Conduent Human Resource Services
Retirement Consulting

The State Police Retirement System of New Jersey

Information Required Under Governmental Accounting Standards Board Statement No. 67 as of June 30, 2017

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CONDUENT
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March 23, 2018

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

Director:

This valuation provides information concerning the State Police Retirement System of New Jersey in accordance with the Governmental Accounting Standards Board (GASB) Statement No. 67, effective for the fiscal year ending June 30, 2017.

This valuation reflects Chapter 26, P.L. 2016. This law amends the definition of "child" to include a child 18 years of age or older and enrolled in a secondary school, or under the age of 24 and enrolled in a degree program in an institution of higher education for at least 12 credit hours in each semester, provided that the member died in the line of duty while in active service. This law also 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.

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 State Police Retirement System of New Jersey in accordance with the requirements of GASB Statement No. 67 as of June 30, 2017.

The Board of Trustees may use this report for the review of the operation of the plan and as a source of information for the State financial statements. The report may also be used in the preparation of the plan's audited financial statements.

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. Conduent HR Consulting should be asked to review any statement to be made on the basis of 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 Section 32 of Chapter 89, P.L. 1965, experience studies are performed once in every three year period. The valuation was prepared using demographic assumptions recommended on the basis of the July 1, 2011 – June 30, 2014 Experience Study and approved by the Board of Trustees at the January 26, 2016 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 projected actuarially determined contributions are 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

Table of Contents

Section I – GASB 67 Information

Notes to the Financial Statements for the Year Ended June 30, 2017

Summary of Significant Accounting Policies

Method used to value investments: Investments are reported at fair value.

Actuarial cost method: Entry Age Normal – Level Percentage of Pay

Plan Description

Plan administration. The State of New Jersey Division of Pensions and Benefits administers the State Police Retirement System of New Jersey (Plan), a single-employer defined benefit pension plan that provides pensions for all individuals who become full-time troopers or commissioned or noncommissioned officers of the Division of State Police enrolled in the Plan.

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

The Board of Trustees consists of two active or retired members of the system appointed by the Superintendent of State Police, two members appointed by the Governor, the State Treasurer, who serves as an ex-officio member, and a member appointed by the Director of the Division of Pensions and Benefits of the State Department of the Treasury who shall be the secretary of the Board.

In accordance with Chapter 78, P.L. 2011, a pension committee is to be established when the Plan's "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 it is to remain for all subsequent fiscal years. The Plan attained the required 75% "target funded ratio" in Fiscal Year 2012, establishing the pension committee for the Plan.

The pension committee consists of four members appointed by the Governor as representatives of the public employer whose employees are enrolled in the Plan, three members appointed by the head of the State Troopers Fraternal Association, and one who is appointed by the head of the union representing the greatest number of members of the Plan who are supervisory officers having union membership.

Chapter 78, P.L. 2011 grants the authority to amend the benefit terms of the Plan to the pension committee. The pension committee will have the discretionary authority to modify the member contribution rate, formula for calculation of final compensation, fraction used to calculate the retirement allowance, age at which a member may be eligible and the benefits for service or early retirement and benefits provided for disability benefit. The pension committee will not have the authority to change the number of years required for vesting. The pension committee will have the authority to reactivate the cost of living adjustment and set the duration and extent of the activation. The pension committee must give priority consideration to the reactivation of the cost of living adjustment. No decision of the pension committee 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.

Plan membership. Pension plan membership consisted of the following:

	June 30, 2015	June 30, 2016
Inactive plan members or beneficiaries currently receiving	3,511	3,566
Inactive plan members entitled to but not yet receiving	0	0
Active plan members	2,676	2,725
	6,187	6,291

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 contributed $53,006,614 to the Plan per the financial statement. This amount excludes transfers from other systems. In addition, the administrative loan fee revenue is not included and has been used as an offset to administrative expenses.

Investments

Rate of return. The money-weighted rate of return expresses investment performance, net of investment expense, adjusted for the changing amounts actually invested. A system specific money-weighted rate of return has not been calculated. The annual money-weighted rate of return on pension plan investments, net of pension plan investment expense, for the co-mingled trust is as follows.

June 30, 2016	June 30, 2017
(1.15%)	13.01%

Receivables

N/A.

Net Pension Liability

The components of the net pension liability were as follows:

	June 30, 2016	June 30, 2017
Total pension liability	$ 5,673,706,321	$ 5,124,274,114
Plan fiduciary net position	(1,694,962,112)	(1,761,497,335)
State's net pension liability	$ 3,978,744,209	$ 3,362,776,779
Plan fiduciary net position as a percentage of the total pension liability	29.87%	34.38%

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 Statement 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 $3,925 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 Pensions and Benefits.

Discount rate

The Tables presented in pages 7 through 10 illustrate the projections and calculations used to determine the discount rate as required by paragraphs 40−45 of this Statement as of June 30, 2017. A similar analysis was performed in determining the discount rate as of June 30, 2016. 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 3.55% as of June 30, 2016 and 4.42% 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, 2017 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, 2011 – June 30, 2014 Experience Study, which was approved by the Board of Trustees on January 26, 2016.

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 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.

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 2037. 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 3.58% as of June 30, 2017, the blended GASB discount rates are 3.55% as of June 30, 2016 and 4.42% as of June 30, 2017. The assumed discount rates have 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’s current funding policy and a 7.00% per annum long-term expected rate of return. Should contributions to the Plan be different from those based on the State’s current funding policy, the results shown in Tables 1 and 2 would reflect the new contribution policy 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.

Schedules of Required Supplementary Information

Sensitivity of the net pension liability to changes in the discount rate. The following presents the net pension liability, calculated using the discount rate of 4.42%, as well as what the State's net pension liability would be if it were calculated using a discount rate that is 1-percentage-point lower (3.42%) or 1-percentage-point higher (5.42%) than the current rate:

	1% Decrease (3.42%)	Current Discount Rate (4.42%)	1% Increase (5.42%)
Net Pension Liability	$ 4,177,923,905	$ 3,362,776,779	$ 2,713,454,218

Schedule of Changes in the State's Net Pension Liability and Related Ratios

	Increase (Decrease)		
Changes in Net Pension Liability	**Total Pension Liability (a)**	**Plan Fiduciary Net Positon (b)**	**Net Pension Liability (a) - (b)**
Balances as of June 30, 2016	$ 5,673,706,321	$ 1,694,962,112	$ 3,978,744,209
Changes for the year:			
Service cost	139,506,057		139,506,057
Interest on total pension liability	202,545,532		202,545,532
Effect of plan changes	0		0
Effect of economic/demographic (gains) or losses	23,786,696		23,786,696
Effect of assumptions changes or inputs	(697,970,471)		(697,970,471)
Benefit payments	(217,303,946)	(217,303,946)	0
Administrative expenses		(294,745)	294,745
Member contributions		23,721,785	(23,721,785)
Net investment income		207,401,590	(207,401,590)
Employer contributions		53,006,614	(53,006,614)
Transfers from other systems	3,925	3,925	0
Balances as of June 30, 2017	$ 5,124,274,114	$ 1,761,497,335	$ 3,362,776,779

Plan fiduciary net position as a percentage of the total pension liability 34.38%

Covered-employee payroll as of the July 1, 2016 actuarial valuation $ 277,771,135
Net pension liability as a percentage of covered-employee payroll 1,210.63%

Notes to Schedule:

Benefit changes. Chapter 26, P.L. 2016 - This law amends the statutes to do the following:

1. Changes the definition of "child" to include a child 18 years of age or older and enrolled in a secondary school, or under the age of 24 and enrolled in a degree program in an institution of higher education for at least 12 credit hours in each semester, provided that the member died in the line of duty while in active service.

2. Increases the accidental death benefit payable to children if there is no surviving spouse to 70% of final compensation.

Based on the demographic assumptions presented in Section II, Chapter 26, P.L. 2016 has no impact on the June 30, 2017 total pension liability.

Changes of assumptions*.* The discount rate changed from 3.55% as of June 30, 2016 to 4.42% as of June 30, 2017 in accordance with Paragraph 44 of the GASB Statement No. 67. In addition, the June 30, 2017 discount rate was determined based on a long-term expected rate of return assumption of 7.00% per annum. Please see Section II of the report for a summary of the assumptions..

Employer Contributions. Includes the State's actual contributions of $ 51,038,000 and contributions to the NCGIPF of $1,968,614.

Schedule of State Contributions

	2016	**2017**
Actuarially determined contribution	$ 120,800,705	$ 135,017,662
Contributions related to the actuarially determined contribution[1]	$ 37,435,541	$ 53,006,614
Contribution deficiency (excess)	$ 83,365,164	$ 82,011,048

1. The amount represents the actual employer contributions made during fiscal year.

Notes to Schedule

Valuation date: Actuarially determined contributions are calculated as of the July 1 preceding the fiscal year in which contributions are made. That is, the contribution calculated as of the July 1, 2016 actuarial valuation will be made during the fiscal year ended June 30, 2018.

The methods and assumptions used to determine the actuarially determined contributions to the plan are set forth in Section II.

Schedule of Investment Returns

	2016	**2017**
Annual money-weighted rate of return, net of investment expenses	**(1.15%)**	**13.01%**

Table 1

Projection of Fiduciary Net Position
(In Thousands)

Fiscal Year June 30	Beginning Fiduciary Net Plan Position	Member Contributions	Employer Contributions	Benefit Payments	Administrative Expenses	Projected Investment Earnings	Ending Fiduciary Net Plan Position
2017	$ 1,694,962	$ 23,722	$ 53,010	$ 217,304	$ 295	$ 207,402	$ 1,761,497
2018	1,761,497	20,895	60,238	222,579	299	117,936	1,737,688
2019	1,737,688	20,741	65,893	227,116	305	116,255	1,713,156
2020	1,713,156	20,401	70,059	233,065	313	114,429	1,684,667
2021	1,684,667	19,836	76,648	240,632	323	112,325	1,652,521
2022	1,652,521	19,285	81,209	247,705	332	109,932	1,614,910
2023	1,614,910	18,825	89,796	253,835	340	107,296	1,576,652
2024	1,576,652	18,076	94,979	262,122	350	104,441	1,531,676
2025	1,531,676	17,408	100,093	269,277	360	101,157	1,480,697
2026	1,480,697	16,945	105,640	274,530	367	97,537	1,425,922
2027	1,425,922	16,010	111,668	284,560	378	93,481	1,362,143
2028	1,362,143	15,041	117,230	294,465	389	88,787	1,288,347
2029	1,288,347	14,277	123,110	302,367	400	83,476	1,206,443
2030	1,206,443	13,261	129,670	311,936	412	77,548	1,114,574
2031	1,114,574	11,762	136,288	325,045	424	70,786	1,007,941
2032	1,007,941	10,310	139,768	337,133	437	62,946	883,395
2033	883,395	9,263	143,351	345,355	447	54,003	744,210
2034	744,210	8,209	147,492	353,221	457	44,060	590,293
2035	590,293	7,075	151,676	361,088	468	33,085	420,573
2036	420,573	6,290	155,852	365,467	473	21,136	237,911
2037	237,911	5,763	160,606	367,201	475	0	0
2038	0	0	0	368,582	477	0	0
2039	0	0	0	372,230	482	0	0
2040	0	0	0	377,498	488	0	0
2041	0	0	0	381,661	494	0	0
2042	0	0	0	384,763	498	0	0
2043	0	0	0	385,107	498	0	0
2044	0	0	0	382,421	494	0	0
2045	0	0	0	378,048	488	0	0
2046	0	0	0	372,276	481	0	0
2047	0	0	0	365,882	472	0	0
2048	0	0	0	359,128	463	0	0
2049	0	0	0	352,080	454	0	0
2050	0	0	0	344,764	444	0	0
2051	0	0	0	337,195	435	0	0
2052	0	0	0	329,364	424	0	0
2053	0	0	0	321,268	414	0	0
2054	0	0	0	312,909	403	0	0
2055	0	0	0	304,293	392	0	0
2056	0	0	0	295,433	381	0	0
2057	0	0	0	286,345	369	0	0
2058	0	0	0	277,057	357	0	0
2059	0	0	0	267,599	345	0	0
2060	0	0	0	258,003	333	0	0
2061	0	0	0	248,306	320	0	0
2062	0	0	0	238,543	307	0	0

Table 1
(continued)
Projection of Fiduciary Net Position
(In Thousands)

Fiscal Year June 30	Beginning Fiduciary Net Plan Position	Member Contributions	Employer Contributions	Benefit Payments	Administrative Expenses	Projected Investment Earnings	Ending Fiduciary Net Plan Position
2063	$ 0	$ 0	$ 0	$ 228,750	$ 295	$ 0	$ 0
2064	0	0	0	218,956	282	0	0
2065	0	0	0	209,186	270	0	0
2066	0	0	0	199,460	257	0	0
2067	0	0	0	189,789	245	0	0
2068	0	0	0	180,179	232	0	0
2069	0	0	0	170,633	220	0	0
2070	0	0	0	161,154	208	0	0
2071	0	0	0	151,746	196	0	0
2072	0	0	0	142,416	184	0	0
2073	0	0	0	133,173	172	0	0
2074	0	0	0	124,031	160	0	0
2075	0	0	0	115,010	148	0	0
2076	0	0	0	106,130	137	0	0
2077	0	0	0	97,427	126	0	0
2078	0	0	0	88,932	115	0	0
2079	0	0	0	80,688	104	0	0
2080	0	0	0	72,731	94	0	0
2081	0	0	0	65,107	84	0	0
2082	0	0	0	57,854	75	0	0
2083	0	0	0	51,009	66	0	0
2084	0	0	0	44,602	57	0	0
2085	0	0	0	38,660	50	0	0
2086	0	0	0	33,200	43	0	0
2087	0	0	0	28,233	36	0	0
2088	0	0	0	23,763	31	0	0
2089	0	0	0	19,788	26	0	0
2090	0	0	0	16,297	21	0	0
2091	0	0	0	13,270	17	0	0
2092	0	0	0	10,679	14	0	0
2093	0	0	0	8,491	11	0	0
2094	0	0	0	6,667	9	0	0
2095	0	0	0	5,166	7	0	0
2096	0	0	0	3,948	5	0	0
2097	0	0	0	2,974	4	0	0
2098	0	0	0	2,206	3	0	0
2099	0	0	0	1,610	2	0	0
2100	0	0	0	1,156	1	0	0
2101	0	0	0	815	1	0	0
2102	0	0	0	564	1	0	0
2103	0	0	0	383	0	0	0
2104	0	0	0	254	0	0	0
2105	0	0	0	165	0	0	0
2106	0	0	0	105	0	0	0
2107	0	0	0	65	0	0	0
2108	0	0	0	40	0	0	0
2109	0	0	0	24	0	0	0
2110	0	0	0	14	0	0	0
2111	0	0	0	7	0	0	0
2112	0	0	0	4	0	0	0
2113	0	0	0	2	0	0	0
2114	0	0	0	1	0	0	0

Table 2

Actuarial Present Values of Projected Benefit Payments
(In Thousands)

Fiscal Year Ending June 30	Beginning Fiduciary Net Plan Position	Benefit Payments	Benefit Payments: Funded Portion	Benefit Payments: Unfunded Portion	Present Value of Benefit Payments: Funded Portion at 7.00%	Present Value of Benefit Payments: Unfunded Portion at 3.58%	Present Value of Benefit Payments: Using Single Discount Rate of 4.42%
2017	$ 1,694,962	$ 217,304	$ 217,304	$ 0	$ 210,076	$ 0	$ 212,650
2018	1,761,497	222,579	222,579	0	201,098	0	208,582
2019	1,737,688	227,116	227,116	0	191,774	0	203,815
2020	1,713,156	233,065	233,065	0	183,922	0	200,291
2021	1,684,667	240,632	240,632	0	177,471	0	198,031
2022	1,652,521	247,705	247,705	0	170,736	0	195,214
2023	1,614,910	253,835	253,835	0	163,515	0	191,568
2024	1,576,652	262,122	262,122	0	157,807	0	189,440
2025	1,531,676	269,277	269,277	0	151,509	0	186,364
2026	1,480,697	274,530	274,530	0	144,359	0	181,948
2027	1,425,922	284,560	284,560	0	139,844	0	180,604
2028	1,362,143	294,465	294,465	0	135,245	0	178,971
2029	1,288,347	302,367	302,367	0	129,789	0	175,986
2030	1,206,443	311,936	311,936	0	125,137	0	173,863
2031	1,114,574	325,045	325,045	0	121,865	0	173,492
2032	1,007,941	337,133	337,133	0	118,128	0	172,319
2033	883,395	345,355	345,355	0	113,092	0	169,041
2034	744,210	353,221	353,221	0	108,101	0	165,565
2035	590,293	361,088	361,090	0	103,279	0	162,081
2036	420,577	365,467	365,468	0	97,693	0	157,095
2037	237,913	367,201	237,913	129,288	59,436	62,864	151,152
2038	0	368,582	0	368,582	0	173,023	145,291
2039	0	372,230	0	372,230	0	168,695	140,512
2040	0	377,498	0	377,498	0	165,170	136,462
2041	0	381,661	0	381,659	0	161,219	132,120
2042	0	384,763	0	384,763	0	156,913	127,550
2043	0	385,107	0	385,107	0	151,625	122,254
2044	0	382,421	0	382,421	0	145,363	116,257
2045	0	378,048	0	378,048	0	138,734	110,058
2046	0	372,276	0	372,276	0	131,894	103,785
2047	0	365,882	0	365,882	0	125,149	97,680
2048	0	359,128	0	359,128	0	118,593	91,814
2049	0	352,080	0	352,080	0	112,247	86,198
2050	0	344,764	0	344,764	0	106,116	80,830
2051	0	337,195	0	337,195	0	100,199	75,706
2052	0	329,364	0	329,364	0	94,489	70,814
2053	0	321,268	0	321,268	0	88,981	66,146
2054	0	312,909	0	312,909	0	83,670	61,695
2055	0	304,293	0	304,293	0	78,554	57,454
2056	0	295,433	0	295,433	0	73,631	53,418
2057	0	286,345	0	286,345	0	68,900	49,581
2058	0	277,057	0	277,057	0	64,360	45,939
2059	0	267,599	0	267,599	0	60,015	42,491
2060	0	258,003	0	258,003	0	55,863	39,231
2061	0	248,306	0	248,306	0	51,905	36,157
2062	0	238,543	0	238,543	0	48,141	33,263
2063	0	228,750	0	228,750	0	44,569	30,546
2064	0	218,956	0	218,956	0	41,186	27,999

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

			Benefit Payments		Present Value of Benefit Payments		
Fiscal Year Ending June 30	Beginning Fiduciary Net Plan Position	Benefit Payments	Funded Portion	Unfunded Portion	Funded Portion at 7.00%	Unfunded Portion at 3.58%	Using Single Discount Rate of 4.42%
2065	$ 0	$ 209,186	$ 0	$ 209,186	$ 0	$ 37,988	$ 25,616
2066	0	199,460	0	199,460	0	34,970	23,390
2067	0	189,789	0	189,789	0	32,125	21,313
2068	0	180,179	0	180,179	0	29,444	19,377
2069	0	170,633	0	170,633	0	26,920	17,572
2070	0	161,154	0	161,154	0	24,546	15,893
2071	0	151,746	0	151,746	0	22,314	14,331
2072	0	142,416	0	142,416	0	20,218	12,880
2073	0	133,173	0	133,173	0	18,253	11,534
2074	0	124,031	0	124,031	0	16,412	10,287
2075	0	115,010	0	115,010	0	14,692	9,134
2076	0	106,130	0	106,130	0	13,089	8,072
2077	0	97,427	0	97,427	0	11,601	7,096
2078	0	88,932	0	88,932	0	10,223	6,203
2079	0	80,688	0	80,688	0	8,955	5,389
2080	0	72,731	0	72,731	0	7,793	4,652
2081	0	65,107	0	65,107	0	6,735	3,988
2082	0	57,854	0	57,854	0	5,778	3,393
2083	0	51,009	0	51,009	0	4,918	2,865
2084	0	44,602	0	44,602	0	4,152	2,399
2085	0	38,660	0	38,660	0	3,474	1,991
2086	0	33,200	0	33,200	0	2,880	1,638
2087	0	28,233	0	28,233	0	2,365	1,334
2088	0	23,763	0	23,763	0	1,922	1,075
2089	0	19,788	0	19,788	0	1,545	857
2090	0	16,297	0	16,297	0	1,228	676
2091	0	13,270	0	13,270	0	966	527
2092	0	10,679	0	10,679	0	750	406
2093	0	8,491	0	8,491	0	576	309
2094	0	6,667	0	6,667	0	437	233
2095	0	5,166	0	5,166	0	327	173
2096	0	3,948	0	3,948	0	241	126
2097	0	2,974	0	2,974	0	175	91
2098	0	2,206	0	2,206	0	125	65
2099	0	1,610	0	1,610	0	88	45
2100	0	1,156	0	1,156	0	61	31
2101	0	815	0	815	0	42	21
2102	0	564	0	564	0	28	14
2103	0	383	0	383	0	18	9
2104	0	254	0	254	0	12	6
2105	0	165	0	165	0	7	4
2106	0	105	0	105	0	5	2
2107	0	65	0	65	0	3	1
2108	0	40	0	40	0	2	1
2109	0	24	0	24	0	1	0
2110	0	14	0	14	0	1	0
2111	0	7	0	7	0	0	0
2112	0	4	0	4	0	0	0
2113	0	2	0	2	0	0	0
2114	0	1	0	1	0	0	0

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 Effective Discount Rate: 7.00% per annum, compounded annually.

GASB 67 Effective Discount Rate:

- June 30, 2016: 3.55% per annum, compounded annually.
- June 30, 2017: 4.42% per annum, compounded annually.

COLA: No future COLA is assumed.

Salary Increases: Salaries are assumed to increase by 2.95% per year through fiscal year 2025 and 3.95% per year for fiscal years 2026 and thereafter.

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.

Termination: Withdrawal rates vary by length of service. Illustrative rates are shown below:

	Lives per Thousand	
Age	Less Than 5 Years of Service	Five to Nineteen Years of Service
25	3.8	0.0
30	3.8	2.0
35	8.3	1.4
40	0.0	0.8
45	0.0	1.0
50	0.0	0.0

Separations From Service: Representative mortality, disability and retirement rates are as follows:

	Annual Rates of*				
	Ordinary Death**				
Age	Male	Female	Accidental Death	Ordinary Disability	Accidental Disability
25	0.4	0.2	0.3	0.4	0.2
30	0.4	0.3	0.5	0.6	0.5
35	0.5	0.5	0.5	1.5	1.9
40	0.9	0.7	0.5	1.7	2.1
45	1.2	1.1	0.7	2.2	2.1
50	1.7	1.6	0.9	3.8	2.3

* Per one thousand lives.

** RP-2000 Combined Healthy Male (set back 3 years) and RP-2000 Combined Healthy Female Mortality Tables projected on a generational basis from the base year of 2000 to 2013 using Projection Scale BB as the base table. The base tables will be further projected using the Conduent Modified 2014 Projection Scale. Rates shown above are unadjusted for the Conduent Modified 2014 Projection Scale.

Deaths After Retirement: For healthy inactive members and beneficiaries of deceased members the RP-2000 Combined Healthy Male (set back 3 years) and RP-2000 Combined Healthy Female Mortality tables projected on a generational basis from the base year of 2000 to 2013 using Projection Scale BB. These base tables will be further projected beyond the valuation date using the Conduent Modified 2014 mortality improvement scale. For disabled members the RP-2000 Combined Healthy Male (set forward 5 years) and RP-2000 Combined Healthy Female Mortality (set forward 5 years) tables are used. Illustrative rates of mortality unadjusted for the Conduent Modified 2014 Projection Scale are shown below:

	Lives per Thousand			
	Retired Members and Beneficiaries of Deceased Members		Disabled Members	
Age	Males	Females	Males	Females
55	2.6	2.5	6.7	5.1
60	4.3	4.4	12.7	9.7
65	7.5	8.3	22.2	16.7
70	13.2	14.3	37.8	28.1
75	22.4	24.0	64.4	45.9
80	38.5	39.2	110.8	77.4
85	66.1	66.2	183.4	131.7
90	117.8	114.0	267.5	194.5

Rates of Retirement: Rates of retirement vary by length of service and age (if more than 24 years of service) with 100% of those remaining at age 55 retiring at age 55. The rates are shown below:

Service	Lives Per 100
20	2.0
21	0.5
22	0.0
23	0.0
24	0.0
25	50.0
Greater than 25 :	
(a) through age 42	5.0
(b) ages 43-47	28.0
(c) ages 48-53	33.0
(d) age 54	61.0

Marriage: Husbands are assumed to be 3 years older than wives. Among the active population, 83.3% of participants are assumed married. No children are assumed. Neither the percentage married nor the number of children assumption is individually explicit but 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, 2019 actuarial valuation, the accrued liability contribution shall be computed so that if the contribution is paid annually in level dollars it will amortize the unfunded accrued liability over a closed 30 year period (i.e., for each subsequent valuation, the amortization period shall decrease by one year.) Beginning with the July 1, 2029 actuarial valuation, when the remaining amortization period reaches 20 years, any increase or decrease in the unfunded accrued liability as a result of actuarial losses or gains for subsequent valuation years shall serve to increase or decrease, respectively, the amortization period for the unfunded accrued liability, unless an increase in the amortization period will cause it to exceed 20 years. If an increase in the amortization period as a result of actuarial losses for a valuation year would exceed 20 years, the accrued liability contribution shall be computed for the valuation year using a 20 year amortization period.

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.

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.

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. 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 53, Chapter 5A.

Eligibility for Membership

All members of the former State Police and Benevolent Fund: full-time commissioned officers, non-commissioned officers or troopers of the Division of State Police. Membership is a condition of employment.

1. Definitions

Plan Year	The 12-month period beginning on July 1 and ending on June 30.
Service	Service rendered while a member as described above.
Credited Service	A year is credited for each year of service as an officer or trooper in the State Police. Service with other State Retirement Systems is included in the calculation of the retirement benefit at the rate of 1% of final compensation for each year of service credit.
Compensation	Based on contractual salary, including maintenance allowance, received by the member in the last 12 months of credited service preceding retirement, termination or death. Compensation does not include individual salary adjustments granted primarily in anticipation of the retirement or for temporary or extracurricular duties beyond the ordinary work day. (Effective June 30, 1996, Chapter 113, P.L. 1997 provided that the amount of compensation used for employer and member contributions and benefits under the program 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, the amount of compensation used for employer and member contributions and benefits under the System cannot exceed the annual maximum wage contribution base for Social Security, pursuant to the Federal Insurance Contributions Act.)
Final Compensation	Average compensation received by member in last 12 months of credited service preceding retirement or death. Such term includes the value of the member's maintenance allowance for the same period. (Chapter 1, P.L. 2010 provides that for members hired on or after May 22, 2010, Final Compensation means the average annual salary for service for which contributions are made during any three fiscal years of membership providing the largest possible benefit to the member or the member's beneficiary. Such term shall include the value of the member's maintenance allowance.)
Aggregate Contributions	The sum of all amounts deducted from the compensation of a member or contributed by him or on his behalf. For contribution

purposes, compensation does not include overtime, bonuses, maintenance or any adjustments before retirement.

Adjusted Final Compensation — The amount of compensation or compensation as adjusted, as the case may be, increased by the same percentage increase which is applied in any adjustments of the compensation schedule of active members after the member's death and before the date on which the deceased member of the retirement system would have accrued 25 years of service under an assumption of continuous service, at which time that amount will become fixed. Adjustments to compensation or adjusted compensation shall take effect at the same time as any adjustments in the compensation schedule of active members.

2. Benefits

Service Retirement — Mandatory retirement at age 55. Voluntary retirement prior to age 55 with 20 years of credited service. Benefit is an annual retirement allowance equal to the greater of (a), (b), or (c), as follows:

(a) 50% of final compensation;

(b) For members retiring with 25 or more years of service, 65% of final compensation, plus 1% for each year of service in excess of 25 years, to a maximum of 70% of final compensation.

(c) For members as of August 29, 1985 who would not have 20 years of service by age 55, benefit as defined in (a) above. For members as of August 29, 1985 who would have 20 years of service but would not have 25 years of service at age 55, benefit as defined in (a) above plus 3% for each year of service in excess of 20 years.

Vested Termination — Termination of service prior to age 55. Benefit for 10 to 20 years of service - Refund of aggregate contributions, or a deferred life annuity beginning at age 55 equal to 2% of final compensation for each year of service up to 20 years.

Non-Vested Termination — Termination of service prior to age 55 and less than 10 years of service – Return of aggregate contributions.

Ordinary Death

Before Retirement — Death of an active member of the plan. Benefit is equal to:

(a) Lump sum payment equal to 3-1/2 times compensation, 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%

or 50% of final compensation payable to one, two or three dependent children. If there is no surviving spouse (or dependent children), 25% or 40% of final compensation to one or two dependent parents.

Minimum benefit: Aggregate contributions.

After Retirement

Death of a retired member of the plan. The benefit is equal to:

(a) Lump sum of 50% of compensation, 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% or 50% of final compensation payable to one, two or three dependent children, respectively.

Accidental Death

Death of an active member of the plan resulting during performance of duties. Benefit is equal to:

(a) Lump sum payment equal to 3-1/2 times compensation, plus
(b) Spousal life annuity of 70% of adjusted final compensation payable until spouse's death. If there is no surviving spouse, or upon death of the surviving spouse, 70% of adjusted final compensation payable to surviving children in equal shares. If there is no surviving spouse or dependent children, 25% or 40% of adjusted final compensation to one or two dependent parents.

Ordinary Disability

Retirement

Mentally or physically incapacitated for the performance of his usual duty and of any other available duty in the Division of State Police and such incapacity is likely to be permanent.

(a) The benefit for members with less than four years of service is a refund of the member's aggregate contributions.
(b) For members with at least four years of service, the benefit is an immediate life annuity equal to 40% of final compensation plus 1-1/2% of final compensation for years of creditable service in excess of 26-2/3.
(c) For members who are forced to retire with 20 but less than 25 years of service, the benefit is 50% of the member's final compensation plus 3% of final compensation for each year of service in excess of 20 years, to a maximum of 65% of final compensation.

For death following disability retirement, a lump sum equal to 3-1/2 times compensation if death occurs prior to age 55 or 1/2 of compensation after age 55.

Accidental Disability	
Retirement	Totally and permanently disabled as a direct result of a traumatic event occurring during and as a result of his regular or assigned duties. Benefit is an immediate life annuity equal to 2/3 of final compensation. Upon death after disability retirement, lump sum benefit of 3-1/2 times final compensation if death occurs before 55 and 1/2 times final compensation if death occurs after 55.
Loan Provision	Eligible if an active member of the State Police Retirement System with at least 3 years of contributory service. If eligible, a member may borrow an amount which is greater than $50, but not more than 50% of aggregate contributions. The loan accrues interest at a rate set by the State Treasurer, which is based on a commercially reasonable rate as required by the Internal Revenue Code. An administrative fee may be charged for the loan.
Member Contributions	Each member contributes 7.5% of Compensation. Chapter 78, P.L. 2011 increased Member Contributions from 7.5% to 9.0% of Compensation effective October 2011.

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 selected by State Treasurer		7.00%