$ 19,797,527,320

June 30, 2017

	1% Decrease (5.14%)	Current (6.14%)	1% Increase (7.14%)
State	$ 5,202,348,756	$ 4,395,743,141	$ 3,734,560,750
Local	22,619,279,081	17,167,260,198	12,687,806,745
Total	$ 27,821,627,837	$ 21,563,003,339	$ 16,422,367,495

Pension Expense as of June 30, 2017

	State	**Local**	**Total**
Service cost	$ 147,458,649	$ 988,879,379	$ 1,136,338,028
Interest cost	346,552,375	2,392,045,934	2,738,598,309
Expected return on assets	(108,008,995)	(1,603,660,187)	(1,711,669,182)
Current period effect of benefit changes	0	0	0
Current period difference between expected and actual experience	(5,833,272)	21,819,845	15,986,573
Current period effect of changes in assumptions	(81,470,716)	(550,828,742)	(632,299,458)
Current period difference between projected and actual investment earnings	(8,970,283)	(206,916,853)	(215,887,136)
Member contributions	(51,759,235)	(344,119,149)	(395,878,384)
Administrative expenses	668,776	3,455,681	4,124,457
Current period recognition of prior years' deferred outflows of resources	156,271,139	1,279,304,541	1,435,575,680
Current period recognition of prior years' deferred inflows of resources	(32,494,394)	(355,524,498)	(388,018,892)
Sub Total	$ 362,414,044	$ 1,624,455,951	$ 1,986,869,995
Pension expense related to specific liabilities of individual employers:			
Employer contribution - delayed enrollment	(4,885)	(174,501)	(179,386)
Employer contribution - delayed appropriations	(1,748)	(890,766)	(892,514)
Employer contribution - retroactive	0	(11,476,881)	(11,476,881)
Employer contribution - additional	0	(268,910)	(268,910)
Pension expense subject to allocation	$ 362,407,411	$ 1,611,644,893	$ 1,974,052,304

The pension expense for the fiscal year ending June 30, 2017 is based on the June 30, 2016 valuation.

The effect of the change in assumptions, experience different than expected and change in employers' proportion are recognized over the average expected remaining service lives of active and inactive members as of June 30, 2016 (5.59 years).

The difference between projected and actual investment earnings is recognized over 5 years.

Deferred Outflows of Resources and Deferred Inflows of Resources Related to Pensions

For the year ended June 30, 2017, employers of the System have a collective pension expense of $1,974,052,304 ($362,407,411 for State and $1,611,644,893 for Local employers). At June 30, 2017, there are deferred outflows of resources and deferred inflows of resources related to pensions from the following sources:

State	Deferred Outflow of Resources	Deferred Inflow of Resources
Changes in assumptions	$ 263,113,179	$ 373,950,589
Difference between expected and actual experience	0	56,987,315
Difference between projected and actual investment earnings	80,422,048	0
Total	$ 343,535,227	$ 430,937,904

Local	Deferred Outflow of Resources	Deferred Inflow of Resources
Changes in assumptions	$ 1,903,685,614	$ 2,528,303,928
Difference between expected and actual experience	100,153,088	90,608,610
Difference between projected and actual investment earnings	294,594,496	0
Total	$ 2,298,433,198	$ 2,618,912,538

Total	Deferred Outflow of Resources	Deferred Inflow of Resources
Changes in assumptions	$ 2,166,798,793	$ 2,902,254,517
Difference between expected and actual experience	100,153,088	147,595,925
Difference between projected and actual investment earnings	375,016,544	0
Total	$ 2,641,968,425	$ 3,049,850,442

Annual changes to the net pension liability (asset) resulting from differences between expected and actual experience with regard to economic and demographic factors and from changes of assumptions about future economic or demographic factors or other inputs are deferred and amortized over a closed period equal to the average of the expected service lives of all employees that are provided with pension benefits determined for the period during which the changes occurred. Differences between projected and actual earnings on pension plan investments are amortized over a closed 5-year period. The following presents a summary of changes in the collective outflows of resources and deferred inflows of resources for the year ended June 30, 2017:

Deferred (Inflows)/Outflows of Resources	Measurement Period July 1- June 30	Amortization Period	Original balance	Accumulated amortization	Beginning balance on prior measurement period deferrals	Current measurement period additions	Amounts recognized in current year expense	End of year balance
State								
Differences between expected and actual experience	2015	5.53	$ (39,739,980)	$ (14,372,506)	$ (25,367,474)	$ -	$ (7,186,253)	$ (18,181,221)
	2016	5.58	(18,752,809)	(3,360,718)	(15,392,091)	-	(3,360,718)	(12,031,373)
	2017	5.59	(32,607,993)	-	-	(32,607,993)	(5,833,272)	(26,774,721)
	Total		$ (91,100,782)	$ (17,733,224)	$ (40,759,565)	$ (32,607,993)	$ (16,380,243)	$ (56,987,315)
Difference due to changes in assumptions	2014	6.17	$ 86,206,580	$ 41,915,679	$ 44,290,901	$ -	$ 13,971,893	$ 30,319,008
	2015	5.53	466,416,499	168,685,894	297,730,605	-	84,342,947	213,387,658
	2016	5.58	30,248,141	5,420,814	24,827,327	-	5,420,814	19,406,513
	2017	5.59	(455,421,305)	-	-	(455,421,305)	(81,470,716)	(373,950,589)
	Total		$ 127,449,915	$ 216,022,387	$ 366,848,833	$ (455,421,305)	$ 22,264,938	$ (110,837,410)
Net difference between projected and actual earnings on investments	2014	5	$ (109,737,117)	$ (65,842,269)	$ (43,894,848)	$ -	$ (21,947,423)	$ (21,947,425)
	2015	5	96,779,272	38,711,708	58,067,564	-	19,355,854	38,711,710
	2016	5	165,898,157	33,179,631	132,718,526	-	33,179,631	99,538,895
	2017	5	(44,851,415)	-	-	(44,851,415)	(8,970,283)	(35,881,132)
	Total		$ 108,088,897	$ 6,049,070	$ 146,891,242	$ (44,851,415)	$ 21,617,779	$ 80,422,048
Local Employers								
Differences between expected and actual experience	2015	5.53	$ (175,382,458)	$ (63,429,460)	$ (111,952,998)	$ -	$ (31,714,730)	$ (80,238,268)
	2016	5.58	(16,163,828)	(2,896,743)	(13,267,085)	-	(2,896,743)	(10,370,342)
	2017	5.59	121,972,933	-	-	121,972,933	21,819,845	100,153,088
	Total		$ (69,573,353)	$ (66,326,203)	$ (125,220,083)	$ 121,972,933	$ (12,791,628)	$ 9,544,478
Difference due to changes in assumptions	2014	6.17	$ 563,607,575	$ 274,039,340	$ 289,568,235	$ -	$ 91,346,447	$ 198,221,788
	2015	5.53	3,289,057,973	1,189,532,720	2,099,525,252	-	594,766,360	1,504,758,892
	2016	5.58	312,830,596	56,062,831	256,767,765	-	56,062,831	200,704,934
	2017	5.59	(3,079,132,670)	-	-	(3,079,132,670)	(550,828,742)	(2,528,303,928)
	Total		$ 1,086,363,474	$ 1,519,634,891	$ 2,645,861,252	$ (3,079,132,670)	$ 191,346,896	$ (624,618,314)
Net difference between projected and actual earnings on investments	2014	5	$ (1,604,565,128)	$ (962,739,074)	$ (641,826,054)	$ -	$ (320,913,025)	$ (320,913,029)
	2015	5	841,058,873	336,423,549	504,635,324	-	168,211,775	336,423,549
	2016	5	1,844,585,642	368,917,128	1,475,668,514	-	368,917,128	1,106,751,386
	2017	5	(1,034,584,263)	-	-	(1,034,584,263)	(206,916,853)	(827,667,410)
	Total		$ 46,495,124	$ (257,398,397)	$ 1,338,477,784	$ (1,034,584,263)	$ 9,299,025	$ 294,594,496
Total								
Differences between expected and actual experience	2015	5.53	$ (215,122,438)	$ (77,801,966)	$ (137,320,472)	$ -	$ (38,900,983)	$ (98,419,489)
	2016	5.58	(34,916,637)	(6,257,461)	(28,659,176)	-	(6,257,461)	(22,401,715)
	2017	5.59	89,364,940	-	-	89,364,940	15,986,573	73,378,367
	Total		$ (160,674,135)	$ (84,059,427)	$ (165,979,648)	$ 89,364,940	$ (29,171,871)	$ (47,442,837)
Difference due to changes in assumptions	2014	6.17	$ 649,814,155	$ 315,955,019	$ 333,859,136	$ -	$ 105,318,340	$ 228,540,796
	2015	5.53	3,755,474,472	1,358,218,614	2,397,255,857	-	679,109,307	1,718,146,550
	2016	5.58	343,078,737	61,483,645	281,595,092	-	61,483,645	220,111,447
	2017	5.59	(3,534,553,975)	-	-	(3,534,553,975)	(632,299,458)	(2,902,254,517)
	Total		$ 1,213,813,389	$ 1,735,657,278	$ 3,012,710,085	$ (3,534,553,975)	$ 213,611,834	$ (735,455,724)
Net difference between projected and actual earnings on investments	2014	5	$ (1,714,302,245)	$ (1,028,581,343)	$ (685,720,902)	$ -	$ (342,860,448)	$ (342,860,454)
	2015	5	937,838,145	375,135,257	562,702,888	-	187,567,629	375,135,259
	2016	5	2,010,483,799	402,096,759	1,608,387,040	-	402,096,759	1,206,290,281
	2017	5	(1,079,435,678)	-	-	(1,079,435,678)	(215,887,136)	(863,548,542)
	Total		$ 154,584,021	$ (251,349,327)	$ 1,485,369,026	$ (1,079,435,678)	$ 30,916,804	$ 375,016,544

Amounts reported as deferred outflows of resources and deferred inflows of resources related to pensions will be recognized in the pension expense as follows:

Fiscal Year ending June 30	**State**	**Local**	**Total**
2018	$ 27,502,472	$ 187,854,289	$ 215,356,761
2019	49,449,899	508,767,317	558,217,216
2020	(17,766,271)	103,726	(17,662,545)
2021	(95,079,419)	(705,089,420)	(800,168,839)
2022	(51,509,358)	(312,115,252)	(363,624,610)
Thereafter	0	0	0

Actuarial Assumptions

The actuarial cost method used to develop the total pension liability is the Entry Age Normal Cost-Level Percent of Pay method, as required by GASB Statements No. 67.

The total pension liability as of June 30, 2017 was determined by rolling forward the Plan's total pension liability as of July 1, 2016 to June 30, 2017 using the following actuarial assumptions, applied to all periods included in the measurement. In addition, an amount of $289,960 has been added to the liability as of June 30, 2017 equal to the amount in the June 30, 2017 Plan Fiduciary Net Position for transfers from other systems.

The Treasurer has recommended a change in the economic assumptions to be used to determine the actuarially determined contribution from 7.65% per annum to:

- 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.

All other methods and assumptions used to determine the total pension liability are set forth in Section II and are consistent with the assumptions used for the July 1, 2016 actuarial valuation.

Long-Term Expected Rate of Return

The long-term expected rate of return used for this valuation is 7.00% per annum.

The long-term expected rate of return on pension System investments was determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of pension System investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation. Best estimates of arithmetic rates of return for each major asset class included in the System's target asset allocation as of June 30, 2017 are summarized in Appendix A, as provided by the Division of Pension and Benefits.

Discount rate

The discount rate is the single rate that reflects (1) the long-term expected rate of return on Plan investments that are expected to be used to finance the payment of benefits, to the extent that the Plan's fiduciary net position is projected to be sufficient to make projected benefit payments and Plan assets are expected to be invested using a strategy to achieve that return, and (2) a yield or index rate for 20-year, tax-exempt general obligation municipal bonds with an average rating of AA/Aa or higher (or equivalent quality on another scale), to the extent that the conditions for use of the long-term expected rate of return are not met.

The discount rates used to measure the total pension liability were 5.55% as of June 30, 2016 and 6.14% as of June 30, 2017. As discussed with the Division of Pensions and Benefits, the projection of cash flows used to determine the discount rate as of June 30, 2016 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 fiduciary net position, contributions, and projected benefit payments were based on the recommended demographic assumptions of the July 1, 2010 – June 30, 2013 Experience Study, which was approved by the Board of Trustees on February 9, 2015. Please see Section II of the report for a summary of the demographic assumptions.

  The Treasurer has recommended a change in the economic assumptions to be used to determine the actuarially determined contribution from 7.65% per annum to:

- 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.

Please see Section II of the report for a summary of the demographic and economic assumptions used to determine the actuarially determined contribution.

- It is assumed that the Locals will contribute 100.00% of their actuarially determined contribution and the NCGIPF contribution while the State will contribute 40.00% of the actuarially determined contribution and 100% of its NCGIPF contribution. . The 40.00% contribution rate is the actual total State contribution rate paid in fiscal year ending June 30, 2017 with respect to the actuarially determined contribution for the fiscal year ending June 30, 2017 for all State administered retirement systems.

- Prior to the July 1, 2017 valuation, it is assumed the State will make pension contributions the June 30th following the valuation date. Effective with the July 1, 2017 valuation, 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.

- Under Chapter 98, P.L. 2017 - Lottery Enterprise Contribution Act, the Police and Firemen's Retirement System receives 1.2% of the proceeds of the Lottery Enterprise, based upon their members' past or present employment in schools and institutions in the State for a term of 30 years. Revenues from Chapter 98, P.L. 2017 – Lottery Enterprise Contribution Act are assumed to be contributed to the trust on a monthly basis.

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 until fiscal year 2057. Municipal bond rates of 2.85% as of June 30, 2016 and 3.58% as of June 30, 2017 were used in the development of the blended GASB discount rate after that point. 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 7.65% and the municipal bond rate of 2.85% as of June 30, 2016 and the long-term rate of return of 7.00% and the municipal bond rate of 3.58% as of June 30, 2017, the blended GASB discount rates are 5.55% as of June 30, 2016 and 6.14% as of June 30, 2017. The assumed discount rate has been determined in accordance with the method prescribed by GASB Statement No. 67. We believe this assumption is reasonable for the purposes of the measurements required by the Statement.

The projections of the Fiduciary Net Plan Position are based on contributions to the plan in accordance with the State and the Local Employers' current funding policy and a 7.00% per annum long-term expected rate of return. Should contributions to the Plan be different from those outlined above, the results would be different and may result in the Fiduciary Net Plan Position not being sufficient to cover the Plan's benefit payments at some other future date and thus changing the discount rate used to determine the Plan's Total Pension Liability.

Actuarial Cost Method

Entry Age Normal – Level Percentage of Pay

Asset Valuation Method

Invested assets are reported at fair value.

Section II – Actuarial Assumptions and Methods

Investment Rate of Return to Determine the Actuarially Determined Contribution:

- July 1, 2016 valuation: 7.65% per annum, compounded annually.
- 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.

Long-Term Expected Rate of Return to Project the
Plan Fiduciary Net Position and GASB 67 Discount Rate: 7.00% per annum, compounded annually.

GASB 67 Effective Discount Rate:

- June 30, 2016: 5.55% per annum, compounded annually.
- June 30, 2017: 6.14% per annum, compounded annually.

COLA: No future COLA is assumed.

Separations from Service and Salary Increases: Representative values of the assumed annual rates of separation and annual rates of salary increases are as follows:

401(a)(17) Pay Limit: $265,000 for 2016 increasing 3.00% per annum, compounded annually.

Social Security Wage Base: $118,500 for 2016 increasing 4.00% per annum, compounded annually.

Annual Rates of

	Select Withdrawal					Ultimate Withdrawal
Age	Up to the 1st Year	2nd Year	3rd Year	4th Year	5 to 9 Years	After 9 Years
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

Annual Rates of

	Death			Disability	
	Ordinary				
Age	Male*	Female*	Accidental	Ordinary	Accidental
25	.035%	.019%	.006%	.045%	.029%
30	.041	.025	.006	.147	.278
35	.072	.045	.008	.265	.393
40	.100	.065	.008	.362	.423
45	.138	.103	.009	.394	.396
50	.195	.156	.009	.449	.179
55	.282	.233	.014	.554	.161
60	.435	.335	.013	1.024	.161
64	.593	.445	.008	1.680	.161
65 and over	0.000	0.000	0.000	0.000	0.000

* RP2000 Employee Pre-Retirement mortality tables projected thirteen-years using Projection Scale BB and then projected on a generational basis using the Conduent Modified 2014 Projection Scales. The above tables are representative for the 2016 valuation.

Age	Service Retirements Length of Service Less Than 21 Years*	21 to 24 Years	25 Years	26 or More Years	Salary Increases Effective July 1, 2016 FY2016 to FY2026	FY2026 and thereafter	Salary Increases Effective July 1, 2015 FY2016 to FY2026	FY2022 and thereafter
25					8.98%	9.98%	9.48%	10.48%
30					5.97	6.97	6.47	7.47
35					4.17	5.17	4.67	5.67
40	4.00%	0.60%	45.57%	15.40%	3.33	4.33	3.83	4.83
45	4.00	0.60	54.83	15.40	2.90	3.90	3.40	4.40
50	4.30	0.60	57.62	18.48	2.75	3.75	3.25	4.25
55	6.00	0.00	64.94	24.47	2.60	3.60	3.10	4.10
60	3.20	0.00	77.49	27.34	2.35	3.35	2.85	3.85
64	37.50	0.00	85.24	51.03	2.10	3.10	2.60	3.60
65 and over	100.00	100.00	100.00	100.00				

* Retirement assumption prior to age 55 is for any member as of January 18, 2000 upon completion of 20 years of service.

Deaths after Retirement: RP-2000 Combined Healthy Mortality Tables projected one year using Projection Scale AA and three years using the Conduent Modified 2014 Projection Scales is the base table as of the 2016 measurement date for male service retirements and will be further projected on a generational basis using the Conduent Modified 2014 Projection Scales. RP-2000 Combined Healthy Mortality Tables projected thirteen-years using Projection Scale BB and then three years projected using the Conduent Modified 2014 Projection Scales is the base table as of the 2016 measurement date for female service retirements and beneficiaries and will be further projected on a generational basis using the Conduent Modified 2014 Projection Scales. Special mortality tables are used for the period after disability retirement. The following representative values of the assumed annual rates of mortality are effective 2016:

Age	Service Retirements Men	Women	Beneficiaries Men	Women	Age	Disability Retirements
55	0.344%	0.250%	0.337%	0.250%	35	0.598%
60	0.649	0.431	0.602	0.431	40	0.634
65	1.221	0.794	1.059	0.794	45	0.803
70	2.098	1.362	1.750	1.362	50	1.058
75	3.551	2.290	2.959	2.290	55	1.210
80	6.055	3.741	5.026	3.741	60	1.426
85	10.464	6.306	8.658	6.306	65	1.949

Marriage: Husbands are assumed to be 3 years older than wives. Among the active population, 90% of participants are assumed married. No children are assumed. Neither the percentage married nor the number of children assumption is individually explicit, but they are considered reasonable as a single combined assumption.

Valuation Method:

GASB actuarial cost method: Entry Age Normal – Level Percentage of Pay

Funding calculations: Projected Unit Credit Method. This method essentially funds the System's benefits accrued to the valuation date. Experience gains and losses are recognized in future accrued liability contributions. 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 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.

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.

State Contribution Payable Dates:

Prior to the July 1, 2017 valuation, it is assumed the State will make pension contributions the June 30th following the valuation date. Effective with the July 1, 2017 valuation, 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 addition, revenues from Chapter 98, P.L. 2017 – Lottery Enterprise Contribution Act are assumed to be contributed to the trust on a monthly basis.

Receivable Contributions:

For the July 1, 2016 valuation, State contributions are expected to be paid the June 30th following the valuation date and are discounted by the valuation interest rate of 7.65% to the valuation date. Effective with the July 1, 2017 valuation, State contributions are expected to be paid in equal quarterly amounts as of September 30th, December 31st, March 31st, and June 30th following the valuation date and are discounted by the interest rate used at the valuation date.

Local contributions expected to be paid the April 1st, following the valuation are discounted by the valuation interest rate of 7.65% to the valuation date for the July 1, 2016 valuation and by the interest rate used at future valuation dates.

Asset Valuation Method:

GASB method used to value investments: Investments are reported at fair value.

Funding calculations: A five year average of market values with write-up was used. This method takes into account appreciation (depreciation) in investments in order to smooth asset values by averaging the excess of the actual over the expected income, on a market value basis, over a five-year period.

Section III – Summary of Plan Provisions

New Jersey Statutes, Title 43, Chapter 16A.

Eligibility for Membership

Enrollment is restricted to eligible policemen and firemen who are permanent and full-time and who pass the physical and mental fitness requirements. The maximum enrollment age is 35.

1. <u>Definitions</u>

Plan Year	The 12-month period beginning on July 1 and ending on June 30.
Credited 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.
Average Final Compensation (AFC)	The average annual compensation for the three consecutive years of Service immediately preceding retirement or the highest three consecutive fiscal years of Membership Service.
Compensation	Base salary upon which contributions by a Member to the Annuity Savings Fund were based in the last year of Service. For Accidental Death, benefits are computed at the annual rate of salary. In accordance with Chapter 1, P.L. 2010, 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.
Final Compensation (FC)	Annual compensation received by the member in the last 12 months of Credited Service preceding his retirement. In accordance with Chapter 1, P.L. 2010, for members hired on or after May 22, 2010, FC means the average annual compensation for the three fiscal years of membership providing the largest benefit.
Accumulated Deductions	The sum of all amounts deducted from the compensation of a Member or contributed by him or on his behalf without interest.

2. <u>Benefits</u>

Service Retirement	Eligibility means age 55 or 20 years of credited service for an employee who was a member of the Retirement System as of January 18, 2000 and age 55 for an employee who became a member of the Retirement System after January 18, 2000; mandatory at age 65 (except that a member hired prior to January 1, 1987 may remain a member of the Retirement System until the member attains the earlier of age 68 or 25 years of creditable service). Benefit is an annual retirement allowance equal to a member annuity plus an employer pension which together equals the greater of:

(i) 1/60th of FC for each year of Credited Service; or

(ii) 2% of FC multiplied by years of Credited Service up to 30 plus 1% of FC multiplied by years of Service over 30. (Prior to January 18, 2000, this benefit was based on AFC rather than FC. However, Policy Memorandum 4-2000, which interpreted the provisions of Chapter 428, P.L. 1999, authorized the change in the salary basis).

(iii) 50% of FC if the member has 20 or more years of Credited Service.

Chapter 428 also requires that, in addition to the 50% of FC benefit, any member as of January 18, 2000 who will have 20 or more years of Credited Service and is required to retire upon attaining age 65 (except that a member hired prior to January 1, 1987 may remain a member of the System until the member attains the earlier of age 68 or 25 years of creditable service), shall receive an additional benefit equal to 3% of FC for each year of Credited Service over 20 years but not over 25 years.

Special Retirement

After completion of 25 years of Credited Service. The annual retirement benefit is equal to a member annuity plus an employer pension which together equal 65% of FC plus 1% of FC for each year of Credited Service over 25. Effective for members hired after June 28, 2011, the annual retirement benefit is equal to a member annuity plus an employer pension which together equal 60% of FC plus 1% of FC for each year of Credited Service over 25. There is a maximum benefit of 70% of FC (65% of FC for members hired after June 28, 2011) except for those members with 30 or more years of Credited Service on June 30, 1979.

Vested Termination

(A) Eligible upon termination of service prior to age 55 and prior to 10 years of Credited Service. The benefit equals a refund of Accumulated Deductions less any outstanding loans.

(B) Eligible upon termination of service prior to age 55 and after 10 years of Credited Service (but less than 20 years if a member on or prior to January 18, 2000 or less than 25 years of service if a member after January 18, 2000). The benefit is a deferred retirement benefit, commencing at age 55, equal to a member annuity plus an employer pension which together provide a retirement allowance equal to 2% of FC multiplied by years of Credited Service up to 30 plus 1% of FC multiplied by years of Credited Service over 30.

Death Benefits

Ordinary Death Benefit - Lump Sum (NCGIPF)

(1) If a member dies prior to retirement, the benefit payable is as follows:

A lump sum amount equal to 3-1/2 times FC payable to the member's beneficiary.

(2) After retirement but prior to age 55, the benefit is as follows:

(i) For death while a Disabled Retiree the benefit is equal to 3-1/2 times Compensation.

(ii) For death while a Deferred Retiree the benefit is equal to his Accumulated Deductions.

(iii) For death while a Retiree who has completed 20 years of Credited Service, the benefit is equal to 1/2 times FC.

(3) After retirement and after age 55, the benefit payable is equal to 1/2 times Compensation. (Note: If a Member is not disabled, 10 years of Credited Service is required for Members enrolling after July 1, 1971.)

Ordinary Death Benefit - Survivor Annuity

(1) If a member dies prior to retirement, the benefit payable to a widow (widower) is equal to 50% of FC (20% of FC payable to one child, 35% of FC payable to two children or 50% of FC payable to three or more children if there is no surviving widow or widower or if the widow or widower dies or remarries or 25% of FC payable to one parent or 40% of FC payable to two parents if no surviving widow, widower or child. If no widow, widower, child or parent, the benefit payable to a beneficiary is the aggregate Accumulated Contributions at the time of death).

(2) For any member who retired after December 18, 1967, the benefit payable to a widow (widower) is equal to 50% of FC plus 15% of FC for one child and 25% of FC for two or more children.

If no spouse, or spouse remarries, the benefit is equal to 20% of FC for one child, 35% for two children, and 50% for three or more children.

There is also a minimum benefit payable to widows (widowers) of $4,500 a year.

(3) For any member who retired with an Accidental Disability Benefit, the benefit payable is equal to $4,500 a year to the widow (widower). If there is no widow (widower) the benefit payable is $600 a year for 1 child, $960 a year for 2 children, and $1,500 a year for 3 or more children. The benefit for children is payable until age 18.

Accidental Death Benefit

A death while active resulting from injuries received from an accident during performance of duty is eligible for a lump sum equal to the Accumulated Deductions plus 3-1/2 times Compensation plus an annuity benefit payable is as follows:

(i) The benefit to a widow or widower is equal to 70% of Compensation.

(ii) The benefit, when there is no spouse, or spouse is remarried, is equal to 70% of Compensation to surviving children in equal shares. The benefit is payable while the children are under age 18, or until age 24 if they are full-time students, or it is payable for life if they are disabled.

(iii) The benefit, when there is no spouse or children, is equal to 25% of Compensation for one parent and 40% for two parents.

(iv) The benefit, when there is no relation as stated above, is equal to the Accumulated Deductions and is payable to a beneficiary or to the Member's estate. This is also the minimum benefit payable under (i), (ii) and (iii).

Disability Benefits

Ordinary Disability Retirement

A Member is eligible for Ordinary Disability Retirement if he (she) has 4 years of Service and is totally and permanently incapacitated from the performance of usual or available duties. The benefit is equal to the greater of:

(i) 1-1/2% of FC times the number of years of Credited Service; or

(ii) 40% of FC.

In addition, a member who has at least 20 years but less than 25 years of Credited Service and who is required to retire upon application by the employer on and after January 18, 2000 shall receive a benefit equal to a member annuity plus an employer pension which together provide a total retirement allowance equal to 50% of FC plus 3% of FC multiplied by the number of years of Credited Service over 20 but not over 25.

Accidental Disability Retirement

A Member is eligible upon total and permanent incapacitation from the performance of usual or available duties as a result of injury during the performance of regular duties. The benefit payable is equal to a Member annuity plus an employer pension which together equals 2/3 of the Compensation at date of injury.

Special Disability Retirement

A member is eligible for Special Disability Retirement if he (she) has 5 years of Credited Service, is under age 55, and has received a heart transplant. The benefit payable is equal to a Member annuity plus an employer pension which together equals 50% of FC.

3. Member Contributions

Each member contributes 8.5% of Compensation. Chapter 78, P.L. 2011 increased the Member Contributions from 8.5% to 10.0% of Compensation effective October 2011.

4. Chapter 19, P.L. 2009

Chapter 19, P.L. 2009 provides that the State Treasurer will reduce for Local employers the normal and accrued liability contributions to 50 percent of the amount certified for fiscal years 2009. The additional unfunded liability will be paid by 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 annually by the rate of return on the actuarial value of assets. The legislation also provides that a Local employer may opt to pay 100 percent of the recommended contribution for fiscal year 2009. Employers making this election will be credited with the full payment. In addition, certain employers who were eligible to defer 50% of their fiscal year 2009 recommended contributions but instead paid 100% of the 2009 recommended contributions are permitted to elect to defer 50% of their recommended 2010 fiscal year contributions. The additional unfunded liability will be paid by 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.

5. Early Retirement Incentive Contribution

The following legislation provides additional retirement benefits to certain employees of Local employers: Ch. 99, P.L. 1993, Ch. 59, P.L. 1999, Ch. 126, P.L. 2000 and Ch. 130, P.L. 2003. The cost of the enhanced pension benefits will be funded by employer contributions to the retirement system and paid by the employer that elected to participate. The additional pension liability shall be paid by each electing employer entity over a period of years.

Appendix A – Information on Projected Returns by Asset Class Provided by the Division of Pensions and Benefits

FY18 Long-Term Expected Rate of Return

The best estimate long-term expected rate of return for the Pension Fund is based on the targeted asset allocation, long-term capital market assumptions (including compound expected returns, volatility of returns, and correlation of returns), and the application of modern portfolio theory. Long-term capital market assumptions are determined by a survey of a wide universe of third party investment professionals and reflect nominal return expectations, as well as the analysis of the Division of Investment and its team of outside investment consultants.

Asset Class	Targeted Asset Allocation	Expected Returns (Arithmetic)
Risk Mitigation Strategies	5.00%	5.51%
Cash Equivalents	5.50%	1.00%
US Treasuries	3.00%	1.87%
Investment Grade Credit	10.00%	3.78%
High Yield	2.50%	6.82%
Global Diversified Credit	5.00%	7.10%
Credit-Oriented HFs	1.00%	6.60%
Debt-Related PE	2.00%	10.63%
Debt Related Real Estate	1.00%	6.61%
Private Real Assets	2.50%	11.83%
Equity Related Real Estate	6.25%	9.23%
US Equity	30.00%	8.19%
Non-US Dev Market Eq	11.50%	9.00%
Emerging Market Eq	6.50%	11.64%
Buyouts/Venture Cap	8.25%	13.08%
Portfolio One-Year Arithmetic Return		7.83%
Portfolio Standard Deviation		12.27%
Portfolio Long-Term Expected Return		7.14%
Long-Term Expected Rate of Return		7.00%