



The Teachers' Pension and Annuity Fund of New Jersey

**GASB 68 Report
as of June 30, 2021**

Produced by Cheiron

April 2022

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**TEACHERS' PENSION AND ANNUITY FUND OF NEW JERSEY
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SECTION I – BOARD SUMMARY

The purpose of this report is to provide accounting and financial disclosure information under Governmental Accounting Standards Board Statement 68 for the Teachers' Pension and Annuity Fund of New Jersey (TPAF, Plan or Fund). This information includes:

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

Highlights

The reporting date for the TPAF is June 30, 2021. Measurements as of the reporting date are based on the fair value of assets as of June 30, 2021 and the Total Pension Liability as of the valuation date, July 1, 2020, updated to June 30, 2021. There were two changes in the assumptions. The discount rate used to measure the Total Pension Liability was changed as of the measurement date. In addition, the mortality assumption was updated upon direction from the Division of Pensions and Benefits (DPB). We are not aware of any other significant events that are measurable at this time between the valuation date and the measurement date, so the update procedures only include the addition of service cost and interest cost offset by actual benefit payments and an adjustment to reflect the changes in assumptions.

Additional information about the TPL can be found in the GASB 67 report. This report contains the GASB 68 collective employer reporting amounts. The individual employer reporting amounts can be found in the GASB 67-68 Employer Schedules provided separately in Excel format.

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

Table I-1 Summary of Collective Results		
Measurement Date	6/30/2021	6/30/2020
Net Pension Liability	\$ 48,165,991,182	\$ 65,993,498,688
Deferred Outflows	(6,230,825,389)	(9,458,881,999)
Deferred Inflows	<u>27,221,092,460</u>	<u>14,424,322,612</u>
Net Impact on Statement of Net Position	\$ 69,156,258,253	\$ 70,958,939,301
Total Pension Expense	\$ 1,133,770,138	\$ 4,099,006,933
Pension Expense (% of Payroll)	10.00%	37.06%

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SECTION II – CERTIFICATION

The purpose of this report is to provide accounting and financial reporting information under GASB 68 for the Teachers' Pension and Annuity Fund of New Jersey (TPAF). This report is for the use of TPAF, the DPB and their auditors in preparing financial reports in accordance with applicable law and accounting requirements. This report is not appropriate for other purposes, including the measurement of funding requirements for TPAF and estimating the price to settle TPAF's obligations.

In preparing our report, we relied on information (some oral and some written) supplied by the DPB. This information includes, but is not limited to, the plan provisions, employee data, and financial information. We performed an informal examination of the obvious characteristics of the data for reasonableness and consistency in accordance with Actuarial Standard of Practice No. 23.

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

For purposes of this report, the projection of the Plan's contributions and projected benefit payments as of June 30, 2021 was based on the recommended demographic assumptions of the July 1, 2015 – June 30, 2018 Experience Study, approved by the Board of Trustees on February 6, 2020. The calculation of the Total Pension Liability as of June 30, 2021 was based on the same demographic assumptions except for the mortality assumption, which was based on the SOA's MP-2021 mortality improvement scale upon direction from the DPB. While we do not find the use of the SOA's Scale MP-2021 unreasonable, it does not reflect the analysis of actual mortality experience from our Experience Study which was the basis for our recommended mortality assumptions, including the mortality improvement scale.

This report was prepared using census data as of the July 1, 2020 valuation date and financial information as of the June 30, 2021 measurement date. Given the uncertainty and lack of credible data regarding the impact that COVID-19 may have had on the Fund's demographic experience between the measurement date and reporting date, no specific adjustments have been made at this time. We will continue to monitor developments regarding the COVID-19 pandemic and the impact it may have on the Fund. Actual experience, both demographic and economic, will be reflected in subsequent years as experience emerges.

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

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

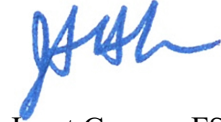
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SECTION II – CERTIFICATION

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. The discount rate used to measure the Total Pension Liability is 7.00% as of June 30, 2021 and is described in Section III of the report.

This report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices and our understanding of the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board as well as applicable laws and regulations. Furthermore, as credentialed actuaries, we meet the Qualification Standards of the American Academy of Actuaries to render the opinion contained in this report. This report does not address any contractual or legal issues. We are not attorneys and our firm does not provide any legal services or advice.

This report was prepared for TPAF for the purposes described herein and for the use by the plan auditor in completing an audit related to the matters herein. Other users of this report are not intended users as defined in the Actuarial Standards of Practice, and Cheiron assumes no duty or liability to such other users.



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



Anu Patel, FSA, MAAA, EA
Principal Consulting Actuary

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SECTION III – DETERMINATION OF DISCOUNT RATE

The discount rate used to measure the Total Pension Liability was 5.40% as of June 30, 2020 and 7.00% as of June 30, 2021. As discussed with the DPB, the projection of cash flows used to determine the discount rate as of June 30, 2021 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 are based on the same assumptions used to determine the expected contributions for the Fund. The demographic assumptions are based on the recommendations of the July 1, 2015 – June 30, 2018 Experience Study as approved by the Board of Trustees on February 6, 2020.

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

- Effective with the July 1, 2019 valuation: 7.30% per annum,
- Effective with the July 1, 2021 valuation: 7.00% per annum.
- The State contributed 107.91% of the actuarially determined contribution for fiscal year ending June 30, 2022 at the beginning of the fiscal year. This contribution has been included in the projections. In subsequent years, it is assumed that the State will contribute 100% of the actuarially determined contribution and Non-Contributory Group Insurance Premium Fund (NCGIPF). The 100% contribution rate is the total State contribution rate expected to be paid in fiscal year ending June 30, 2023 with respect to the actuarially determined contribution for the fiscal year ending June 30, 2023 for all State-administered retirement systems.
- Consistent with Chapter 83, P.L. 2016, it is assumed that the State will make pension contributions in equal amounts at the end of each quarter. This assumption does not apply to the fiscal year ending June 30, 2022 contribution that was paid in full at the beginning of the fiscal year.
- In accordance with Chapter 98, P. L. 2017, TPAF receives 77.78% of the proceeds of the Lottery Enterprise for a period of 30 years. Revenues received from lottery proceeds are assumed to be contributed to the Fund on a monthly basis.
- It is assumed that Local employers' contributions are expected to be received on April 1st, 21 months after the associated valuation date.
- The NCGIPF contributions are assumed to be paid monthly.
- Annual administrative expenses are assumed to be 0.19% of expected pension benefit payments.

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SECTION III – DETERMINATION OF DISCOUNT RATE

The Fiduciary Net Position (FNP) includes Local employers' contributions receivable as reported in the financial statements provided to us by the DPB. In determining the discount rate in Appendix D, the FNP at the beginning of each year does not reflect receivable contributions as those amounts are not available at the beginning of the year to pay benefits. The receivable contributions for the current year include receivable contributions of \$2,817,747 for Local employers' Early Retirement Incentive (ERI).

Municipal bond rates of 2.21% as of June 30, 2020 and 2.16% as of June 30, 2021 were used in the development of the blended GASB discount rate in the event the Plan's fiduciary net position was no longer sufficient to make future benefit payments. As selected by the State Treasurer, the rates are based on the Bond Buyer GO 20-Bond Municipal Bond Index. Based on the long-term rate of return of 7.00% and the municipal bond rate of 2.21% as of June 30, 2020, the blended GASB discount rate was 5.40% as of June 30, 2020. As of June 30, 2021, based on the assumptions above, the pension Plan's fiduciary net position is expected to be sufficient to make all projected future benefit payments for current Plan members; therefore, the GASB discount rate as of June 30, 2021 is equal to the long-term rate of return of **7.00%**. The assumed discount rates have been determined in accordance with the method prescribed by GASB Statement No. 67.

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SECTION IV – COLLECTIVE EMPLOYER REPORTING AMOUNTS

We understand the State and Local employers have elected to use the 2021 measurement date for their 2022 reporting date. As a result, the schedules in this section will be used by the State and Local employers for their 2022 reporting.

The impact of experience gains or losses and assumption changes on the TPL are recognized in expense over the average expected remaining service life of all active and inactive members of the System. As of the measurement date, this recognition period was 7.93 years.

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

Table IV-1		
Schedule of Collective Deferred Inflows and Outflows of Resources		
	Deferred Outflows of Resources	Deferred Inflows of Resources
Differences between expected and actual experience	\$ 941,265,828	\$ 142,774,569
Changes in assumptions	5,289,559,561	24,224,281,713
Net differences between projected and actual earnings on pension plan investments	0	2,854,036,178
Total	<u>\$ 6,230,825,389</u>	<u>\$ 27,221,092,460</u>
Amounts reported as deferred outflows and deferred inflows of resources will be recognized in pension expense as follows:		
Measurement year ended June 30:		
2022	\$ (2,914,282,899)	
2023	(3,500,098,875)	
2024	(4,665,036,366)	
2025	(4,192,375,542)	
2026	(2,350,648,872)	
Thereafter	\$ (3,367,824,517)	

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SECTION IV – COLLECTIVE EMPLOYER REPORTING AMOUNTS

Table IV-2

Detailed Schedule of Collective Deferred Inflows and Outflows of Resources

Recognition of differences between expected and actual experience

From Measurement Year Ending	Remaining Recognition Period	Remaining Deferred (Inflows) and Outflows*	Recognition Year						
			2021	2022	2023	2024	2025	2026	Thereafter
2021	7.93	\$ 195,943,171	\$ 24,709,101	\$ 24,709,101	\$ 24,709,101	\$ 24,709,101	\$ 24,709,101	\$ 24,709,101	\$ 47,688,565
2020	6.99	(7,520,890)	(1,075,950)	(1,075,950)	(1,075,950)	(1,075,950)	(1,075,950)	(1,075,950)	(1,065,190)
2019	6.04	(116,909,940)	(19,355,950)	(19,355,950)	(19,355,950)	(19,355,950)	(19,355,950)	(19,355,950)	(774,240)
2018	5.29	763,099,015	144,253,122	144,253,122	144,253,122	144,253,122	144,253,122	41,833,405	0
2017	4.30	122,460,660	28,479,224	28,479,224	28,479,224	28,479,224	8,543,764	0	0
2016	3.30	(53,533,223)	(16,222,189)	(16,222,189)	(16,222,189)	(4,866,656)	0	0	0
2015	2.30	101,207,836	44,003,407	44,003,407	13,201,022	0	0	0	0
2014	1.50	(4,393,807)	(2,929,202)	(1,464,605)	0	0	0	0	0
Total		\$ 1,000,352,822	\$ 201,861,563	\$ 203,326,160	\$ 173,988,380	\$ 172,142,891	\$ 157,074,087	\$ 46,110,606	\$ 45,849,135

Recognition of changes in assumptions

From Measurement Year Ending	Remaining Recognition Period	Remaining Deferred (Inflows) and Outflows*	Recognition Year						
			2021	2022	2023	2024	2025	2026	Thereafter
2021	7.93	\$ (14,765,458,197)	\$ (1,861,974,552)	\$ (1,861,974,552)	\$ (1,861,974,552)	\$ (1,861,974,552)	\$ (1,861,974,552)	\$ (1,861,974,552)	\$ (3,593,610,885)
2020	6.99	1,411,170,422	201,884,181	201,884,181	201,884,181	201,884,181	201,884,181	201,884,181	199,865,336
2019	6.04	(3,009,143,115)	(498,202,502)	(498,202,502)	(498,202,502)	(498,202,502)	(498,202,502)	(498,202,502)	(19,928,103)
2018	5.29	(4,349,959,805)	(822,298,640)	(822,298,640)	(822,298,640)	(822,298,640)	(822,298,640)	(238,466,605)	0
2017	4.30	(6,882,861,832)	(1,600,665,542)	(1,600,665,542)	(1,600,665,542)	(1,600,665,542)	(480,199,664)	0	0
2016	3.30	4,304,747,820	1,304,469,036	1,304,469,036	1,304,469,036	391,340,712	0	0	0
2015	2.30	1,638,696,238	712,476,627	712,476,627	213,742,984	0	0	0	0
2014	1.50	461,324,773	307,549,848	153,774,925	0	0	0	0	0
Total		\$ (21,191,483,696)	\$ (2,256,761,544)	\$ (2,410,536,467)	\$ (3,063,045,035)	\$ (4,189,916,343)	\$ (3,460,791,177)	\$ (2,396,759,478)	\$ (3,413,673,652)

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

From Measurement Year Ending	Remaining Recognition Period	Remaining Deferred (Inflows) and Outflows*	Recognition Year						
			2021	2022	2023	2024	2025	2026	Thereafter
2021	5.00	\$ (4,443,292,264)	\$ (888,658,453)	\$ (888,658,453)	\$ (888,658,453)	\$ (888,658,453)	\$ (888,658,452)	\$ 0	\$ 0
2020	4.00	965,582,162	241,395,541	241,395,541	241,395,541	241,395,539	0	0	0
2019	3.00	108,662,078	36,220,693	36,220,693	36,220,692	0	0	0	0
2018	2.00	(192,060,744)	(96,030,371)	(96,030,373)	0	0	0	0	0
2017	1.00	(226,008,261)	(226,008,261)	0	0	0	0	0	0
Total		\$ (3,787,117,029)	\$ (933,080,851)	\$ (707,072,592)	\$ (611,042,220)	\$ (647,262,914)	\$ (888,658,452)	\$ 0	\$ 0

Grand Total		\$ (23,978,247,903)	\$ (2,987,980,832)	\$ (2,914,282,899)	\$ (3,500,098,875)	\$ (4,665,036,366)	\$ (4,192,375,542)	\$ (2,350,648,872)	\$ (3,367,824,517)
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* As of the beginning of the measurement year

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SECTION IV – COLLECTIVE EMPLOYER REPORTING AMOUNTS

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

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

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

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

The final category is changes. This category will drive most of the volatility in pension expense from year to year. It includes any changes in benefits made during the year and the recognized amounts due to assumption changes, gains or losses on the TPL, and investment gains or losses.

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

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SECTION IV – COLLECTIVE EMPLOYER REPORTING AMOUNTS

Table IV-3 Calculation of Collective Pension Expense		
Measurement Year Ending	2021	2020
Change in Net Pension Liability	\$ (17,827,507,506)	\$ 4,474,386,245
Change in Deferred Outflows	3,228,056,610	473,885,607
Change in Deferred Inflows	12,796,769,848	(3,115,522,811)
Employer Contributions*	<u>2,936,047,960</u>	<u>2,271,007,729</u>
Subtotal	\$ 1,133,366,912	\$ 4,103,756,770
Employer Contribution - delayed enrollments	403,226	329,571
Employer Contribution - delayed appropriations	<u>0</u>	<u>(5,079,408)</u>
Total Pension Expense	\$ 1,133,770,138	\$ 4,099,006,933
Total Pension Expense as % of Payroll	10.00%	37.06%
Operating Expenses		
Service cost	\$ 1,759,507,848	\$ 1,643,902,335
Employee contributions	(883,659,076)	(867,037,595)
Administrative expenses	<u>9,042,590</u>	<u>13,511,148</u>
Total	\$ 884,891,362	\$ 790,375,888
Financing Expenses		
Interest cost	\$ 4,695,758,765	\$ 4,680,942,056
Expected return on assets	<u>(1,458,899,157)</u>	<u>(1,525,370,804)</u>
Total	\$ 3,236,859,608	\$ 3,155,571,252
Changes		
Benefit changes	\$ 0	\$ (16,738,469)
Recognition of assumption changes	(2,256,761,544)	(394,786,992)
Recognition of liability gains and losses	201,861,563	177,152,462
Recognition of investment gains and losses	<u>(933,080,851)</u>	<u>387,432,792</u>
Total	\$ (2,987,980,832)	\$ 153,059,793
Total Pension Expense	\$ 1,133,770,138	\$ 4,099,006,933

* Includes appropriations and lottery revenue

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APPENDIX A – MEMBERSHIP INFORMATION

Plan Membership		
	July 1, 2020	July 1, 2019
Contributing Actives	142,283	141,795
Non-Contributing Members	14,119	14,271
Terminated Vested	407	432
Inactive Receiving Benefits	107,890	106,388
Total	264,699	262,886
Annual Compensation for Contributing Actives	\$ 11,338,928,538	\$ 11,061,603,138
Annual Retirement Allowances for Those Receiving Benefits	\$ 4,478,447,877	\$ 4,391,260,795

* QDRO recipients are excluded from the counts.

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APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

A. Actuarial Assumptions

- | | |
|--|--|
| 1. Investment Rate of Return for determining Actuarially Determined Contributions | <ul style="list-style-type: none">• July 1, 2020 valuation: 7.30% per annum, compounded annually.• July 1, 2021 and later valuations: 7.00% per annum, compounded annually. |
| 2. Long-Term Expected Rate of Return | 7.00% per annum, compounded annually. |
| 3. Interest Crediting Rate on Accumulated Deductions | 7.30% per annum, compounded annually. Interest credits are assumed to end upon termination. |
| 4. GASB 67 Effective Discount Rate | <ul style="list-style-type: none">• June 30, 2020: 5.40% per annum, compounded annually.• June 30, 2021: 7.00% per annum, compounded annually. |
| 5. Price Inflation | 2.75% per annum, compounded annually. |
| 6. Wage Inflation | 3.25% per annum, compounded annually. |
| 7. Cost-of-Living Adjustments (COLAs) | No future COLAs are assumed. Previously granted COLAs are included in the data. |

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APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

8. Salary Increases

Salary increases vary by years of service and time period. Annual salary increases are shown below.

Years of Service	Period Ending June 30, 2026	Ultimate Period
0-2	3.05%	4.25%
3	3.20	4.40
4	3.35	4.55
5	3.50	4.70
6	3.65	4.85
7	3.80	5.00
8	3.95	5.15
9	4.10	5.30
10	4.20	5.40
11	4.30	5.50
12-16	4.45	5.65
17	3.70	4.90
18	3.30	4.50
19	3.05	4.25
20	2.85	4.05
21	2.65	3.85
22	2.45	3.65
23	2.25	3.45
24	2.05	3.25
25	1.85	3.05
26	1.75	2.95
27-28	1.65	2.85
29+	1.55	2.75

Salary increases are assumed to occur on October 1.

9. 401(a)(17) Pay Limit

\$285,000 in 2020 increasing 2.75% per annum, compounded annually.

10. Social Security Wage Base

\$137,700 in 2020 increasing 3.25% per annum, compounded annually.

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APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

11. Termination

Termination rates are as follows:

Service	Rates
0	7.00%
1	7.00
2	6.25
3	5.50
4	4.25
5	3.75
6	3.25
7	3.00
8	2.50
9	2.50
10	2.25
11	2.20
12	1.95
13	1.70
14	1.40
15	1.20
16	1.00
17	0.90
18	0.90
19	0.70
20	0.55
21	0.55
22	0.55
23	0.40
24-29	0.30

No termination is assumed after attainment of retirement eligibility.

67% of members with 10 or more years of service at termination are assumed to elect a deferred retirement benefit.

All other members are assumed to receive a refund of Accumulated Deductions with credited interest.

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APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

12. Disability

Disability rates are as follows:

Age	Ordinary Disability	Accidental Disability	Age	Ordinary Disability	Accidental Disability
20	0.005%	0.006%	48	0.170%	0.006%
21	0.005	0.006	49	0.180	0.006
22	0.005	0.006	50	0.200	0.006
23	0.005	0.006	51	0.220	0.006
24	0.005	0.006	52	0.240	0.006
25	0.005	0.006	53	0.260	0.006
26	0.005	0.006	54	0.280	0.006
27	0.005	0.006	55	0.350	0.006
28	0.005	0.006	56	0.420	0.006
29	0.005	0.006	57	0.490	0.006
30	0.005	0.006	58	0.560	0.006
31	0.010	0.006	59	0.630	0.006
32	0.015	0.006	60	0.710	0.006
33	0.020	0.006	61	0.790	0.006
34	0.030	0.006	62	0.870	0.006
35	0.040	0.006	63	0.950	0.006
36	0.050	0.006	64	1.030	0.006
37	0.060	0.006	65	1.120	0.006
38	0.070	0.006	66	1.210	0.006
39	0.080	0.006	67	1.300	0.006
40	0.090	0.006	68	1.390	0.006
41	0.100	0.006	69	1.480	0.006
42	0.110	0.006	70	1.580	0.006
43	0.120	0.006	71	1.680	0.006
44	0.130	0.006	72	1.780	0.006
45	0.140	0.006	73	1.880	0.006
46	0.150	0.006	74	1.980	0.006
47	0.160	0.006			

Accidental disability rates apply at all ages.

Ordinary disability rates apply upon attainment of 10 years of service until the attainment of unreduced retirement eligibility with at least 25 years of service.

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

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

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

13. Mortality

Pre-Retirement Mortality: The Pub-2010 Teachers Above-Median Income Employee mortality table [*PubT-2010(A) Employee*] as published by the Society of Actuaries with a 93.9% adjustment for males and 85.3% adjustment for females, and with future improvement from the base year of 2010 on a generational basis. For purposes of calculating projected cash flows used to determine the GASB discount rate, mortality improvement is based on SOA's Scale MP-2018. Upon direction from the DPB, for purposes of calculating the Total Pension Liability, mortality improvement is based on SOA's Scale MP-2021.

All pre-retirement deaths are assumed to be ordinary deaths.

Healthy Retirees and Beneficiaries (Healthy Annuitants): The Pub-2010 Teachers Above-Median Income Healthy Retiree mortality table [*PubT-2010(A) Healthy Retiree*] as published by the Society of Actuaries with a 114.7% adjustment for males and 99.6% adjustment for females, and with future improvement from the base year of 2010 on a generational basis. For purposes of calculating projected cash flows used to determine the GASB discount rate, mortality improvement is based on SOA's Scale MP-2018. Upon direction from the DPB, for purposes of calculating the Total Pension Liability, mortality improvement is based on SOA's Scale MP-2021.

Disabled Retirees (Disabled Annuitants): The Pub-2010 Non-Safety Disabled Retiree mortality table [*PubNS-2010 Disabled Retiree*] as published by the Society of Actuaries with a 106.3% adjustment for males and 100.3% adjustment for females, and with future improvement from the base year of 2010 on a generational basis. For purposes of calculating projected cash flows used to determine the GASB discount rate, mortality improvement is based on SOA's Scale MP-2018. Upon direction from the DPB, for purposes of calculating the Total Pension Liability, mortality improvement is based on SOA's Scale MP-2021.

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APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

14. Retirement

Retirement rates for Tier 1-4 members are as follows:

Age	Less Than 25 Years of Service	25 Years of Service	26 or More Years of Service
< 50	N/A	1.5%	1.5%
50	N/A	1.5	1.5
51	N/A	2.0	2.0
52	N/A	3.0	2.5
53	N/A	4.0	3.0
54	N/A	6.0	3.5
55	N/A	10.0	13.0
56	N/A	18.0	17.0
57	N/A	18.0	17.0
58	N/A	20.0	17.0
59	N/A	25.0	17.0
60	4.0	25.0	20.0
61	6.0	25.0	22.0
62	6.0	33.0	27.0
63	8.0	42.0	30.0
64	8.0	42.0	30.0
65	12.0	42.0	30.0
66	18.0	55.0	35.0
67	18.0	55.0	40.0
68	18.0	55.0	30.0
69	18.0	55.0	30.0
70	18.0	55.0	30.0
71	18.0	55.0	30.0
72	18.0	55.0	30.0
73	18.0	55.0	30.0
74	18.0	55.0	30.0
75	100.0	100.0	100.0

Rates apply upon retirement eligibility by tier.

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Retirement rates for Tier 5 members are as follows:

Age	Less Than 25 Years of Service	25 Years of Service	26 to 29 Years of Service	30 Years of Service	31 or More Years of Service
< 50	N/A	N/A	N/A	1.5%	1.5%
50	N/A	N/A	N/A	1.5	1.5
51	N/A	N/A	N/A	2.0	2.0
52	N/A	N/A	N/A	3.0	2.5
53	N/A	N/A	N/A	4.0	3.0
54	N/A	N/A	N/A	6.0	3.5
55	N/A	N/A	N/A	10.0	13.0
56	N/A	N/A	N/A	18.0	17.0
57	N/A	N/A	N/A	18.0	17.0
58	N/A	N/A	N/A	20.0	17.0
59	N/A	N/A	N/A	25.0	17.0
60	N/A	N/A	N/A	25.0	20.0
61	N/A	N/A	N/A	25.0	22.0
62	N/A	N/A	N/A	33.0	27.0
63	N/A	N/A	N/A	42.0	30.0
64	N/A	N/A	N/A	42.0	30.0
65	12.0	42.0	42.0	42.0	30.0
66	18.0	55.0	35.0	35.0	35.0
67	18.0	55.0	40.0	40.0	40.0
68	18.0	55.0	30.0	30.0	30.0
69	18.0	55.0	30.0	30.0	30.0
70	18.0	55.0	30.0	30.0	30.0
71	18.0	55.0	30.0	30.0	30.0
72	18.0	55.0	30.0	30.0	30.0
73	18.0	55.0	30.0	30.0	30.0
74	18.0	55.0	30.0	30.0	30.0
75	100.0	100.0	100.0	100.0	100.0

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

- 15. Family Composition Assumptions**
- For members not currently in receipt, 100% of members are assumed married to spouses of the opposite sex. Males are assumed to be three years older than females.
- For purposes of the optional form of payment death benefit for members currently in receipt, beneficiary status is based on the beneficiary allowance reported. If no beneficiary date of birth is provided, the beneficiary is assumed to be the member's spouse of the opposite sex with males assumed to be three years older than females.
- No additional dependent children or parents are assumed.
- 16. Form of Payment**
- Current actives are assumed to elect the Maximum Option.
- 17. Data**
- Information provided by the prior actuary was relied upon for the purposes of setting the status of and valuing non-contributing records. For non-contributing terminated members, a deferred retirement benefit is estimated, when applicable, based on the last known salary. For non-contributing members with incomplete information, the benefit is based on the Annuity Savings Fund and.
- For current beneficiaries with incomplete information, reasonable assumptions were made based on information available in prior years.
- Inactive participants receiving benefits according to the 2019 data but omitted from the 2020 data are assumed to have died without a beneficiary.
- Tier 4 and 5 members on long-term disability appeared on the active data for the first time in 2019. The number of members on long-term disability is immaterial for valuation purposes. Therefore, we valued these members as regular contributing and non-contributing members while we gain clarity on what happens with these members.
- 18. Rationale for Assumptions**
- The demographic and economic assumptions used in this report, except for the investment return assumption, reflect the results of the July 1, 2015 – June 30, 2018 Experience Study, which was approved by the Board of Trustees on February 6, 2020.
- The investment return assumption was recommended by the State Treasurer.
- The MP-2021 mortality improvement scale was used to calculate the Total Pension Liability upon direction from the DPB.

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APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

19. Projection Basis

This report includes projections of future assets, benefit payments and contributions for the purpose of determining the GASB 67 discount rate.

The projections are based on the census data as of July 1, 2020 and the financial information as of June 30, 2021. The projections assume continuation of the plan provisions and actuarial assumptions in effect as of July 1, 2020 and do not reflect the impact of any changes in benefits or actuarial assumptions that may be adopted after July 1, 2021 unless otherwise indicated. While the assumptions individually are reasonable for the underlying valuation that supports the projections, specifically for projection purposes, they are also considered reasonable in the aggregate.

The projections assume that all future assumptions are met except where indicated with respect to future investment returns and demographic assumptions.

**20. Changes in Assumptions
Since Last Valuation**

The mortality improvement scale used to calculate the Total Pension Liability was updated from the MP-2020 scale to the MP-2021 scale upon direction from the DPB.

The GASB 67 effective discount rate has been updated in accordance with the method prescribed by GASB Statement No. 67.

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

B. Actuarial Methods

The actuarial methods used for determining State contributions are described below.

1. Actuarial Cost Method

The actuarial cost method for funding calculations is the Projected Unit Credit Cost Method. Non-contributory active members only use the Unit Credit Cost Method.

The actuarial liability is calculated as the actuarial present value of the projected benefits linearly allocated to periods prior to the valuation year based on service. Refunds are valued as the Accumulated Deductions with interest as of the valuation date provided by the Division of Pensions and Benefits. The unfunded actuarial liability is the actuarial liability on the valuation date less the actuarial value of assets.

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

- Beginning with the July 1, 2010 actuarial valuation, the accrued liability contribution shall be computed so that if the contribution is paid annually in level dollars, it will amortize the unfunded accrued liability over an open 30 year period.
- Beginning with the July 1, 2019 actuarial valuation, the accrued liability contribution shall be computed so that if the contribution is paid annually in level dollars, it will amortize the unfunded accrued liability over a closed 30 year period (i.e., for each subsequent actuarial valuation the amortization period shall decrease by one year).
- Beginning with the July 1, 2029 actuarial valuation, when the remaining amortization period reaches 20 years, any increase or decrease in the unfunded accrued liability as a result of actuarial losses or gains for subsequent valuation years shall serve to increase or decrease, respectively, the amortization period for the unfunded accrued liability, unless an increase in the amortization period will cause it to exceed 20 years. If an increase in the amortization period as a result of actuarial losses for a valuation year would exceed 20 years, the accrued liability contribution shall be computed for the valuation year using a 20 year amortization period.

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

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

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

2. Asset Valuation Method

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

The actuarial value of assets is adjusted to reflect actual contributions and benefit payments and administrative expenses, and an assumed rate of return on the previous year's assets and current year's cash flow at the prior year's actuarial valuation interest rate, with a further adjustment to reflect 20% of the difference between the resulting value and the actual market value of Fund assets.

3. Contributions

Chapter 83, P.L. 2016 requires the State to make the required pension contributions on a quarterly basis in each fiscal year according to the following schedule: at least 25% by September 30, at least 50% by December 31, at least 75% by March 31, and at least 100% by June 30. As such, contributions are assumed to be made on a quarterly basis with the first contribution 15 months after the associated valuation date.

Chapter 98, P.L. 2017, the Lottery Enterprise Contribution Act, allows the TPAF to receive 77.78% of the proceeds of the Lottery Enterprise, based upon their members' past or present employment in schools and institutions in the State for a term of 30 years. Revenues from Chapter 98, P.L. 2017, the Lottery Enterprise Contribution Act, are assumed to be contributed to the trust on a monthly basis. The State's pension contribution is reduced by the product of the allocable percentage for the TPAF, the adjustment percentage, and the special asset value.

Contributions payable in the fiscal year starting on the valuation date are included in the actuarial value of assets as receivable contributions, discounted by the applicable valuation interest rate.

Legislation has provided for additional benefits and/or funding requirements which are included in this valuation and are described as follows.

Early Retirement Incentive Programs

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

Chapter 133, P.L. 2001

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

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

Chapter 133, P.L. 2001 established the Benefit Enhancement Fund (BEF) to fund the additional annual employer normal contribution due to the Statute's increased benefits. (Chapter 353, P.L. 2001 extended this coverage to this Statute's additional annual employer normal contribution.) If the assets in the BEF are insufficient to cover the normal contribution for the increased benefits for a valuation period, the State will pay such amount. As of July 1, 2020, there are no assets in the BEF.

4. Valuation Software

Cheiron utilizes ProVal, an actuarial valuation software leased from Winklevoss Technologies (WinTech) to calculate liabilities and project benefit payments. We have relied on WinTech as the developer of ProVal. We have reviewed ProVal and have a basic understanding of it and have used ProVal in accordance with its original intended purpose. We have not identified any material inconsistencies in assumptions or output of ProVal that would affect this actuarial valuation.

5. Changes in Methods Since the Last Valuation

None.

APPENDIX C – SUMMARY OF PLAN PROVISIONS

This summary of Plan provisions provides an overview of the major provisions of the TPAF used in the actuarial valuation. It is not intended to replace the more precise language of the NJ State Statutes, Title 18A, Chapter 66, and if there is any difference between the description of the plan herein and the actual language in the NJ State Statutes, the NJ State Statutes will govern.

1. Eligibility for Membership

Employees appointed to positions requiring certification by the New Jersey Department of Education as members of a regular teaching or professional staff of a public school system in New Jersey are required to enroll as a condition of employment. Employees of the Department of Education holding unclassified, professional and certificated titles are eligible for membership. Temporary or substitute employees are not eligible. The eligible employee must be scheduled to work at least 32 hours per week effective May 22, 2010, per Chapter 1, P.L. 2010.

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

2. Plan Year

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

3. Years of Service

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

APPENDIX C – SUMMARY OF PLAN PROVISIONS

4. Compensation

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

5. Final Compensation

The average annual compensation upon which contributions by a Member are made for the three consecutive years of service immediately preceding retirement, or the highest three fiscal years of service, if greater. Chapter 1, P. L. 1997 provides that for a Tier 4 or Tier 5 Member, Final Compensation is the average annual compensation upon which contributions by a Member are made for the five consecutive years of service immediately preceding retirement, or the highest five fiscal years of service, if greater.

6. Final Year Compensation

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

7. Accumulated Deductions

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

8. Interest Credits on Accumulated Deductions

Members receive interest credits while contributing and for the first two years of inactivity. The rate depends on the type of benefit. Prior to July 1, 2018, members received interest credits for the entire period of inactivity until retirement or death.

9. Member Contributions

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

APPENDIX C – SUMMARY OF PLAN PROVISIONS

10. Benefits

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

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

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

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

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

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

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

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

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

Veterans may receive a Service Retirement benefit if greater.

APPENDIX C – SUMMARY OF PLAN PROVISIONS

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

Benefit is either:

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

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

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

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

- f) **Death Benefits**

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

- a. Lump sum payment equal to 150% of Final Year Compensation, also known as the non-contributory group life insurance benefit, plus
- b. Accumulated Deductions with credited interest.

- (2) **Accidental Death Before Retirement:** Death of an active Member resulting from injuries received from an accident during performance of duty and not a result of willful negligence. Benefit is equal to:

- a. Lump sum payment equal to 150% of Final Year Compensation, also known as the non-contributory group life insurance benefit, plus
- b. Spouse life annuity of 50% of Final Year Compensation payable until spouse's death or remarriage. If there is no surviving spouse or upon death or remarriage, a total of 20% (35%, 50%) of Final Year Compensation payable to one (two, three or more) dependent child(ren). If there is no surviving spouse or dependent child(ren), 25% (40%) of Final Year Compensation to one (two) dependent parent(s). If there is no surviving spouse, dependent child(ren) or parent(s), the benefit is a refund of Accumulated Deductions with credited interest.

APPENDIX C – SUMMARY OF PLAN PROVISIONS

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

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

g) **Disability Retirement**

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

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

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

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

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

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

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

APPENDIX C – SUMMARY OF PLAN PROVISIONS

11. Optional Forms of Payment

The member may elect the following forms of payment.

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

12. Cost-of-Living Adjustments

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

13. Changes in Plan Provisions Since Last Valuation

None.

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APPENDIX D – DETERMINATION OF DISCOUNT RATE

Table 1 - Projection of the Pension Plan's Fiduciary Net Position
(In Thousands)
Projections Commence June 30, 2021

Year	Projected Beginning Fiduciary Net Position (a)	Projected Member Contributions (b)	Projected Employer Contributions (c)	Projected Lottery Contributions (d)	Projected Benefit Payments (e)	Projected Administrative Expenses (f)	Projected Investment Earnings (g)	Projected Ending Fiduciary Net Position (h) = (a) + (b) + (c) + (d) - (e) - (f) + (g)
1	\$ 26,530,325	\$ 834,156	\$ 3,315,680	\$ 854,907	\$ 4,835,360	\$ 9,307	\$ 1,979,051	\$ 28,669,452
2	28,669,452	820,294	3,251,907	857,939	4,936,708	9,499	1,978,968	30,632,353
3	30,632,353	806,629	3,251,070	867,755	5,034,419	9,685	2,112,867	32,626,571
4	32,626,571	792,416	3,253,904	875,751	5,131,470	9,869	2,248,995	34,656,298
5	34,656,298	776,791	3,258,550	882,943	5,232,605	10,061	2,387,439	36,719,354
6	36,719,354	766,097	3,263,248	891,786	5,339,804	10,265	2,528,235	38,818,652
7	38,818,652	756,017	3,260,333	899,574	5,450,473	10,475	2,671,237	40,944,865
8	40,944,865	744,618	3,254,475	908,412	5,563,260	10,690	2,815,964	43,094,384
9	43,094,384	731,380	3,247,824	925,676	5,681,419	10,915	2,962,344	45,269,275
10	45,269,275	716,138	3,238,181	934,943	5,808,794	11,157	3,109,761	47,448,345
11	47,448,345	698,939	3,236,472	944,302	5,941,596	11,411	3,257,424	49,632,477
12	49,632,477	679,781	3,231,133	953,755	6,077,968	11,671	3,405,159	51,812,666
13	51,812,666	658,629	3,221,865	963,303	6,218,418	11,940	3,552,314	53,978,420
14	53,978,420	635,442	3,209,274	972,946	6,362,403	12,215	3,698,179	56,119,644
15	56,119,644	610,546	3,192,967	982,686	6,505,658	12,489	3,842,200	58,229,895
16	58,229,895	584,498	3,173,874	992,523	6,643,921	12,754	3,984,115	60,308,231
17	60,308,231	557,835	3,153,316	1,002,458	6,775,019	13,006	4,123,985	62,357,801
18	62,357,801	531,117	3,132,040	1,012,493	6,895,247	13,237	4,262,198	64,387,165
19	64,387,165	504,739	3,110,786	1,022,628	7,001,608	13,441	4,399,488	66,409,758
20	66,409,758	478,842	3,090,228	1,032,865	7,093,840	13,618	4,536,827	68,441,063
21	68,441,063	452,527	3,070,814	1,043,204	7,174,846	13,774	4,675,180	70,494,168
22	70,494,168	424,340	3,051,746	1,053,646	7,252,437	13,924	4,815,123	72,572,663
23	72,572,663	393,634	3,031,248	1,064,193	7,329,932	14,074	4,956,723	74,674,454
24	74,674,454	360,403	3,008,297	1,074,845	7,407,720	14,226	5,099,794	76,795,849
25	76,795,849	325,653	2,982,531	1,085,604	7,481,270	14,369	5,244,260	78,938,258
26	78,938,258	290,053	2,954,755	1,096,470	7,549,869	14,504	5,390,290	81,105,454
27	81,105,454	253,841	3,666,841	0	7,614,273	14,630	5,519,223	82,916,456
28	82,916,456	217,179	2,374,580	0	7,676,198	14,752	5,609,147	83,426,413
29	83,426,413	180,417	431,542	0	7,733,478	14,864	5,591,311	81,881,340
30	81,881,340	146,325	310,502	0	7,770,603	14,938	5,477,563	80,030,190
31	80,030,190	117,001	270,770	0	7,778,209	14,954	5,345,677	77,970,475
32	77,970,475	92,007	238,612	0	7,749,964	14,901	5,200,773	75,737,002
33	75,737,002	71,195	210,351	0	7,704,828	14,814	5,044,535	73,343,441
34	73,343,441	54,234	185,948	0	7,633,703	14,676	4,878,220	70,813,463
35	70,813,463	40,615	165,424	0	7,537,804	14,490	4,703,427	68,170,635
36	68,170,635	29,839	148,501	0	7,418,475	14,258	4,521,736	65,437,976
37	65,437,976	21,472	134,839	0	7,278,422	13,985	4,334,639	62,636,519
38	62,636,519	15,143	124,105	0	7,118,783	13,674	4,143,550	59,786,860
39	59,786,860	10,488	115,997	0	6,941,949	13,329	3,949,806	56,907,874
40	56,907,874	7,175	110,148	0	6,749,822	12,955	3,754,643	54,017,062
41	54,017,062	4,859	106,181	0	6,544,901	12,555	3,559,177	51,129,823
42	51,129,823	3,255	103,644	0	6,329,005	12,133	3,364,401	48,259,985
43	48,259,985	2,158	102,119	0	6,104,617	11,695	3,171,180	45,419,129
44	45,419,129	1,415	101,275	0	5,873,839	11,245	2,980,238	42,616,974
45	42,616,974	915	100,855	0	5,637,723	10,784	2,792,208	39,862,445
46	39,862,445	578	100,656	0	5,397,134	10,315	2,607,677	37,163,908
47	37,163,908	346	100,519	0	5,152,877	9,839	2,427,195	34,529,252
48	34,529,252	195	100,323	0	4,905,585	9,358	2,251,289	31,966,116
49	31,966,116	98	100,000	0	4,656,051	8,872	2,080,464	29,481,754
50	29,481,754	40	99,493	0	4,405,081	8,384	1,915,197	27,083,019
51	27,083,019	9	98,764	0	4,153,554	7,896	1,755,936	24,776,278
52	24,776,278	0	97,775	0	3,902,346	7,409	1,603,095	22,567,394
53	22,567,394	0	96,511	0	3,652,515	6,925	1,457,047	20,461,512
54	20,461,512	0	94,944	0	3,405,125	6,446	1,318,115	18,463,000
55	18,463,000	0	93,060	0	3,161,184	5,975	1,186,569	16,575,469
56	16,575,469	0	90,852	0	2,921,711	5,513	1,062,626	14,801,723
57	14,801,723	0	88,323	0	2,687,751	5,063	946,447	13,143,680
58	13,143,680	0	85,483	0	2,460,338	4,625	838,130	11,602,330
59	11,602,330	0	82,346	0	2,240,461	4,203	737,712	10,177,723
60	10,177,723	0	78,936	0	2,029,041	3,798	645,165	8,868,984

**TEACHERS' PENSION AND ANNUITY FUND OF NEW JERSEY
GASB 68 REPORTING FOR JUNE 30, 2021 MEASUREMENT DATE**

APPENDIX D – DETERMINATION OF DISCOUNT RATE

Table 1 - Projection of the Pension Plan's Fiduciary Net Position
(In Thousands)

Projections Commence June 30, 2021

Year	Projected Beginning Fiduciary Net Position (a)	Projected Member Contributions (b)	Projected Employer Contributions (c)	Projected Lottery Contributions (d)	Projected Benefit Payments (e)	Projected Administrative Expenses (f)	Projected Investment Earnings (g)	Projected Ending Fiduciary Net Position (h) = (a) + (b) + (c) + (d) - (e) - (f) + (g)
61	8,868,984	0	75,270	0	1,826,912	3,412	560,400	7,674,331
62	7,674,331	0	71,379	0	1,634,819	3,045	483,266	6,591,111
63	6,591,111	0	67,293	0	1,453,389	2,700	413,558	5,615,874
64	5,615,874	0	63,042	0	1,283,128	2,377	351,019	4,744,430
65	4,744,430	0	58,667	0	1,124,420	2,076	295,342	3,971,942
66	3,971,942	0	54,200	0	977,506	1,799	246,181	3,293,019
67	3,293,019	0	49,677	0	842,506	1,545	203,158	2,701,803
68	2,701,803	0	45,138	0	719,427	1,314	165,862	2,192,063
69	2,192,063	0	40,619	0	608,166	1,106	133,863	1,757,273
70	1,757,273	0	36,166	0	508,524	920	106,712	1,390,706
71	1,390,706	0	31,827	0	420,197	757	83,949	1,085,527
72	1,085,527	0	27,651	0	342,775	614	65,114	834,903
73	834,903	0	23,680	0	275,744	491	49,746	632,094
74	632,094	0	19,964	0	218,509	387	37,396	470,557
75	470,557	0	16,547	0	170,375	300	27,631	344,060
76	344,060	0	13,470	0	130,559	228	20,044	246,786
77	246,786	0	10,754	0	98,200	171	14,257	173,426
78	173,426	0	8,410	0	72,397	125	9,932	119,246
79	119,246	0	6,430	0	52,236	89	6,766	80,117
80	80,117	0	4,799	0	36,832	63	4,503	52,525
81	52,525	0	3,492	0	25,338	43	2,923	33,558
82	33,558	0	2,471	0	16,979	28	1,848	20,870
83	20,870	0	1,698	0	11,063	18	1,138	12,623
84	12,623	0	1,130	0	7,000	11	681	7,423
85	7,423	0	727	0	4,295	7	396	4,245
86	4,245	0	452	0	2,553	4	225	2,364
87	2,364	0	270	0	1,470	2	124	1,287
88	1,287	0	156	0	821	1	67	687
89	687	0	86	0	446	1	36	363
90	363	0	46	0	237	0	19	191
91	191	0	24	0	124	0	10	101
92	101	0	12	0	64	0	5	54
93	54	0	6	0	33	0	3	30
94	30	0	3	0	17	0	2	18
95	18	0	1	0	9	0	1	11
96	11	0	1	0	5	0	1	8
97	8	0	0	0	3	0	0	6
98	6	0	0	0	2	0	0	5
99	5	0	0	0	1	0	0	4
100	4	0	0	0	1	0	0	3
101	3	0	0	0	1	0	0	3
102	3	0	0	0	0	0	0	3
103	3	0	0	0	0	0	0	3
104	3	0	0	0	0	0	0	3
105	3	0	0	0	0	0	0	3
106	3	0	0	0	0	0	0	3
107	3	0	0	0	0	0	0	3
108	3	0	0	0	0	0	0	3
109	3	0	0	0	0	0	0	3
110	3	0	0	0	0	0	0	4
111	4	0	0	0	0	0	0	4
112	4	0	0	0	0	0	0	4
113	4	0	0	0	0	0	0	4
114	4	0	0	0	0	0	0	5
115	5	0	0	0	0	0	0	5

**TEACHERS' PENSION AND ANNUITY FUND OF NEW JERSEY
GASB 68 REPORTING FOR JUNE 30, 2021 MEASUREMENT DATE**

APPENDIX D – DETERMINATION OF DISCOUNT RATE

Table 2 - Actuarial Present Values of Projected Benefit Payments

(In Thousands)

Projections Commence June 30, 2021

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

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

Year	Projected Beginning Fiduciary Net Position*	Projected Benefit Payments for current Plan participants**	"Funded" Portion of Benefit Payments (d) = (c) if (b) >= (c)	"Unfunded" Portion of Benefit Payments (e) = (c) - (d)	Present Value of "Funded" Benefit Payments (f) = (d) / (1+7.00%)^(a) - .5]	Present Value of "Unfunded" Benefit Payments (g) = (e) / (1+2.16%)^(a) - .5]	Present Value of Benefit Payments Using the Single Discount Rate (h) = (c) / (1+7.00%)^(a) - .5]
(a)	(b)	(c)	(d) = (c) if (b) >= (c)	(e) = (c) - (d)	(f) = (d) / (1+7.00%)^(a) - .5]	(g) = (e) / (1+2.16%)^(a) - .5]	(h) = (c) / (1+7.00%)^(a) - .5]
1	\$ 26,530,325	\$ 4,835,360	\$ 4,835,360	\$ 0	\$ 4,674,519	\$ 0	\$ 4,674,519
2	28,669,452	4,936,708	4,936,708	0	4,460,276	0	4,460,276
3	30,632,353	5,034,419	5,034,419	0	4,250,988	0	4,250,988
4	32,626,571	5,131,470	5,131,470	0	4,049,473	0	4,049,473
5	34,656,298	5,232,605	5,232,605	0	3,859,144	0	3,859,144
6	36,719,354	5,339,804	5,339,804	0	3,680,565	0	3,680,565
7	38,818,652	5,450,473	5,450,473	0	3,511,071	0	3,511,071
8	40,944,865	5,563,260	5,563,260	0	3,349,277	0	3,349,277
9	43,094,384	5,681,419	5,681,419	0	3,196,647	0	3,196,647
10	45,269,275	5,808,794	5,808,794	0	3,054,500	0	3,054,500
11	47,448,345	5,941,596	5,941,596	0	2,919,937	0	2,919,937
12	49,632,477	6,077,968	6,077,968	0	2,791,547	0	2,791,547
13	51,812,666	6,218,418	6,218,418	0	2,669,209	0	2,669,209
14	53,978,420	6,362,403	6,362,403	0	2,552,350	0	2,552,350
15	56,119,644	6,505,658	6,505,658	0	2,439,082	0	2,439,082
16	58,229,895	6,643,921	6,643,921	0	2,327,962	0	2,327,962
17	60,308,231	6,775,019	6,775,019	0	2,218,596	0	2,218,596
18	62,357,801	6,895,247	6,895,247	0	2,110,249	0	2,110,249
19	64,387,165	7,001,608	7,001,608	0	2,002,617	0	2,002,617
20	66,409,758	7,093,840	7,093,840	0	1,896,259	0	1,896,259
21	68,441,063	7,174,846	7,174,846	0	1,792,442	0	1,792,442
22	70,494,168	7,252,437	7,252,437	0	1,693,295	0	1,693,295
23	72,572,663	7,329,932	7,329,932	0	1,599,429	0	1,599,429
24	74,674,454	7,407,720	7,407,720	0	1,510,657	0	1,510,657
25	76,795,849	7,481,270	7,481,270	0	1,425,846	0	1,425,846
26	78,938,258	7,549,869	7,549,869	0	1,344,786	0	1,344,786
27	81,105,454	7,614,273	7,614,273	0	1,267,530	0	1,267,530
28	82,916,456	7,676,198	7,676,198	0	1,194,242	0	1,194,242
29	83,426,413	7,733,478	7,733,478	0	1,124,442	0	1,124,442
30	81,881,340	7,770,603	7,770,603	0	1,055,925	0	1,055,925
31	80,030,190	7,778,209	7,778,209	0	987,812	0	987,812
32	77,970,475	7,749,964	7,749,964	0	919,837	0	919,837
33	75,737,002	7,704,828	7,704,828	0	854,654	0	854,654
34	73,343,441	7,633,703	7,633,703	0	791,368	0	791,368
35	70,813,463	7,537,804	7,537,804	0	730,305	0	730,305
36	68,170,635	7,418,475	7,418,475	0	671,724	0	671,724
37	65,437,976	7,278,422	7,278,422	0	615,927	0	615,927
38	62,636,519	7,118,783	7,118,783	0	563,007	0	563,007
39	59,786,860	6,941,949	6,941,949	0	513,105	0	513,105
40	56,907,874	6,749,822	6,749,822	0	466,265	0	466,265
41	54,017,062	6,544,901	6,544,901	0	422,532	0	422,532
42	51,129,823	6,329,005	6,329,005	0	381,864	0	381,864
43	48,259,985	6,104,617	6,104,617	0	344,229	0	344,229
44	45,419,129	5,873,839	5,873,839	0	309,548	0	309,548
45	42,616,974	5,637,723	5,637,723	0	277,668	0	277,668
46	39,862,445	5,397,134	5,397,134	0	248,428	0	248,428
47	37,163,908	5,152,877	5,152,877	0	221,669	0	221,669
48	34,529,252	4,905,585	4,905,585	0	197,225	0	197,225
49	31,966,116	4,656,051	4,656,051	0	174,946	0	174,946
50	29,481,754	4,405,081	4,405,081	0	154,688	0	154,688
51	27,083,019	4,153,554	4,153,554	0	136,314	0	136,314
52	24,776,278	3,902,346	3,902,346	0	119,691	0	119,691
53	22,567,394	3,652,515	3,652,515	0	104,699	0	104,699
54	20,461,512	3,405,125	3,405,125	0	91,222	0	91,222
55	18,463,000	3,161,184	3,161,184	0	79,147	0	79,147
56	16,575,469	2,921,711	2,921,711	0	68,366	0	68,366
57	14,801,723	2,687,751	2,687,751	0	58,777	0	58,777
58	13,143,680	2,460,338	2,460,338	0	50,284	0	50,284
59	11,602,330	2,240,461	2,240,461	0	42,794	0	42,794
60	10,177,723	2,029,041	2,029,041	0	36,221	0	36,221

**TEACHERS' PENSION AND ANNUITY FUND OF NEW JERSEY
GASB 68 REPORTING FOR JUNE 30, 2021 MEASUREMENT DATE**

APPENDIX D – DETERMINATION OF DISCOUNT RATE

Table 2 - Actuarial Present Values of Projected Benefit Payments

(In Thousands)

Projections Commence June 30, 2021

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

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

Year	Projected Beginning Fiduciary Net Position*	Projected Benefit Payments for current Plan participants**	"Funded" Portion of Benefit Payments	"Unfunded" Portion of Benefit Payments	Present Value of "Funded" Benefit Payments (f) = (d) / (1+7.00%) ^[(a) - .5]	Present Value of "Unfunded" Benefit Payments (g) = (e) / (1+2.16%) ^[(a) - .5]	Present Value of Benefit Payments Using the Single Discount Rate (h) = (c) / (1+7.00%) ^[(a) - .5]
(a)	(b)	(c)	(d) = (c) if (b) >= (c)	(e) = (c) - (d)			
61	8,868,984	1,826,912	1,826,912	0	30,479	0	30,479
62	7,674,331	1,634,819	1,634,819	0	25,490	0	25,490
63	6,591,111	1,453,389	1,453,389	0	21,179	0	21,179
64	5,615,874	1,283,128	1,283,128	0	17,474	0	17,474
65	4,744,430	1,124,420	1,124,420	0	14,311	0	14,311
66	3,971,942	977,506	977,506	0	11,627	0	11,627
67	3,293,019	842,506	842,506	0	9,366	0	9,366
68	2,701,803	719,427	719,427	0	7,474	0	7,474
69	2,192,063	608,166	608,166	0	5,905	0	5,905
70	1,757,273	508,524	508,524	0	4,615	0	4,615
71	1,390,706	420,197	420,197	0	3,564	0	3,564
72	1,085,527	342,775	342,775	0	2,717	0	2,717
73	834,903	275,744	275,744	0	2,043	0	2,043
74	632,094	218,509	218,509	0	1,513	0	1,513
75	470,557	170,375	170,375	0	1,102	0	1,102
76	344,060	130,559	130,559	0	789	0	789
77	246,786	98,200	98,200	0	555	0	555
78	173,426	72,397	72,397	0	382	0	382
79	119,246	52,236	52,236	0	258	0	258
80	80,117	36,832	36,832	0	170	0	170
81	52,525	25,338	25,338	0	109	0	109
82	33,558	16,979	16,979	0	68	0	68
83	20,870	11,063	11,063	0	42	0	42
84	12,623	7,000	7,000	0	25	0	25
85	7,423	4,295	4,295	0	14	0	14
86	4,245	2,553	2,553	0	8	0	8
87	2,364	1,470	1,470	0	4	0	4
88	1,287	821	821	0	2	0	2
89	687	446	446	0	1	0	1
90	363	237	237	0	1	0	1
91	191	124	124	0	0	0	0
92	101	64	64	0	0	0	0
93	54	33	33	0	0	0	0
94	30	17	17	0	0	0	0
95	18	9	9	0	0	0	0
96	11	5	5	0	0	0	0
97	8	3	3	0	0	0	0
98	6	2	2	0	0	0	0
99	5	1	1	0	0	0	0
100	4	1	1	0	0	0	0
101	3	1	1	0	0	0	0
102	3	0	0	0	0	0	0
103	3	0	0	0	0	0	0
104	3	0	0	0	0	0	0
105	3	0	0	0	0	0	0
106	3	0	0	0	0	0	0
107	3	0	0	0	0	0	0
108	3	0	0	0	0	0	0
109	3	0	0	0	0	0	0
110	3	0	0	0	0	0	0
111	4	0	0	0	0	0	0
112	4	0	0	0	0	0	0
113	4	0	0	0	0	0	0
114	4	0	0	0	0	0	0
115	5	0	0	0	0	0	0
					\$ 86,818,467	\$ 0	\$ 86,818,467

APPENDIX E – GLOSSARY OF TERMS

1. Actuarially Determined Contribution

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

2. Actuarial Valuation Date

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

3. Deferred Inflow of Resources

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

4. Deferred Outflow of Resources

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

5. Entry Age Actuarial Cost Method

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

6. Measurement Date

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

APPENDIX E – GLOSSARY OF TERMS

7. Net Pension Liability

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

8. Plan Fiduciary Net Position

The fair or market value of assets.

9. Reporting Date

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

10. Service Cost

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

11. Total Pension Liability

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