



# **Judicial Retirement System** of New Jersey

Actuarial Experience Study for July 1, 2021 through June 30, 2024

**Produced by Cheiron** 

August 2025

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August 26, 2025

State House Commission Judicial Retirement System of New Jersey State of New Jersey Department of the Treasury Division of Pension and Benefits, CN 295 Trenton, NJ 08625-0295

#### **Dear Commission Members:**

The purpose of this report is to present the Actuarial Experience Study of the Judicial Retirement System of New Jersey (JRS, the System) in accordance with Title 43, Chapter 6A-31 of the NJ State Statute. This Statute requires the actuary to conduct an actuarial investigation into the mortality, service and salary experience of the members and beneficiaries of the System at least once every three years.

This study covers the actuarial experience from July 1, 2021 through June 30, 2024. The report includes analyses and results of our study as well as recommended assumptions for consideration by the State House Commission to be used beginning with the July 1, 2025 actuarial valuation. It also includes the estimated financial impact of these assumption changes. The prior experience study was performed by Cheiron and covered the period July 1, 2018 through June 30, 2021.

If you have any questions about the report or would like additional information, please let us know.

Sincerely, Cheiron

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#### SECTION I – EXECUTIVE SUMMARY

Actuarial assumptions (economic and demographic) are intended to be long-term in nature and should be both individually reasonable and consistent in the aggregate. The purpose of this experience study is to evaluate whether the current assumptions adequately reflect the long-term expectations for JRS, and if not, to recommend adjustments. It is important to note that frequent and significant changes in the actuarial assumptions are not typically recommended, unless there are known fundamental changes in expectations of the economy, or with respect to JRS's membership or assets that would warrant such frequent or significant changes.

#### SUMMARY OF ASSUMPTION ANALYSIS

This experience study specifically analyzes and makes recommendations for the following assumptions.

- **Retirement rates** Continue with the current assumption.
- **Termination rates** Continue with the current assumption.
- **Disability rates** Continue with the current assumption.
- **Mortality rates** Update to newly published Pub-2016 mortality tables. Continue with generational mortality improvement scale MP-2021.
- **Family composition** Continue with the current assumptions.
- Price and wage inflation rates Continue with the current assumptions.
- Salary increase rates Continue with the current assumption consistent with Chapter 349, P. L. 2023.

The recommended changes to the assumptions will decrease the actuarial liability and the Statutory Contributions.

Further information about the impact of these changes on the Statutory Contributions and funded status can be found on the next page.



#### **SECTION I – EXECUTIVE SUMMARY**

Cost Impact of Assumption Ch	Table I anges o		lluatio	n Results
	P	Current Assumptions		ecommended Assumptions
Assets and Liabilities				
Actuarial Liability	\$	909,557,632	\$	896,624,708
Actuarial Value of Assets (AVA) <sup>1</sup>	·	321,882,453		321,882,453
Unfunded Actuarial Liability/(Surplus)	\$	587,675,179	\$	574,742,255
Funded Ratio	•	35.4%	4	35.9%
Contribution Amounts				
State Normal Cost at End of Year	\$	20,902,679	\$	20,714,354
Amortization Payment of UAL		50,428,711		49,318,930
Total Statutory Contribution for FYE	\$	71,331,390	\$	70,033,284
Difference due to assumption abangos				
Difference due to assumption changes Actuarial Liability			\$	(12,932,924)
Actuarial Value of Assets (AVA) <sup>1</sup>			Ψ	0
Unfunded Actuarial Liability/(Surplus)			\$	(12,932,924)
Funded Ratio			Ψ	0.5%
State Normal Cost at End of Year			\$	(188,325)
Amortization Payment of UAL				(1,109,781)
Total Statutory Contribution for FYE			\$	(1,298,106)

<sup>&</sup>lt;sup>1</sup> Includes discounted State appropriations receivable

The body of this report provides details and support for our conclusions and recommendations for the assumptions.



#### **SECTION II - CERTIFICATION**

The purpose of this report is to provide the results of an Actuarial Experience Study of the Judicial Retirement System of New Jersey (JRS) covering the three-year period from July 1, 2021 through June 30, 2024. This report is for the use of the Division of Pensions and Benefits and the State House Commission in selecting assumptions to be used in actuarial valuations beginning July 1, 2025. This experience study was completed in accordance with the provisions of Title 43, Chapter 6A-31 of the NJ State Statute which requires periodic review of the experience of the System.

In preparing our report, we relied on information (some oral and some written) supplied by the Division of Pensions and Benefits. This information includes, but is not limited to, 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, *Data Quality*.

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 used ProVal in accordance with its original intended purpose. We have not identified any material inconsistencies in ProVal assumptions or output that would affect this analysis.

The data, plan provisions and actuarial methods are the same as those shown in our July 1, 2024 actuarial valuation report, and the actuarial assumptions are the same except as modified for the purpose of estimating the financial impact of the recommended assumption changes.

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 exclusively for the Judicial Retirement System of New Jersey for the purposes described 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.

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#### SECTION III – DEMOGRAPHIC ASSUMPTIONS

Demographic assumptions are used to predict membership behavior, including rates of retirement, termination, disability, and mortality. These assumptions are based primarily on the historical experience of JRS, with some adjustments where future experience is expected to differ from historical experience and with deference to standard tables where JRS experience is not fully credible, which means there is insufficient data to support an assumption, and a standard table is available.

#### ANALYSIS OF DEMOGRAPHIC ASSUMPTIONS

For all of the demographic assumptions, we determined the ratio of the actual number of decrements for each membership group compared to the expected number of decrements (A/E ratio or actual-to-expected ratio). Generally, the goal is to get as close as possible to an A/E ratio of 100%. Appropriate assumptions are often dependent on the amount of data available, and if there is insufficient data, then the best assumption may be a reflection of standard tables. For example, there are typically relatively low incidences of pre-retirement deaths so using standard mortality tables may be more appropriate. This could result in the A/E ratio being further away from 100%. Also, we aggregate participants for demographic assumptions review when the data at individual ages is no longer credible. For example, we may reduce the number of service bands for an assumption with low incidences, if those service bands do not materially improve the quality of the results.

We also calculate an r-squared statistic for each assumption. R-squared measures how well the assumption fits the actual data and can be thought of as the percentage of the variation in actual data explained by the assumption. Ideally, r-squared would equal 1.000, although this is never the case in reality. Any recommended assumption change should increase the r-squared compared to the current assumption making it closer to 1.000 unless the pattern of future decrements is expected to be different from the pattern experienced during the period of study.

In addition, we calculated the 90% confidence interval, which represents the range within which the true decrement rate during the experience study period is expected to fall 90% of the time. In the graphs, the black squares represent the actual experience observed and the gray bars represent the 90% confidence interval around that experience. The red and green lines represent the current and recommended assumptions, respectively. When the recommended assumption is the same as the current assumption, the green line sits over the red line and the red line does not show. Where there is sufficient experience, the confidence interval is relatively narrow, and where there is little experience, the confidence interval can be very wide. We generally recommend assumption changes when the current assumption is outside the 90% confidence interval of the observed experience. However, adjustments are made to account for differences between future expectations and historical experience and to account for the past experience represented by the current assumption. For mortality rates, we compare JRS's experience to that of a standard table.



### SECTION III – DEMOGRAPHIC ASSUMPTIONS RETIREMENT RATES

#### RETIREMENT RATES

The current retirement rates vary by age and service as a judge and are applied to all members who are eligible to retire. As a result, a judge who is age 60 with 10 years of service as a judge, for example, is assumed to be less likely to retire than a judge who is age 60 with 25 years of service as a judge. In reviewing the data for JRS, we find that at many ages, members with more service as a judge are generally more likely to retire than members with fewer years of service as a judge. JRS is not large enough to justify assumptions for each age and service combination, so we recommend separate assumptions by service groups for members:

- Members with less than 15 years of service as a judge,
- Members with 15 to 19 years of service as a judge, and
- Members with 20 or more years of service as a judge.

Members are eligible to retire prior to age 60 only if they have 25 or more years in aggregate of public service. Due to the demographic make-up of the group, few, if any, members attain 25 years of service as a judge prior to age 60. As such, members who retire prior to age 60 generally do so based on non-judicial service. No members retired prior to age 60 during the experience period. Therefore, we recommend continuing to assume no retirements prior to age 60.

Likewise, few members utilized non-judicial service when retiring after attaining age 60.

The following exhibits focus on members age 60 and above and on service as a judge only. In the interest of brevity, further references to years of service mean years of service as a judge.

The ultimate retirement age remains at age 70, per plan provisions.



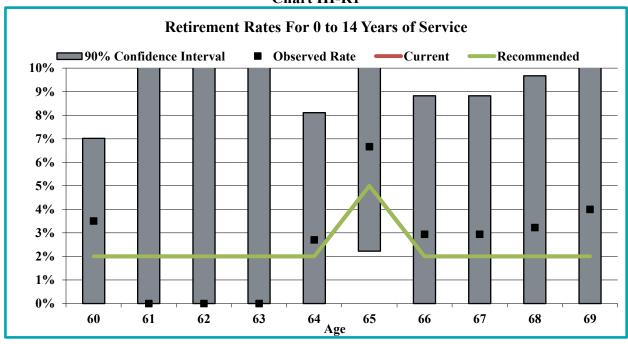
### SECTION III – DEMOGRAPHIC ASSUMPTIONS RETIREMENT RATES

In Table III-R1 we show the calculation of actual-to-expected ratios and the r-squared statistic for members with less than 15 years of service, and Chart III-R1 shows the information graphically along with the 90% confidence interval. For this group, the actual experience was very close to the expected number of assumed retirements. Based on the experience, we recommend no change to the retirement rates for members with 0 to 14 years of service as shown in the table below.

Table III-R1

			Reti	rement Rates Fo	r 0 to 14 Y	ears of Se	rvice		
			Retireme	ents		Retirement	A/E Ratios		
Age	Exposures	Actual	Current	Recommended	Actual	Current	Recommended	Current	Recommended
60	57	2	1.1	1.1	3.51%	2.00%	2.00%	175%	175%
61	59	0	1.2	1.2	0.00%	2.00%	2.00%	0%	0%
62	48	0	1.0	1.0	0.00%	2.00%	2.00%	0%	0%
63	39	0	0.8	0.8	0.00%	2.00%	2.00%	0%	0%
64	37	1	0.7	0.7	2.70%	2.00%	2.00%	135%	135%
65	45	3	2.3	2.3	6.67%	5.00%	5.00%	133%	133%
66	34	1	0.7	0.7	2.94%	2.00%	2.00%	147%	147%
67	34	1	0.7	0.7	2.94%	2.00%	2.00%	147%	147%
68	31	1	0.6	0.6	3.23%	2.00%	2.00%	161%	161%
69	25	1	0.5	0.5	4.00%	2.00%	2.00%	200%	200%
Total	Total 409 10 9.5 9.5				2.44%	2.33%	2.33%	105%	105%
R-squar	red		0.400	0.400					

**Chart III-R1** 





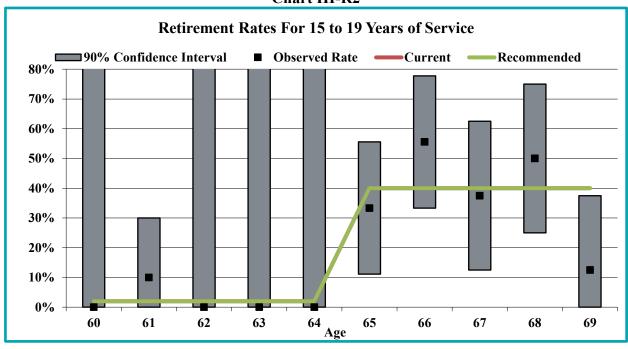
### SECTION III – DEMOGRAPHIC ASSUMPTIONS RETIREMENT RATES

Table III-R2 shows the calculation of actual-to-expected ratios and the r-squared statistic for members with service between 15 and 19 years, and Chart III-R2 shows the information graphically along with the 90% confidence interval. For this group, the actual experience was very close to the expected number of assumed retirements. Based on the experience, we recommend no change to the retirement rates for members with 15 to 19 years of service.

Table III-R2

	Retirement Rates For 15 to 19 Years of Service													
			Retireme	nts		Retirement	A/E Ratios							
Age	Exposures	Actual	Current	Recommended	Actual	Current	Recommended	Current	Recommended					
60	6	0	0.1	0.1	0.00%	2.00%	2.00%	0%	0%					
61	10	1 0.2		0.2	10.00%	2.00%	2.00%	500%	500%					
62	14 0 0.3		0.3	0.00%	2.00%	2.00%	0%	0%						
63	17	0 0.3		0.3	0.00%	2.00%	2.00%	0%	0%					
64	18	0	0.4	0.4	0.00%	2.00%	2.00%	0%	0%					
65	9	3	3.6	3.6	33.33%	40.00%	40.00%	83%	83%					
66	9	5	3.6	3.6	55.56%	40.00%	40.00%	139%	139%					
67	8	3	3.2	3.2	37.50%	40.00%	40.00%	94%	94%					
68	8	4	3.2	3.2	50.00%	40.00%	40.00%	125%	125%					
69	9 8 1 3.2 3.		3.2	12.50%	40.00%	40.00%	31%	31%						
Total	Total 107 17 18.1 18				15.89%	16.92%	16.92%	94%	94%					
R-squar	red		0.729	0.729										

**Chart III-R2** 



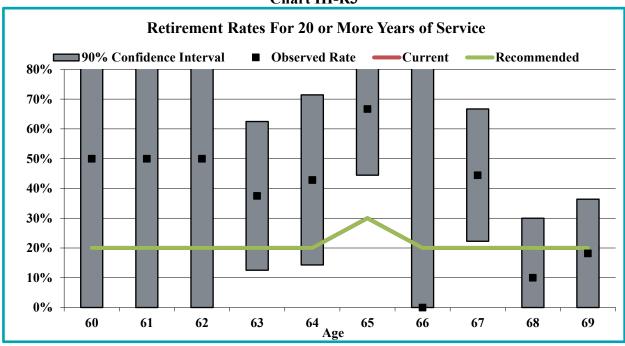


### SECTION III – DEMOGRAPHIC ASSUMPTIONS RETIREMENT RATES

Table III-R3 shows the calculation of actual-to-expected ratios and the r-squared statistic for members with 20 or more years of service, and Chart III-R3 shows the information graphically along with the 90% confidence interval. The data shows more retirements than expected under the assumption. This is a change from the trend observed in the prior two experience studies. The same assumptions produced A/E ratios of 76% in the 2021 study and 92% in the 2018 study. The combined A/E ratio using the data from the last three studies is 104%. Based on this longer term trend and the relatively small amount of data, we recommend no change to the retirement rates for members with 20 or more years of service.

Table III-R3

			Retiren	nent Rates For	20 or Mor	e Years of	f Service		
			Retireme	nts		Retirement	Rates	A/	E Ratios
Age	Exposures	Actual	Current	Recommended	Actual	Current	Recommended	Current	Recommended
60	2	1	0.4	0.4	50.00%	20.00%	20.00%	250%	250%
61	4	2	0.8	0.8	50.00%	20.00%	20.00%	250%	250%
62	4	2	0.8	0.8	50.00%	20.00%	20.00%	250%	250%
63	8	3	1.6	1.6	37.50%	20.00%	20.00%	188%	188%
64	7	3	1.4	1.4	42.86%	20.00%	20.00%	214%	214%
65	9	6	2.7	2.7	66.67%	30.00%	30.00%	222%	222%
66	7	0	1.4	1.4	0.00%	20.00%	20.00%	0%	0%
67	9	4	1.8	1.8	44.44%	20.00%	20.00%	222%	222%
68	10	1	2.0	2.0	10.00%	20.00%	20.00%	50%	50%
69	11	2	2.2	2.2	18.18%	20.00%	20.00%	91%	91%
Total	71	24	15.1	15.1	33.80%	21.27%	21.27%	159%	159%
R-squar	red		0.320	0.320					





### SECTION III – DEMOGRAPHIC ASSUMPTIONS TERMINATION RATES

Termination rates reflect the frequency at which active members leave employment for reasons other than retirement, death, or disability. The current assumption is that no vested or non-vested member terminates. The experience shows that of the 548 exposures in the three years of experience, there were only 7 terminations. Given the low rate of terminations, we recommend continuing the current assumption of no terminations.

Table III-T1

	Termination Rates												
Service			Terminati	ons	1	<b>Termination</b>	Rates	A/E Ratios					
Band	Exposures	Actual	Current	Recommended	Actual	Current	Recommended	Current	Recommended				
0 - 4	182	1	0.0	0.0	0.55%	0.00%	0.00%	0%	0%				
5 - 9	256	4	0.0	0.0	1.56%	0.00%	0.00%	0%	0%				
10 - 14	90	2	0.0	0.0	2.22%	0.00%	0.00%	0%	0%				
15 +	20	0.0		0.0	0.00%	0.00%	0.00%	0%	0%				
Total	Total 548 7 0.0 0.0				1.28%	0.00%	0.00%	0%	0%				
R-square	R-squared 0.000 0												



### SECTION III – DEMOGRAPHIC ASSUMPTIONS DISABILITY RATES

The following table shows the calculation of actual-to-expected ratios and the r-squared statistic for terminations due to disability. The actual experience was very close to the expected number of assumed disabilities. Since there has historically been very low incidence of disability, we recommend continuing the current assumption.

Table III-D1

				Disa	bility Rate	es				
Age			Disabilit	ies		Disability I	Rates	A/E Ratios		
Band	Exposures	Actual	Current	Recommended	Actual	Current	Recommended	Current	Recommended	
35 - 39	0	0	0.0	0.0	0.00%	0.00%	0.00%	0%	0%	
40 - 44	26	0	0.0	0.0	0.00%	0.05%	0.05%	0%	0%	
45 - 49	71	0	0.1	0.1	0.00%	0.09%	0.09%	0%	0%	
50 - 54	200	2	0.3	0.3	1.00%	0.15%	0.15%	675%	675%	
55 - 59	254	0	0.6	0.6	0.00%	0.25%	0.25%	0%	0%	
60 - 64	330	0	1.3	1.3	0.00%	0.38%	0.38%	0%	0%	
65 - 69	256	2	1.4	1.4	0.78%	0.55%	0.55%	142%	142%	
Total	1,137	4	3.7	3.7	0.35%	0.32%	0.32%	109%	109%	
R-squar	ed		0.023	0.023						



### SECTION III – DEMOGRAPHIC ASSUMPTIONS MORTALITY RATES

Mortality assumptions are typically developed separately by gender. Unlike most demographic assumptions, mortality assumptions do not rely exclusively on plan experience. Standard mortality tables and projection scales, reflecting future life expectancy improvements, serve as the primary basis for the assumptions. The standard tables can then be modified to better reflect the System's experience, depending on the amount of available data.

The Society of Actuaries (SOA) completed an extensive mortality study of public pension plan experience and issued a set of mortality tables named the Pub-2016 mortality tables which provide insights into the composition of gender-specific pension mortality by factors such as job category (e.g. General Employees, Teachers, Public Safety), salary/benefit amount and health status (e.g. healthy or disabled).

In addition, there has been a long history of mortality improvement among pensioners in the U.S., and there is an expectation that mortality rates will continue to improve in the future. The SOA periodically publishes mortality improvement scales that reflect continued mortality improvement trends. The SOA's MP-2021 scale remains the most recent mortality improvement projection scale at the time this analysis was prepared. However, the MP-2021 scale only reflects historical mortality data through calendar year 2019. The COVID-19 pandemic may have caused a temporary change in mortality patterns.

The steps in our analysis of the mortality assumptions are as follows:

- 1. Select a standard mortality table that reflects the anticipated experience of the System.
- 2. Compare actual experience of the System to what would have been predicted by the selected standard table for the period of the experience study.
- 3. Adjust the standard table either fully or partially depending on the level of credibility for the System's experience. This adjusted table is called the base table.
- 4. Select an appropriate standard mortality improvement projection scale and apply it to the base table.

Similar to the methodology used to develop the Pub-2016 tables, when actual experience of the System is compared to that of the standard table, the experience is weighted based on the amount of income (salary for pre-retirement mortality and pension benefit for post-retirement mortality). Mortality studies in the U.S. have consistently shown that individuals with higher income have longer life expectancies than individuals with lower income. It is important for a pension plan to use assumptions that are weighted by income to reflect not just the incidence of a decrement but the impact on liabilities.



### SECTION III – DEMOGRAPHIC ASSUMPTIONS MORTALITY RATES

In the prior study, JRS adopted the following assumptions:

**Active members (Non-Annuitants)**: The Pub-2010 Teachers Above-Median Income Employee mortality table *[PubT-2010(A) Employee]* as published by the Society of Actuaries, unadjusted, and with future improvement from the base year of 2010 on a generational basis using SOA's Scale MP-2021.

**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, unadjusted, and with future improvement from the base year of 2010 on a generational basis using SOA's Scale MP-2021.

**Disabled members (Disabled Annuitants)**: The Pub-2010 Non-Safety Disabled Retiree mortality table *[PubNS-2010 Disabled Retiree]* as published by the Society of Actuaries, unadjusted, and with future improvement from the base year of 2010 on a generational basis using SOA's Scale MP-2021.

Deaths among active and inactive lives for JRS in a three-year period represent a relatively small sample size and may not provide meaningful statistics. There was only one active death in total which does not provide a large enough sampling to analyze this group in detail. For healthy retirees and survivors there were 83 deaths over this period, and for disabled retirees there were six deaths. For reference, a fully credible sample would include 1,082 deaths. We therefore recommend using standard Pub-2016 tables for Teachers without any adjustments.

Since the SOA has not released a more recent mortality improvement scale due to the impact of the COVID-19 pandemic on the underlying data, we recommend continuing to use MP-2021 as the mortality improvement scale.

We recommend the following mortality assumptions:

**Active members (Non-Annuitants):** The Pub-2016 Teachers Above-Median Income Employee mortality table [PubT-2016(A) Employee] as published by the Society of Actuaries, unadjusted, and with future improvement from the base year of 2016 on a generational basis using SOA's Scale MP-2021.

**Healthy retirees and beneficiaries (Healthy Annuitants)**: The Pub-2016 Teachers Above-Median Income Healthy Retiree mortality table [PubT-2016(A) Healthy Retiree] as published by the Society of Actuaries, unadjusted, and with future improvement from the base year of 2016 on a generational basis using SOA's Scale MP-2021.

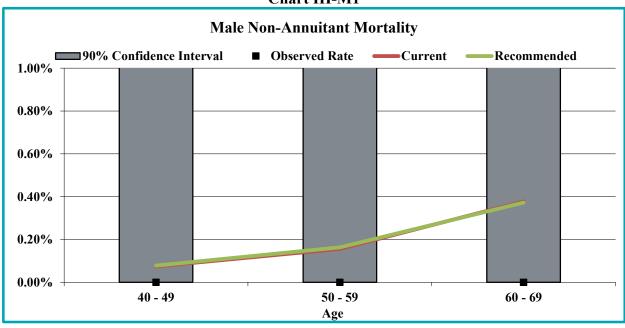
**Disabled members (Disabled Annuitants):** The Pub-2016 Non-Safety Disabled Retiree mortality table *[PubNS-2016 Disabled Retiree]* as published by the Society of Actuaries, unadjusted, and with future improvement from the base year of 2016 on a generational basis using SOA's Scale MP-2021.



### SECTION III – DEMOGRAPHIC ASSUMPTIONS MORTALITY RATES

**Table III-M1 – Active Males** 

	Non-Annuitant Mortality - Base Table for Males												
Age Actual Weighted Weighted Deaths A/E Ratio													
Band	Exposures	Deaths	Exposures	Actual	Current	Recommended	Current	Recommended					
30 - 39	0	0	0	0	0	0	0%	0%					
40 - 49	43	0	8,445,443	0	6,249	6,572	0%	0%					
50 - 59	279	0	54,968,952	0	85,937	89,568	0%	0%					
60 - 69	389	0	76,941,162	0	290,571	286,435	0%	0%					
Total	711	0	140,355,557	0	382,757	382,574	0%	0%					
R-square	ed				0.000	0.000							

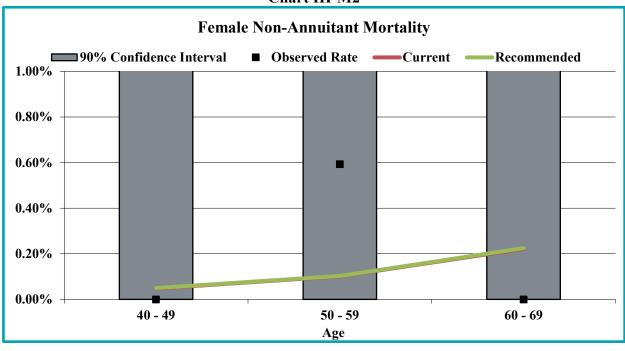




### SECTION III – DEMOGRAPHIC ASSUMPTIONS MORTALITY RATES

**Table III-M2 – Active Females** 

	Non-Annuitant Mortality - Base Table for Females												
Age		Actual	Weighted		Weighted I	Deaths	A	/E Ratio					
Band	Exposures	Deaths	Exposures	Actual	Current	Recommended	Current	Recommended					
30 - 39	0	0	0	0	0	0	0%	0%					
40 - 49	54	0	10,717,908	0	5,095	5,341	0%	0%					
50 - 59	174	1	34,274,841	203,227	34,707	35,409	586%	574%					
60 - 69	197	0	39,088,431	0	86,716	87,899	0%	0%					
Total	425	1	84,081,180	203,227	126,519	128,649	161%	158%					
R-square	ed				0.008	0.006							

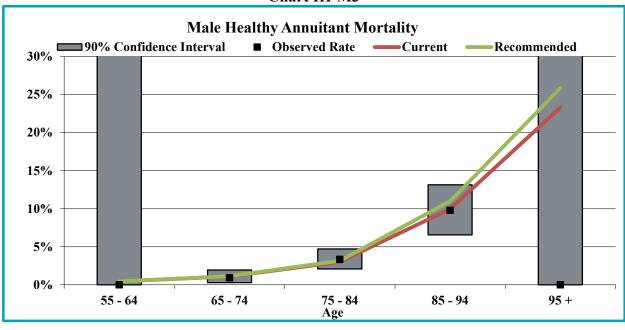




### SECTION III – DEMOGRAPHIC ASSUMPTIONS MORTALITY RATES

Table III-M3 – Healthy Retiree and Survivor Males

	Healthy Annuitant Mortality - Base Table for Males											
Age		Actual	Weighted		Weighted De	eaths	<b>A</b> /	E Ratios				
Band	Exposures	Deaths	Exposures	Actual	Current	Recommended	Current	Recommended				
55 - 64	17	0	1,585,057	0	7,309	7,424	0%	0%				
65 - 74	358	3	40,754,740	380,914	444,668	465,058	86%	82%				
75 - 84	573	19	61,162,152	2,049,628	1,850,331	1,942,451	111%	106%				
85 - 94	213	24	21,690,022	2,125,060	2,159,869	2,381,204	98%	89%				
95 +	9	0	903,789	0	210,561	233,694	0%	0%				
Total	1,170	46	126,095,760	4,555,602	4,672,739	5,029,831	97%	91%				
R-squar	ed				0.358	0.353						

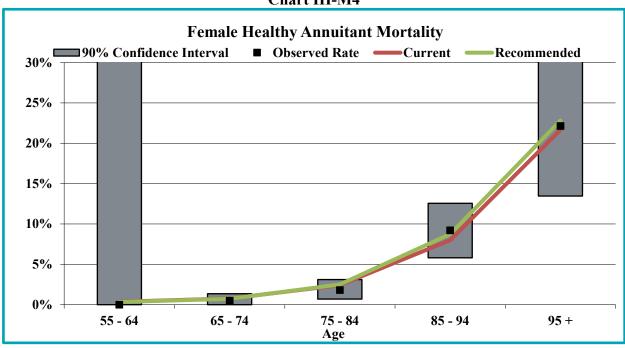




### SECTION III – DEMOGRAPHIC ASSUMPTIONS MORTALITY RATES

**Table III-M4 – Healthy Retiree and Survivor Females** 

	Tuble III MI Treatery Rectified and Survivor I chiares											
		Hea	lthy Annuit:	ant Mortal	ity - Base T	able for Female	es					
Age		Actual	Weighted		Weighted De	eaths	<b>A</b> /	E Ratios				
Band	Exposures	Deaths	Exposures	Actual	Current	Recommended	Current	Recommended				
55 - 64	20	0	2,156,962	0	7,746	6,779	0%	0%				
65 - 74	223	1	24,547,175	119,802	182,615	177,137	66%	68%				
75 - 84	290	5	24,240,452	437,204	581,168	606,789	75%	72%				
85 - 94	207	21	12,417,946	1,144,560	992,135	1,085,795	115%	105%				
95 +	52	10	2,044,733	452,723	442,738	466,295	102%	97%				
Total	792	37	65,407,268	2,154,289	2,206,402	2,342,794	98%	92%				
R-squar	ed				0.465	0.472						





### SECTION III – DEMOGRAPHIC ASSUMPTIONS MORTALITY RATES

For disabled mortality, given the low exposures and limited data, we have only included the tables in the report and do not show the graphs.

**Table III-M5 – Disabled Retiree Males** 

		Disa	bled Annuit	ant Morta	ılity - Bas	e Table for Mal	es	
Age		Actual	Weighted		Weighted I	Deaths	<b>A</b> /	E Ratios
Band	Exposures	Deaths	Exposures	Actual	Current	Recommended	Current	Recommended
50 - 54	0	0	0	0	0	0	0%	0%
55 - 59	0	0	0	0	0	0	0%	0%
60 - 64	0	0	0	0	0	0	0%	0%
65 - 69	1	1	104,335	104,335	3,296	2,588	3166%	4031%
70 - 74	10	0	1,272,792	0	51,099	40,655	0%	0%
75 - 79	6	1	730,496	111,746	37,446	32,878	298%	340%
80 - 84	0	0	0	0	0	0	0%	0%
85 - 89	0	0	0	0	0	0	0%	0%
90 +	2	1	190,230	95,115	64,565	71,405	147%	133%
Total	19	3	2,297,853	311,196	156,406	147,526	199%	211%
R-squar	ed				0.180	0.184		

**Table III-M6 – Disabled Retiree Females** 

Disabled Annuitant Mortality - Base Table for Females								
Age		Actual	Weighted	Weighted Deaths		A/E Ratios		
Band	Exposures	Deaths	Exposures	Actual	Current	Recommended	Current	Recommended
50 - 54	2	2	305,884	305,884	4,538	2,491	6740%	12280%
55 - 59	0	0	0	0	0	0	0%	0%
60 - 64	1	1	99,000	99,000	2,077	1,796	4766%	5513%
65 - 69	3	0	346,593	0	7,750	6,654	0%	0%
70 - 74	2	0	247,500	0	7,704	6,798	0%	0%
75 - 79	1	0	123,750	0	4,325	3,936	0%	0%
80 - 84	0	0	0	0	0	0	0%	0%
85 - 89	0	0	0	0	0	0	0%	0%
90 +	0	0	0	0	0	0	0%	0%
Total	9	3	1,122,727	404,884	26,395	21,675	1534%	1868%
R-squared					0.082	0.022		



### SECTION III – DEMOGRAPHIC ASSUMPTIONS FAMILY COMPOSITION

In the event of a member death, pension benefits may extend to a surviving spouse. Spousal demographic information is important in determining the value of their potential future benefit. However, marital information is not always readily available. In the case of an unmarried active member, they could marry before commencing benefits. Even married retirees are sometimes reported without a beneficiary date of birth. With this uncertainty, we make assumptions regarding the frequency with which participants are married at the time of benefit commencement as well as the age difference between the retirees and their spouses.

We currently assume the following:

- For members not currently receiving a benefit, 90% of members are assumed married to spouses of the opposite sex.
- Males are assumed to be two years older than females.

Based on healthy and disabled retirees that have commenced between July 1, 2021 and June 30, 2024, approximately 89.8% are married with males being older than females by an average of 2.3 years.

As a result, we recommend continuing the current assumptions.



#### **SECTION IV – ECONOMIC ASSUMPTIONS**

The economic assumptions used in actuarial valuations are intended to be long-term in nature and should be both individually reasonable and consistent with each other. The specific assumptions analyzed in this report are:

- **Price inflation** used to project increases in the 401(a)(17) pay limit. This assumption is also used indirectly as an underlying component of other economic assumptions.
- Wage inflation broad-based wage growth which is used to project the Social Security Wage Base. Note that this assumption does not impact the JRS valuation.
- Salary increase rate used to project increases in pay for active members in determining liabilities and costs of the System.

We have not studied the investment rate of return assumption since that assumption is set by the NJ State Treasurer.

In order to develop recommendations for each of these assumptions, we considered historical data, both nationally and for the System, expectations for the future and assumptions used by other public sector plans.

#### PRICE INFLATION

Long-term price inflation rates are the foundation of other economic assumptions. In a growing economy, wages and investments are expected to grow at the underlying inflation rate plus an additional real growth rate, whether it reflects productivity in terms of wages, or risk premiums in terms of investments.



#### SECTION IV – ECONOMIC ASSUMPTIONS

#### **Historical Data**

Chart IV-1 below shows inflation based on CPI-U for the U.S. by individual year from 1950 through 2024.

**Chart IV-1 Historical Rates of Inflation** 16% 14% 12% 10% 8% **50-Year Average: 3.79%** 6% 4% 2% 0% **-2% 30-Year Average: 2.54%** -4% 1950 1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005 2010 2015 2020 Fiscal Year Ending

Data Source: US Bureau of Labor Statistics

Over the 50 years ending June 2024, the geometric average inflation rate for the U.S. has been about 3.8%, but this average is heavily influenced by the high inflation rates in the 1970s and early 1980s. Over the last 30 years, the geometric average inflation rate has been about 2.5%, and it has been 2.8% over the last ten years.

Recently, inflation broke from the long-term trend with annual rates of 5.4% and 9.1% for the years ending June 2021 and 2022, respectively. This spike was followed by annual rates of 3.0% in both June 2023 and 2024.

Short-term deviations bear monitoring but do not require an immediate revision to expectations. Economic assumptions frequently deviate significantly from expectations. Often those deviations are followed by offsetting deviations in the opposite direction. The assumptions used in actuarial valuations are long-term in nature and are not necessarily driven by the most recent events.



#### SECTION IV - ECONOMIC ASSUMPTIONS

#### **Future Expectations**

A measure of the market consensus of expected future inflation rates is the difference in yields between conventional Treasury securities and Treasury inflation-protected securities (TIPS) at the same maturity. Table IV-1 shows the yields on both types of securities and the break-even inflation rate as of May 2025. Break-even inflation is the level of inflation needed for an investment in TIPS to "break even" with an investment in conventional treasury securities of the same maturity.

Table IV-1

Break-Even Inflation Based on Treasury Yields				
Time to Maturity	Conventional	TIPS	Break Even	
	Yield	Yield	Inflation	
5 Years	4.02%	1.64%	2.38%	
10 Years	4.42%	2.11%	2.31%	
20 Years	4.92%	2.46%	2.46%	

Data Source: Federal Reserve, Constant Maturity Yields, Monthly Series

The Federal Reserve Bank of Philadelphia publishes a quarterly survey of professional economic forecasters that includes their forecasts of inflation over the next 10 years. The survey for the second quarter of 2025 shows a median inflation (CPI) forecast of 2.35%, a minimum forecast of about 2.20%, and a maximum forecast of 2.80%.

Additionally, we consider the Federal Reserve's statutory mandate of stable prices. Inflation does not occur in a vacuum. The Federal Reserve actively conducts monetary policy to bring inflation in line with a target. While the effectiveness of monetary policy may vary, the Fed's inflation target is an important reference point when setting an inflation assumption.

The Fed interprets stable prices as 2.0% annual inflation on a personal consumption expenditure (PCE) basis, which may differ from the CPI-based inflation used in setting the inflation assumption for JRS. Since 2000, the annual change in CPI-U has been higher than the annual change in PCE by about 40 basis points, on average<sup>1</sup>. Therefore, an inflation assumption somewhat above 2.0% may be consistent with the Fed's inflation target.

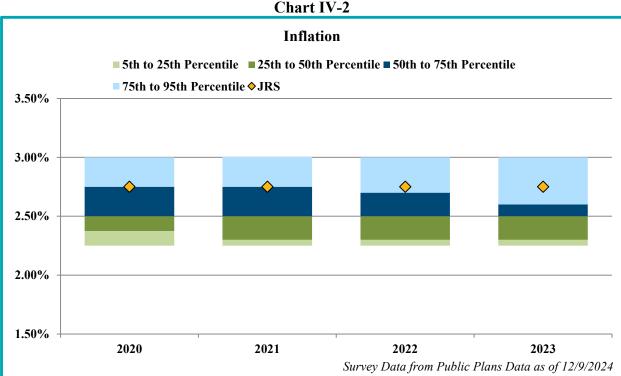
<sup>&</sup>lt;sup>1</sup> Based on PCE data from US Bureau of Economic Analysis, retrieved from FRED, Federal Reserve Bank of St. Louis.



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#### SECTION IV – ECONOMIC ASSUMPTIONS

Finally, Chart IV-2 below shows the distribution from the 5th to 95th percentile of inflation assumptions in the Public Plans Data<sup>2</sup>, a database of information on large public sector retirement systems in the United States.



For 2020 through 2023, the median inflation assumption from this data was 2.50%. There has been a minor trend toward lowering the assumption, as evidenced by the decrease in the quartiles.

#### Recommendation

Based on these considerations, we believe a reasonable range for the long-term price inflation assumption is 2.00% to 3.00%. Recent inflation rates have been near the top end of this range while future expectations generally point toward the midpoint. We recommend maintaining the current assumption of 2.75% since it remains within the reasonable range.

#### WAGE INFLATION

Wage inflation can be thought of as the annual across-the-board increase in wages. Individuals often receive salary increases in excess of the wage inflation rate, and we study these increases as a part of the merit salary scale assumption. Wage inflation generally exceeds price inflation by some margin reflecting the history of increased purchasing power.

<sup>&</sup>lt;sup>2</sup> www.publicplansdata.org. 2001-2023. Center for Retirement Research at Boston College, Mission Square Research Institute, National Association of State Retirement Administrators, and the Government Finance Officers Association.



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#### SECTION IV – ECONOMIC ASSUMPTIONS

Chart IV-3 shows the increase in national average wages (on a calendar year basis, as reported by the Social Security Administration) compared to inflation (on a June-to-June basis) from 2004 through 2023. National average wage data for 2024 is not yet available.

Chart IV-3 **Social Security National Average Wage Growth** 10.0% 7.5% 5.0% 2.5% 0.0% 2004 2005 2006 2007 2008 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 -2.5% Social Security National Average Wage Index (AWI) National CPI-U Social Security Median Net Comp ····· Geometric Avg. CPI-U ····· Geometric Avg. AWI

Over this period, national wage inflation averaged approximately 3.4% compared to annual price inflation of 2.6%, making real wage increases about 0.8%. Over the same time period, the increase in the median real wage was about 0.7% per year.

It is acceptable to assume some additional level of base payroll increase beyond general inflation. Potential reasons contributing to the increase may include productivity increases, the presence of strong union representation in the collective bargaining process, competition in hiring among other similar employers, and regional factors – such as the local inflation index exceeding the national average. Also, the Social Security Administration projects real wage growth of 0.5% to 1.7% going forward in their Social Security solvency projections included in the 2025 annual Trustees Report.

We recommend maintaining a small non-inflationary base payroll growth assumption of 0.5% annually. As a result, after factoring in inflation, the annual expected wage base increase assumption remains at 3.25%. Note that this assumption does not impact the JRS valuation.



#### **SECTION IV – ECONOMIC ASSUMPTIONS**

#### SALARY INCREASE RATE

The salary increase rate represents the year over year increase in pay of continuing actives. The current assumption is 2.00% per year through calendar year ending 2027 and 2.75% per year thereafter.

Based on salary information provided to us, members of the System did not receive salary increases on an annual basis from 2010 to 2017. Chapter 14, P. L. 2018 (N. J. State Statute 2B: 2-4) granted salary increases to judges as follows: \$8,000 increase beginning January 1, 2018, \$8,000 increase beginning January 1, 2019, and \$8,000 increase beginning January 1, 2020. In addition, beginning on January 1, 2021 and on the January 1 of each year for four years thereafter, the amount of the annual salary determined for the prior calendar year shall be adjusted annually by the State Treasurer in direct proportion to the percent change in the Consumer Price Index over a 12-month period beginning November 1 and ending October 31. For this purpose, "Consumer Price Index" means the Consumer Price Index for All Urban Consumers, New York-Northern New Jersey-Long Island Metropolitan Area, All Items (1982-84=100), as published by the Bureau of Labor Statistics in the United States Department of Labor. An adjustment in the annual payment shall be made only if the percent change in the Consumer Price Index for the period specified is greater than zero. Such an annual adjustment shall in no event be greater than two percent. Chapter 349, P.L. 2023 defined judicial salaries for calendar year 2024 in a manner consistent with the procedure established by Chapter 14, P.L. 2018 and extended the use of this procedure to set judicial salaries through calendar year 2027.

For JRS, the salary scale is not dependent on the age or service of members but is based on a standard rate increase by job category for all active members. Consistent with the salary increases already granted through Chapter 349, P. L. 2023, we recommend continuing to use the current salary increase assumption of 2.0% per year through the fiscal year ending 2027 and 2.75% per year thereafter. The ultimate rate of 2.75% is based on the recommended inflation assumption.



#### APPENDIX A – SUMMARY OF RECOMMENDED ASSUMPTIONS

The demographic assumptions are based on an experience study covering the period July 1, 2021 through June 30, 2024.

#### **1. Disability** Disability rates are as follows:

Age	Rates	Age	Rates
20	0.019%	45	0.064%
21	0.020	46	0.071
22	0.020	47	0.080
23	0.020	48	0.091
24	0.021	49	0.102
25	0.021	50	0.114
26	0.021	51	0.126
27	0.021	52	0.142
28	0.022	53	0.157
29	0.022	54	0.177
30	0.022	55	0.197
31	0.023	56	0.218
32	0.024	57	0.218
33	0.024	58	0.269
34	0.026	59	0.296
35	0.026	60	0.326
36	0.028	61	0.354
37	0.028	62	0.383
38	0.030	63	0.412
39	0.030	64	0.442
40	0.033	65	0.473
41	0.036	66	0.510
42	0.043	67	0.550
43	0.047	68	0.599
44	0.054	69	0.652

#### 2. Mortality

Healthy Retirees (Healthy Annuitants): The Pub-2016 Teachers Above-Median Income Healthy Retiree mortality table [PubT-2016(A) Healthy Retiree] as published by the Society of Actuaries, unadjusted, and with future improvement from the base year of 2016 on a generational basis using SOA's Scale MP-2021.

<u>Disabled Retiree (Disabled Annuitants)</u>: The Pub-2016 Non-Safety Disabled Retiree mortality table [PubNS-2016 Disabled Retiree] as published by the Society of Actuaries, unadjusted, and with future improvement from the base year of 2016 on a generational basis using SOA's Scale MP-2021.



#### APPENDIX A – SUMMARY OF RECOMMENDED ASSUMPTIONS

<u>Pre-Retirement (Non-Annuitants)</u>: The Pub-2016 Teachers Above-Median Income Employee mortality table [PubT-2016(A) Employee] as published by the Society of Actuaries, unadjusted, and with future improvement from the base year of 2016 on a generational basis using SOA's Scale MP-2021.

#### **3. Retirement** Retirement rates are as follows:

Age	Less than 15 Years of Judicial Service	15-19 Years of Judicial Service	20 or more Years of Judicial Service
< 60	0.0%	0.0%	0.0%
60	2.0	2.0	20.0
61	2.0	2.0	20.0
62	2.0	2.0	20.0
63	2.0	2.0	20.0
64	2.0	2.0	20.0
65	5.0	40.0	30.0
66	2.0	40.0	20.0
67	2.0	40.0	20.0
68	2.0	40.0	20.0
69	2.0	40.0	20.0
70	100.0	100.0	100.0

#### **4. Termination** None assumed.

### 5. Salary Increases

Salaries are assumed to increase 2.75% per year, except that increases are limited to 2.0% per year through calendar year 2027 in accordance with Chapter 349, P.L. 2023.

Salary increases are assumed to occur on January 1.

6. 401(a)(17) Pay Limit \$345,000 in 2024 increasing 2.75% per annum, compounded annually.

7. Family Composition Assumptions

For members not currently receiving a benefit, 90% of members are assumed married to spouses of the opposite sex. Males are assumed to be two years older than females.



#### APPENDIX A – SUMMARY OF RECOMMENDED ASSUMPTIONS

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 two years older than females.

For purposes of the statutory death benefit for members currently in receipt, 100% of participants are assumed married to spouses of the opposite sex, with the exception of those members who elected Optional Forms A, B, C or D and are currently in receipt of their maximum retirement allowance. The spouse is assumed to be the reported beneficiary. If no beneficiary date of birth is provided, males are assumed to be two years older than females.

No additional dependent children or parents are assumed.

Current dependents under age 21 are assumed to receive a benefit until age 21. Current dependents over age 21 are assumed to receive a benefit for the remainder of their lifetime.

### 8. Form of Payment

Current actives are assumed to elect the Maximum Option.



#### APPENDIX B – SUMMARY OF CURRENT ASSUMPTIONS

The following are the assumptions used in the actuarial valuation as of July 1, 2024. The demographic and economic (other than the investment rate of return) assumptions for that valuation were the based on the recommended assumptions from the July 1, 2018 – June 30, 2021 Experience Study, which was approved by the State House Commission on January 9, 2023. The salary assumption was updated to reflect Chapter 349, P. L. 2023.

#### 1. Disability

Disability rates are as follows:

Age	Rates	Age	Rates
20	0.019%	45	0.064%
21	0.020	46	0.071
22	0.020	47	0.080
23	0.020	48	0.091
24	0.021	49	0.102
25	0.021	50	0.114
26	0.021	51	0.126
27	0.021	52	0.142
28	0.022	53	0.157
29	0.022	54	0.177
30	0.022	55	0.197
31	0.023	56	0.218
32	0.024	57	0.218
33	0.024	58	0.269
34	0.026	59	0.296
35	0.026	60	0.326
36	0.028	61	0.354
37	0.028	62	0.383
38	0.030	63	0.412
39	0.030	64	0.442
40	0.033	65	0.473
41	0.036	66	0.510
42	0.043	67	0.550
43	0.047	68	0.599
44	0.054	69	0.652

#### 2. Mortality

Healthy Retiree (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, unadjusted, and with future improvement from the base year of 2010 on a generational basis using SOA's Scale MP-2021.

<u>Disabled Retiree (Disabled Annuitants)</u>: The Pub-2010 Non-Safety Disabled Retiree mortality table [PubNS-2010 Disabled Retiree] as published by the Society of Actuaries, unadjusted, and with future improvement from the base year of 2010 on a generational basis using SOA's Scale MP-2021.



#### APPENDIX B – SUMMARY OF CURRENT ASSUMPTIONS

<u>Pre-Retirement (Non-Annuitants)</u>: The Pub-2010 Teachers Above-Median Income Employee mortality table [PubT-2010(A) Employee] as published by the Society of Actuaries, unadjusted, and with future improvement from the base year of 2010 on a generational basis using SOA's Scale MP-2021.

#### **3. Retirement** Retirement rates are as follows:

Age	Less than 15 Years of Judicial Service	15-19 Years of Judicial Service	20 or more Years of Judicial Service
< 60	0.0%	0.0%	0.0%
60	2.0	2.0	20.0
61	2.0	2.0	20.0
62	2.0	2.0	20.0
63	2.0	2.0	20.0
64	2.0	2.0	20.0
65	5.0	40.0	30.0
66	2.0	40.0	20.0
67	2.0	40.0	20.0
68	2.0	40.0	20.0
69	2.0	40.0	20.0
70	100.0	100.0	100.0

#### 4. Termination

None assumed.

#### 5. Salary Increases

Salaries are assumed to increase 2.75% per year, except that increases are limited to 2.0% per year through calendar year 2027 in accordance with Chapter 349, P.L. 2023.

Salary increases are assumed to occur on January 1.

#### 6. 401(a)(17) Pay Limit

\$345,000 in 2024 increasing 2.75% per annum, compounded annually.

## 7. Family Composition Assumptions

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



#### **APPENDIX B – SUMMARY OF CURRENT ASSUMPTIONS**

For purposes of the statutory death benefit for members currently in receipt, 100% of participants are assumed married to spouses of the opposite sex, with the exception of those members who elected Optional Forms A, B, C or D and are currently in receipt of their maximum retirement allowance. The spouse is assumed to be the reported beneficiary. If no beneficiary date of birth is provided, males are assumed to be two years older than females.

No additional dependent children or parents are assumed.

Current dependents under age 21 are assumed to receive a benefit until age 21. Current dependents over age 21 are assumed to receive a benefit for the remainder of their lifetime.

8. Form of Payment

Current actives are assumed to elect the Maximum Option.

