

2026 Annual Report to the Comptroller on **ACTUARIAL ASSUMPTIONS**

Recommendations by
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Retirement Systems Chief Actuary

Office of the New York State Comptroller
Thomas P. DiNapoli

NYSLRS

New York State and Local Retirement System

This report, and the recommended assumptions herein, have been shared with the members of the Actuarial Advisory Committee (AAC) — composed of volunteers who are current or retired actuaries from insurance companies or pension plans, or pension consulting— for their review and commentary. The AAC members provide feedback to the New York State Comptroller Thomas P. DiNapoli, ensuring actuarial oversight of the recommendations. This provides the Comptroller with diverse perspectives on the assumptions' reasonableness and possible future direction.

A copy of other publications issued by the Actuarial bureau were also provided to the committee members.

Actuarial funding is a long-term endeavor, intended to accumulate sufficient assets over the next 30 years to provide benefits that are payable over the next 100 years. The assumptions used to establish the billing rates are similarly long term in nature. While the assumptions are reviewed annually, a change is only appropriate when it is considered material and expected to better forecast future outcomes.

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August 2026

Actuarial Certification

This actuarial certification has been prepared solely for the New York State and Local Retirement System (NYSLRS) for the purpose of establishing actuarial assumptions, determining funding requirements, and providing accounting disclosures in compliance with Governmental Accounting Standards Board (GASB) Statement Nos. 67 and 68.

As the Actuary for the Employees' Retirement System, the Police and Fire Retirement System, and the Group Life Insurance Plan, known collectively as *the System*, it is my duty to ensure that the benefits of members, retirees, and beneficiaries are properly funded.

Every April 1st, employer contribution requirements are determined for the next fiscal year, in compliance with New York State Retirement and Social Security Law (RSSL) Sections 11(c) and 311(c). Employer billing rates are established using an enhanced Aggregate Funding Method. For reporting purposes, accrued liabilities are calculated under the Entry Age Normal Actuarial Cost Method in accordance with GASB parameters. The System's funded condition is disclosed in the 2026 Actuarial Valuation report.

Census data used in the annual valuation is extracted directly from the System's administration databases by the Actuarial Bureau. While participant data is reviewed for reasonableness, consistency, and completeness in accordance with Actuarial Standard of Practice (ASOP) No. 23 (Data Quality), I have not performed an audit of the underlying records. In my opinion, the data extracted by the Actuarial Bureau is sufficient and reliable for the intended purpose, including the valuation, conducting annual experience studies, and setting assumptions. Corrections, alterations, and missing data assumptions used to improve data quality can be found in the Actuarial Valuations Data Supplement.

Proper funding requires that liabilities and employer contribution rates are developed using reasonable actuarial assumptions and methods. The demographic and economic assumptions recommended in this report were selected based primarily on the results of the 2025 NYSLRS Actuarial Experience Study. Annual experience studies ascertain how closely the NYSLRS' experience is conforming to the assumptions. In my judgement, (1) the economic assumptions (including inflation, salary scale, and the discount rate) comply with ASOP No. 27, (2) the demographic assumptions (including rates of payee mortality, and rates of employee turnover, disability, death, and retirement) comply with ASOP No. 35, and (3) the selected assumptions are, individually and in aggregate, internally consistent and reasonably reflect anticipated future experience of the plans. The Systems' assumptions, including experience and rationale, can be found herein.

To limit volatility in employer contribution rates, an actuarial valuation method is used to recognize unexpected investment gains and losses over 8 years. In my judgement, this is a reasonable period and will maintain an asset value that resembles fair value, satisfying ASOP No. 44. The method is appropriate for use in satisfying funding requirements in RSSL Section 23(b)(1) and in preparing accounting disclosures for GASB Statement Nos. 67 and 68. Actuarial measurements are based on projections of future economic and demographic events. Future results may differ significantly from current measurements due to plan experience differing from expected assumptions, changes in economic or market conditions, or statutory updates. An assessment of risks faced

by the plan (including cashflow timing, and sensitivity analysis of investment returns and discount rates) is set forth in the Risk Disclosures section of this report.

Moreover, most calculations in this report were completed using internal actuarial valuation software and may rely upon stochastic models maintained within the Actuarial Bureau. In accordance with ASOP No. 56, I have reviewed these models, including the underlying logic, parameters, and inputs. In my judgement, the models are appropriate for the intended purpose, including the valuation, conducting annual experience studies, and setting assumptions. I am not aware of any material limitations or model dependencies that would impair the reliability of the model output.

Finally, in compliance with RSSL Section 11(d), a summary of the valuation assets, liabilities, and membership demographics can be found in the 2026 Report of the Actuary.

All publications are issued annually, and actuarial work is subject to multiple independent reviews. An Actuarial Advisory Committee meets annually to review the actuarial assumptions and the results of the actuarial valuation. Additionally, the System retains an external auditor to independently review its financial records and accounting disclosures. The System is audited every five years by the New York State Department of Financial Services, and an outside actuarial consultant is commissioned to perform a review of the Actuarial Bureau's work product. Lastly, the Comptroller's Office of the Inspector General, Office of Internal Audit, periodically reviews actuarial processes.

To the best of my knowledge, this actuarial assumptions report was prepared in accordance with the standards of practice prescribed by the Actuarial Standards Board and satisfies the applicable financial reporting and funding requirements for NYSLRS, including GASB Statement Nos. 67 and 68. I meet the Qualification Standards of the American Academy of Actuaries and adhere to its Code of Professional Conduct (the Code). In accordance with Precept 7 of the Code, I disclose that I am an active member of NYSLRS and affirm that this relationship does not impair my ability to act fairly, objectively, and independently in rendering this actuarial opinion.



Aaron Schottin Young, MA, FSA, EA, MAAA
Retirement Systems Chief Actuary

8/28/2026

Dated

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Executive Summary

This report details the assumptions recommended for use in the Actuarial Valuation for fiscal year beginning April 1, 2026 establishing employer billing rates for bills paid February 1, 2028 (local participating employers) or March 1, 2028 (the State of New York). It serves to document the considerations and rationale underpinning the recommended assumptions, in keeping with Actuarial Standards of Practice (ASOPs).

Should these recommendations be adopted by the New York State Comptroller, the average employer contribution rate is estimated to be 17.3% in ERS (down 0.3% from last year) and 37.4% in PFRS (up 0.9%).

Because funding is a long-term endeavor, NYSLRS has a history of revising major assumptions in a five-year cycle (“quinquennially”). The FYB 2025 actuarial valuation implemented changes to the major demographic assumptions. Except for ERS salary scale, the economic assumptions were not revised. The FYE 2026 is the first year of the five-year cycle. With only one year of experience to reflect upon, there is little cause to revise major actuarial assumptions.

I recommend maintaining all economic and demographic assumptions for the April 1, 2026 Actuarial Valuation.

This report presents actual experience against expected over the past year. In both systems, the actuarial gains and losses were balanced and had marginal rate impact in aggregate.

Salary increases were higher than expected, particularly in PFRS. The PFRS salary scale was not revised last year due to unusually volatile experience in the years prior. This year saw continued volatility and reaffirmed the need for continued monitoring and possible changes before 2030.

Experience in payee mortality aligned closely to assumptions.

In age-based plans, both service retirements and withdrawals were lower than expected, a reversal from the prior five years. Service-based plans show high rates of service retirement and withdrawals.

Last year, the assumed rate of disability was increased to reflect the ultimate number of disability inceptions. In age-based plans, the experience was close. In service-based plans, disabilities continue to exceed expectations.

In all cases, one year of experience does not motivate changes to the assumptions established last year. If a pattern forms over the next four years, the assumption will become a focal point of the FYE 2030 quinquennial experience study.

Major Assumption or Method	Last Changed in Valuation Dated	Assumption Recommended for the Actuarial Valuation dated April 1, 2025
Inflation	April 1, 2022	2.9%
Cost-of-Living Adjustment	April 1, 2022	1.5%
Liability Discount Rate (expected asset rate of return)	April 1, 2021	5.9%
PFRS Salary Scale	April 1, 2021	Based on System experience FYE 2012 – FYE 2021 (6.1% average expected for FYB 2025 cohort)
ERS Salary Scale	April 1, 2025	Based on System experience FYE 2016 – FYE 2025 (5.2% average expected for FYB 2025 cohort)
Asset Smoothing Method	April 1, 2021	8-year level smoothing of unexpected gain/(loss)
Payee Mortality	April 1, 2025	Varies by population
Retirees		Based on System experience FYE 2016 – FYE 2025
Beneficiaries		Society of Actuaries' PUB-2016
Mortality Improvement	April 1, 2022	Society of Actuaries' MP-2021 (for payees only)
Active-Member Decrements	April 1, 2025	Based on System experience, period varies by assumption
Death		FYE 2021 – FYE 2025
Withdrawal		FYE 2021 – FYE 2025
Disability Retirement		FYE 2021 – FYE 2025
Service Retirement		
Age-Based Plans		FYE 2021 – FYE 2025
Service-Based Plans		FYE 2020 assumptions, increased by 10% Based on System experience FYE 2016 – FYE 2025

Since the last actuarial valuation, Tier 6 member benefits were enhanced:

- Tier 6 member contributions have decreased.
- Allowable overtime pay in pensionable compensation has increased for Tier 5 and Tier 6 members.

Benefits specific to employees of the State were also enhanced:

- State correction officers' "death gamble" was eliminated, offering the pension reserve upon the active death of a retirement-eligible member.
- State police (non-troopers) may now receive accruals for up to 35 years of service (previously 32) and member contribution requirements are the same as all other plans (previously 1.5% higher).

Moreover, considering legislative focus on benefits for World Trade Center (WTC) workers, refinements were made to the valuation methodology for measuring death benefits awarded to current and future retirees with an approved WTC notice on file.

With these changes, it is necessary to update the new entrant rates and indices, which measure the relative value of each plan and are used to differentiate billing rates by tier and plan. Appendix B provides a summary of the updated new entrant rates.

Economic Assumptions

Economic assumptions include the inflation rate, cost-of-living adjustment, liability discount rate (and the investment rate of return), and salary scale assumptions. Economic assumptions are forward-looking and therefore based more on future expectations and professional judgment than past economic experience. This gives economic assumptions a degree of subjectivity.

While actuaries are well versed in economic and investment considerations, it is not a pension actuary's primary area of expertise. For this reason, the setting of economic assumptions typically relies in part on the expertise of investment professionals and economists. NYSLRS has a team of investment professionals in the Division of Pension Investment and Cash Management (PICM) who work with an external investment consultant to develop expected returns and volatilities by asset class. They then apply the asset class estimates to the current and target Asset Allocation (AA) Policy for the Common Retirement Fund (CRF).

The last asset allocation study was made effective April 1, 2024. A natural consequence of any asset allocation study is recommended changes in the CRF's AA Policy and updated capital market forecasts by asset class. The investment rate of return forecasted by the 2024 AA Policy and the associated capital market assumptions serve as the primary consideration, but not the only consideration, when evaluating the liability discount rate assumption.

Economic assumptions are interconnected. Setting these assumptions relies on a “building block” approach. Based upon the recommended assumptions, the implied building block components are as follows:

Cost-of-Living Adjustment = Inflation Rate / 2	= 2.9% / 2	= 1.5%
Liability Discount Rate ≈ Investment Rate of Return		
= Inflation Rate + Risk Premium	= 2.9% + 3.0%	= 5.9%
Salary Scale = Inflation Rate + (Merit + Productivity)	= 2.9% + 3.2%	= 6.1% in PFRS
	= 2.9% + 2.3%	= 5.2% in ERS

Rate of Inflation

The U.S. Bureau of Labor Statistics (BLS) measures and tracks the change in prices for goods and services. Its Consumer Price Indexes (CPI) program produces monthly data on changes in the prices paid by consumers for a representative basket of goods and services. The two CPI measures of greatest interest today are the CPI for All Urban Consumers (CPI-U) and the Chained CPI for All Urban Consumers (C-CPI-U).

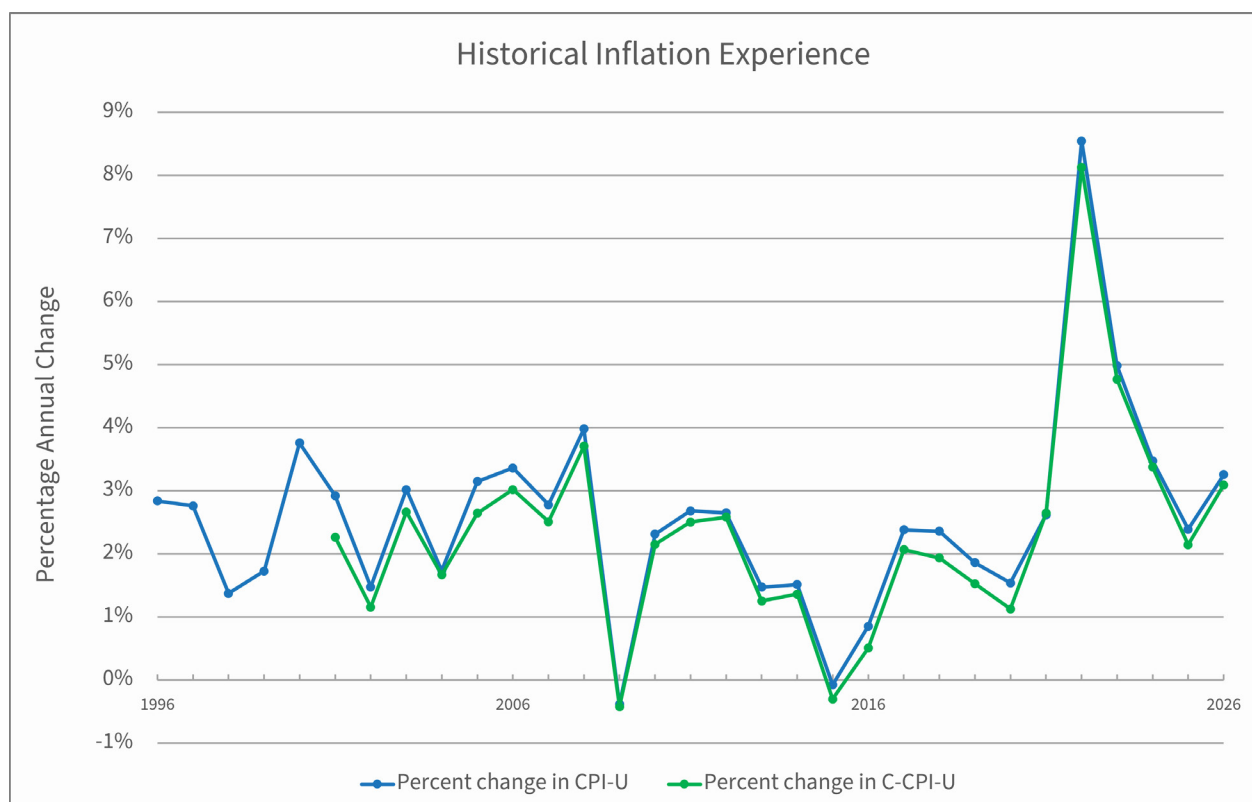
A general and progressive increase in prices is called inflation.

A general and progressive decrease in prices is called deflation.

Inflation does not impact all socioeconomic levels equally. Those with marginal purchasing power are often purchasing lower-cost goods; when inflation strikes, the cost of those goods increases. In contrast, a person who purchases higher-quality goods at a premium price has the option to purchase lower-quality goods for a lower price, thereby mitigating the impact of inflation.

Similarly, shifts in the relative cost of individual goods can trigger a change in consumer behavior. For example, a spike in the cost of orange juice could trigger increased consumption of another juice where the price did not increase.

The C-CPI-U was developed to reflect shifts in consumer behavior. The C-CPI-U is considered “a closer approximation to the true cost-of-living index for the average consumer than the CPI-U” according to the BLS. Since consumer behavior tends to counteract inflation, changes in the C-CPI-U are generally moderated relative to the CPI-U.



Historically, there have been varying levels of inflation, with occasional brief episodes of deflation. Inflation has remained above the Fed’s target of 2.0%.

The annualized increase in the C-CPI-U over the past twenty years is given by:

$$(183.013 / 116.000)^{1/20} - 1 = 2.31\%$$

The annualized increase in the C-CPI-U over the past five years is given by:

$$(183.013 / 148.746)^{1/5} - 1 = 4.23\%$$

In addition to prior experience, consideration is given to four methods that forecast inflation.

1. Input from the Federal Open Market Committee (FOMC)

The FOMC, a key entity of the Federal Reserve (the “Fed”) whose membership consists of financial and economic experts, establishes monetary policy with two goals in mind: (1) to pursue maximum employment, and (2) to promote stable prices (that is, control inflation). A change in monetary policy consists of raising or lowering the federal funds rate, which is the interest rate for overnight borrowing for banks. When the economy is slowing or inflation is too low, the FOMC can ease monetary policy by decreasing the federal funds rate. In contrast, if the economy is overheating or inflation is too high, the FOMC can tighten monetary policy by increasing the federal funds rate.

The June 17, 2026 FOMC Meeting Statement acknowledged that current inflation remains above the 2.0% target and that the economic outlook is unclear, in part due to supply shocks and price increases in the energy sector. In the past year, the target range for the federal funds rate decreased 0.75%, now standing at 3.50% to 3.75%. However, most recently, the Fed expressed intentions to bring down inflation and maintain price stability, possibly increasing the federal funds rate.

2. Yields on US Treasury Bills (T-bills) versus Treasury Inflation-Protected Securities (TIPS)

When a T-bill is purchased, the buyer is promised an interest payment every six months, based on the principal and the yield, through the maturity date. At maturity, in addition to the semi-annual interest payment, the principal is paid.

A TIPS is a T-bill where the principal increases with inflation and decreases with deflation, so the semi-annual interest payments are inflation-adjusted. At maturity, the larger of the original principal or the inflation-adjusted principal is paid.

When inflation is higher than expected, the TIPS outperform the T-bill. When inflation is less than expected, the T-bill outperforms the TIPS. As a result, the T-bill yield minus the TIPS yield approximates investor expectations of future inflation in the open market.

Asset Duration	T-bill Yield	TIPS Yield	Breakeven Inflation (T-bill – TIPS)
5 years	3.92%	1.38%	2.54%
7 years	4.11%	1.70%	2.41%
10 years	4.30%	2.00%	2.30%
20 years	4.88%	2.46%	2.42%
30 years	4.88%	2.69%	2.19%

3. PICM Inflation Assumption and Investment Consultant Inflation Forecasting

PICM assumes 2.5% inflation when forecasting asset performance, reflecting a 10-year investment horizon.

In 2023, PICM's investment consultant conducted a stochastic simulation of inflation reflecting assumptions used in the 2023 asset allocation study. The details of this model can be found in Appendix E. Using the model's output, the 20-year annual rate of inflation was 3.3%.

4. Actuarial Bureau Multiple-State Stochastic Model for Inflation Forecasting

This model requires two inputs to establish the starting conditions (see Appendix E for complete details). For FYE 2026, the initial state was defined as “normalized” (reflecting the neutral, hold-steady position of the FOMC) with a current rate of inflation of 4.61% (equal to the annualized rate of inflation for the quarter ending June 30, 2026). The resulting 30-year annual rate of inflation was 3.15% with a median of 2.89%.

Currently, the inflation assumption is 2.9%.

While deterministic models suggest the inflation assumption could be lower, the more robust stochastic models used to forecast inflation suggest that the assumption is well-positioned. Further, near-term inflation is expected to exceed the 2.9% assumption. With some indicators above and others below, I consider the assumption reasonable.

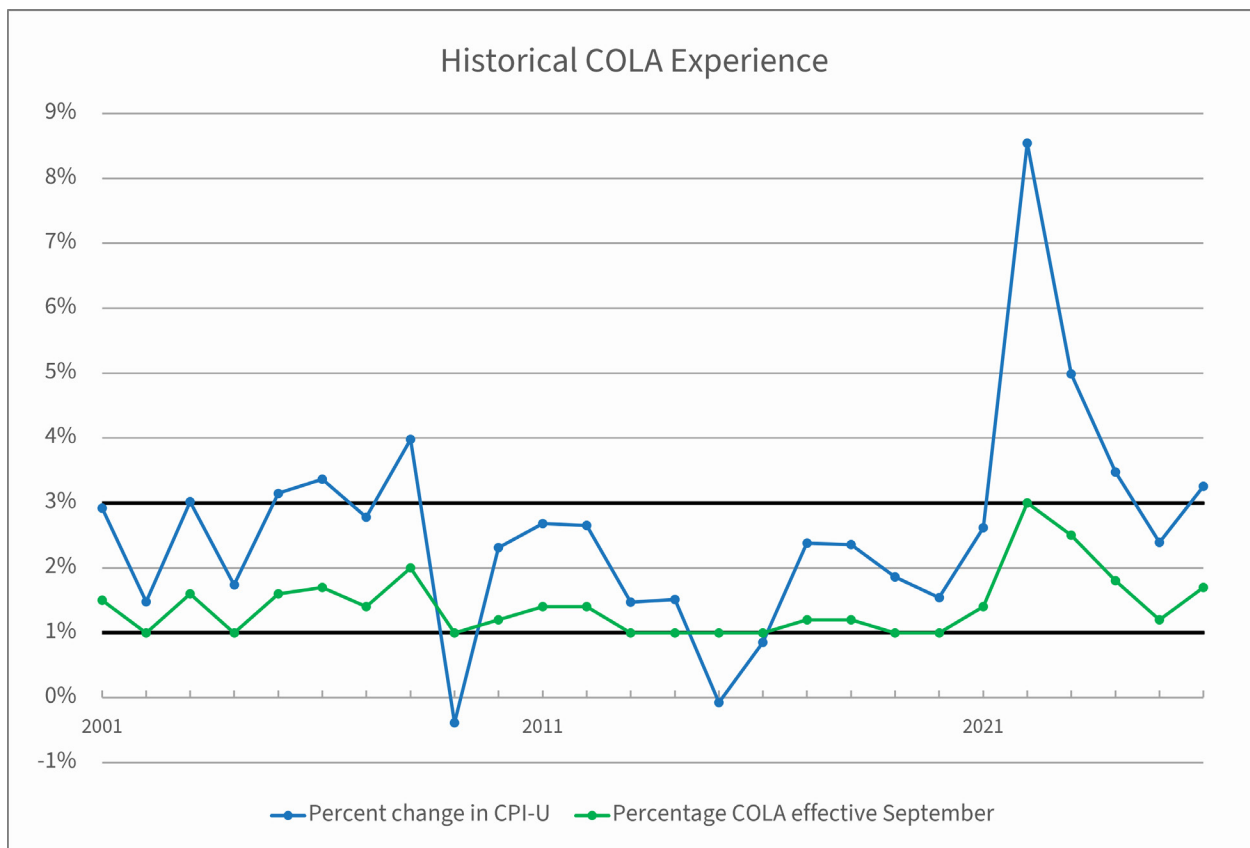
I recommend maintaining the current inflation assumption of 2.9%.

Cost-of-Living Adjustment (COLA)

Inflation reduces the buying power of consumers with a fixed income, as is often the case with payees (retirees and beneficiaries). To combat this, NYSLRS retirement benefits include an annual COLA.

Chapter 125 of the Laws of 2000 established a permanent COLA program first implemented in September 2001. The program provides an annual COLA (each September) equal to one-half of the CPI-U increase for the previous fiscal year. The COLA is rounded to the next highest 0.1%, subject to a 1% floor and a 3% ceiling. The COLA percentage is applied to the first \$18,000 of a retiree's pension benefit or a beneficiary's accidental death benefit. Most spousal beneficiaries of a deceased retiree are entitled to 50% of the retiree's COLA.

The Actuarial Valuation must estimate future COLAs, which is done by means of a COLA assumption. The graph below summarizes the annual COLA percentage since the program's inception, alongside the annual rate of inflation (as measured by the percentage change in the CPI-U).



The accumulated COLA over the past 20 years is approximately 32.54%.

The level COLA, rounded to tenths of a percent, that best matches this experience is 1.4%.

$$1.013^{20} - 1 = 29.47\%$$

$$1.014^{20} - 1 = 32.06\%$$

$$1.015^{20} - 1 = 34.69\%$$

In addition to prior experience, consideration is given to methods that forecast the COLA assumption.

1. Actuarial Inflation Assumption

An inflation assumption of 2.9% would project COLAs of 1.5% for all future years:

$$2.9\% / 2 = 1.45\% \text{ rounded up to } 1.5\%$$

2. PICM Inflation Assumption and Investment Consultant Inflation Forecasting

The inflation assumption of 2.5% used by PICM in forecasting asset performance would imply a COLA of 1.3% for all future years.

In 2023, the PICM consultant performed stochastic simulations to forecast inflation. The results of this study can be used to inform the COLA assumption by applying the COLA formula. Using the model's output, the 20-year annualized COLA was 1.83%.

3. Actuarial Bureau Multiple-state Stochastic Model for Inflation Forecasting

The Actuarial Bureau's stochastic model can be used to forecast the annual COLA percentage by applying the COLA formula. Using the model's output, the 30-year annualized COLA was 1.60%, when averaged over 5,000 simulations, with median 1.56%.

Currently, the COLA assumption is 1.5%.

The results of this analysis align with the COLA assumption. I consider the COLA assumption reasonable.

I recommend maintaining the current COLA assumption of 1.5%.

Liability Discount Rate (and the Investment Rate of Return)

The actuarial liability discount rate assumption is closely related to the long-term (that is, 30-year) rate of return on pension plan assets. The liability discount rate is used to discount the value of projected contributions and projected benefits.

The concept of discounting is perhaps best understood by way of illustration. Consider the following question:

Who is older, person A, aged 50 today, or person B, aged 62 ten years from now?

We trust that you answered person B. You probably arrived at your answer by adding ten years to person A's age and comparing 60 with 62, or by subtracting ten years from person B's age, and comparing 50 with 52. In either case, you brought the data to a common date and then made your comparison. You intuitively understood the "time value of age."

The *time value of money* can be illustrated with a question:

If you have an investment fund that has an annual rate of return of 5.9%,
which is worth more, \$100 today or \$115 three years from now?

Your intuition may have led you to select \$100, as you reasoned that even at simple interest, \$100 earning 5.9% per year adds \$17.70 in interest, and your investment grew to \$117.70 after three years.

Assuming compound returns, \$100 would become $\$100 \times (1.059 \times 1.059 \times 1.059) = \118.76 .

Again, you likely brought the data to a common date and made your comparison. Perhaps in this case you were more likely to bring the \$100 forward in time (accumulating) than you were to bring the \$115 backward in time (discounting), but the idea was the same.

To solve the problem by discounting, you would divide the \$115 by 1.059 three times to compare to the \$100 today.

$$\frac{\$115}{(1.059 \times 1.059 \times 1.059)} = \$96.83$$

So, \$100 today is more valuable than \$115 three years from now.

These calculations illustrate the concept of the "time value of money." Note, however, that the answer would have been different if your investment returned only 4% annually.

The liability discount rate assumption is used to discount projected cash flows to a valuation date. If the assumption is too optimistic, then there will be more investment losses than gains, and contributions to the fund will be less timely. If the assumption is too pessimistic, then there will be more investment gains than losses and contributions to the fund will be front-loaded.

Historically, NYSLRS' returns by fiscal year (since 1981, the first year of serious commitment to equities) are as follows:

Year	Return	Year	Return	Year	Return	Year	Return	Year	Return
81	16.7%	91	11.7%	01	-8.7%	11	14.6%	21	33.6%
82	3.3%	92	10.7%	02	2.8%	12	6.0%	22	9.5%
83	21.4%	93	12.5%	03	-10.2%	13	10.4%	23	-4.1%
84	7.9%	94	6.9%	04	28.8%	14	13.0%	24	11.6%
85	13.7%	95	8.8%	05	8.5%	15	7.2%	25	5.8%
86	24.0%	96	21.8%	06	14.6%	16	0.2%	26	11.9%
87	17.8%	97	10.9%	07	12.6%	17	11.5%		
88	1.6%	98	30.4%	08	2.6%	18	11.4%		
89	13.4%	99	8.8%	09	-26.4%	19	5.2%		
90	13.9%	00	17.8%	10	25.9%	20	-2.7%		

This produces the following time-weighted annualized returns (gross of expenses) after consideration of benefits paid and contributions collected throughout each fiscal year:

Period ending March 31, 2026	Annualized Return
5-year	6.8%
10-year	9.0%
15-year	8.4%
20-year	7.3%
25-year	7.5%
30-year	8.1%
35-year	8.6%
40-year	9.0%

There have been 5 years since the market restart of 2021 and the initiation of 8-year asset smoothing. The annualized return since 2021 is greater than 5.9%; therefore, investment performance has exceeded expectations and is applying downward pressure on billing rates.

In addition to prior experience, consideration is given to methods that forecast asset returns.

The Comptroller, as the trustee of the CRF, establishes the AA Policy. A portfolio's AA Policy is the single most important factor in establishing the fund's long-term rate of return. Pursuing higher returns requires more risk (volatility in returns year over year), which triggers volatility in employer contribution rates (potentially putting stress on municipal budgets). In this way, establishing the AA Policy allows the Comptroller to set the risk appetite for PICM and define the level of volatility expected in employer billing rates.

The last trustee-approved AA Policy was made effective April 1, 2024 and is based on especially robust analysis by PICM. The AA Policy reflects the following risk (*standard deviation*) and reward (*arithmetic return*) relationship by asset class.

Asset Class	(A) Allocation	(B) Arithmetic Return Assumption	Standard Deviation Assumption	(A) × (B)
Broad US Equity	25%	6.80%	16.10%	1.700%
Broad International Equity	14	9.35	18.70	1.309
US Agg Fixed Income	22	4.00	5.00	0.880
CRF Credit	4	7.93	12.45	0.317
Core Real Estate	12	7.10	16.32	0.852
CRF Private Equity	15	10.00	20.00	1.500
CRF Opportunistic	3	7.88	14.32	0.236
CRF Real Assets	4	8.34	17.01	0.334
Cash Equivalents	1	2.50	2.00	0.025
Expected Arithmetic Return				7.153%

The capital market assumptions used in the report are applicable to a 10-year time frame and are net of investment fees and expenses.

The expected arithmetic return for this portfolio is 7.15%, with a standard deviation of 10.89%, for a geometric return of 6.60%. A discussion of arithmetic returns versus geometric returns can be found later in this report (see *Understanding the Difference Between Arithmetic Return and Geometric Return* in Appendix D).

Annually, PICM provides updated capital market assumptions. Based on the FYE 2026 assumptions, the arithmetic return is 6.8%, standard deviation is 11.0% and geometric return is 6.4%. These results supplement the more robust analysis of the trustee-approved AA Policy.

Other considerations in setting the liability discount rate include plan maturity, cash flow needs, and the potential to worsen the credit risk of participating employers.

For funding purposes, the liability discount rate is applied in a geometric manner. To sustain this discount rate, the investments must earn a return close to the arithmetic return. Why? NYSLRS has a strongly negative net cashflow (benefit payments are more than double employer contributions), meaning that investment earnings are used to pay benefits and are not reinvested. The portion of investment earnings that are used to pay benefits do not get compounded. This inhibits the fund's ability to rebound from a market downturn. To mitigate the funding risk posed by a strongly negative annual cashflow, it is appropriate to use a liability discount rate that is lower than the geometric returns projected under the AA Policy and capital market assumptions.

The Risk Disclosure section of this report includes additional details regarding volatility in employer billing rates.

For a credit rating perspective, we can look at the funding guidelines published by S&P Global Ratings. Credit rating agencies review the financial health of public entities, including states and municipalities. Like an individual's credit score, a credit rating agency's analysis of a public entity will affect the cost of issuing debt and may limit the ability to borrow altogether (for example, the interest rate paid on municipal bonds). This can have serious consequences that impact the financial health of the public entity for a prolonged period.

One consideration of S&P Global Ratings is the discount rate used to value pension plan liabilities. Highest rated creditworthiness generally corresponds with practices:

- To not exceed 6.0% based on current market conditions for a typical public pension plan,
- To reflect realistic performance of the target investment portfolio, and
- To be cognizant of the level of budgetary stress (contribution volatility) the participating employers can withstand.

Currently, the liability discount rate assumption is 5.9%.

With due consideration given to the 10-year PICM projections and other capital market assumptions, the implications of maturity and net cashflows, and the credit rating guidance, I consider the current assumption to be prudently placed within a reasonable range.

I recommend maintaining the current liability discount rate assumption of 5.9%, which will be used to discount future projected contributions and benefits.

The data below is taken from the National Association of State Retirement Administrators (NASRA) and represents the investment return assumption distribution for public systems in their database. Investment portfolios vary significantly from one system to another, making it impractical to rely upon the assumptions used by other systems. But a comparison to other systems can serve as a reasonability check or reveal trends across the larger group.

Investment Return Assumption	Number of Public Systems				
	July 2026	July 2025	July 2020	May 2015	March 2010
< 6.00	* 3 *	* 3 *	2	4	0
6.00	2	2			
6.01 – 6.49	5	5			
6.50	14	14			
6.51-6.99	26	26	* 17 *	* 43 *	1
7.00	47	47	32		21
7.01-7.49	32	31	38		
7.50	3	3	26		
7.51-7.99	0	0	7	36	16
8.00	0	0	3	34	* 51 *
8.01-8.49	0	0	0	3	16
8.50	0	0	0	2	19
Median	7.00%	7.00%	7.25%	7.75%	7.97%
* NYSLRS *	5.90%	5.90%	6.80%	7.50%	8.00%

Salary Scales

The purpose of the salary scale assumption is to project future billable salary and estimate a member’s FAS and future benefits.

There are two salary scale assumptions. The first applies to ERS members who must attain age 55 to be eligible for a service retirement benefit (called an age-based plan). The second applies to PFRS members and ERS members who become retirement eligible upon attaining 20 or 25 years of service credit (called a service-based plan). In both cases, the salary increase varies by service credit. Salary scale experience has exerted upward pressure on billing rates because salary grew faster than assumed (an A/E ratio greater than 1.00).

Fiscal Year Ending	ERS			PFRS			The Fed Median Wage Growth (Full-time)
	Actual	Expected	A/E	Actual	Expected	A/E	
2026	6.02%	5.33%	1.13	9.61%	6.00%	1.60	4.0%

In the 2025 valuation, the ERS salary scale was updated based on experience from FYE 2016 through FYE 2025. The PFRS salary scale was maintained, with plans to gather more experience and potentially revisit the assumption before 2030. The addition of another year of volatile PFRS salary experience does not provide clarity or credibility to modify the salary scale assumption.

Given the continued volatility of salary experience, I recommend that we maintain the salary scale assumptions, with plans to revisit the PFRS assumption before 2030.

Of practical consideration, next year we may anticipate salary scale losses in both systems resulting from increases in pensionable overtime earnings. No adjustments were made to account for this one-time spike, which will be countered in part by an increase in the billable salary base.

The increase in pensionable overtime dissuaded the use of a 14% cap on an individual’s one-year increase in pensionable earnings. This cap was used in the past to limit the influence of retroactive contract settlements.

The salary information available to study is improving, and there is future potential to measure each category of earnings (base pay, overtime pay, retro pay). This could help identify the source(s) of salary volatility and eliminate the ‘noise’ impacting the salary estimates used in the annual valuation.

Asset Valuation Method

Pension fund managers could direct all assets to be invested in a fixed income portfolio. While this would greatly reduce investment income volatility, it would also increase the expected employer contribution rates.

In general, one expects to profit more as an owner (that is, an investor in equities) than as a lender (that is, an investor in bonds), especially if the equity ownership can be diversified and held. Thus, pension funds invest in equity index funds. Unfortunately, this introduces volatility in investment income.

The following basic equation governs pension funding: $C + I = B + E$

where, C = Contributions (both employer and employee)

I = Investment income

B = Benefits

E = Expenses

In NYSLRS, administrative expenses are funded independently of the benefits.

The basic funding equation highlights the fact that volatility in investment income translates to volatility in employer contributions. The right side of the equation (benefits plus expenses) is highly predictable and, barring a major change in assumptions or benefits, fluctuates little year after year. Employee contributions are defined in law and are therefore predictable year after year. As a result, any volatility in investment income is countered by a change in future employer contributions.

Asset valuation methods “smooth” the investment income volatility by phasing in both “unexpected” gains and “unexpected” losses. The amount deemed “unexpected” and the period of smoothing are defined by the method.

A fair value corridor would require the Actuarial Value of Assets (AVA) to remain within a certain range around the Fair Value of Assets (FVA). This can generate increased employer contribution requirements after experiencing market losses, and reduced employer contribution requirements after experiencing market gains. That is, it reinforces contribution rates that are cyclical with investment markets, giving rate relief when least necessary and rate increases when least affordable. This conflicts with the System’s objective of smooth employer contribution rates. While many actuaries prefer an asset corridor to help optics, NYSLRS’ funding strategy renders it unnecessary.

NYSLRS' asset valuation method was revised in 2022 and has the following features:

1. Expects a gain of the assumed rate of return on the plan net position and fiscal year cash flows.
2. Recognizes (smooths) the unexpected gain (= actual gain – expected gain) over 8 years in equal annual portions.
3. Does not apply a fair value corridor.

I recommend maintaining 8-year smoothing of unexpected investment returns, without an asset corridor.

The table below provides a summary of key values related to the Asset Smoothing Method and metrics related to funding progress. Definitions are provided below the table.

Fair Value of Assets (FVA) vs. Actuarial Value of Assets (AVA)¹

FYB	FVA	AVA	AL _{EAN}	UAL _{EAN}	Roll-forward TPL _{EAN} [*]	GASB 67 Ratio
2015	\$ 189.3	\$ 184.2	\$ 196.5	\$ 12.4	\$ 193.1	98.0%
2016	183.5	190.6	203.0	12.4	202.7	90.6
2017	197.5	198.0	210.1	12.1	209.1	94.5
2018	212.0	206.7	217.6	10.9	216.3	98.0
2019	215.2	212.8	224.0	11.2	223.9	96.1
2020	198.1	214.1	231.9	17.8	229.9	86.2
2021*	260.1	260.1	260.4	0.3	261.9	99.3
2022	273.7	267.2	270.9	2.8	266.1	102.9
2023	249.5	269.6	281.1	11.5	276.5	90.3
2024	267.4	272.4	290.3	17.9	286.8	93.2
2025	273.1	276.9	297.6	20.7	296.3	92.2
2026	\$ 294.4	\$ 284.1	\$ 307.5	\$ 23.4	304.2	96.8%
2027					\$ 314.3	

* The market restart led to recomputing the TPL_{EAN} under new assumptions.

¹ Accrued Liability under the Entry Age Normal actuarial funding method (AL_{EAN})

The AL_{EAN} is a measure of the pension benefits earned by members and retirees (excluding certain dedicated liabilities) as of the valuation date, often called a past service cost. At entry, the AL is zero. At retirement, the AL is the present value of all future benefits. The actuarial funding method decides how the AL moves from zero to 100%. Under the Entry Age Normal actuarial method, the AL generally increases stably throughout a member's working career.

Unfunded Accrued Liability under the Entry Age Normal actuarial funding method (UAL_{EAN})

The unfunded accrued liability is the portion of the system accrued liability that is not covered by the current Actuarial Value of Assets. Therefore, $UAL_{EAN} = AL_{EAN} - AVA$.

Total Pension Liability under the Entry Age Normal actuarial funding method (TPL_{EAN})

The total pension liability is the sum of all accrued liabilities (for active members and those collecting benefits) plus certain dedicated liabilities. This value is rolled forward from the prior year valuation to allow auditors time to review the calculation.

Governmental Accounting Standards Board Statement No. 67 Ratio (GASB 67 Ratio)

GASB 67 amended GASB 27, changing financial reporting required by public pension plans. The GASB 67 Ratio was first reported for the fiscal year ending 2015 and is equal to the plan net position (equal to the FVA) divided by the total pension liability. Therefore, $GASB\ 67\ Ratio = FVA \div TPL_{EAN}$.

Demographic Assumptions

Demographic assumptions include payee mortality and mortality improvement, and assumptions estimating the method and timing of an active member separating from service (called active-member decrements). While demographic assumptions are forward looking, they are generally best estimated by recent experience of similarly positioned individuals.

What is meant by *similarly positioned individuals*?

The type of work performed by civil servants can vary widely. The careers of firefighters, correction officers, and clerks are not likely to mirror one another. When evaluating relevant experience, consideration must be given to differences in job duties and plan provisions. Accordingly, it is preferable to set assumptions based on specific retiree and member cohorts rather than to rely upon the experience of non-participants (such as Social Security recipients or the Bureau of Labor Statistics workforce measurements).

What is meant by *recent experience*?

Member behavior is influenced by outside forces, such as legislative decisions (for example, retirement incentives) and economic forces (such as opportunities in the private sector). As conditions change, so will member behavior and demographic experience. Generally, the more recent the experience, the more reliable in predicting future experience.

The accuracy of demographic assumptions in predicting actual experience is evaluated annually by conducting an *experience study*. Ideally, the ratio of “actual to expected” (called an A/E ratio) is close to 1.00. A large divergence suggests the assumptions are not closely predicting experience. Resulting actuarial gains or losses could lead to fluctuation in the annual billing rates.

Payee (Retiree & Beneficiary) Mortality Experience

The most significant demographic assumption is payee mortality. NYSLRS mortality tables are not developed on a “by-number” basis, but on a “by-liability” basis.

For example, a mortality rate of 1% for age-65 retirees does not mean that we expect 1 in every 100 age-65 retirees to expire within the year, rather it means that we expect \$1 in every \$100 of age 65 retiree liabilities to expire within a year.

The *by-liability* method is preferred over the *by-number* method because the valuation is concerned with the cessation of benefit obligations, not necessarily the cessation of benefit recipients. Generally, mortality by number and mortality by liability should be roughly equivalent. However, experience studies have shown that retirees with more lucrative benefits enjoy better longevity than those with lesser benefits. Thus, mortality by number would undervalue the present value of future benefits.

Since the FYB 2025 valuation, the retiree mortality assumption is based on ten years of NYSLRS experience (from April 1, 2015 through March 31, 2025), and the beneficiary mortality assumption is based on SOA Pub-2016 mortality rates.

Payee Deaths*	FYE 2026			
	Exposures	Actual	Expected	A/E
ERS Service (Males)	6,824.205	166.600	161.538	1.03
ERS Service (Females)	5,912.176	110.824	110.203	1.01
ERS Disability	447.386	12.678	13.832	0.92
PFRS All Plans	2,665.128	34.856	34.228	1.02
All Retiree Mortality	15,848.894	324.958	319.800	1.02
ERS & PFRS Beneficiaries	872.799	24.484	29.434	0.83
All Payee Mortality	16,721.693	349.442	349.234	1.00

* Retiree Mortality is studied in 10 groupings (ERS service retirees are grouped by sex identification and collar color, ERS disability retirees are grouped by sex identification, PFRS retirees are grouped by retirement type, and beneficiaries are grouped by sex identification), but these groups are combined for display purposes in this table.

I recommend maintaining the payee mortality assumptions implemented in the April 1, 2025 valuation.

Retirees with an approved World Trade Center (WTC) notice are entitled to additional benefits should they die of a WTC qualifying condition (such as most cancers) within the first 25 years of retirement. In lieu of the optional continuance selected at retirement, the statutory beneficiary is paid an accidental death benefit. For the FYB 2026 valuation, this liability is estimated for any retiree with an approved WTC notice and a spousal beneficiary. The retiree is assumed to die of a WTC qualifying condition 70% of the time.

Payee Mortality Improvement Assumption

A second feature of the retiree mortality assumption is the inclusion of a projection regarding mortality improvement. The interaction of the (static) mortality assumption and the mortality improvement assumption is best demonstrated with real-world context.

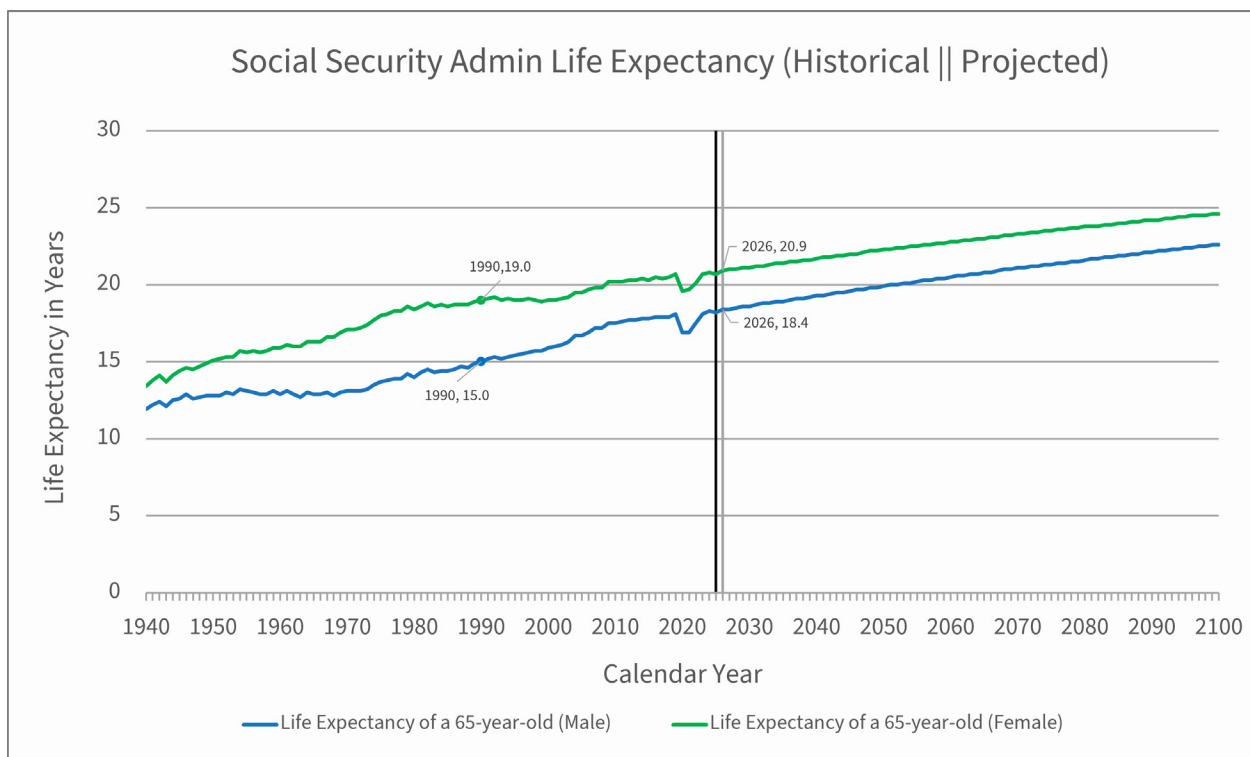
Pretend it is 1990. How long do we expect a 65-year-old to live? Well, the Social Security Administration estimated life expectancy was 15 years for a male and 19 years for a female.

Fast forward to 2026. Do we expect a 65-year-old to live longer? The SSA says yes, now expecting females to live 20.9 years and males to live 18.4 years.

But in 1990, the Actuary needed to estimate the life expectancy of a 65-year-old (newly retired, perhaps) and the 25-year-old (newly hired, perhaps) who would be 65 in 2025. To do this, a mortality improvement factor is applied.

Without a mortality improvement assumption, the life expectancy of all 65-year-olds would be the same, regardless of when the person turns 65. The mortality improvement assumption addresses the fact that,

“given two people survive to age 65, the person that was born later in time will survive longer.”



NYSLRS relies upon a mortality improvement scale developed by the Society of Actuaries denoted MP-2021, which is developed by the Retirement Plans Experience Committee (RPEC). RPEC has not issued an updated MP scale since 2021 because the COVID experience generated illogical results when included in the model.

RPEC's official statement said:

"It continues to be our opinion that it would not be appropriate to publish an MP scale reflecting a COVID adjustment, given the uncertainty regarding the effects of the pandemic on future mortality levels."

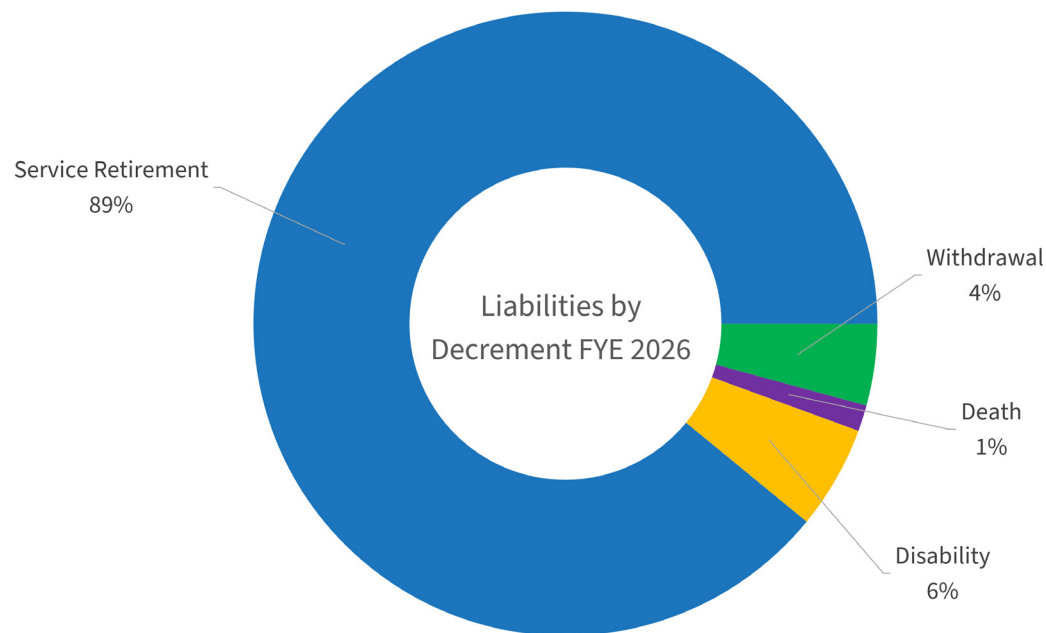
Moreover, the Society of Actuaries Research Institute released 2026 updates to its Mortality Improvement Model (MIM) in June 2026. In an accompanying overview document, the MIM Advisory Group echoed its October 2025 report, in which it referenced that "the Retirement Plan Experience Committee (RPEC) concluded that post-pandemic data remains insufficient to support publication of a new MP scale."

So, the current generational mortality improvement assumption is the most recent.

Therefore, I recommend maintaining the mortality improvement assumption, which is the Society of Actuaries' Mortality Projection Scale MP-2021, centered on October 1, 2022.

Active Member Experience

Active members separate from service in one of four ways: withdrawal, death, disablement, or retirement. These are called *decrements*. Whenever a member separates from service, they are entitled to a benefit from NYSLRS. Sometimes the benefit is simply a return of member contributions, other times a lump sum payment. In most cases, a monthly benefit is paid for life (called an annuity). The benefit amount and form of payment are defined in the Retirement and Social Security Law, but will vary by plan, service, and salary.



Assumptions are needed to estimate the timing and type of benefit payable under each decrement. Like retiree deaths, an annual experience study is conducted to compare the fiscal year experience to the assumptions. Unlike retiree mortality, this experience study is done on a by-number basis. That is, the number of people (not dollars) are counted.

A review of each active-member decrement experience follows. Ideally, the ratio of “actual to expected” is close to 1.00. A large divergence suggests the assumptions did not closely predict experience. As a result, actuarial gains/losses could lead to fluctuation in the annual billing rates.

Withdrawals

When a member withdraws from active service, the form of benefit depends upon the service credit accrued. If less than 5 years, the member is not vested, and the benefit is a return of the member's contributions. If more than 10 years, the member is vested, and the benefit is a deferred annuity benefit payable after attaining age 55. A member with service credit between 5 and 10 years is allowed to choose either the non-vested benefit or the vested benefit.

Generally, when members withdraw, actuarial gains apply downward pressure on the billing rates. As shown in the table below, NYSLRS members in age-based plans withdrew at slower rates than expected, while service-based plans exceeded expectations.

Withdrawals *	FYE 2026			
	Exposures	Actual	Expected	A/E
Age-Based Plans	401,375	36,858	48,409	0.76
0 ≤ Service Credit < 2	139,553	25,802	32,770	0.79
2 ≤ Service Credit < 3	41,657	3,477	4,730	0.74
3 ≤ Service Credit < 4	32,560	1,790	3,216	0.56
4 ≤ Service Credit < 5	21,374	1,112	1,656	0.67
5 ≤ Service Credit < 10	68,609	2,959	3,848	0.77
10 ≤ Service Credit	97,624	1,718	2,190	0.78
Service-Based Plans — Correction Officers	20,111	1,979	535	3.70
Adjusted for State Dismissals		879	535	1.64
Service-Based Plans — Other Than Correction Officers	33,808	761	527	1.45

* Rates of withdrawal for ERS age-based plans are defined by age and service credit while assumptions for other plans are defined by service credit. To summarize experience, similar groups are combined.

As part of the 2025 quinquennial study, the withdrawal rates for correction officers (COs) were assumed to be double that of the non-CO population.² This year, the stark difference in correction officer (CO) withdrawals is largely attributed to a three-week strike in 2025 resulting in the dismissal of a reported 2,000 correction officers, 900 of whom returned to their positions thereafter. If we eliminate those 1,100 withdrawals from the experience, the A/E shifts down to 1.64. While still elevated, it is more illustrative of 2026 experience and more in-line with the experience of jobs other than CO (such as police officers, firefighters, and deputy sheriffs).

I recommend maintaining the active member withdrawal assumptions, which are based on NYSLRS' active member experience from April 1, 2020 through March 31, 2025.

² Even still, the withdrawal rates experienced between 2021 and 2025 were 24% higher than the new assumption. If the assumptions were increased that 24%, the adjusted A/E for COs would be approximately 1.32.

Active Member Deaths

When an active member dies, a benefit is payable to a named beneficiary or a statutory beneficiary (spouse, children, dependent parents). Ordinary death benefits are payable as a lump sum while accidental death benefits are often payable for the life of the beneficiary.

Excess deaths can result in downward pressure on the billing rates. Unlike retiree mortality, active member deaths were fewer than expected.

Active Member Deaths	FYE 2026			
	Exposures	Actual	Expected	A/E
Age-Based Plans	523,369	624	754	0.83
Service-Based Plans	63,028	20	40	0.50

I recommend maintaining the active member mortality assumptions, which are based on NYSLRS’ active member experience from April 1, 2020 through March 31, 2025.

Active members with an approved WTC notice are entitled to additional post-retirement death benefits should they die of a WTC qualifying condition (such as most cancers) within the first 25 years of retirement. In lieu of any benefits otherwise payable, the statutory beneficiary is paid an accidental death benefit. For the FYB 2026 valuation, this liability is estimated for any member with an approved WTC notice. The member is assumed to die of a WTC qualifying condition 70% of the time. Further, the retirement benefit is assumed to be a single life allowance, and the member is assumed to have a spouse of the same age. Female beneficiary mortality is used.

Disability Retirements

When an active member becomes permanently disabled, typically annuity (lifetime) benefits become payable. There are three types of disability, although not all plans provide all three types. An accidental disability generally requires a *sudden, fortuitous mischance, out of the ordinary and injurious on impact*. An injury arising from risks inherent in an employee's regular duties does not constitute an accident but may suffice for a disability in the performance of duty (POD). An ordinary disability benefit is generally payable after a member attains 10 years of service credit.

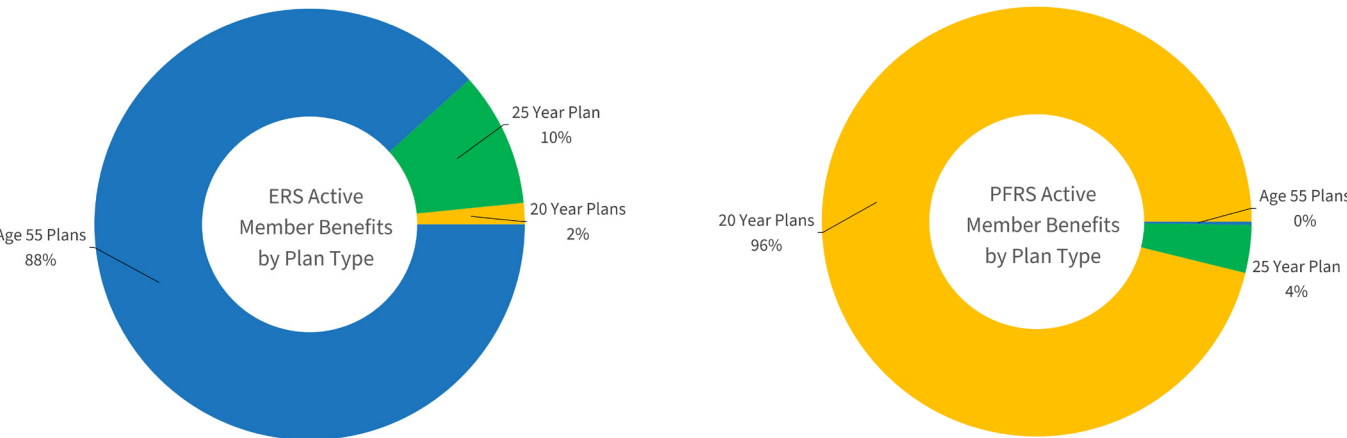
To avoid undercounting disability decrements, we assume that all disability benefit inceptions represent a disability decrement, regardless of the retiree's prior status (active, inactive, service retired, or even a different disability benefit). The exposures are still limited to active members.

Active Member Disability	FYE 2026			
	Exposures	Actual (active + inceptions)	Expected	A/E
Age-Based Plans	523,369	482 (86+396)	565	0.85
Service-Based Plans — Ordinary	23,958	29 (19+10)	18	1.62
Service-Based Plans — Accidental	63,028	193 (113+80)	118	1.64
Service-Based Plans — POD	55,069	335 (137+198)	202	1.66

I recommend maintaining the active member disability assumptions, which are based on NYSLRS' active experience from April 1, 2020 through March 31, 2025, including the rates of apportionment among the available disability types (ordinary, accidental, and/or POD).

Service Retirements

When a member does not withdraw, die, or become disabled, they file for a service retirement benefit. Service retirement benefits represent approximately 89% of all active member liabilities, making these the most important active member assumptions. There are a variety of different assumptions based on plan provisions (such as 20-year plans, 25-year plans, and provisions for additional accruals after initial eligibility) and population (such as public safety, correction officers, and others).



Service retirement benefits are most costly when members retire at first eligibility for an unreduced benefit. Therefore, actual service retirements exceeding expectations will create an upward pressure on billing rates.

Last year, ERS members in age-based plans retired at slower rates than anticipated.

Service Retirements *	FYE 2026			
	Exposures	Actual	Expected	A/E
Age-Based Plans	121,994	15,914	19,026	0.84
0-19	67,435	5,708	7,684	0.74
20	5,066	1,033	1,232	0.84
21-29	33,109	4,773	5,323	0.90
20-29	38,174	5,806	6,555	0.89
30+ when not 55 & 30	13,646	3,330	3,585	0.93
55 & 30	2,739	1,070	1,202	0.89
30+	16,385	4,400	4,786	0.92

* Rates of service retirement for age-based plans are defined by age and attainment of service milestones. To summarize system-level experience, different plans are combined.

Members in PFRS and service-based plans in ERS retired faster than anticipated, applying upward pressure on billing rates.

Service Retirements	FYE 2026			
	Exposures	Actual	Expected	A/E
Service-Based Plans	9,109	2,130	1,499	1.42
25-Year State COs	1,351	531	343	1.55
25-Year (other than State COs)	1,005	262	241	1.09
25-Year w/ 60ths	190	31	40	0.78
All 25-Year Plans	2,456	824	624	1.32
20-Year	1,642	363	260	1.39
20-Year w/ 60ths	3,832	750	487	1.54
20-Year w/ 60ths State Police	1,090	193	129	1.50
All 20-Year Plans	6,564	1,306	876	1.49

* Assumptions for service-based plans are defined by service credit. To summarize system-level experience, different plans are combined.

In 2026, service retirement rates exceeded the 2025 assumptions in most plan groupings. In context, much of the disparity is understandable.

The 25-year State CO retirement rates were significantly elevated during and around the recent strike, like the CO withdrawal experience. There is a clear increase in retirements from March–June, 2025. Compared to the prior fiscal year, there were about 100 more retirements in the first three months of the fiscal year. Removing these excess retirements brings the A/E down to 1.25.

For 20-year plans, service retirements continued to exceed assumptions, but the experience is more in line with the last 5 years. The service retirement assumptions were increased in 2025 as part of the quinquennial experience study. The size of the increase anticipated that retirements would subside over the next few years. As a 12-year assumption, the service retirement rates may need to be revisited before the next quinquennial study, but not now.

I recommend maintaining the active member service retirement assumptions, which are based on NYSLRS' active experience as follows:

For age-based plans: April 1, 2020 through March 31, 2025.

For service-based plans: April 1, 2016 through March 31, 2020, adjusted upward 10%.

Effect on Contributions

The table below summarizes the projected average employer contribution rates for the most recent valuations.

Valuation 4/1	Local Employer Billing Date 2/1	ERS Avg Rate (reg plan GLIP)	PFRS Avg Rate (GLIP)	Employer Contributions/ FY Benefits (\$ billions)	CSP Mitigated Rates (does not apply to GLIP, strikethrough => no amortizing)				CSP Amort/ Reserve (billions)
					ERS		PFRS		
					Original	Alternate	Original	Alternate	
2009	2011	11.9 (0.4)	18.2 (0.1)	\$ 3.6 / 8.5	9.5%		17.5%		
2010	2012	16.3 (0.4)	21.6 (0.0)	4.9 / 8.9	10.5		18.5		
2011	2013	18.9 (0.4)	25.8 (0.1)	5.5 / 9.5	11.5		19.5		\$ 0.3 / 0.0
2012	2014	20.9 (0.4)	28.9 (0.0)	6.2 / 10.0	12.5	12.0%	20.5	20.0%	1.1 / 0.0
2013	2015	20.1 (0.4)	27.6 (0.1)	6.1 / 10.5	13.5	12.0	21.5	20.0	2.1 / 0.0
2014	2016	18.2 (0.5)	24.7 (0.0)	5.5 / 11.1	14.5	12.5	22.5	20.5	3.3 / 0.0
2015	2017	15.5 (0.4)	24.3 (0.0)	4.8 / 11.5	15.1	13.0	23.5	21.0	4.1 / 0.0
2016	2018	15.3 (0.4)	24.4 (0.1)	4.9 / 12.1	14.9	13.5	24.3	21.5	4.2 / 0.0
2017	2019	14.9 (0.5)	23.5 (0.0)	4.9 / 12.8	14.4	14.0	23.5	22.0	3.8 / 0.0
2018	2020	14.6 (0.4)	23.5 (0.0)	4.9 / 13.4	14.2	14.2	23.5	22.5	3.3 / 0.0
2019	2021	14.6 (0.5)	24.4 (0.0)	5.1 / 14.0	14.1	14.1	24.4	23.0	2.8 / 0.0
2020	2022	16.2 (0.4)	28.3 (0.0)	5.9 / 14.7	15.1	14.6	25.4	23.5	2.3 / 0.0
2021	2023	11.6 (0.2)	27.0 (0.0)	4.4 / 15.4	14.1	14.1	26.4	24.0	0.8 / 0.0
2022	2024	13.1 (0.7)	27.8 (0.1)	5.1 / 16.2	13.1	13.6	27.4	24.5	0.4 / 0.0
2023	2025	15.2 (0.4)	31.2 (0.1)	6.2 / 17.4	14.1	14.1	28.4	25.0	0.1 / 0.3
2024	2026	16.5 (0.4)	33.7 (0.0)	7.1 / 17.6	15.1	14.6	29.4	25.5	0.1 / 0.4
2025	2027	17.6 (0.7)	36.5 (0.0)	8.2 / 18.7	16.1	15.1	30.4	26.0	0.1 / 0.2
2026	2028	17.3 (0.6)	37.4 (0.0)	\$ 8.5 / 18.9	16.7	15.6%	31.4%	26.5%	0.1 / 0.0

The new entrant rate for the:

- ERS A15 Tier 6 plan is 10.5% normal cost + 1.3% GLIP & Admin = 11.8% total rate
- ERS valuation cohort is 13.5% normal cost + 1.3% GLIP & Admin = 14.8% total rate
- PFRS 384D contrib Tier 6 plan is 22.3% normal cost + 0.6% GLIP & Admin = 22.9% total rate
- PFRS valuation cohort is 25.2% normal cost + 0.6% GLIP & Admin = 25.8% total rate

The March 31, 2026 Contribution Stabilization Program (CSP) amortization balance is approximately \$113 million, all held by local employers, and a CSP reserve balance of \$30 million, which is also all held by local employers.

Employers participating in the CSP are always required to pay their graded rate (plus GLIP and amortization payments). For the original CSP in ERS, the graded rate equals the system average rate, so those employers will not be allowed to amortize, nor will a reserve payment be required. For the other three versions, the graded rate is less than the system average rate, so those employers will be eligible to amortize a portion of their invoice. The amount eligible for amortization will first be paid by reserve funds, if any, reducing or eliminating the amortization and the future installment payments.

Gain/Loss Analysis

		ERS	PFRS
FYE 2027 System Average Rate (Feb 1, 2027 payment)		17.6%	36.5%
Benefit Improvements		0.6%	0.8%
Combined Investment Performance		-0.4%	-0.1%
Components*	FYE 2022 (9.5% v 5.9%)	-0.3%	-0.3%
	FYE 2023 (-4.4% v 5.9%)	0.9%	1.2%
	FYE 2024 (11.6% v 5.9%)	-0.5%	-0.5%
	FYE 2025 (5.8% v 5.9%)	0.0%	0.0%
	FYE 2026 (11.9% v 5.9%)	-0.5%	-0.5%
Combined FYE 2026 Experience		-0.1%	0.2%
Components	Member Demographics	0.3%	0.6%
	Service Credit Increases	0.1%	0.3%
	Salary Increases	0.0%	0.3%
	New Members	-0.5%	-1.0%
Change in Administrative Rate		-0.2%	-0.2%
Change in GLIP Rate		-0.1%	0.0%
Miscellaneous		-0.1%	0.2%
Net Change		-0.3%	0.9%
FYE 2028 System Average Rate (Feb 1, 2028 Payment)		17.3%	37.4%

* Rate impact diminishes as billable salary increases

In the fiscal year ending 2026, legislated benefit improvements pushed rates higher. In ERS, demographic experience was favorable, with small losses offset by the new entrants, and some rate relief from investment performance. Lower administrative and GLIP rates generated the extra push necessary to drop the billing rate. In PFRS, demographic losses (attributed to elevated rates of retirement and salary increases) were mostly offset by a large class of new entrants.

Service Credit Increases is a new gain/loss category representing service credit increases exceeding expectations (typically 1 year for full-time members). These arise through prior year corrections in employer reporting or adjustments outside the employer reporting of days worked such as the purchase of prior service or military service, and members transferring in from another system.

Summary of Assumptions and Methods

I recommend maintaining all assumptions used in the actuarial valuation dated April 1, 2025.

Major Assumption or Method	Last Changed in Valuation Dated	Assumption Recommended for the Actuarial Valuation dated April 1, 2026
Inflation	April 1, 2022	2.9%
Cost-of-Living Adjustment	April 1, 2022	1.5%
Liability Discount Rate (expected asset rate of return)	April 1, 2021	5.9%
PFRS Salary Scale	April 1, 2021	Based on System experience FYE 2012 – FYE 2021 (6.3% average expected for FYB 2026 cohort)
ERS Salary Scale	April 1, 2025	Based on System experience FYE 2016 – FYE 2025 (5.3% average expected for FYB 2026 cohort)
Asset Smoothing Method	April 1, 2021	8-year level smoothing of unexpected gain/(loss) No corridor
Payee Mortality	April 1, 2025	Varies by population
Retirees		Based on System experience FYE 2016 – FYE 2025
Beneficiaries		Society of Actuaries' PUB-2016
Mortality Improvement	April 1, 2022	Society of Actuaries' MP-2021 (for payees only)
Active-Member Decrements	April 1, 2025	Based on System experience, period varies by assumption
Death		FYE 2021 – FYE 2025
Withdrawal		FYE 2021 – FYE 2025
Disability Retirement		FYE 2021 – FYE 2025
Service Retirement		
Age-Based Plans		FYE 2021 – FYE 2025
Service-Based Plans		FYE 2020 assumptions, increased by 10% Based on System experience FYE 2016 – FYE 2025

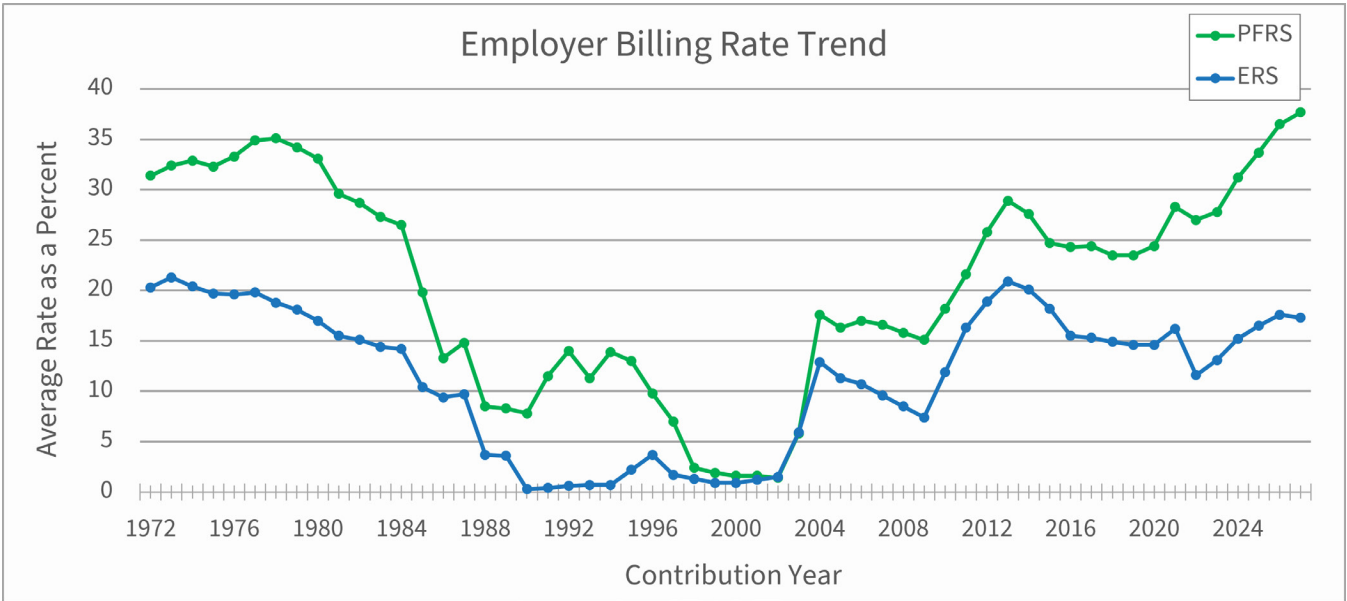
This recommendation was reviewed by the AAC in a meeting on August 4, 2026.

Historic Employer Contribution Average Rate

Average Rate		
Year	ERS	PFRS
1972	21.9	28.8
1973	20.3	31.4
1974	21.3	32.4
1975	20.4	32.9
1976	19.7	32.3
1977	19.6	33.3
1978	19.8	34.9
1979	18.8	35.1
1980	18.1	34.2
1981	17.0	33.1
1982	15.5	29.6
1983	15.1	28.7
1984	14.4	27.3
1985	14.2	26.5
1986	10.4	19.8
1987	9.4	13.3
1988	9.7	14.8
1989	3.7	8.5
1990	3.6	8.3

Average Rate		
Year	ERS	PFRS
1991	0.3	7.8
1992	0.4	11.5
1993	0.6	14.0
1994	0.7	11.3
1995	0.7	13.9
1996	2.2	13.0
1997	3.7	9.8
1998	1.7	7.0
1999	1.3	2.4
2000	0.9	1.9
2001	0.9	1.6
2002	1.2	1.6
2003	1.5	1.4
2004	5.9	5.8
2005	12.9	17.6
2006	11.3	16.3
2007	10.7	17.0
2008	9.6	16.6
2009	8.5	15.8

Average Rate		
Year	ERS	PFRS
2010	7.4	15.1
2011	11.9	18.2
2012	16.3	21.6
2013	18.9	25.8
2014	20.9	28.9
2015	20.1	27.6
2016	18.2	24.7
2017	15.5	24.3
2018	15.3	24.4
2019	14.9	23.5
2020	14.6	23.5
2021	14.6	24.4
2022	16.2	28.3
2023	11.6	27.0
2024	13.1	27.8
2025	15.2	31.2
2026	16.5	33.7
2027	17.6	36.5
2028	17.3	37.4



Risk Disclosures

Why should a governmental entity take on defined benefit (DB) pension risk? DB plans are an economically efficient means of attracting and retaining employees. For example, in the matter of public safety, special plans that offer half-pay at 20 or 25 years of service will guarantee income in middle age when physicality may wane while tasks remain grueling. During their career, disability and death benefits provide income protection to those who risk their lives in service to the public.

Optimizing the economic efficiencies of a DB plan requires prefunding the benefit promises, ideally by way of smooth employer contribution rates. ASOP No. 51 (Assessment and Disclosure of Risk Associated with measuring Pension Obligations and Determining Pension Plan Contributions) requires assessment and disclosure of risks inherent in the funding of DB plans. The two primary forms of risk are:

1. Insufficient employer contributions to fund the benefits, and
2. Intolerable volatility in the employer contribution rate.

Employer Contribution Sufficiency Risk

Contribution Fulfillment Risk

In New York State, employers are required to pay the actuarially determined contribution. Employers who are delinquent are pursued, and interest is charged on any late payments. Thus, there is very little risk that employer contributions will not be paid. This is the most significant component of a well-funded DB plan. Poorly funded DB plans invariably have a stretch of time when employer contributions are neglected.

Actuarial Assumptions

Actuarial assumptions and methods determine the allocation of benefit costs over time; they do not, however, determine the ultimate benefit costs. The ultimate cost of benefits is based on the lucrativeness of the promises and the performance of the assets.

A new entrant rate is the employer contribution rate that would be charged if assets equaled liabilities and all assumptions were met prospectively. As experience deviates from what was assumed, the employer billing rates deviate from the new entrant rates. When billing rates are greater than the new entrant rates, the current taxpayer is funding benefits earned in prior years. When billing rates are less than the new entrant rates, the current taxpayer is benefiting from contributions collected in prior years. The more conservative a set of assumptions, the more quickly contributions are collected, possibly levying too great a cost to current taxpayers. The less conservative a set of assumptions, the more likely contributions will increase, possibly levying too great a cost to future taxpayers. The best assumptions decrease the likelihood of deviations in one direction persisting over long periods. In so doing, governmental services are compensated by the taxpayers benefiting from those services (that is, there is intergenerational equity).

New York State Retirement and Social Security Law requires a review of all assumptions at least once every five years. To comply, NYSLRS undertakes a quinquennial comprehensive experience study with an annual review to assess reasonability. Any emerging trends that are believed to continue in the future may warrant an assumption adjustment between quinquennial studies. Assumptions are reviewed annually by the Comptroller's AAC and quinquennially by a consulting firm. The annual online publishing of the actuarial assumptions provides transparency to interested parties.

Assumed Investment Return Expectation Risk

Employer contribution rates are most sensitive to the assumed investment return. The following table shows the FYE 2028 system average billing rates and April 1, 2026 total pension liability (actuarial accrued liability under the Entry Age Normal method + dedicated assets) for various assumed investment returns using the April 1, 2026 valuation cohort. In addition, it designates the Low-Default Risk Obligation Measure (LDROM) required under ASOP No. 4 (Measuring Plan Obligations and Determining Pension Plan Costs or Contributions), which is discussed below the table.

The exceedance column shows the probability that the return on assets exceeds the assumed discount rate over a 30-year period. PICM completed a comprehensive asset/liability analysis resulting in a new AA Policy effective as of April 1, 2024. The probability of exceedance was determined using a stochastic model, which relied upon the trustee-approved target asset allocation and PICM's 2026 capital market assumptions.

Assumed Rate	Employees' Retirement System		Police and Fire Retirement System		2026 CAPM Assumptions
	FYE 2028 System Average Billing Rate	April 1, 2026 TPL (\$ in billions)	FYE 2028 System Average Billing Rate	April 1, 2026 TPL (\$ in billions)	Probability of Assumed Rate Exceedance
6.90%	5.3%	\$230	20.1%	\$46	36%
5.90%	17.3%	\$256.2	37.4%	\$51.6	56%
5.40%	23.6%	\$271	46.7%	\$55	66%
4.90%	30.3%	\$287	56.6%	\$58	74%
4.40%	37.3%	\$304	67.1%	\$62	82%
3.90% (LDROM)	44.8%	\$324	78.3%	\$66	88%

The LDROM represents the funding liability if the plan invested solely in high-quality bonds with cash flows matching future benefit payments. An all-bond investment strategy is approximated by an assumed rate of return of 3.9%. Under the current discount rate, which compares to the rate of return on the plan's diversified portfolio, the pension liability dropped \$82 billion (\$68 in ERS and \$14 in PFRS).

The difference between these liability measures represents the expected tax savings due to investment in the plan's diversified portfolio instead of solely in high-quality bonds. If the plan switched to investing in high-quality bonds, the higher LDROM liability implies higher employer contribution rates. Unnecessarily high contribution rates in the near term may not be affordable and could jeopardize the sustainability of the DB plan.

Inflation and Salary Scale Expectation Risk

The inflation assumption is used to compute COLA payments to retirees and beneficiaries. The COLA program provides payments equal to one-half of the inflation rate on the first \$18,000 of the single life allowance. A floor of 1% and a cap of 3% reduces the risk of extreme gains or losses due to inflation being different than assumed.

The salary scale assumption is used to project future increases in a member's salary to estimate the FAS at retirement and determine the billable salary over a member's career. If members receive greater salary increases than assumed, the expected benefit increases. Employer contributions need to be increased to cover the shortfall. Differences between actual and expected salary experience typically generate the largest gains/losses for active members.

Demographic Expectation Risks

Demographic assumptions estimate member behavior regarding decrements (that is, change in status) such as retiring, withdrawing, or dying. Because NYSLRS is large (over 1.25 million participants), many of these assumptions are developed with a high degree of credibility using NYSLRS' own experience. Actual/Expected (A/E) ratios are displayed earlier in this report to show how actual retiree mortality and active-member decrements track expectations. Decrement vary within a relatively narrow range, so there is measured risk of significant gains or losses in this valuation component.

NYSLRS is not large enough to develop in-house mortality improvement assumptions and thus relies on mortality improvement scales based on nationwide experience derived from data collected from the Social Security Administration by the Society of Actuaries (SOA). This report recommends using scale MP-2021. Updated SOA tables gradually incorporate new data after decades of experience, and there is low risk of significant gains or losses in this valuation component.

Employer Contribution Volatility Risk

Investment Volatility Risk

Employer contribution rate smoothness is most sensitive to the investment return experience. We can evaluate exposure to investment volatility risk using the following Asset Leverage Ratio:

$$\text{Asset Leverage Ratio} = \frac{\text{Fair Value of Assets (FVA)}}{\text{Present Value of Valuation Cohort Billable Salary (PVBS)}}$$

The following table displays the ratio and its components in the middle of the last four decades, the year 2021 (in which the actuarial value of assets began employing eight-year smoothing), and for the most recent year (dollar amounts in billions).

ERS

FYE	1985	1995	2005	2015	2021*	2026
FVA	\$22.8	\$53.3	\$108.7	\$161.2	\$220.6	\$248.1
PVBS	\$102.0	\$158.2	\$176.1	\$203.1	\$266.0	\$344.4
Asset Leverage Ratio	22%	34%	62%	79%	83%	72%
Smoothing Period	5	5	5	5	8	8
Smoothed Asset Leverage Ratio	4.5%	6.7%	12.3%	15.9%	10.4%	9.0%

PFRS

FYE	1985	1995	2005	2015	2021*	2026
FVA	\$4.1	\$9.8	\$19.3	\$28.2	\$39.5	\$46.3
PVBS	\$11.9	\$16.5	\$27.0	\$30.9	\$41.4	\$52.1
Asset Leverage Ratio	34%	59%	71%	91%	95%	89%
Smoothing Period	5	5	5	5	8	8
Smoothed Asset Leverage Ratio	6.9%	11.9%	14.3%	18.3%	11.9%	11.1%

* first year of market-value restart and commencement of eight-year smoothing

The ratio is zero at plan inception but increases as assets accumulate. Poor investment performance in a new plan is not problematic as there was not much asset value to lose and there was plenty of billable salary from which to collect contributions and accumulate assets before benefits become due. In a more mature fund with a high asset leverage ratio, investment volatility has a greater impact on the employer contribution rate. NYSLRS is now a mature plan with the associated significant exposure to investment volatility risk.

Increasing Plan Maturity

Pension plans mature slowly with a regular infusion of new entrants and the release of liabilities as payees die. A pension plan becomes mature when those collecting a benefit (payees) outweigh those contributing to the plan (active members). The following ratio of the payee actuarial accrued liability to total actuarial accrued liability shows the scales tipping in favor of the payee population.

Ratio of Payee Accrued Liability to Total Accrued Liability

FYE	1985	1995	2005	2015	2025	2026
ERS	21%	26%	45%	54%	61%	61%
PFRS	20%	36%	54%	58%	67%	67%

As NYSLRS becomes more heavily steeped in payee liability, shortfalls of assets will trigger a larger increase in the billing rates, as a smaller contribution base must recoup the shortfall for a larger inactive population. Since active members must support the payee liability after a market decline, it may be necessary to limit investment risk. Liquidity risk also becomes a concern if the cash contributions are not enough to pay benefit payments as they come due.

Cashflow Timing Risk

Cash assets are required to fulfill benefit promises when due. As a plan matures and more benefits are being paid out of the fund, there is a cash flow concern. The net cash flow is the difference between the cash inflows (employer contributions, member contributions, and member loan repayments) and the cash outflows (benefit payments and administrative expenses). A positive net cash flow indicates that assets are accumulating. A negative net cash flow will require the drawdown of assets (or investment gains) to pay benefits.

$$\text{Net Benefits Cash Flow Ratio} = \frac{\text{Contributions} - \text{Benefit Payments and Expenses}}{\text{Fair Value of Assets}}$$

NYSLRS has had a negative net cash flow over recent years, but this does not indicate a financial hardship. The purpose of prefunding a pension plan is to accumulate assets, which are then drawn down to settle benefits. In fact, negative net cash flows are expected when a system is well-funded, because employer contributions (the largest source of cash inflow) are relatively lower.

However, a slow and steady change in membership demographics will change a pension plan’s liquidity needs and risk exposure. To monitor exposure to liquidity risk over time, we can use the Net Cash Flow Ratio.

Net Benefits Cash Flow Ratio by Fiscal Year

FYE	1995	2005	2015	2025	2026
ERS	-3.1%	-1.8%	-2.3%	-3.8%	-3.2%
PFRS	-2.1%	-2.3%	-2.4%	-2.8%	-2.4%

Because its net cash flow is relatively small compared to its assets, the ability of NYSLRS to make timely benefit payments is not impaired and there is little concern of liquidity risk in the near term. Liquidity concerns are further mitigated by cash flows available from assets (interest, dividends, bond maturities, and rental income from real estate) and the ability to sell highly liquid assets to meet benefit requirements.

A negative Net Cash Flow Ratio does make the system more sensitive to short-term investment performance. After a market decline, it is necessary to draw down liquid assets to continue benefit payments. This can compete with an investment strategy directing the purchase of cheap equity investments in anticipation of a market recovery, potentially constraining the flexibility of the PICM division. More conservative asset allocations may limit exposure to market declines, while larger cash allocation could improve flexibility. But both would be expected to reduce the expected investment return in the long term. While higher expected returns could reduce contributions, a negative net cashflow creates a risk that is greatly reduced by a lower liability discount rate.

The negative Net Cash Flow Ratio can also be viewed in terms of continued accumulation of assets. Cash inflows are directed toward benefits, so the fund is reliant upon investment income to continue asset accumulation. This increases exposure to investment risk.

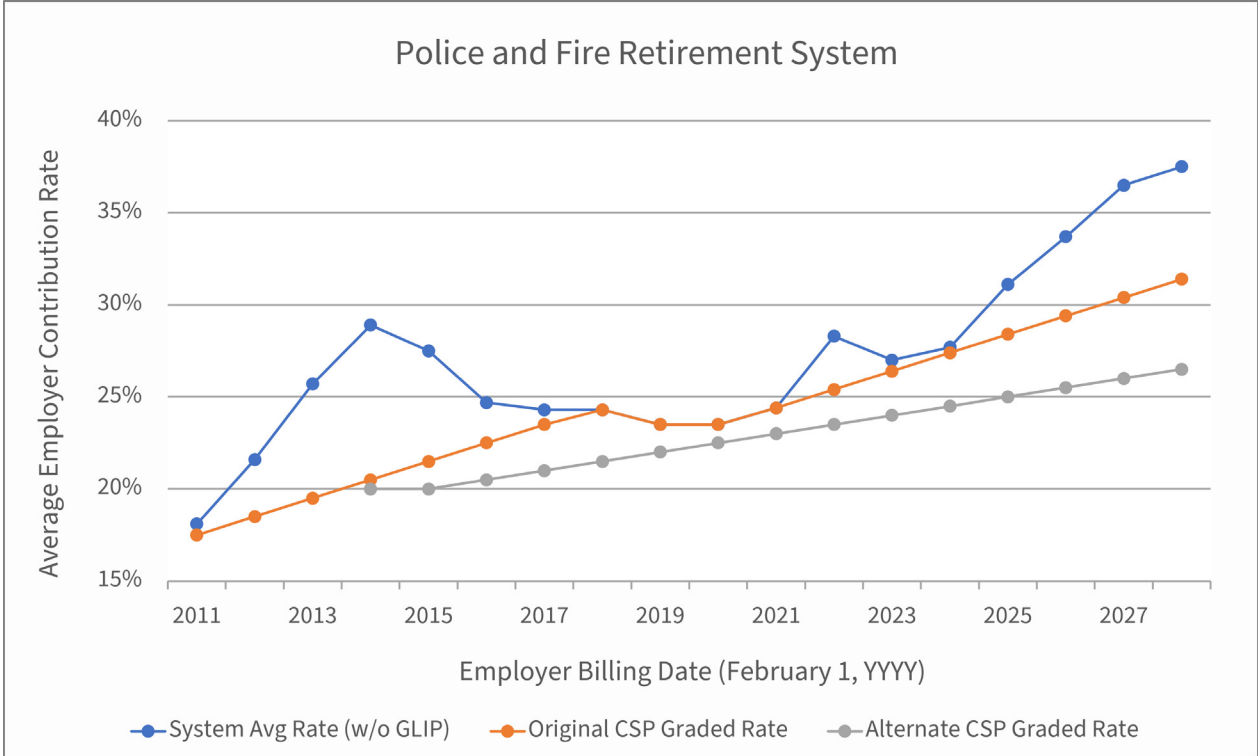
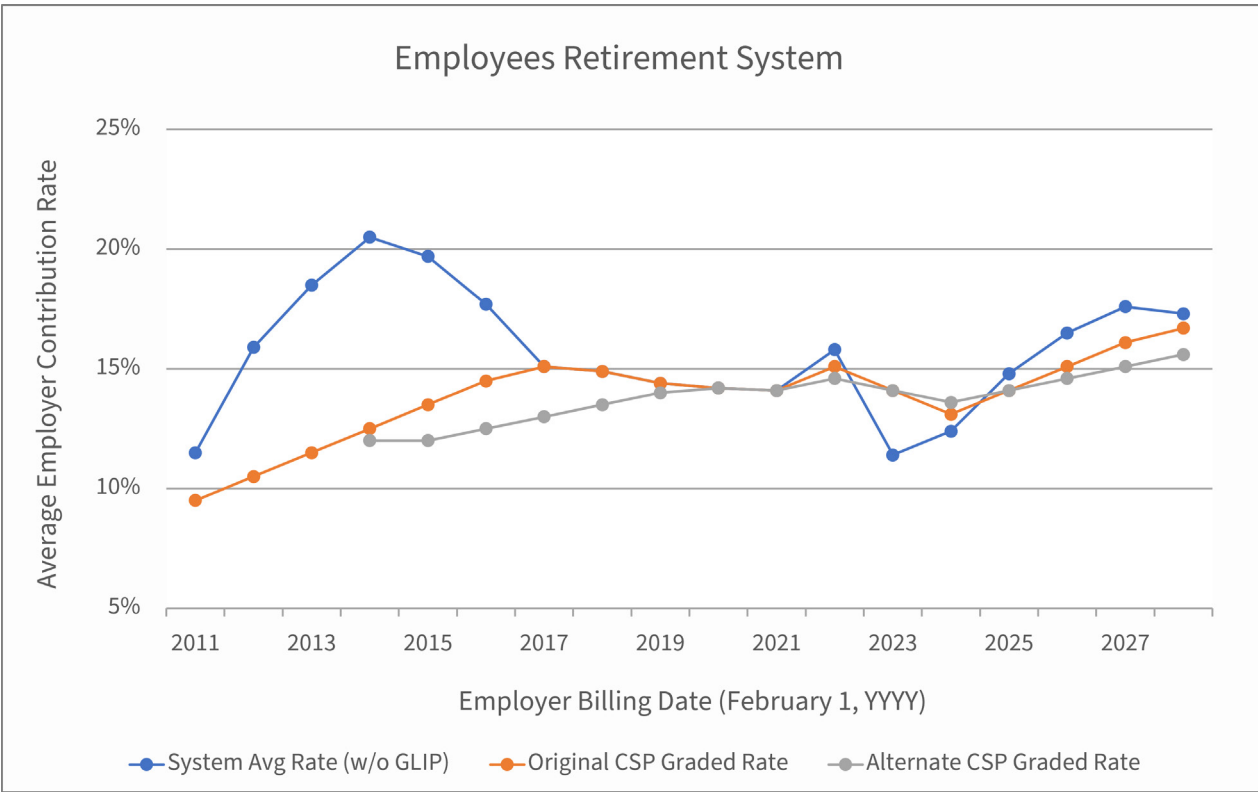
Mitigating Employer Contribution Volatility Risk

NYSLRS' Actuarial Valuation currently employs two methods to reduce employer contribution rate volatility.

First, an 8-year smoothing method is used to reduce annual investment return volatility. Any deviations from the current expected return of 5.9% are recognized as equal increments over a period of eight years. Note that 8-year smoothing in 2026 has the same impact as 5-year smoothing in the 1990s for PFRS, and around the year 2000 in ERS.

Second, the Contribution Stabilization Program (CSP) was signed into law in 2010. The Alternate Contribution Stabilization Program (ALT_CSP) was signed in 2014 and had a one-year opt-in window. The CSP provides an optional additional layer of employer contribution rate smoothing. Under the CSP, on the billing date, a participating employer is required to remit a graded rate contribution and permitted to amortize over a 10-year period the balance between the actuarial contribution and the graded rate contribution (12-year period for the ALT_CSP). The graded rate increases or decreases by up to 1% each year (0.5% for the ALT_CSP) in the direction of the system's average contribution rate. During "ordinary" investment periods, the actuarial and graded rates converge. Large deviations may occur when there is extraordinary asset performance, such as after the global financial crisis of 2008 or the COVID pandemic.

The graphs on the following page show the graded rates versus the system average rates over the course of both programs. The system average rates are much more volatile than the graded rates. The graded rates peak lower and later than the system average rates. Therefore, employers in the CSP experience less contribution risk due to increased stability of billing rates.



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Appendices

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Appendix A: History of Cashflows, Assets, and Billing Rates

FYE 3/31	Contributions* [C]		Benefits* [B]	Invested Assets* [CRF]	(C-B) CRF	S&P 500	Assumed CRF Return	Average Employer Contribution Rate	
	Employer	Employee						ERS	PFRS
1970	\$ 299.2	\$ 75.0	\$ 158.2	\$ 3,532.6	6.1%	89.63	4.87%	18.9%	22.2%
1971	346.0	77.4	194.3	3,888.2	5.9	100.31	4.87	19.8	23.9
1972	490.8	80.4	243.2	4,389.5	7.5	107.20	4.87	21.9	28.8
1973	553.0	73.0	287.9	5,167.8	6.5	111.52	4.87	20.3	31.4
1974	664.5	61.6	334.6	5,393.0	7.3	93.98	4.87	21.3	32.4
1975	749.3	52.9	373.4	5,915.3	7.2	83.36	5.50	20.4	32.9
1976	872.2	48.0	431.0	7,080.7	6.9	102.77	5.50	19.7	32.3
1977	981.3	41.7	461.3	7,852.0	7.2	98.42	5.50	19.6	33.3
1978	1,001.4	71.7	516.8	8,812.5	6.3	89.21	5.50	19.8	34.9
1979	1,020.6	61.2	568.8	10,326.7	5.0	101.59	5.50	18.8	35.1
1980	1,296.7	34.5	631.4	11,725.9	6.0	102.09	5.50	18.1	34.2
1981	1,296.0	47.8	695.5	14,194.6	4.6	136.00	5.50	17.0	33.1
1982	1,363.9	61.5	755.8	15,088.5	4.4	111.96	7.50	15.5	29.6
1983	1,481.3	84.0	840.3	18,626.5	3.9	152.96	7.50	15.1	28.7
1984	1,496.1	97.5	940.5	20,618.3	3.2	159.18	7.50	14.4	27.3
1985	1,610.5	116.0	1,063.4	24,062.3	2.8	180.66	7.50	14.2	26.5
1986	1,277.0	132.3	1,157.0	29,926.1	0.8	238.90	8.00	10.4	19.8
1987	1,174.0	151.2	1,275.8	35,621.8	0.1	291.70	8.00	9.4	13.3
1988	1,321.3	188.5	1,381.9	35,812.5	0.4	258.89	8.00	9.7	14.8
1989	759.4	194.7	1,624.7	40,280.6	-1.7	294.87	8.75	3.7	8.5
1990	412.2	229.9	1,670.4	45,189.3	-2.3	339.94	8.75	3.6	8.3
1991	-72.4	255.3	1,834.2	48,945.5	-3.4	375.22	8.75	0.3	7.8
1992	356.8	287.0	2,067.7	51,925.8	-2.7	403.69	8.75	0.4	11.5
1993	369.8	284.1	2,267.9	56,428.9	-2.9	451.67	8.75	0.6	14.0
1994	530.1	307.5	2,393.7	58,416.8	-2.7	445.77	8.75	0.7	11.3
1995	315.1	334.0	2,527.9	63,406.6	-3.0	500.71	8.75	0.7	13.9
1996	776.9	341.9	2,877.9	74,827.9	-2.4	645.50	8.75	2.2	13.0
1997	903.5	348.2	3,122.0	82,333.8	-2.3	757.12	8.75	3.7	9.8
1998	462.6	369.4	3,305.0	104,921.8	-2.4	1,101.75	8.50	1.7	7.0
1999	291.7	399.8	3,482.0	111,008.7	-2.5	1,286.37	8.50	1.3	2.4
2000	164.5	422.7	3,720.2	127,138.9	-2.5	1,498.58	8.50	0.9	1.9
2001	214.8	319.1	4,181.0	112,432.9	-3.2	1,160.33	8.00	0.9	1.6
2002	263.8	210.2	4,488.3	111,168.5	-3.6	1,147.39	8.00	1.2	1.6
2003	651.9	219.2	4,984.6	95,598.3	-4.3	848.18	8.00	1.5	1.4
2004	1,286.5	221.9	5,347.5	119,245.0	-3.2	1,126.21	8.00	5.9	5.8
2005	2,964.8	227.3	5,674.7	126,083.5	-2.0	1,180.59	8.00	12.9	17.6
2006	2,782.2	241.2	6,028.9	140,453.3	-2.1	1,294.87	8.00	11.3	16.3
2007	2,718.6	250.2	6,383.4	154,575.5	-2.2	1,420.86	8.00	10.7	17.0
2008	2,648.4	265.7	6,835.6	153,877.7	-2.5	1,322.70	8.00	9.6	16.6
2009	2,456.2	273.3	7,212.1	108,960.7	-4.1	797.87	8.00	8.5	15.8
2010	2,344.2	284.3	7,718.9	132,500.2	-3.8	1,169.43	8.00	7.4	15.1
2011	4,164.6	286.2	8,520.2	147,237.0	-2.8	1,325.83	7.50	11.9	18.2
2012	4,585.2	273.2	8,937.8	150,658.9	-2.7	1,408.47	7.50	16.3	21.6
2013	5,336.0	269.1	9,521.5	160,660.8	-2.4	1,569.19	7.50	18.9	25.8
2014	6,064.1	281.4	9,977.5	176,835.1	-2.1	1,872.34	7.50	20.9	28.9
2015	5,797.4	284.8	10,513.7	184,502.0	-2.4	2,067.89	7.50	20.1	27.6
2016	5,140.2	306.6	11,060.5	178,639.7	-3.1	2,059.74	7.00	18.2	24.7
2017	4,787.0	328.8	11,508.3	192,410.6	-3.3	2,362.72	7.00	15.5	24.3
2018	4,823.3	349.4	12,128.9	207,416.0	-3.4	2,640.87	7.00	15.3	24.4
2019	4,744.3	386.5	12,833.9	210,523.7	-3.7	2,834.40	6.80	14.9	23.5
2020	4,782.7	453.7	13,311.1	194,317.2	-4.2	2,584.59	6.80	14.6	23.5
2021	5,029.8	492.3	14,122.0	258,135.8	-3.3	3,972.89	6.80	14.6	24.4
2022	5,627.7	577.6	14,905.0	272,121.3	-3.4	4,530.41	5.90	16.2	28.3
2023	4,404.1	656.8	15,174.3	248,524.9	-4.1	4,109.31	5.90	11.4	27.0
2024	5,054.5	788.8	15,808.7	268,088.7	-4.0	5,243.77	5.90	13.1	27.8
2025	6,206.3	963.9	16,425.3	273,287.5	-3.4	5,611.85	5.90	15.2	31.2
2026	\$ 7,139.4	\$1,074.2	\$ 17,069.8	\$ 294,420.0	-3.0%	6,258.52	5.90%	16.5%	33.7%

* Millions of dollars

Appendix B: Long-Term New Entrant Rates

New Entrant Rates (NER) are a measurement of the Employer Contribution Rate expected, based on current assumptions, for a hypothetical new hire entering a system with no unfunded liability/asset. Basically, it represents the employer billing rate necessary to fully fund the plan benefits for an individual in a vacuum. These rates are colloquially called the “long-term rates.”

Generally, actual billing rates will be higher than the NER, with the excess used to reduce the system’s unfunded liability, if any. Should the system reach fully funded status (net assets equal or exceed present value of future benefits), excess assets would *reduce* billing rates below the NER.

By comparing different plans’ NER, we gain insight into the relative generosity of each plan. Plans with higher NER are more costly to employers and more lucrative to members.

At NYSLRS, one funding objective is the alignment of employer costs with value of member benefits. An employer providing lucrative benefits should contribute more than an employer offering lesser benefits. Charging all employers the same billing rate would cause a “race to the top” as superior benefits could be offered without material increases in the employer’s required contributions, effectively subsidized by those offering lesser benefits. The NER is used to scale the system’s “basic rate” and provide different billing rates for each plan, where more lucrative plans have higher employer billing rates.

ERS

Plan Type	Model Plan	Tier 4	Tier 6
Age 55 Retirement	Article 15	16.2%	10.5%
Age 55 Retirement (Unified Court Peace Officers)	UCPO	17.4	11.9
50% benefit at 25 years	89-p	18.7	13.1
50% benefit at 25 years (State Correction Officers)	A14CO	22.4	17.5
50% benefit at 25 years and 60% benefit at 30 years	89-f	18.9	13.8
50% benefit at 25 years and additional 60ths thereafter	89-v	19.9	15.0
50% benefit at 25 years (law enforcement only)	551	21.5	16.1
50% benefit at 20 years (law enforcement only)	552	26.8	21.9
50% benefit at 20 years and additional 60ths thereafter (law enforcement only)	553	27.2	22.7

PFRS

Plan Type	Model Plan	Tier 2	Tier 6*
Age 55 Retirement	375-i	20.3%	13.5%
Age 55 Retirement with no early age reductions	375ijp	20.7	13.8
50% benefit at 25 years	384	23.6	17.7
50% benefit at 25 years and additional 60ths thereafter	383-d	24.8	18.4
Police and Fire Article 14	PFA14	27.8**	N/A
50% benefit at 20 years	384-d	28.1	22.3
50% benefit at 20 years and additional 60ths thereafter	384-e	28.5	22.6
50% benefit at 20 years and additional 60ths thereafter	381-b	29.8	23.2

* When member contributions are required

** Tier 3

Appendix C: Assumption Details

This section strives to disclose all material assumptions, and details various decrement rates used in the valuation.

Some miscellaneous assumptions for ERS include:

- When a disability benefit is subject to a workers’ compensation offset, we assume the offset is 10% of FAS.
- Some members can convert unused sick leave at retirement into additional service credit. We assume that 3 days are credited for each year of service for Tiers 1–5 and 2 days per year of service for Tier 6.
- Active members with approved WTC notices are assumed to elect single life allowances that convert to accidental death benefits to a female beneficiary of the same age, if death occurs within 25 years of retirement, with 70% of active members assumed to die of a qualified WTC condition.
- Retired members with approved WTC notice that named a spouse for continuing benefits, are assumed to die of a WTC qualifying condition 70% of the time. Should the member die in the first 25 years of retirement, the spousal beneficiary that survives the retiree is assumed to collect an accidental death benefit.
- Members in Tiers 5 and 6 are subject to a limitation on how much overtime can be included in FAS, increasing at 3% per year. In FYB 2026, the limit was increased to \$30,000. We assume no valuation impact.
- Withdrawal rates for correction officers are assumed to be double those of others in service-based plans.
- When calculating a Tier 6 member’s FAS, each year’s salary is capped at the Governor’s salary, which increased to \$250,000 in 2021. While it has not increased since 2021, the Governor’s salary is assumed to increase annually by the assumed rate of inflation in years after the valuation date.
- For projecting the billable salary base, tier specific assumptions are used, as shown below.

Tier	1	2	3	4	5	6
Payroll Projection Factor	0.75	0.75	0.97	0.97	1.02	1.15

Some miscellaneous assumptions for PFRS include:

- When a disability benefit is subject to a workers' compensation offset, we assume the offset is 3.5% of FAS. For accidental death benefits, we assume the workers' compensation offset is 18% of the FAS, and we assume the social security offset is 6% of salary.
- Some members can convert unused sick leave at retirement into additional service credit. We assume that 4 days are credited for each year of service, subject to a maximum of 165 days.
- Active members with approved WTC notices are assumed to elect single life allowances that convert to accidental death benefits to a female beneficiary of the same age, if death occurs within 25 years of retirement, with 70% of retiree deaths assumed to die of a qualifying WTC condition.
- Retired members with approved WTC notice that named a spouse for continuing benefits, are assumed to die of a WTC qualifying condition 70% of the time. Should the member die in the first 25 years of retirement, the spousal beneficiary that survives the retiree is assumed to collect an accidental death benefit.
- Some members are entitled to a benefit based upon a 1-year FAS. In these cases, salary is seen to increase faster than the assumed salary scale in the year prior to retirement. A factor (*OneYearFAS*) is multiplied by the plan's usual FAS calculation to estimate the 1-year FAS.
 - For Tier 1 members with date of membership prior to April 1, 1972, *OneYearFAS* is 1.08.
 - For Tiers 5 and 6, where more strict overtime limits apply, *OneYearFAS* is 1.14.
 - And for all others, *OneYearFAS* is 1.18.
- Members in Tiers 5 and 6 are subject to a narrower definition of how much overtime can be included in FAS. This reduces the lucrativeness of Tier 5 and 6 plans relative to earlier tiers. Therefore, in calculating plan indices, the active valuation includes an *OTLimit* factor that trims liabilities by 5% for affected plans. This factor is not used in developing valuation liabilities.
- When calculating a Tier 6 member's FAS, each year's salary is capped at the Governor's salary, which increased to \$250,000 in 2021. While it has not increased since 2021, the Governor's salary is assumed to increase annually by the assumed rate of inflation in years after the valuation date.
- For projecting the billable salary base, tier specific assumptions are used, as shown below.

Tier	1	2	3	4	5	6
Payroll Projection Factor	0.50	0.90	0.90	N/A	1.05	1.18

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The remainder of this appendix provides the assumed decrement rates for retiree mortality (including beneficiary mortality) and active-member decrements (withdrawal, death, disability, service retirement) and salary scale assumptions, for both systems.

Assumption sets are presented in a series of tables organized by system and decrement type.

Table 1	Healthy Retiree Mortality Probability — ERS Age-Based Plans ¹
Table 2	Disabled Retiree Mortality Probability — ERS Age-Based Plans ¹
Table 3	Service and Disabled Retiree Mortality Probability — ERS Service-Based Plans and PFRS Plans ¹
Table 4	Beneficiary Mortality Probability ^{1,2}
Table 5	Active Death and Total Disability Probability (Population Average)
Table 6	Segmented Disability Factors by Disability Type and Retirement Plan
Table 7	Withdrawal Probability — ERS Age-Based Plans
Table 8	Withdrawal Probability — ERS Service-Based Plans and PFRS Plans
Table 9	Service Retirement Probability — ERS Age-Based Plans
Table 10	Service Retirement Probabilities — ERS Service-Based Plans and PFRS Plans
Table 11	Salary Scale Assumptions

¹ Base mortality rates (qx) are generally only changed once every five years, with the quinquennial review. We assume the base mortality is “as of” the midpoint of the experience study period (10/1/2022). Mortality improvement MP-2021 is subsequently applied generationally for the actuarial valuation.

² In the active valuation, it is assumed that all beneficiaries will be females with the same age as the member.

TABLE 1: Healthy Retiree Mortality Probability — ERS Age-Based Plans

Effective 10/1/2022, prior to application of MP-2021 mortality improvement

Age	White Collar “Clerks”		Blue Collar “Laborers”	
	q _x , Male	q _x , Female	q _x , Male	q _x , Female
55	0.00503	0.00328	0.00493	0.00457
56	0.00545	0.00368	0.00565	0.00503
57	0.00588	0.00407	0.00638	0.00547
58	0.00633	0.00447	0.00710	0.00588
59	0.00681	0.00460	0.00730	0.00627
60	0.00731	0.00476	0.00756	0.00664
61	0.00784	0.00497	0.00791	0.00700
62	0.00832	0.00522	0.00832	0.00736
63	0.00882	0.00554	0.00882	0.00772
64	0.00940	0.00592	0.00940	0.00810
65	0.01007	0.00639	0.01007	0.00852
66	0.01087	0.00696	0.01087	0.00901
67	0.01181	0.00763	0.01181	0.00960
68	0.01292	0.00842	0.01292	0.01033
69	0.01416	0.00934	0.01422	0.01124
70	0.01549	0.01040	0.01574	0.01235
71	0.01703	0.01161	0.01750	0.01370
72	0.01880	0.01297	0.01951	0.01529
73	0.02084	0.01450	0.02180	0.01714
74	0.02319	0.01622	0.02439	0.01924
75	0.02588	0.01816	0.02731	0.02161
76	0.02898	0.02037	0.03061	0.02427
77	0.03254	0.02288	0.03433	0.02727
78	0.03663	0.02576	0.03854	0.03067
79	0.04132	0.02907	0.04331	0.03456
80	0.04667	0.03289	0.04873	0.03904
81	0.05276	0.03729	0.05488	0.04423
82	0.05967	0.04236	0.06186	0.05023
83	0.06745	0.04815	0.06978	0.05712
84	0.07617	0.05477	0.07873	0.06498
85	0.08589	0.06228	0.08880	0.07386
86	0.09665	0.07076	0.10009	0.08377
87	0.10849	0.08027	0.11265	0.09473
88	0.12143	0.09090	0.12658	0.10671
89	0.13548	0.10268	0.14191	0.11970
90	0.15067	0.11568	0.15870	0.13367
91	0.16699	0.12995	0.17699	0.14859
92	0.18444	0.14552	0.19681	0.16446
93	0.20303	0.16243	0.21817	0.18127
94	0.22275	0.18070	0.24109	0.19901
95	0.24360	0.20037	0.26557	0.21766
96	0.26024	0.21796	0.28173	0.23487
97	0.27839	0.23715	0.29936	0.25364
98	0.29806	0.25794	0.31845	0.27398
99	0.31924	0.28033	0.33902	0.29589
100	0.34193	0.30432	0.36105	0.31936
101	0.36689	0.33071	0.38528	0.34518
102	0.39488	0.36030	0.41246	0.37412
103	0.42665	0.39388	0.44330	0.40698
104	0.46447	0.43386	0.48003	0.44610
105	0.50985	0.48184	0.52409	0.49304
106	0.56507	0.54021	0.57770	0.55015
107	0.63466	0.61378	0.64527	0.62213
108	0.72391	0.70814	0.73193	0.71444
109	0.84116	0.83208	0.84577	0.83571
110	1.00000	1.00000	1.00000	1.00000

TABLE 2: Disabled Retiree Mortality Probability — ERS Age-Based Plans

Effective 10/1/2022, prior to application of MP-2021 mortality improvement

Age	q _x , Male	q _x , Female
15	0.00011	0.00006
16	0.00013	0.00006
17	0.00018	0.00008
18	0.00150	0.00150
19	0.00170	0.00170
20	0.00180	0.00180
21	0.00190	0.00190
22	0.00200	0.00200
23	0.00220	0.00220
24	0.00230	0.00230
25	0.00250	0.00250
26	0.00260	0.00260
27	0.00280	0.00280
28	0.00300	0.00300
29	0.00320	0.00320
30	0.00340	0.00340
31	0.00370	0.00370
32	0.00390	0.00390
33	0.00420	0.00420
34	0.00450	0.00450
35	0.00480	0.00480
36	0.00548	0.00548
37	0.00615	0.00615
38	0.00683	0.00683
39	0.00751	0.00751
40	0.00819	0.00819
41	0.00908	0.00893
42	0.00959	0.00959
43	0.01058	0.01034
44	0.01141	0.01108
45	0.01227	0.01227
46	0.01304	0.01304
47	0.01374	0.01374
48	0.01449	0.01449
49	0.01533	0.01533
50	0.01611	0.01611
51	0.01680	0.01680
52	0.01746	0.01746
53	0.01800	0.01800
54	0.01855	0.01855
55	0.01902	0.01902
56	0.01944	0.01944
57	0.02000	0.02000
58	0.02059	0.02059
59	0.02117	0.02101
60	0.02174	0.02125
61	0.02248	0.02159
62	0.02337	0.02207

Age	q _x , Male	q _x , Female
63	0.02437	0.02267
64	0.02553	0.02343
65	0.02687	0.02430
66	0.02844	0.02531
67	0.03025	0.02643
68	0.03233	0.02771
69	0.03472	0.02915
70	0.03742	0.03074
71	0.04051	0.03252
72	0.04391	0.03449
73	0.04780	0.03670
74	0.05208	0.03924
75	0.05686	0.04200
76	0.06216	0.04504
77	0.06794	0.04848
78	0.07425	0.05236
79	0.08128	0.05666
80	0.08920	0.06145
81	0.09709	0.06689
82	0.10572	0.07296
83	0.11565	0.07965
84	0.12611	0.08719
85	0.13725	0.09544
86	0.14887	0.10447
87	0.16208	0.11425
88	0.17507	0.12484
89	0.18948	0.13612
90	0.20479	0.14843
91	0.22146	0.16129
92	0.23862	0.17528
93	0.25692	0.18944
94	0.27601	0.20445
95	0.29448	0.22065
96	0.31000	0.23779
97	0.32693	0.25650
98	0.34527	0.27676
99	0.36503	0.29858
100	0.38619	0.32196
101	0.40948	0.34768
102	0.43558	0.37652
103	0.46521	0.40925
104	0.50049	0.44822
105	0.54282	0.49498
106	0.59432	0.55187
107	0.65923	0.62357
108	0.74248	0.71554
109	0.85184	0.83634
110	1.00000	1.00000

TABLE 3: Service and Disabled Retiree Mortality Probability — ERS Service-Based Plans and PFRS Plans
Effective 10/1/2022, prior to application of MP-2021 mortality improvement

Age	q _x , Service Retirees	q _x , Disabled Retirees
35	0.00055	0.00180
36	0.00073	0.00190
37	0.00090	0.00205
38	0.00105	0.00220
39	0.00120	0.00235
40	0.00135	0.00250
41	0.00148	0.00270
42	0.00160	0.00290
43	0.00172	0.00310
44	0.00182	0.00330
45	0.00192	0.00355
46	0.00200	0.00375
47	0.00208	0.00400
48	0.00214	0.00412
49	0.00218	0.00424
50	0.00221	0.00427
51	0.00222	0.00433
52	0.00222	0.00444
53	0.00222	0.00459
54	0.00222	0.00478
55	0.00224	0.00500
56	0.00229	0.00525
57	0.00238	0.00554
58	0.00253	0.00586
59	0.00275	0.00621
60	0.00306	0.00659
61	0.00347	0.00700
62	0.00398	0.00746
63	0.00460	0.00797
64	0.00533	0.00855
65	0.00617	0.00922
66	0.00713	0.01001
67	0.00821	0.01094
68	0.00942	0.01207
69	0.01077	0.01342
70	0.01227	0.01504
71	0.01396	0.01698
72	0.01584	0.01929

Age	q _x , Service Retirees	q _x , Disabled Retirees
73	0.01796	0.02202
74	0.02036	0.02522
75	0.02309	0.02892
76	0.02622	0.03316
77	0.02982	0.03799
78	0.03397	0.04343
79	0.03877	0.04951
80	0.04430	0.05625
81	0.05065	0.06368
82	0.05792	0.07182
83	0.06620	0.08068
84	0.07557	0.09030
85	0.08608	0.10068
86	0.09782	0.11186
87	0.11084	0.12385
88	0.12518	0.13667
89	0.14089	0.15034
90	0.15802	0.16486
91	0.17660	0.18026
92	0.19665	0.19665
93	0.21819	0.21819
94	0.24123	0.24123
95	0.26579	0.26579
96	0.28194	0.28194
97	0.29956	0.29956
98	0.31865	0.31865
99	0.33921	0.33921
100	0.36124	0.36124
101	0.38546	0.38546
102	0.41263	0.41263
103	0.44347	0.44347
104	0.48018	0.48018
105	0.52423	0.52423
106	0.57783	0.57783
107	0.64538	0.64538
108	0.73201	0.73201
109	0.84582	0.84582
110	1.00000	1.00000

TABLE 4: Beneficiary Mortality Probability

Effective 10/1/2022, prior to further application of MP-2021 mortality improvement

Age	q _x , Male	q _x , Female
45	0.00560	0.00245
46	0.00593	0.00248
47	0.00627	0.00252
48	0.00664	0.00257
49	0.00705	0.00262
50	0.00752	0.00269
51	0.00764	0.00287
52	0.00780	0.00308
53	0.00800	0.00331
54	0.00823	0.00357
55	0.00851	0.00386
56	0.00883	0.00419
57	0.00918	0.00454
58	0.00958	0.00494
59	0.01001	0.00535
60	0.01047	0.00580
61	0.01097	0.00626
62	0.01150	0.00674
63	0.01206	0.00725
64	0.01268	0.00778
65	0.01335	0.00836
66	0.01410	0.00896
67	0.01493	0.00963
68	0.01589	0.01038
69	0.01699	0.01122
70	0.01830	0.01217
71	0.01988	0.01324
72	0.02174	0.01447
73	0.02394	0.01587
74	0.02652	0.01748
75	0.02953	0.01936
76	0.03300	0.02152
77	0.03699	0.02400

Age	q _x , Male	q _x , Female
78	0.04154	0.02687
79	0.04668	0.03016
80	0.05244	0.03395
81	0.05887	0.03832
82	0.06601	0.04332
83	0.07395	0.04900
84	0.08280	0.05545
85	0.09270	0.06269
86	0.10375	0.07078
87	0.11610	0.07982
88	0.12987	0.08989
89	0.14520	0.10108
90	0.16219	0.11347
91	0.17973	0.12686
92	0.19713	0.14103
93	0.21408	0.15594
94	0.23067	0.17144
95	0.24703	0.18761
96	0.26424	0.20493
97	0.28226	0.22315
98	0.30139	0.24227
99	0.32180	0.26221
100	0.34333	0.28297
101	0.36547	0.30422
102	0.38711	0.32563
103	0.40806	0.34694
104	0.42830	0.36802
105	0.44738	0.38869
106	0.46550	0.40867
107	0.48250	0.42796
108	0.49429	0.44634
109	0.49506	0.46374
110	1.00000	1.00000

The Society of Actuaries Pub-2016 rates of contingent annuitant mortality commence at age 45 and are centered at January 1, 2016. For ages 0–17, Pub-2016 Juvenile mortality was assumed. For ages 18–44, Pub-2016 Healthy Annuitant mortality was assumed.

In addition, to ensure these beneficiary mortality rates have the same effective date as NYSLRS other mortality assumptions, it was necessary to apply MP-2021 mortality improvement to the published Pub-2016 mortality rates (thereby advancing the center period of study from January 1, 2016 to NYSLRS center of October 1, 2022).

TABLE 5: Active Death and Total Disability Probability (Population Average)

Age	ERS Age-Based Plans			ERS Service-Based Plans* and PFRS Plans		
	Ordinary Death	Accidental Death	Total Disability** (no POD)	Ordinary Death	Accidental Death	Total Disability** (with POD)
15	0.00013	0.00001	0.00003	0.00010	0.00001	0.00047
16	0.00014	0.00001	0.00003	0.00011	0.00001	0.00047
17	0.00014	0.00001	0.00004	0.00011	0.00001	0.00047
18	0.00015	0.00001	0.00004	0.00011	0.00001	0.00047
19	0.00017	0.00001	0.00005	0.00013	0.00001	0.00047
20	0.00018	0.00001	0.00005	0.00014	0.00001	0.00047
21	0.00019	0.00001	0.00006	0.00014	0.00001	0.00047
22	0.00020	0.00001	0.00007	0.00015	0.00001	0.00047
23	0.00022	0.00001	0.00008	0.00017	0.00001	0.00047
24	0.00023	0.00001	0.00009	0.00017	0.00001	0.00047
25	0.00025	0.00001	0.00010	0.00019	0.00001	0.00047
26	0.00026	0.00001	0.00011	0.00020	0.00001	0.00047
27	0.00028	0.00001	0.00013	0.00021	0.00001	0.00047
28	0.00030	0.00001	0.00014	0.00023	0.00001	0.00047
29	0.00032	0.00001	0.00016	0.00024	0.00001	0.00047
30	0.00034	0.00001	0.00019	0.00026	0.00001	0.00047
31	0.00037	0.00001	0.00021	0.00028	0.00001	0.00068
32	0.00039	0.00001	0.00024	0.00029	0.00001	0.00093
33	0.00042	0.00001	0.00027	0.00032	0.00001	0.00124
34	0.00045	0.00001	0.00030	0.00034	0.00001	0.00159
35	0.00048	0.00001	0.00034	0.00036	0.00001	0.00198
36	0.00051	0.00001	0.00039	0.00038	0.00001	0.00241
37	0.00055	0.00001	0.00044	0.00041	0.00001	0.00289
38	0.00059	0.00001	0.00050	0.00044	0.00001	0.00342
39	0.00063	0.00001	0.00057	0.00047	0.00001	0.00401
40	0.00067	0.00001	0.00064	0.00050	0.00001	0.00467
41	0.00072	0.00001	0.00073	0.00054	0.00001	0.00541
42	0.00077	0.00001	0.00082	0.00058	0.00001	0.00624
43	0.00082	0.00001	0.00093	0.00062	0.00003	0.00715
44	0.00088	0.00001	0.00105	0.00066	0.00003	0.00813
45	0.00094	0.00001	0.00119	0.00071	0.00003	0.00915
46	0.00100	0.00001	0.00135	0.00075	0.00003	0.01017
47	0.00107	0.00001	0.00153	0.00080	0.00003	0.01117
48	0.00115	0.00001	0.00173	0.00086	0.00003	0.01210
49	0.00123	0.00001	0.00196	0.00092	0.00003	0.01293
50	0.00131	0.00001	0.00222	0.00098	0.00003	0.01363
51	0.00140	0.00001	0.00251	0.00105	0.00003	0.01418
52	0.00150	0.00001	0.00284	0.00113	0.00003	0.01457
53	0.00160	0.00001	0.00322	0.00120	0.00003	0.01478
54	0.00171	0.00001	0.00365	0.00128	0.00003	0.01483
55	0.00183	0.00001	0.00413	0.00137	0.00003	0.01483
56	0.00196	0.00001	0.00467	0.00147	0.00003	0.01483
57	0.00209	0.00001	0.00529	0.00157	0.00003	0.01483
58	0.00223	0.00001	0.00599	0.00167	0.00003	0.01483
59	0.00239	0.00001	0.00678	0.00179	0.00003	0.01483
60	0.00255	0.00001	0.00768	0.00191	0.00003	0.01483
61	0.00273	0.00001	0.00870	0.00205	0.00003	0.01483
62	0.00292	0.00001	0.00985	0.00219	0.00003	0.01483
63	0.00312	0.00001	0.01115	0.00234	0.00003	0.01483
64	0.00334	0.00001	0.01262	0.00251	0.00003	0.01483
65	0.00367	0.00001	0.01429	0.00276	0.00003	0.01483
66	0.00404	0.00001	0.01618	0.00304	0.00003	0.01483
67	0.00444	0.00001	0.01832	0.00334	0.00003	0.01483
68	0.00488	0.00001	0.02074	0.00367	0.00003	0.01483
69	0.00537	0.00001	0.02349	0.00404	0.00003	0.01483
70	0.00591	0.00001	0.02349	0.00444	0.00003	0.01483
71	0.00650	0.00001	0.02349	0.00488	0.00003	0.01483
72	0.00715	0.00001	0.02349	0.00537	0.00003	0.01483
73	0.00787	0.00001	0.02349	0.00591	0.00003	0.01483
74	0.00866	0.00001	0.02349	0.00650	0.00003	0.01483
75	0.00953	0.00001	0.02349	0.00715	0.00003	0.01483
76	0.01048	0.00001	0.02349	0.00787	0.00003	0.01483
77	0.01153	0.00001	0.02349	0.00866	0.00003	0.01483
78	0.01268	0.00001	0.02349	0.00953	0.00003	0.01483
79	0.01395	0.00001	0.02349	0.01048	0.00003	0.01483
80	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

* Security Hospital Treatment Assistants (SHTAs) employed by the State of New York are covered under plans that provide a 75% POD benefit and are therefore assigned the same disability decrement probability as PFRS members.

**Total Disability is further broken down by plan type in Table 6.

TABLE 6: Segmented Disability Factors by Disability Type and Retirement Plan

Experience shows that there are distinct disability incidence patterns based on the availability of a performance of duty (POD) benefit.

Total Disability is proportioned to three types of disability benefits: Ordinary, Accidental, and POD.

The proportions vary by plan based on the benefit amount and job titles typically covered under the plan.

For plans with above average benefits or job titles with a high propensity for disability, the proportions will sum to more than 100%.

For plans with below average benefits or job titles with a low propensity for disability, the proportions will sum to less than 100%.

Where a POD benefit is greater than or equal to the Accidental benefit, any instance of an accidental disability is assumed to be paid under the POD benefit. Therefore, the Accidental Proportion is merged with the POD Proportion and zeroed out; the Ordinary Proportion is unaffected.

ERS Age-Based Plans

System	Plan	Ordinary Proportion	Accidental Proportion	POD Proportion	Total as a Percentage of Population Average
ERS	Article 15 Plan	84%	21%	N/A	105%
ERS	Unified Court Peace Officers Plan	320%	80%	N/A	400%
ERS	Age-Based Plans, Tiers 1-2	84%	48%	N/A	132%

ERS Service-Based Plans and PFRS Plans

System	Plan	Ordinary Proportion	Accidental Proportion	POD Proportion	Total as a Percentage of Population Average
ERS	Article 14-B Deputy Sheriff Plans, Tiers 1-2	10%	45%	45%	100%
ERS	Article 14-B Deputy Sheriff Plans, Tiers 3-6	10%	40%	45%	95%
ERS	Article 14-B Deputy Sheriff Plans, Tiers 3-6, with 75% POD *	10%	0%	85%	95%
ERS	County Plans, Tiers 1-2	8%	36%	N/A	44%
ERS	County Plans, Tiers 3-6	8%	16%	N/A	24%
ERS	County Plans, Tiers 3-6, with 75% POD *	8%	0%	90%	98%
ERS	State Correction Officers & SHTA Plans, Tiers 1-2	8%	36%	N/A	44%
ERS	State Correction Officers & SHTA Plans, Tiers 3-6 *	8%	0%	90%	98%
ERS	State SHTA Plan, with 75% POD *	10%	0%	113%	123%
ERS	Nassau County Fire Marshals	10%	45%	45%	100%
ERS	Nassau County Police Department Ambulance Medical Technicians	11%	50%	50%	111%
ERS	Town of Tonawanda Paramedics	11%	22%	N/A	33%
ERS	Rockland County District Attorney Investigators	10%	20%	N/A	30%
ERS	Westchester County District Attorney Investigators	10%	45%	45%	100%
PFRS	State Trooper and State Police Plans	13%	59%	59%	131%
PFRS	Other Plans	13%	57%	57%	127%

* The POD benefit is superior to the Accidental benefit.

TABLE 7: Withdrawal Probability — ERS Age-Based Plans

Age	0 ≤ Service < 2	2 ≤ Service < 3	3 ≤ Service < 4	4 ≤ Service < 5	5 ≤ Service < 10	10 ≤ Service
15	0.30703	0.14225	0.12070	0.09387	0.06393	0.03285
16	0.30703	0.14225	0.12070	0.09387	0.06393	0.03285
17	0.30703	0.14225	0.12070	0.09387	0.06393	0.03285
18	0.30703	0.14225	0.12070	0.09387	0.06393	0.03285
19	0.30703	0.14225	0.12070	0.09387	0.06393	0.03285
20	0.30703	0.14225	0.12070	0.09387	0.06393	0.03285
21	0.30613	0.14225	0.12070	0.09387	0.06393	0.03285
22	0.30206	0.14225	0.12070	0.09387	0.06393	0.03285
23	0.29534	0.14225	0.12070	0.09387	0.06393	0.03285
24	0.28662	0.14225	0.12070	0.09387	0.06393	0.03285
25	0.27660	0.14225	0.12070	0.09387	0.06393	0.03285
26	0.26600	0.14454	0.12070	0.09525	0.06393	0.03285
27	0.25546	0.14483	0.12070	0.09606	0.06393	0.03285
28	0.24549	0.14350	0.12070	0.09634	0.06393	0.03285
29	0.23643	0.14085	0.12070	0.09613	0.06393	0.03285
30	0.22841	0.13715	0.12070	0.09546	0.06393	0.03285
31	0.22146	0.13265	0.11910	0.09435	0.06310	0.03220
32	0.21548	0.12763	0.11717	0.09283	0.06232	0.03151
33	0.21036	0.12236	0.11496	0.09096	0.06158	0.03081
34	0.20599	0.11717	0.11246	0.08883	0.06083	0.03011
35	0.20227	0.11237	0.10962	0.08657	0.06003	0.02942
36	0.19911	0.10823	0.10641	0.08432	0.05917	0.02877
37	0.19643	0.10490	0.10286	0.08221	0.05825	0.02814
38	0.19414	0.10241	0.09906	0.08032	0.05727	0.02755
39	0.19215	0.10064	0.09522	0.07870	0.05628	0.02700
40	0.19035	0.09936	0.09159	0.07732	0.05532	0.02649
41	0.18867	0.09829	0.08841	0.07610	0.05444	0.02600
42	0.18704	0.09718	0.08584	0.07496	0.05369	0.02553
43	0.18542	0.09590	0.08395	0.07383	0.05310	0.02503
44	0.18385	0.09443	0.08267	0.07262	0.05268	0.02447
45	0.18237	0.09289	0.08179	0.07133	0.05242	0.02380
46	0.18106	0.09145	0.08109	0.06993	0.05226	0.02300
47	0.17998	0.09026	0.08034	0.06845	0.05211	0.02207
48	0.17916	0.08941	0.07941	0.06690	0.05188	0.02108
49	0.17860	0.08891	0.07827	0.06533	0.05143	0.02008
50	0.17827	0.08864	0.07701	0.06377	0.05062	0.01917
51	0.17827	0.08847	0.07577	0.06224	0.04935	0.01840
52	0.17827	0.08826	0.07473	0.06079	0.04754	0.01780
53	0.17827	0.08793	0.07406	0.05946	0.04518	0.01738
54	0.17827	0.08752	0.07385	0.05829	0.04236	0.01712
55	0.17827	0.08712	0.07413	0.05736	0.03922	0.01698
56	0.17827	0.08690	0.07489	0.05671	0.03597	0.01694
57	0.17827	0.08703	0.07606	0.05641	0.03283	0.01696
58	0.17827	0.08766	0.07758	0.05650	0.02998	0.01703
59	0.17827	0.08884	0.07938	0.05699	0.02757	0.01713
60	0.17827	0.09057	0.08139	0.05789	0.02564	0.01724
61	0.17827	0.09275	0.08358	0.05917	0.02419	0.01735
62	0.17827	0.09526	0.08591	0.06083	0.02316	0.01746
63	0.17827	0.09796	0.08836	0.06285	0.02247	0.01757
64	0.17827	0.10073	0.09092	0.06519	0.02206	0.01766
65	0.17827	0.10347	0.09359	0.06787	0.02187	0.01774
66	0.17827	0.10614	0.09636	0.07085	0.02187	0.01780
67	0.17827	0.10872	0.09922	0.07416	0.02205	0.01785
68	0.17827	0.10872	0.09922	0.07416	0.02205	0.01785
69	0.17827	0.10872	0.09922	0.07416	0.02205	0.01785
70	0.17827	0.10872	0.09922	0.07416	0.02205	0.01785
71	0.17827	0.10872	0.09922	0.07416	0.02205	0.01785
72	0.17827	0.10872	0.09922	0.07416	0.02205	0.01785
73	0.17827	0.10872	0.09922	0.07416	0.02205	0.01785
74	0.17827	0.10872	0.09922	0.07416	0.02205	0.01785
75	0.17827	0.10872	0.09922	0.07416	0.02205	0.01785
76	0.17827	0.10872	0.09922	0.07416	0.02205	0.01785
77	0.17827	0.10872	0.09922	0.07416	0.02205	0.01785
78	0.17827	0.10872	0.09922	0.07416	0.02205	0.01785
79	0.17827	0.10872	0.09922	0.07416	0.02205	0.01785
80	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

TABLE 8: Withdrawal Probability — ERS Service-Based Plans and PFRS Plans

Years of Service Credit	Probability
0	0.06343
1	0.04027
2	0.02479
3	0.01588
4	0.01161
5	0.00997
6	0.00943
7	0.00908
8	0.00862
9	0.00805
10	0.00745
11	0.00684
12	0.00621
13	0.00552
14	0.00474
15	0.00389
16	0.00306
17	0.00238
18	0.00188
19	0.00156
20	0.00409
21	0.00443
22	0.00464
23	0.00426
24	0.00310
≥ 25	0.00310

Correction Officers are subject to assumed withdrawal at double the rates above.

TABLE 9: Service Retirement Probability — ERS Age-Based Plans

Age	Service < 20	Service = 20*	20 < Service < 30	30 ≤ Service
55	0.057	0.095	0.068	0.255
56	0.046	0.081	0.058	0.242
57	0.046	0.083	0.059	0.209
58	0.048	0.085	0.061	0.206
59	0.049	0.098	0.070	0.208
60	0.056	0.115	0.082	0.220
61	0.092	0.245	0.175	0.243
62	0.159	0.463	0.331	0.315
63	0.123	0.298	0.213	0.253
64	0.134	0.297	0.212	0.256
65	0.181	0.371	0.265	0.278
66	0.210	0.423	0.302	0.300
67	0.196	0.374	0.267	0.260
68	0.167	0.357	0.255	0.232
69	0.186	0.350	0.250	0.248
70	0.250	0.350	0.250	0.250
71	0.300	0.420	0.300	0.300
72	0.350	0.490	0.350	0.350
73	0.400	0.560	0.400	0.400
74	0.450	0.630	0.450	0.450
75	0.500	0.700	0.500	0.500
76	0.500	0.700	0.500	0.500
77	0.500	0.700	0.500	0.500
78	0.500	0.700	0.500	0.500
79	0.500	0.700	0.500	0.500
80	1.000	1.000	1.000	1.000

* Rates at 20 years of service are 140% of the rates from 21–29 years of service. These rates are applied unrounded to plans that include a benefit increase from 31.67% to 40.00% upon reaching 20 years of service (for example, ERS Tiers 4 and 5 but not Tier 6). When the benefit does not increase to 40% at 20 years, no adjustment is applied to the 21–29 year rates.

Rates at ages 70–75 are graded from 25% to 50%, which is assumed until the ultimate active retirement age of 80.

When an unreduced benefit is payable before attaining age 62, the probability of retirement is increased by adding 0.20.

Otherwise, these rates are not modified for ERS Tiers 1–4 and PFRS Tiers 1–5. ERS Tier 5 and all Tier 6 retirements are modified as described below.

Age	ERS Tier 5 Modifications			ERS and PFRS Tier 6 Modifications		
	Service < 20	20 ≤ Service < 30	30 ≤ Service	Service < 20	20 ≤ Service < 30	30 ≤ Service
< 62	× 0.8	× 0.8	× 0.8	× 0.8	× 0.8	Svc 20-30 Rates
62	+ 0.05	+ 0.07**	+ 0.15	× 0.8 - 0.05	× 0.8 - 0.10	Svc 20-30 Rates - 0.10
63	none	none	none	× 0.8 + 0.15	× 0.8 + 0.15	Svc 20-30 Rates + 0.15
64–70	none	none	none	× 0.8	× 0.8	Svc 20-30 Rates
> 70	none	none	none	none	none	none

** Other than at the 20 years of service milestone.

TABLE 10: Service Retirement Probabilities — ERS Service-Based Plans and PFRS Plans

Years of Service Credit	20-Year Plan State Police (OR20SP)	20-Year Plans non-State (OR20)	20-Year Plans with add'l 60ths (OR20p60)	25-Year Plan State COs (OR25SC)	25-Year Plans non-State (OR25)	25-Year Plans with add'l 60ths (OR25p60)
20	0.10508	0.29929	0.11080			
21	0.07884	0.15258	0.06787			
22	0.08199	0.13184	0.06259			
23	0.07148	0.13429	0.07261			
24	0.10420	0.10776	0.08952			
25	0.13063	0.10507	0.09739	0.32880	0.36505	0.20829
26	0.12025	0.08136	0.08789	0.20535	0.14322	0.21922
27	0.13858	0.12192	0.09662	0.17896	0.13151	0.22174
28	0.12584	0.10194	0.13070	0.17725	0.06604	0.21654
29	0.14939	0.08604	0.13270	0.18380	0.12959	0.20285
30	0.21709	0.08012	0.17931	0.24452	0.29564	0.18186
31	0.36947	0.13151	0.26874	0.23660	0.22000	0.15954
32	0.46225	0.15808	0.35164	0.22553	0.22464	0.16095
33	0.42945	0.12693	0.27565	0.19304	0.27887	0.18325
34	0.29333	0.12821	0.26934	0.21255	0.37885	0.20507
35	0.30800	0.15715	0.24801	0.23393	0.36502	0.22750
36	0.30800	0.14453	0.31513	0.28058	0.36502	0.26247
37	0.30800	0.14252	0.27867	0.31192	0.36502	0.31325
38	0.30800	0.14252	0.27867	0.31192	0.36502	0.35318
39	0.30800	0.14252	0.27867	0.31192	0.36502	0.35940
40	0.30800	0.14252	0.27867	0.31192	0.36502	0.35940
≥ 41	0.30800	0.14252	0.27867	0.31192	0.36502	0.35940

The PFRS **20-Year Plan with add'l 100ths (OR20p100)** are valued with 120% of the retirement rates shown in OR20p60 above.

TABLE 11: Salary Scale Assumptions

Years of Service Credit	ERS Age-Based Plans	ERS Service-Based Plans and PFRS Plans
0	9.0%	28.0%
1	8.5%	28.0%
2	8.0%	18.0%
3	7.5%	13.0%
4	7.0%	10.0%
5	6.5%	8.0%
6	6.5%	6.0%
7	6.0%	5.0%
8	6.0%	4.0%
9	5.5%	4.0%
10	5.0%	4.0%
11	5.0%	4.0%
12	4.5%	4.0%
13	4.5%	4.0%
14	4.5%	4.0%
15	4.5%	4.0%
16	4.5%	4.0%
17	4.5%	4.0%
18	4.0%	4.0%
19	4.0%	4.0%
20	4.0%	4.0%
21	4.0%	4.0%
22	4.0%	4.0%
23	4.0%	4.0%
24	4.0%	4.0%
25	3.5%	4.0%
26	3.5%	3.0%
≥ 27	3.5%	3.0%

Appendix D: Additional Considerations in Setting the Liability Discount Rate (and the Investment Rate of Return Assumption)

The AA Policy analysis is heavily reliant upon the asset class return assumptions adopted by PICM. While the target asset allocation is typically reviewed in five-year cycles, the forecasted asset class return assumptions are updated annually. Generally, the annual update of capital market assumptions is less scrutinized than those used to set the AA Policy. A shift in expectations may reflect a divergence from the risk/reward balance preferred by the Trustee, which would be corrected with the next quinquennial review of the AA Policy. Therefore, while informative and deserving mention, the annual updates do not necessarily change the long-term expectation.

We close this appendix with two discussions. The first explains the difference between arithmetic return and geometric return. The second provides an illustration of the cyclical relationship between the investment rate of return and the liability discount rate assumption.

Understanding the Difference Between Arithmetic Return and Geometric Return

A full discussion comparing the arithmetic return and the geometric return is beyond the scope of this report. But the geometric return is generally regarded as the appropriate target for the assumed investment rate of return to be consistent with the application of compound interest.

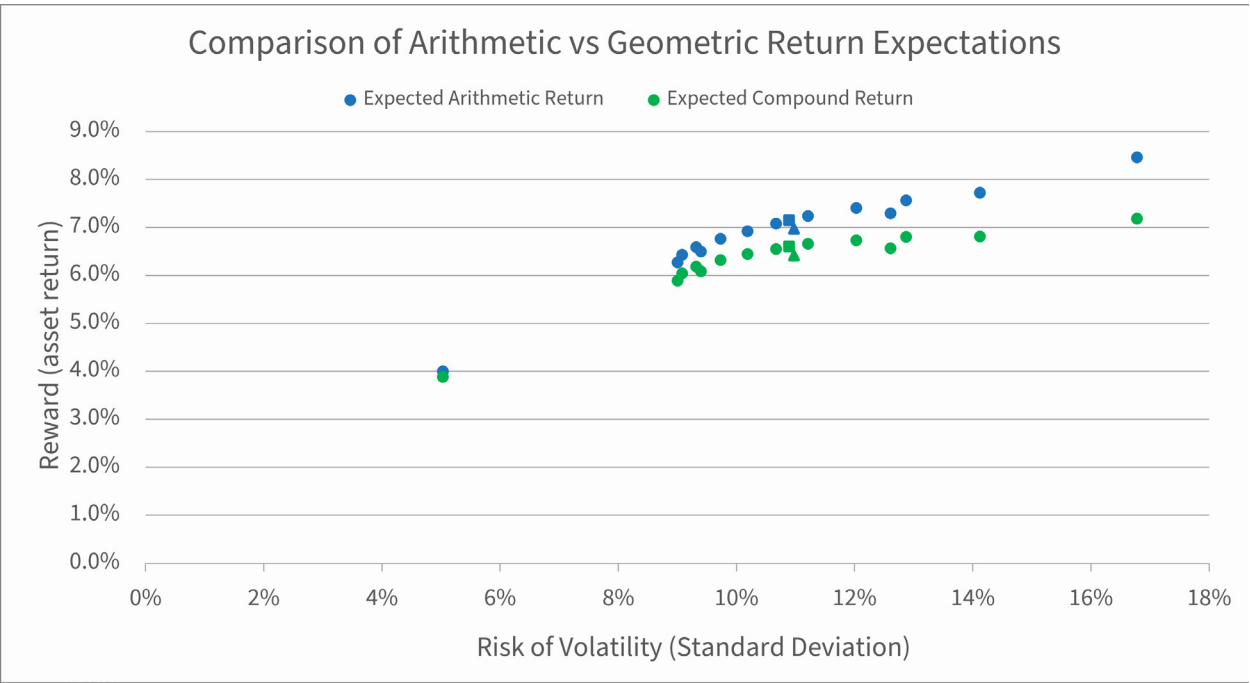
Arithmetic Return (AR) is the average of each year’s annual return over a number of years.

Geometric Return (GR) is the annualized compound return expected over a number of years.

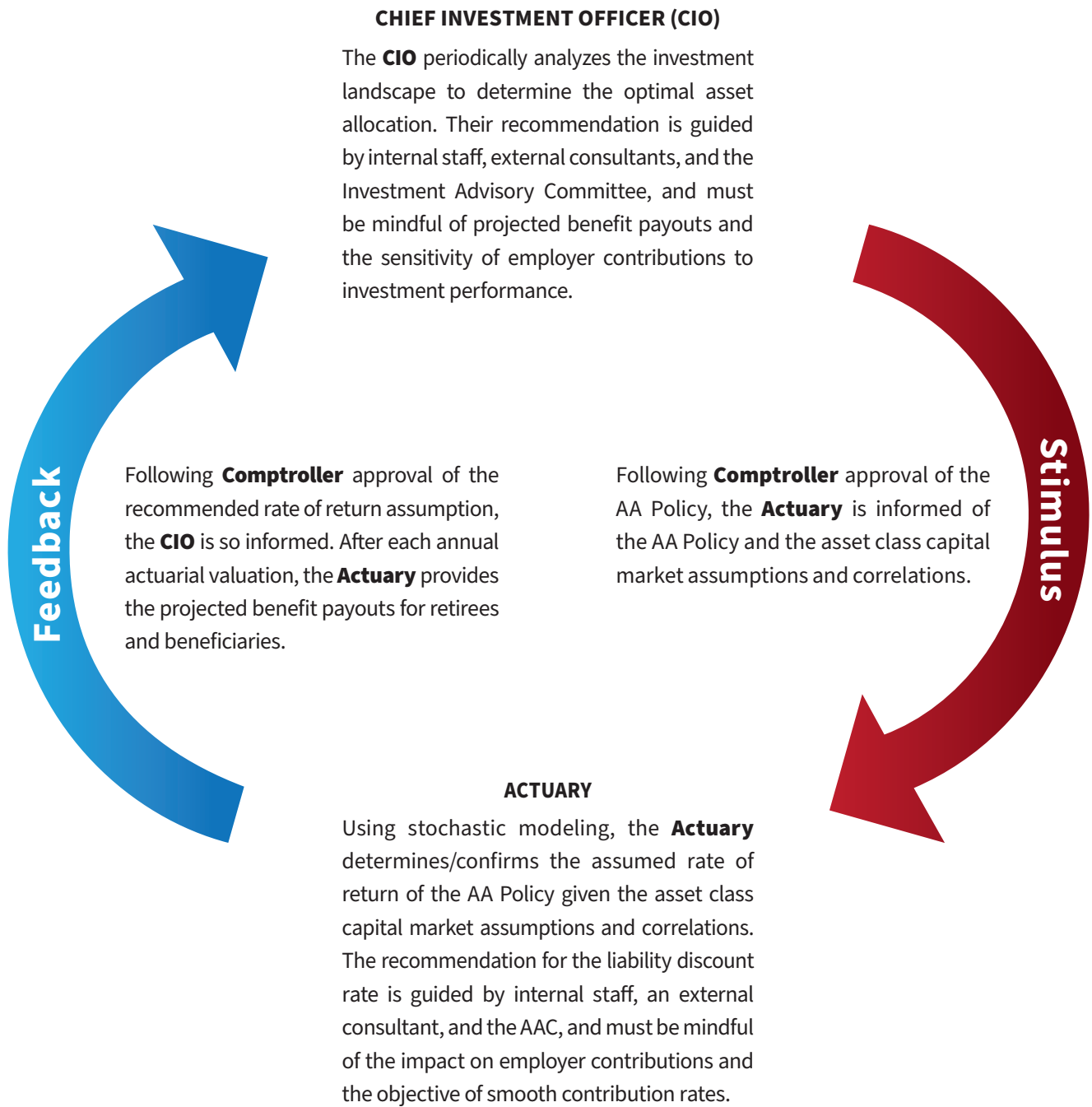
The different meaning of AR versus GR is best illustrated by example. In FY 2009, NYSLRS investment return was -26.4%. In the year that followed it was 25.9%. The arithmetic average of these two years is approximately 0%. This does not mean, however, that FY 2010 recovered all the FY 2009 losses. The GR for the two years was $(1 - 26.4\%) \times (1 + 25.9\%) - 1 = -7.3\%$, or -3.7% annually. This better characterizes the change in asset value over the two years.

The geometric return is always less than the arithmetic return. The more volatile the annual returns, the greater the difference. The arithmetic return “rewards” risk-taking more than the geometric return. To visualize this, the graph below plots both returns for 10 asset allocations presented in the 2024 AA Policy. The square marker represents the 2024 trustee-approved AA Policy and the triangle marker represents the 2020 AA Policy. All possible portfolios reflect the most up-to-date capital market assumptions.

Notice how the geometric return is flatter than the arithmetic return as the risk increases.



Understanding How the Assumed Rate of Return is Developed



Appendix E: Stochastic Models of Future Inflation

The model developed by the PICM Consultant provided data for 2,000 simulations. The model used ProVal to project annual inflation over 20 years. Model inputs, as of June 30, 2022 included an initial inflation rate of 9.06%, a long-term target of 2.5% with standard deviation of 2.5%, and a serial correlation coefficient of 0.70 based on historical analysis of the CPI-U.

This model was used to validate the multiple-state stochastic model developed by the Actuarial Bureau.

The Actuarial Bureau's model used three possible states:

Increasing	inflation is rising, causing an increase in annual inflation of 2.0%
Normalized	inflation is well managed and gliding toward Fed target of 2.0%
Decreasing	inflation is falling, potentially due to Fed combating high inflation

Each year, the modeled state at the beginning of the year (BOY) will influence the modeled state at the end of the year (EOY). A random variable is used to determine the state at EOY according to transition probabilities.

Transition Probabilities		EOY		
		Increasing	Normalized	Decreasing
BOY	Increasing	50%	25%	25%
	Normalized	20%	60%	20%
	Decreasing	10%	60%	30%

The change in the rate of inflation is then determined using prescribed rules intended to reflect different scenarios and the historical average change in the CPI-U, especially the standard deviation of average annual change in the CPI-U (SD_Annual), which is 2.0%.

EOY	Change in Rate of Inflation
Increasing	Rate of inflation increases by 2%, the SD_Annual
Normalized	Rate of inflation moves half the distance toward the FED long-term target
Decreasing	BOY state of <i>Increasing</i> indicates decrease is triggered by Fed Involvement. Rate of inflation decreases by 4%, double the SD_Annual.
	BOY state of <i>Normalized</i> indicates the decrease is naturally occurring. Rate of Inflation decreases 1%, half the SD_Annual.
	BOY state of <i>Decreasing</i> could mean decrease is natural or triggered by Fed. Rate of inflation decreases half the distance toward 0%, generating a large change when inflation is high and minimal change when inflation is low.

Office of the New York State Comptroller
Thomas P. DiNapoli

NYSLRS
New York State and Local Retirement System

