Classic Values, Innovative Advice

State Teachers Retirement System of Ohio

Actuarial Valuation Report as of June 30, 2023

Produced by Cheiron

December 2023

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December 14, 2023

Board of Trustees
State Teachers Retirement System of Ohio
275 East Broad Street
Columbus, Ohio 43215

Dear Members of the Board:

This report presents the most recent annual actuarial valuation as of June 30, 2023 of the State Teachers Retirement System of Ohio ("STRS Ohio") and has been prepared in accordance with Ohio Revised Code Section 3307.51(A), which requires the board to have prepared annually by or under the supervision of an actuary an actuarial valuation of the pension assets, liabilities, and funding requirements of the STRS Ohio defined benefit plan. In preparing our report, we relied on information, some oral and some written, supplied by STRS Ohio. This information includes, but is not limited to, the plan provisions, employee data, and financial information as of the valuation date. We performed an informal examination of the obvious characteristics of the data for reasonableness and consistency in accordance with Actuarial Standard of Practice No. 23.

Included in the report are the following supporting schedules prepared by Cheiron to be included in the Financial, Actuarial and Statistical sections of the STRS Ohio *Annual Comprehensive Financial Report*:

- Financial/Required Supplementary Information
  - Schedule of Changes in Employers' Net Pension Liability
  - Schedule of Employers' Net Pension Liability
  - Schedule of Employers' Contributions – Pension
  - Notes to Required Supplementary Information – Pension
  - Sensitivity of the Net Pension Liability to the Discount Rate Assumption
- Actuarial
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  - Actuarial Funded Ratio & Funding Period
  - Selected Funding Information – Defined Benefit Plan
  - Number of Benefit Recipients by Type
  - Summary of Active Membership Data
  - Benefit Payments by Type

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

We certify that this valuation was performed in accordance with generally accepted actuarial principles and practices and our understanding of the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board as well as applicable laws and regulations. In particular, the assumptions and methods used for funding purposes meet the requirements of the Actuarial Standards of Practice, in particular Standards Nos. 4, 27, 35 and 44. Furthermore, as credentialed actuaries, we meet the Qualification Standards of the American Academy of Actuaries to render the opinion contained in this report. This report does not address any contractual or legal issues. We are not attorneys, and our firm does not provide any legal services or advice.

This report was prepared for STRS Ohio for the purposes described herein. Other users of this report are not intended users as defined in the Actuarial Standards of Practice, and Cheiron assumes no duty or liability to such other users.

Sincerely,
Cheiron

Bonnie Rightnour, FSA, MAAA, EA
Principal Consulting Actuary

Michael Noble, FSA, FCA, MAAA, EA
Principal Consulting Actuary

Gene Kalwarski , FSA, FCA, MAAA, EA
Principal Consulting Actuary

SECTION I – BOARD SUMMARY

The primary purpose of the actuarial valuation and this report is to:

- Measure and disclose as of the valuation date, the financial condition of the Plan,
- Indicate trends, both historical and prospective, in the financial progress of the Plan,
- Identify, assess, and disclose material risks of the Plan,
- Disclose details on STRS Ohio and Member contributions,
- Provide information to be included in the Annual Comprehensive Financial Report, and
- Provide information required for STRS Ohio's financial reporting under GASB 67 and the collective employers' disclosures under GASB 68.

In the balance of this Board Summary, we present (A) the key findings of this valuation including a summary of all key financial results, (B) a review of the historical trends, and (C) the projected financial outlook for STRS Ohio.

Key Findings of this Valuation

The key results of the June 30, 2023 Actuarial Valuation is as follows:

- The Unfunded Actuarial Liability (UAL) increased from $20.1 billion as of June 30, 2022 to $20.2 billion as of June 30, 2023. This increase is higher than expected due to plan changes, and liability losses which were only partially offset by investment gains.
- The fixed employer contribution rate of 14.0% of payroll for members in the Defined Benefit Plan and Combined Plan and 2.91% of payroll for participants in the Defined Contribution Plan and Alternative Retirement Plan, and member contributions of 14.0% of payroll for the Defined Benefit Plan and 2.0% of payroll for the Combined Plan, is expected to cover the cost of ongoing benefit accruals (i.e., normal cost) and amortize the UAL over 11.2 years.
- The STRS Ohio funded ratio, the ratio of the Actuarial Value of Assets over Actuarial Liabilities increased from 80.9% as of June 30, 2022 to 81.3% as of June 30, 2023.
- The Board approved a one-time 1% COLA effective on the anniversary of a benefit recipient's retirement date for those eligible during Fiscal Year 2024 and a plan change to provide unreduced retirement benefits to those with 34 Years of Service, which extends through Fiscal Year 2028. The result of these plan changes increased liabilities by $885 million.

SECTION I – BOARD SUMMARY

- There was a net actuarial experience loss of \$ 0.2 billion and a composite loss of \$ 1.1 billion when factoring in the plan changes.
  - During the year ending June 30, 2023, the Plan's assets earned 8.43% (net of investment and administrative expenses) on a market value basis, but due to smoothing of prior investment gains and losses, the return on the Actuarial Value of Assets was 7.26% (as compared to 7.00% assumed for the fiscal year ending June 30, 2023). This resulted in an actuarial gain on investments of \$ 207 million.
  - On the liability side, the Plan experienced an actuarial experience loss of \$411 million.

We have incorporated a Plan Design Lever Analysis as Section VIII to this report to allow the Board and Cheiron to evaluate whether additional benefit plan design changes may be made in accordance with the laws in effect at this time. Cheiron will perform full fiscal integrity evaluations of any levers requested by the Board in the spring concurrent with the economic assumption analysis.

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Following is Table I-1, which summarizes all the key results of the valuation with respect to the System's membership, assets and liabilities, and contributions. The results are presented and compared for both the current and prior plan year.

Table I-1
State Teachers Retirements System of Ohio
Summary of Principal Results

	June 30, 2023			June 30, 2022	%
	Defined Benefit	**Combined**	**Total**	**Total**	**change**
Counts					
Active Members					
(i) Defined Benefit	167,526	7,506	175,032	174,036	0.57%
(ii) Defined Contribution			11,211	10,829	3.53%
Reemployed Retirees	16,915	-	16,915	17,110	(1.14%)
Inactive Members					
(i) Eligible for Allowances	20,142	799	20,941	20,262	3.35%
(ii) Eligible for Refunds Only	148,465	1,917	150,382	144,446	4.11%
(iii) Defined Contribution			5,759	5,420	6.25%
Retirees and Beneficiaries	155,956	555	156,511	156,225	0.18%
Total	**509,004**	**10,777**	**536,751**	**528,328**	1.59%
Total Payroll					
(i) Defined Benefit Plan Members	$ 12,220,042,344	$ 513,061,198	$ 12,733,103,542	$ 12,224,437,526	4.16%
(ii) Defined Contribution Plan Members			592,673,789	552,902,374	7.19%
(iii) Alternative Retirement Plan Members			886,104,916	847,518,623	4.55%
Total			$ 14,211,882,247	$ 13,624,858,523	4.31%
Annual Allowances	$ 7,263,624,746	$ 5,931,360	$ 7,269,556,106	$ 7,167,926,843	1.42%
Assets and Liabilities					
Actuarial Liability (AL)[1]	$ 107,282,995,873	$ 499,909,355	$ 107,782,905,228	$ 105,264,324,785	2.39%
Actuarial Value of Assets (AVA)			87,580,351,118	85,141,845,586	2.86%
Unfunded Actuarial Liability (UAL)			$ 20,202,554,110	$ 20,122,479,199	0.40%
Funded Ratio (AVA basis)			81.3%	80.9%	
Market Value of Assets (MVA)			$ 86,247,967,418	$ 83,034,198,764	3.87%
Funded Ratio (MVA basis)			80.0%	78.9%	
Funding Period			11.2 years	11.5 years	(2.96%)
Contribution Rates			**Fiscal Year 2023**	**Fiscal Year 2022**	
Total Employer Pension Contribution	14.00%	14.00%	14.00%	14.00%	0.00%
Total Member Pension Contribution	14.00%	2.00%	13.50%	13.52%	(0.12%)
Allocation of Total Contribution Rate					
Normal Cost	10.93%	4.59%	10.66%	10.61%	0.51%
Unfunded Actuarial Liability	17.07%	11.41%	16.84%	16.91%	(0.42%)
Total Contribution Rate	28.00%	16.00%	27.50%	27.52%	(0.06%)

[1]Defined Benefit Actuarial Liability (AL) includes Defined Contribution Account Balances and prior Defined Contribution participants who have converted their account to an annuity.

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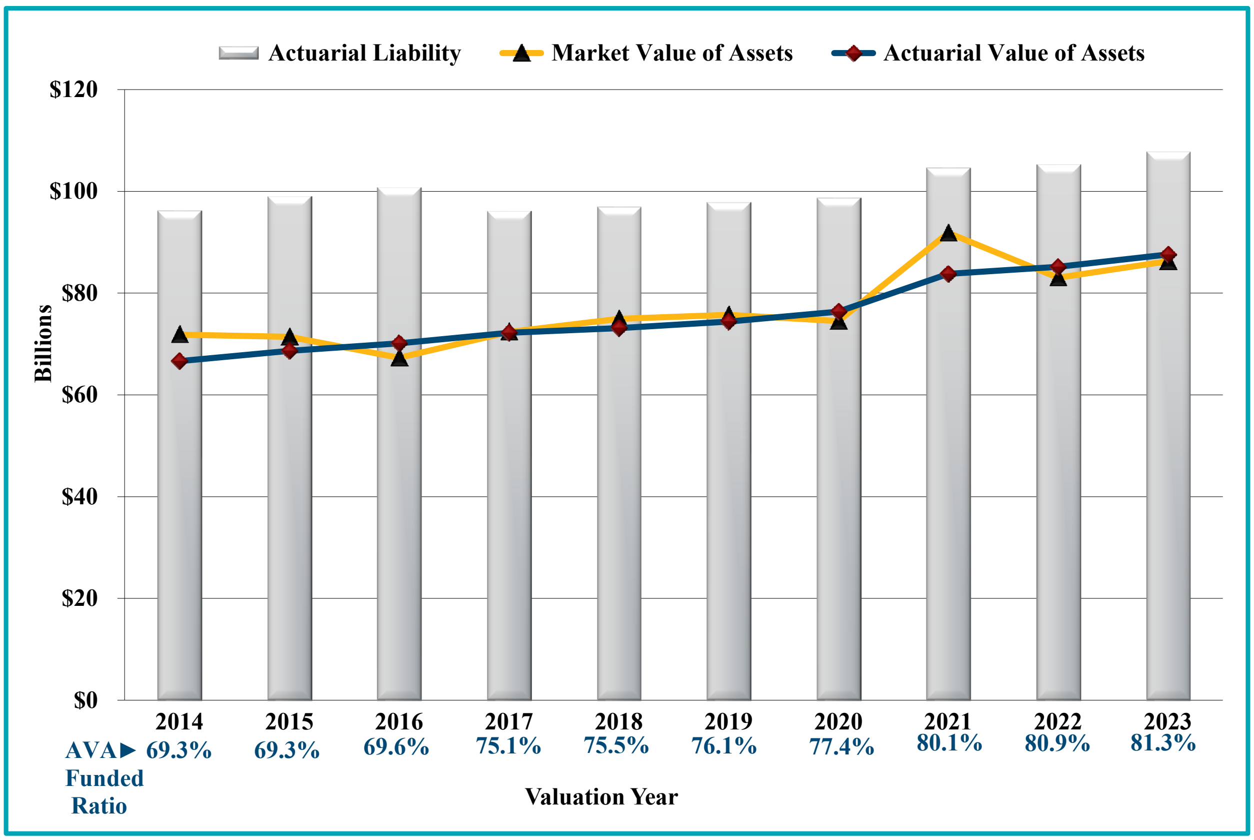
Historical Trends

It is important to take a step back from the latest results and view them in the context of the Plan's recent history. On the next few pages, we present a series of charts which display key results in the valuations over the last few years.

Assets and Liabilities

In the following chart, the gray bars represent the Actuarial Liability (AL), the gold line is the Market Value of Assets (MVA), and the blue line is the Actuarial Value of Assets (AVA). The Plan's funded ratio (ratio of AVA to AL) is shown below the x-axis where we show the valuation year.

While the Plan's funded ratio has been steadily increasing since 2014, it still remains well below the target funded ratio of 100%. The drop in liability shown in 2017 is due to pension reform changes including changes in retirement eligibility requirements and subsidies as well as the reduction of the COLA to 0%. The increase in liability shown in 2021 is largely attributable to the change in the discount rate from 7.45% to 7.00%. In 2023 the liabilities reflect the plan change to extend the 34-year unreduced retirement eligibility for an additional 5 years and the one-time 1% COLA. The Plan experienced favorable investment experience during the 2023 fiscal year, and the funded ratio increased slightly.



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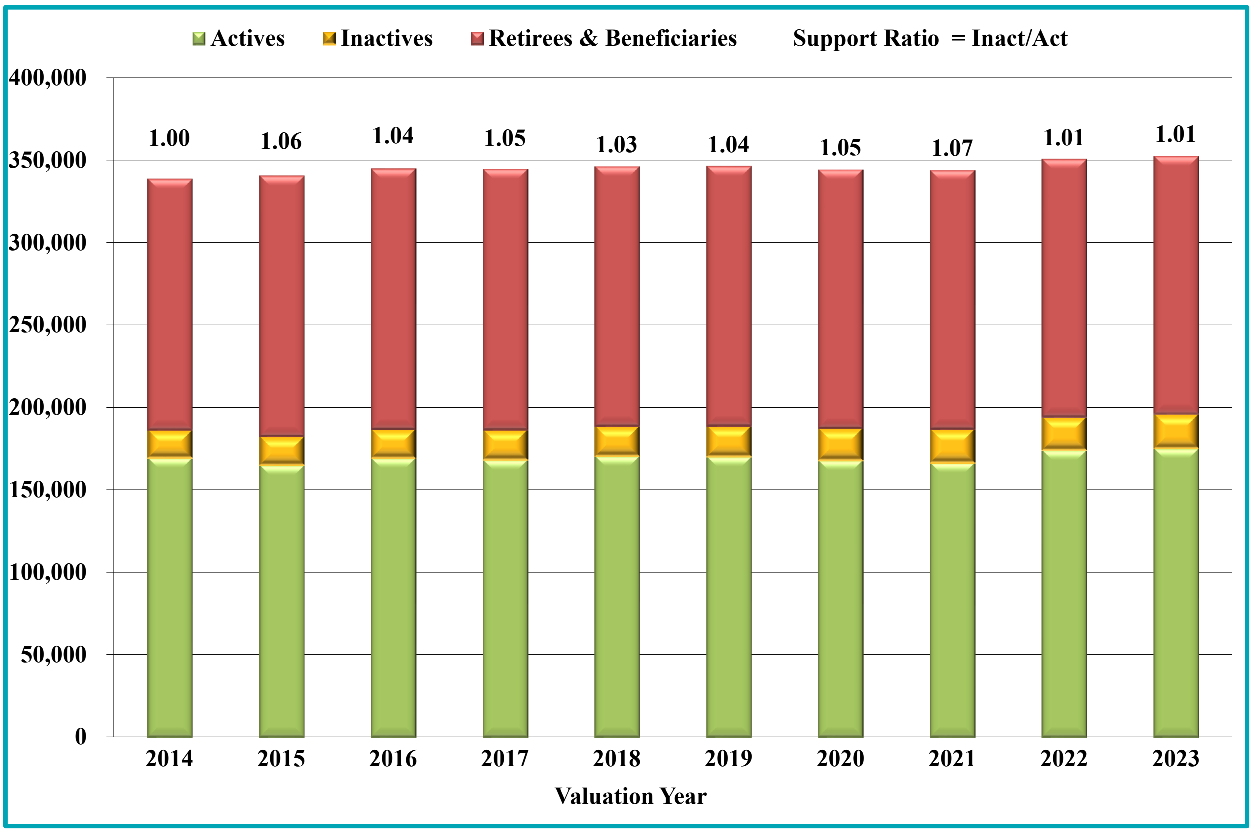
Participant Trends

The following chart shows the membership counts of the Plan at successive valuations. The numbers, which appear above each bar, represent the ratio of inactive members (retirees, reemployed retirees, and inactive members eligible for deferred allowances) to active members at each valuation date. We refer to this ratio as the support ratio.

The more retired and inactive members there are relative to active members, the more challenging it is for a plan to make up for experience losses (investment and liability) with contributions that are tied to payroll.

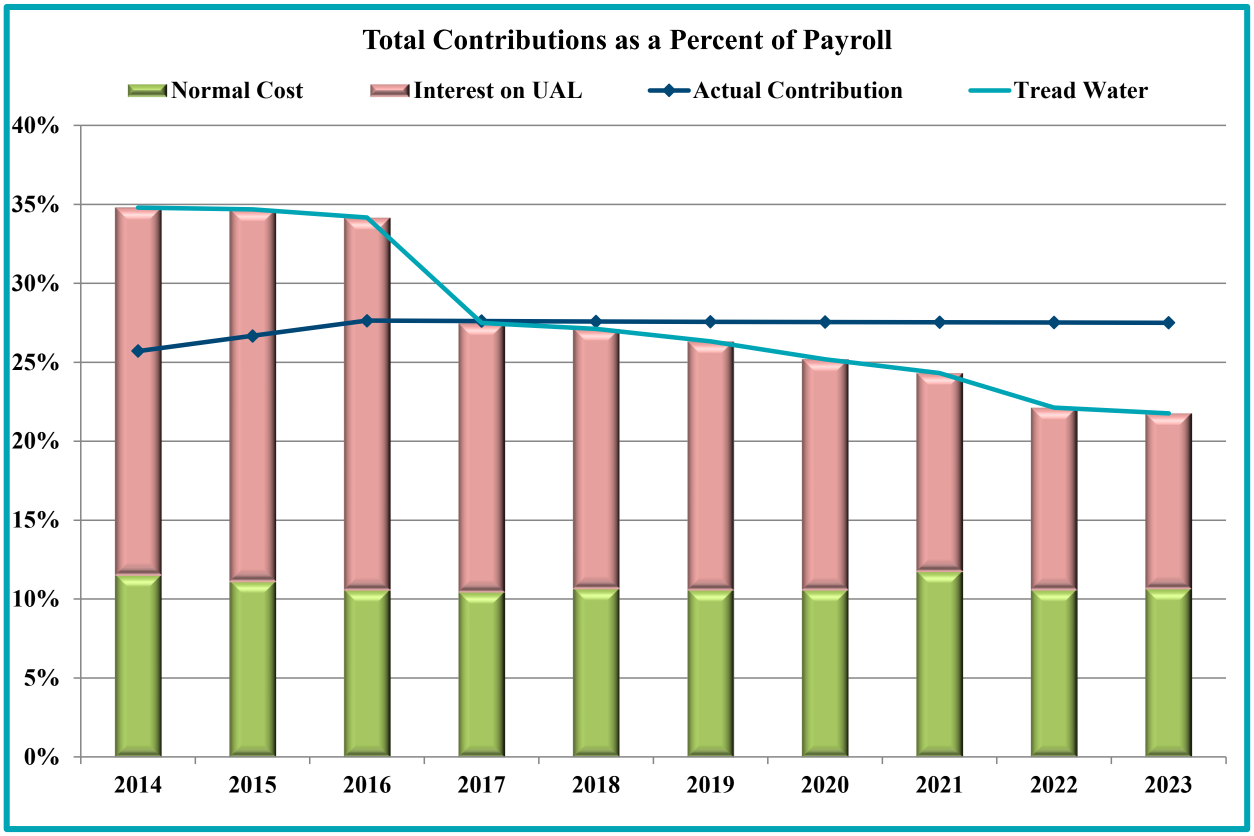
The support ratio had been generally flat from 2015 to 2021. The ratio had a notable decrease in 2022 to 1.01 due to an increase in the active population, and has remained relatively stable in 2023.



Contributions versus Tread Water

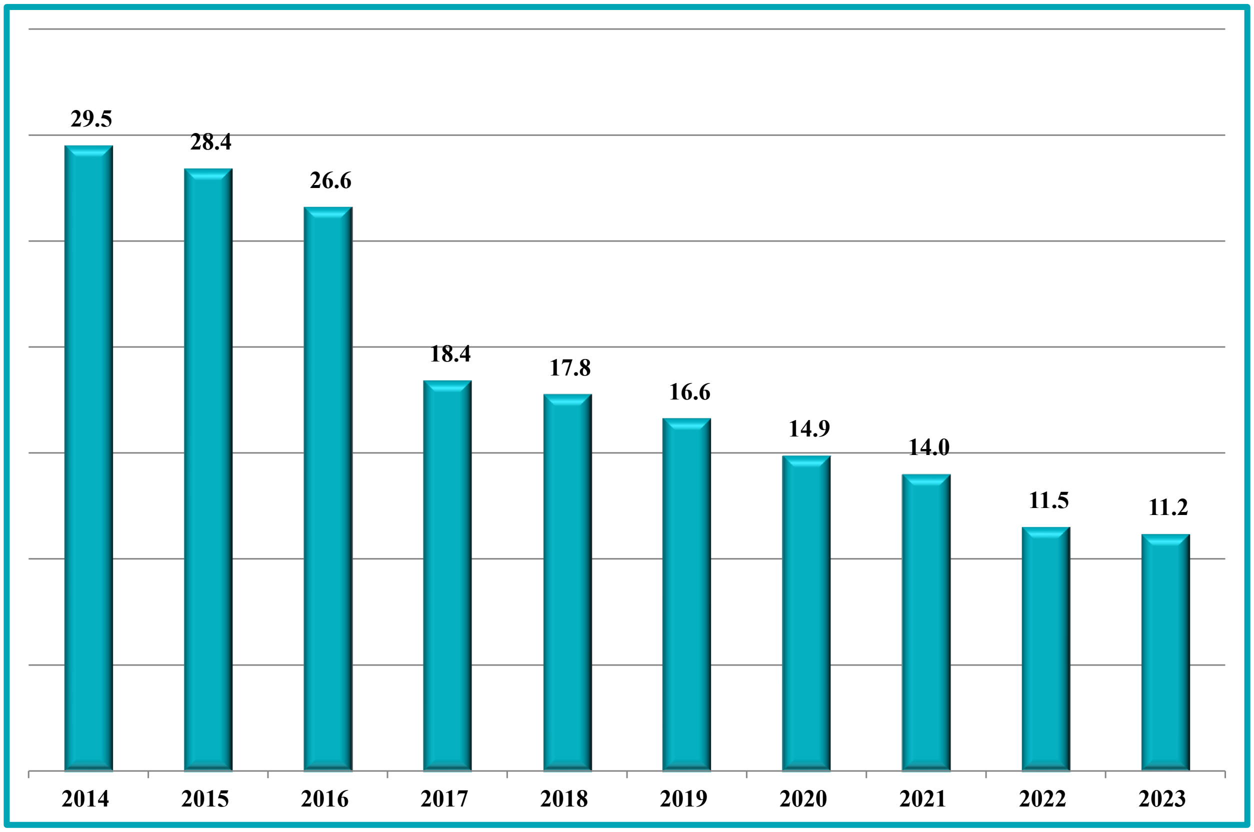
The next chart compares the fixed employer contribution rate to a rate we refer to as the tread water rate. The tread water rate is that rate of payroll which, if contributed, would result in the UAL remaining the same in the following year if all experience exactly matched the assumptions. The tread water rate is the full normal cost plus interest on the UAL.

As can be seen in the following chart, the fixed employer contribution rate for all years shown was well below the tread water rate prior to 2017. Beginning in 2017, the fixed employer contribution rate has exceeded the tread water rate and the excess has continued to grow as the UAL has declined.



Amortization Periods

The chart below shows the effective amortization period for funding the UAL based on the Actuarial Value of Assets on the valuation date. Over this period, the effective amortization period has been decreasing. The pension reform changes in 2017 contributed to a more significant decrease in the amortization period.



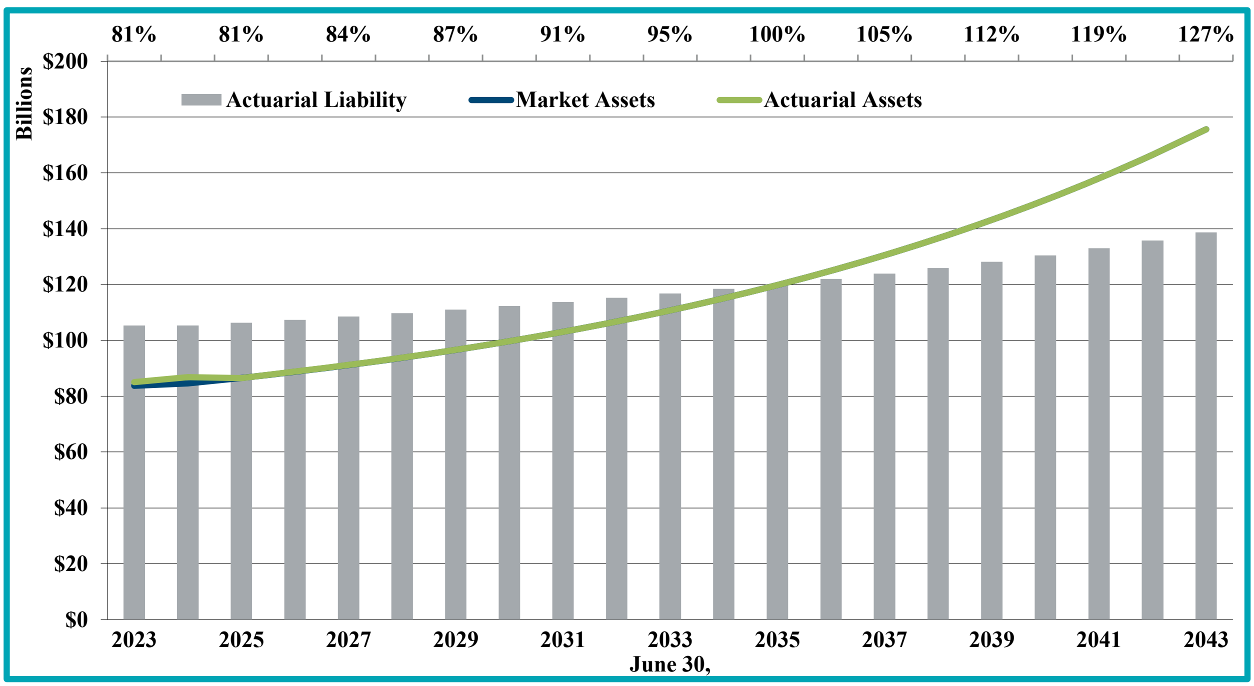
Future Expected Financial Trends

The analysis of projected financial trends is perhaps the most important component of this valuation. The chart presented in this section shows the expected progress of the System's funded level over the next 20 years. This baseline projection is based on all results exactly matching assumptions, including that employers and members will continue to contribute the same percentage of payroll as they are currently contributing for all future years.

The following projection chart compares the Market Value of Assets (blue line) and the smoothed Actuarial Value of Assets (green line) to the System's Actuarial Liabilities (gray bars). In addition, at the top of the chart, we show the System's funded ratio on an Actuarial Value of Assets basis (ratio of Actuarial Value of Assets to Actuarial Liabilities). The years on the X-axis represent the valuation date as of June 30 of the corresponding year.

Assuming all assumptions are exactly met, the System's funded ratio on an Actuarial Value of Assets basis would improve from the current level of 81% to 127% by the 2043 valuation and is projected to reach 100% funded in 2036.

This baseline projection assumes an annual return on the Market Value of Assets each year of 7.00% and the plan provisions, employer, and employee contribution rates remain unchanged. In section II of this report, we include several projections of the System's funded ratio based on varying investment returns.



SECTION II – DISCLOSURES RELATED TO RISK

Introduction

Actuarial Standard of Practice (ASOP) No. 51 was published by the Actuarial Standards Board to provide guidance to actuaries on the assessment and disclosure of risks related to future pension plan experience deviating from assumptions. This section consolidates the information regarding assessment and disclosure of the Plan's risks and includes a number of additional items to help communicate and demonstrate these risks.

The Plan's actuarial valuation results are dependent on assumptions about future economic and demographic experience. Based on actuarial standards of practice, the assumptions represent a reasonable estimate for future experience. However, actual experience will not conform exactly to the assumptions and may differ significantly from the assumptions. This deviation is the risk that pension plan sponsors undertake in relying on a pension plan's actuarial valuation results.

This section of this report is intended to identify the primary drivers of these risks, provide background information and assessments about these identified risks and communicate the significance of these risks to this Plan.

Identification of Risks

For pension plans, the three primary valuation results that can significantly differ from those expected are in assets, liabilities, and employer contributions. While there are several factors that could lead to these results being different, we believe the primary risks to this Plan are:

- Investment risk,
- Longevity and other demographic risks,
- Benefit change risk,
- Contribution risk, and
- Assumption change risk.

Other risks that we have not identified may also turn out to be important.

Investment Risk is the potential for investment returns to deviate from what is expected. When actual investment returns are lower than the investment assumption used in the actuarial valuation, the Unfunded Liability will increase and the period of time over which the Unfunded Liability is expected to be paid will increase. But, when actual returns exceed the assumption, the resulting Unfunded Liability measurements and resulting amortization period will be lower than anticipated.

Longevity and Other Demographic Risk is the potential for mortality or other demographic experience to be different than expected. Generally, longevity and other demographic risks emerge slowly over time as the actual experience deviates from expected. In addition, the extensive number of assumptions related to longevity and demographic experience often result in offsetting factors contributing to the Plan's overall liability experience.

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As such, these risks are often dwarfed by other risks, particularly those due to the investment returns. The following charts show that this has been true for this Plan, with the magnitude of the gains and losses from liability experience significantly smaller than those from investment experience, assumption changes, and benefit changes.

Benefit Change Risk is the potential for the provisions of the Plan to be changed such that the benefits and liabilities are changed materially. In addition to the actual payments to and from the Plan being changed, future valuation measurements can also be impacted, with benefit changes leading to deviations between actual future measurements and those expected by the current valuation.

Contribution Risk is the potential for actual future contributions to deviate from expected future contributions, or that the anticipated contributions will be inadequate to fund the Plan benefits. There are different sources of contribution risk ranging from the sponsor choosing to not make contributions in accordance with the funding policy to material changes in the contribution base (e.g., covered employees, covered payroll, sponsor revenue) that affect the amount of contributions the Plan will receive.

Assumption Change Risk is the potential for the environment to change such that future valuation assumptions are adjusted to be different than the current assumptions. For example, declines in interest rates over time may result in a change in the assumed rates of return used in the valuation. A healthier workforce may result in changes in employee behavior such that retirement rates are adjusted to reflect employees working longer. Assumption change risk is an extension of the risks previously identified, but rather than capturing the risk as it is experienced, it captures the cost of recognizing a change in the environment when the current assumption is no longer reasonable. The historical review section will show that assumption change risk has been a relatively significant risk for this Plan.

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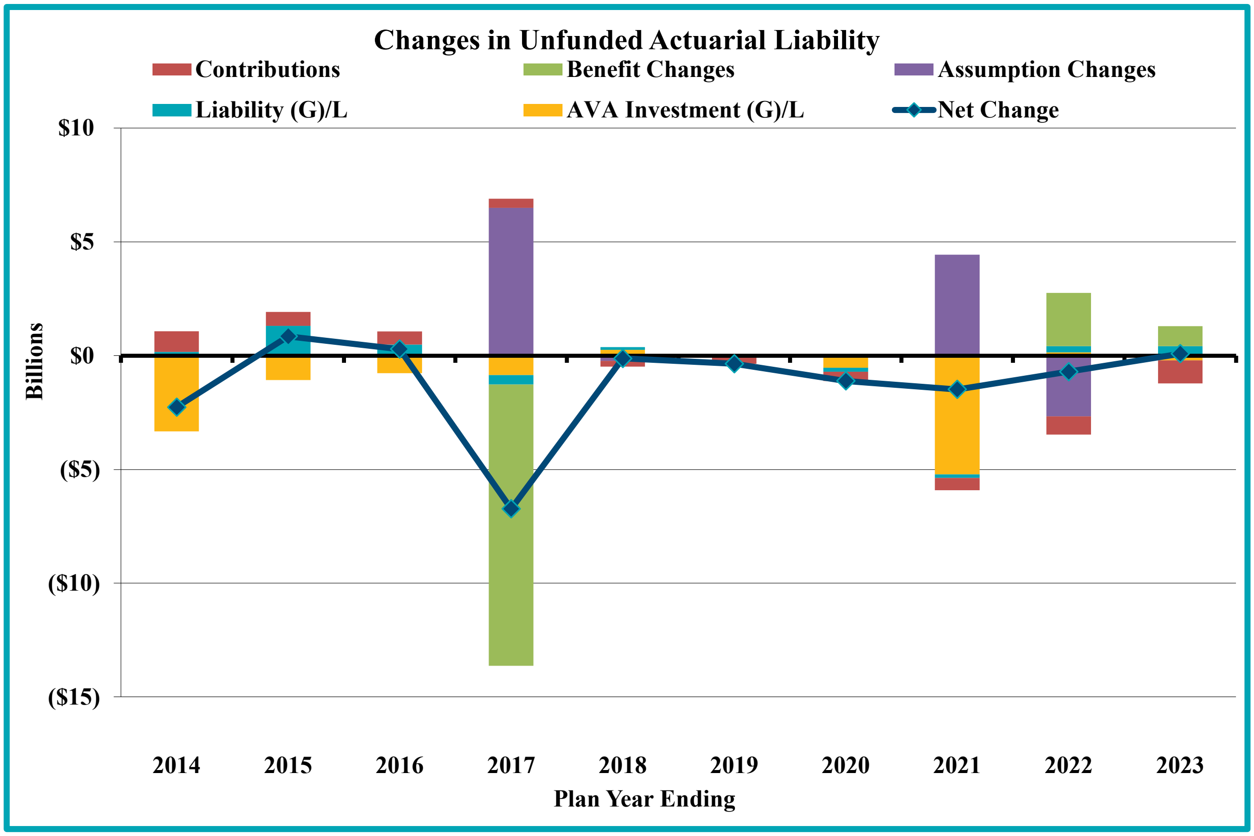
Historical Review

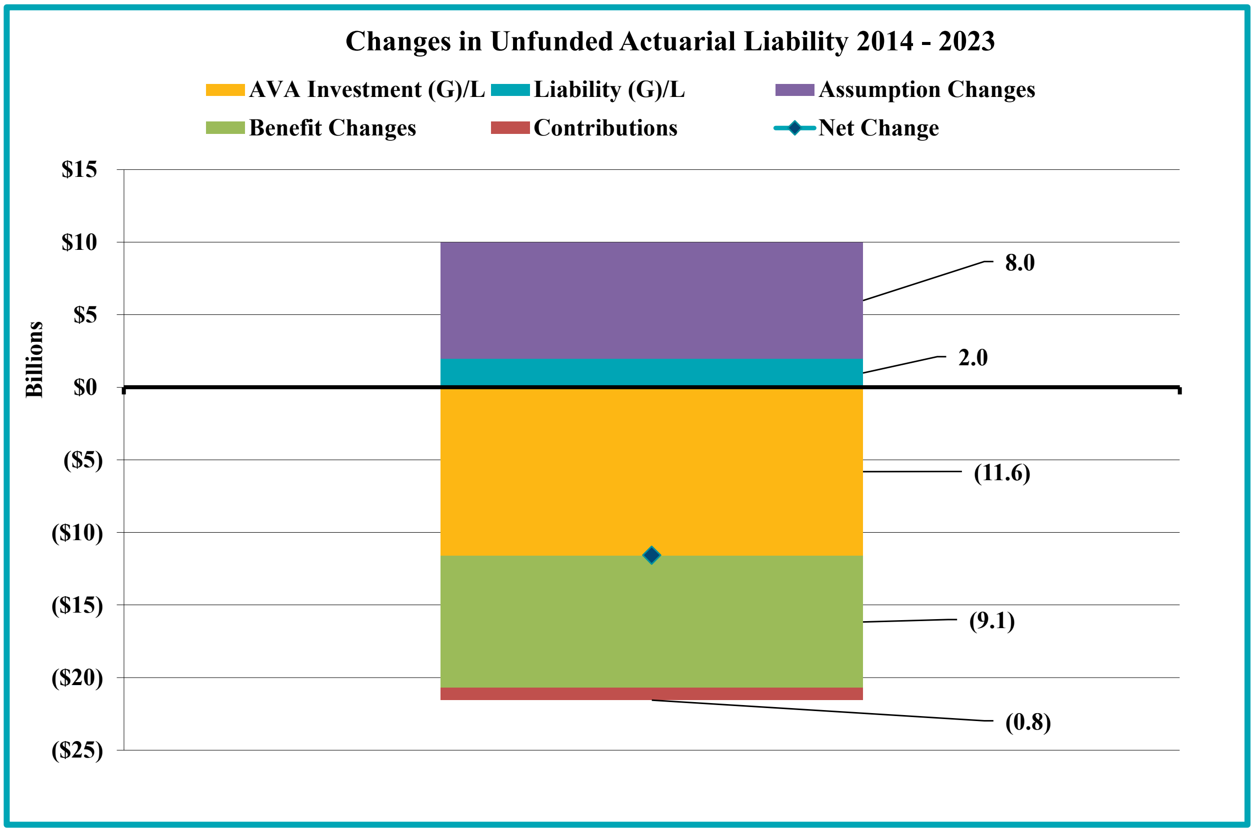
In understanding the magnitude of some of these risks, it is useful to look at what factors have contributed to the Plan's unexpected changes in Unfunded Actuarial Liability (UAL). These factors consist of annual actuarial experience gains and losses (both liability and investment), assumption changes, benefit changes, and contributions differing from tread water. The following chart shows how these factors have contributed to the change in the Plan's UAL in individual years.



As described previously and is evident in this chart, benefit changes and assumption changes have been the most significant factors contributing to the changes in the Plan's UAL in individual years. The next two most significant factors are the investment gains and losses and the fixed contribution shortfalls or excesses when compared to tread water.

Another way to examine how each of the factors contributed to the change in the UAL is to look at the cumulative impact of each factor. The next chart shows this impact over the past ten years.

SECTION II – DISCLOSURES RELATED TO RISK



Over this period, investment gains, benefit changes, and contributions served to decrease the Unfunded Actuarial Liability by $21.5 billion while assumption changes and liability losses served to increase the Unfunded Actuarial Liability by $10.0 billion, resulting in a net reduction in the UAL of $11.5 billion over this period. This 10-year net decrease in the UAL has resulted in a corresponding decrease in the funding period of 18.3 years as well as improvement of the Plan’s funded status from 69.3% to 81.3%.

SECTION II – DISCLOSURES RELATED TO RISK

Plan Maturity Measures

As pension plans become more mature, the identified risks are a more significant concern. Therefore, it is important to examine measures that indicate a pension Plan's maturity level.

The balance of this section discloses and examines three maturity measures for the Plan: the asset leverage ratio, the support ratio, and the net cash flow ratio.

Asset Leverage Ratio

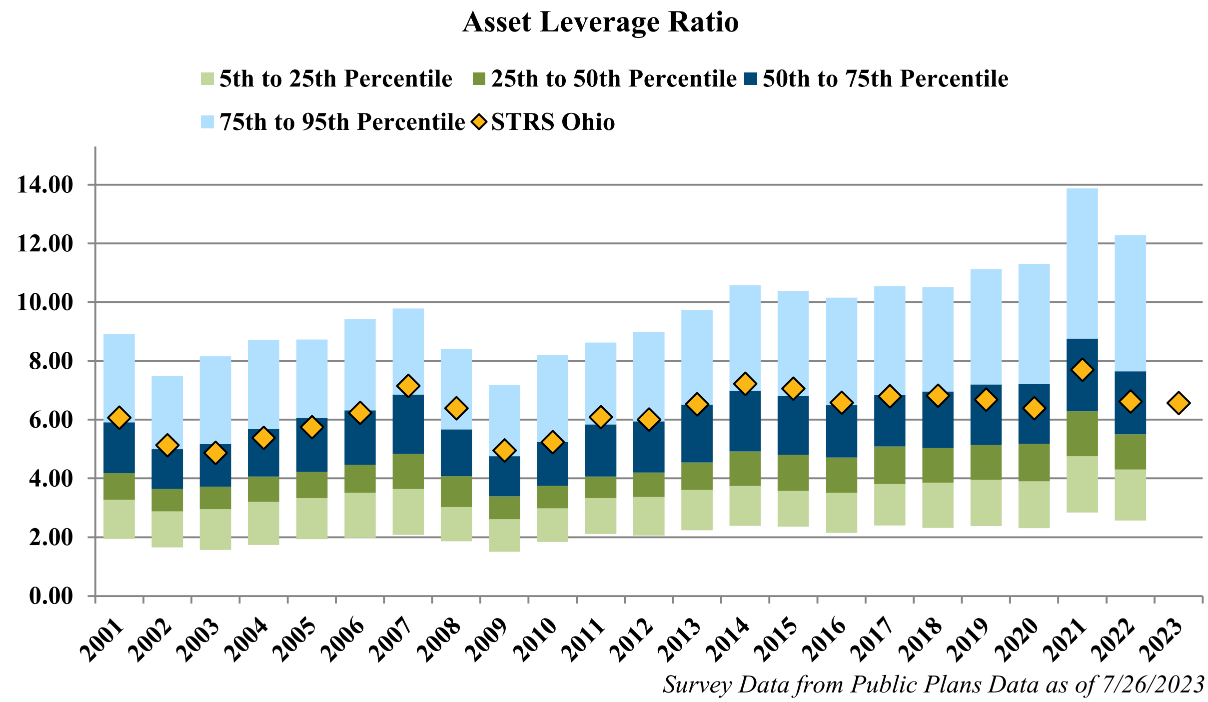
An important plan maturity measure is the asset leverage ratio— the Market Value of Assets divided by the Plan's payroll. As a plan matures, its assets increase. The greater the Plan's assets are relative to payroll, the more vulnerable the Plan is to investment volatility. This can result in higher volatility of contribution rates when measured as a percentage of payroll. The following example demonstrates this.

($ in millions)		
	Plan A	**Plan B**
Plan Assets	$ 5,000	$ 5,000
Payroll	$500	$1000
Asset Leverage Ratio	10.0	5.0
10% Investment Loss	$500.0	$500.0

This example shows two plans that both experience a 10% investment loss equaling $500 million. Although their assets are the same, because of the size of payroll, Plan A's asset leverage ratio is 10 and Plan B's ratio is 5. This means that Plan A has to spread or amortize that loss over a payroll that is half as large as Plan B's. To put it another way, other things being equal, Plan A would need to increase contributions as a percentage of payroll by twice the increase in contribution rate of Plan B in order to make up the same investment loss. Despite the fact that STRS Ohio's contributions are based on a fixed statutory rate and experience gains and losses are not amortized over payroll, the asset leverage ratio still provides some insight into how much the statutory contribution rate would need to be changed if corrective actions were at some point ever necessary to maintain Plan solvency.

The Boston College's Center for Retirement Research, NASRA and the Center for State and Local Government Excellence maintain the Public Plan Database that contains the majority of state plans as well as many large municipal plans. The database contains information for about 200 plans per year. The following chart shows the asset leverage ratios for all plans in this database since 2001. The colored bars represent the central 90% of the asset leverage ratios for the plans. STRS Ohio is represented by the gold diamond. From 2001 through 2016, STRS Ohio's asset leverage ratio was close to the 75th percentile of all plans. Since 2016, STRS Ohio's asset leverage ratio has stayed steady around 6.0 putting the Plan in just over the 60th percentile. This means that while STRS Ohio, by this measure, is more mature than 60 percent of all plans, which is a slight improvement when compared to being more mature than 75 percent of all plans back in 2001

SECTION II – DISCLOSURES RELATED TO RISK



Net Cash Flow Ratio

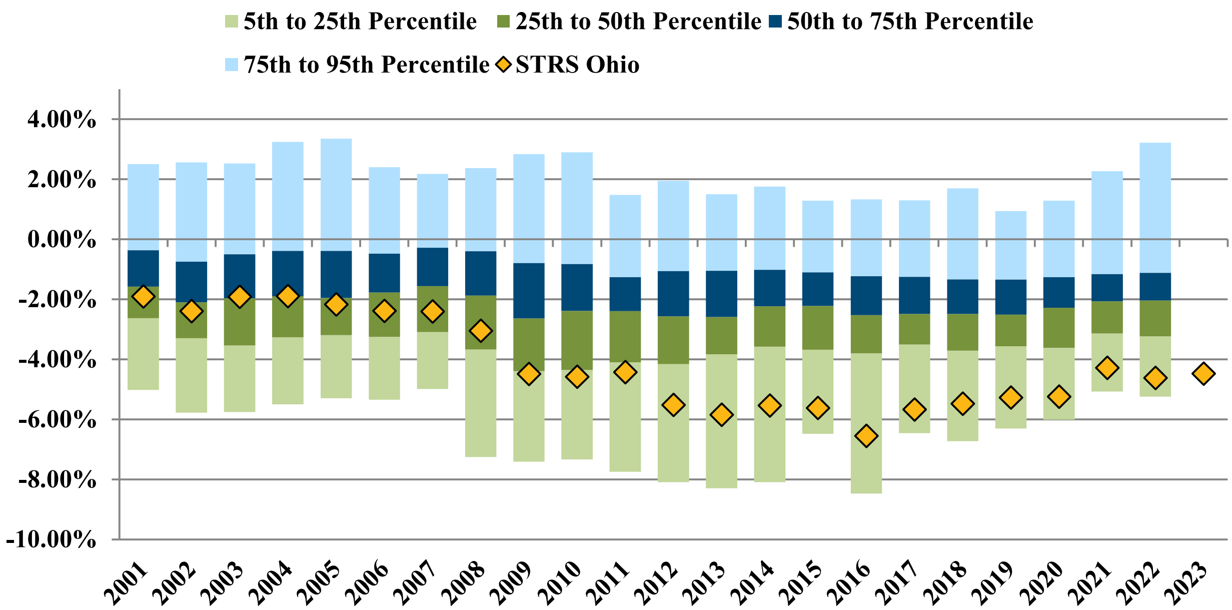
Another measure of plan maturity is the ratio of the net cash flow (contributions minus benefits and expenses) divided by the market value of plan assets. With shrinking workforces, aging Baby Boomers, and increasing life expectancies, plans pay out more in benefits than they receive in contributions, leading to negative net cash flows.

When plans with negative net cash flows suffer investment losses, they need to liquidate assets to pay the benefits and expenses that are in excess of contributions. That means these plans will need to earn higher returns to rebuild their assets to previous levels. Plans with significant negative cash flows are more vulnerable to market declines. In our opinion and based on our experience dealing with pension plans having negative cash flows, negative cash flows start becoming a concern once they exceed 5% of Plan assets, which was the case for STRS Ohio from 2012-2020.

This chart compares STRS Ohio's net cash flow ratio to other plans from the Public Plan database since 2001. The Plan was close to the median of this universe in 2003, dropped into the bottom quartile in 2009 and is at the 8th percentile in 2022. This demonstrates that on this measure STRS Ohio is maturing at a pace faster than other large public pension plans.

SECTION II – DISCLOSURES RELATED TO RISK

Net Cash Flow Rate



Survey Data from Public Plans Data as of 7/26/2023

Assessment of Future Risks

The fundamental risk to the Plan is that contributions will not adequately fund Plan benefits. In assessing this risk, we perform stress testing on the Plan's funded status and contribution adequacy.

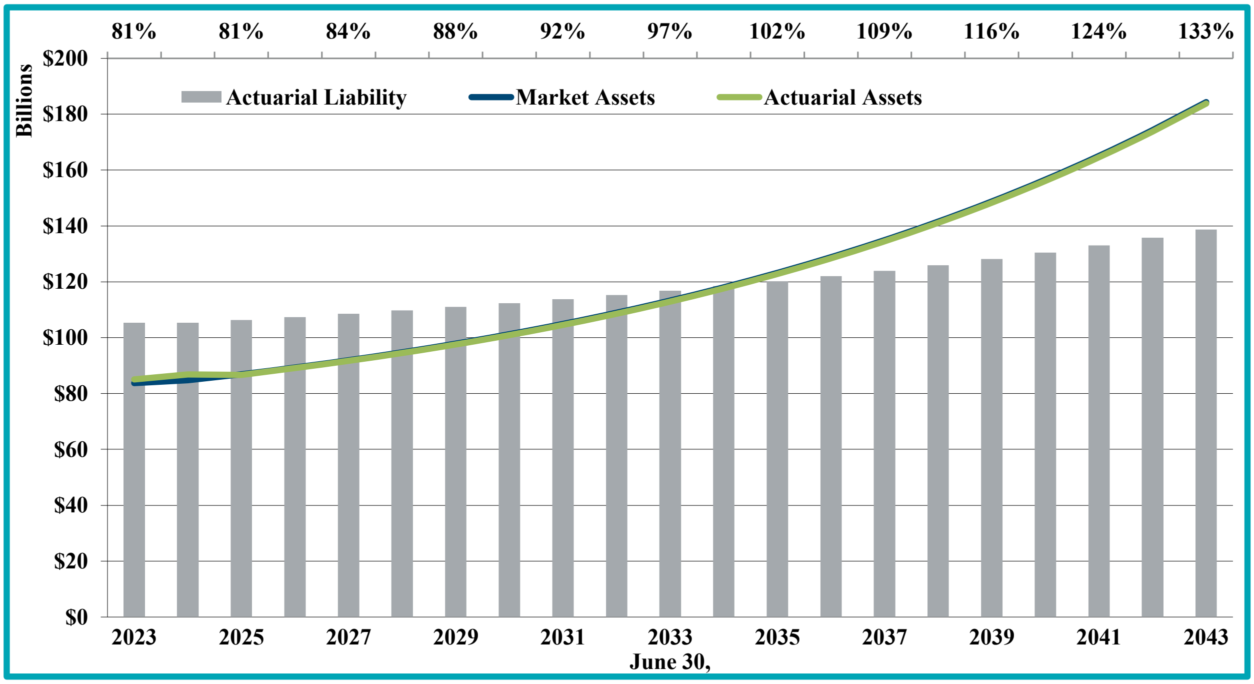
Stress Testing the Plan's Funded Status

One of the ways to assess the investment risk is to project the impact of future investment returns not matching the assumptions.

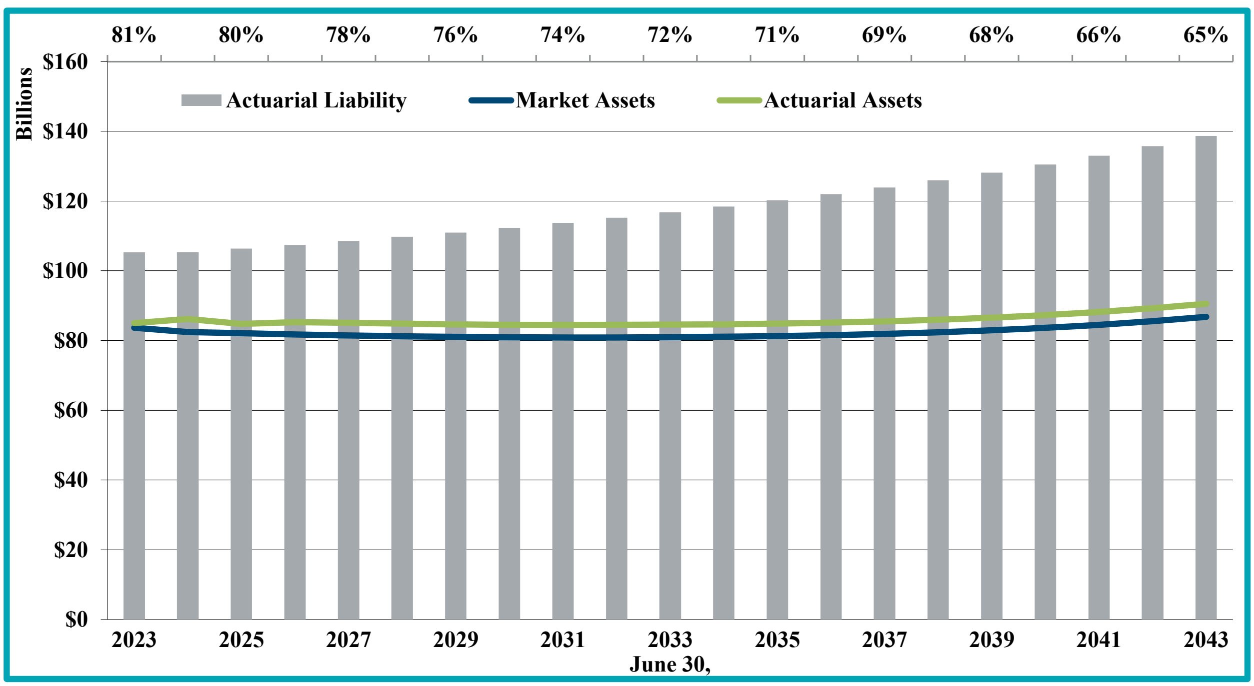
In Callan's March 2023 Capital Market Assumptions report, they reported a 10-year median expected return of 7.2%, a 25th percentile return of 4.3% and 75th percentile return of 10.0%. The following three graphs project returns using these expectations for the next 20 years and can be compared with the baseline projection graph shown on page 8 to provide a sense of the risk associated with investment returns.

If we assume the median 7.2% return on the Market Value of Assets instead of the 7.0% assumption for our 20-year projection, the funded ratio in 2043 is expected to be 133% compared to 127% in the baseline projection.

SECTION II – DISCLOSURES RELATED TO RISK

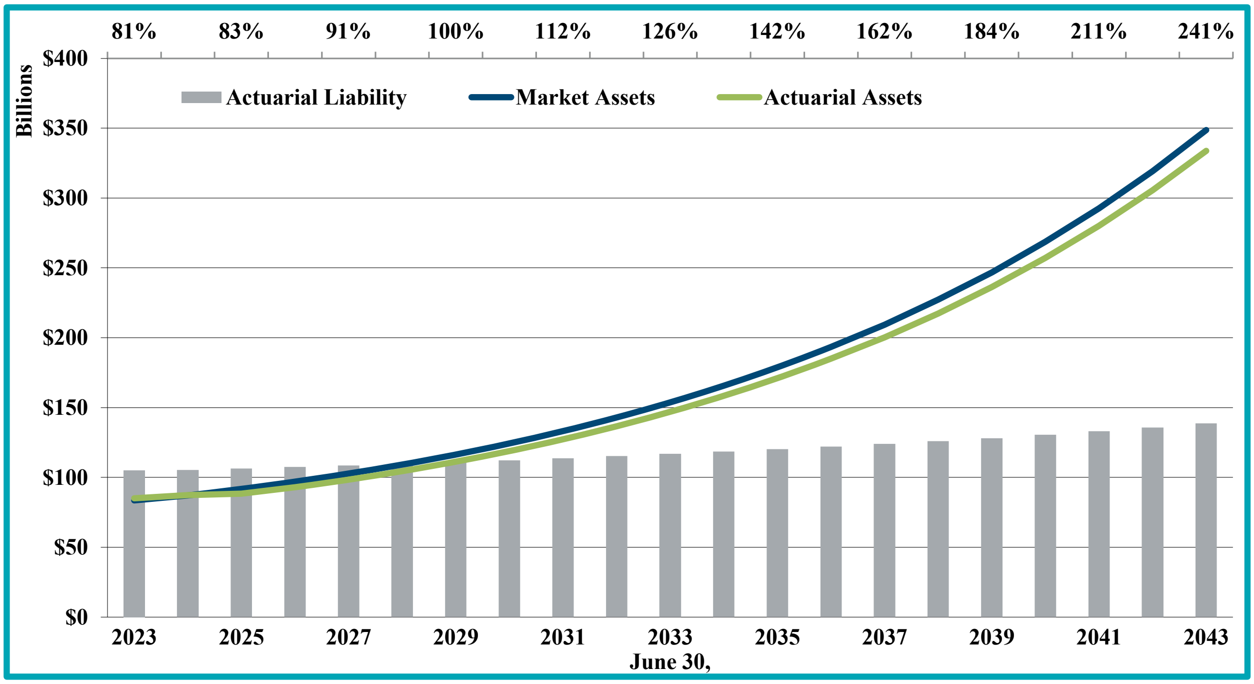


Assuming an annual return each year of 4.3%, Callan's 25th percentile return as of March 2023, results in the funded ratio being 65% in 2043.



SECTION II – DISCLOSURES RELATED TO RISK

Assuming an annual return each year of 10.0%, Callan's 75th percentile return as of March 2023, results in the funded ratio being 241% in 2043.



Stress Testing the Plan's Contribution Adequacy

In assessing contribution risk, it is important to assess the adequacy of contributions, particularly in a plan with a fixed contribution rate. One way to assess adequacy is to compare the contributions to the Plan's tread water cost. As shown on page 6, the Plan's tread water rate decreased in 2017 due to the change in the benefits provided by the Plan. Since that time, the contribution rate has been greater than the tread water rate.

STRS Ohio also uses another measure to assess the adequacy of the current contribution rate. Since the contribution rate is fixed each year, the System calculates the equivalent amortization period of a contribution based on amortizing the Unfunded Actuarial Liability. The chart on page 7 shows that the equivalent amortization period has decreased in recent years.

Assessing the risk that future measurements produced by the actuarial valuations will deviate from the actual values over time is complex and can never be exactly known.

Page 8 shows the baseline projection of the Plan. It is important to note that baseline projections, while valid, are not going to occur as experience never conforms exactly to assumptions every year. As discussed in the Plan maturity section, as plans become more mature it becomes more difficult to recover from market declines even when the average investment return over a long period is equal to the expected return. As a demonstration of this, the following projection is included, which is based on assuming varying returns in the future on the Market Value of Assets. We based these varying returns on assuming the returns for the next 20 years will be the same as those that actually occurred during the 20-year period ending June 30, 2023, shown in Table III-5. This results in an average return of 8.1% over the next 20 years, which is above the current assumed return.

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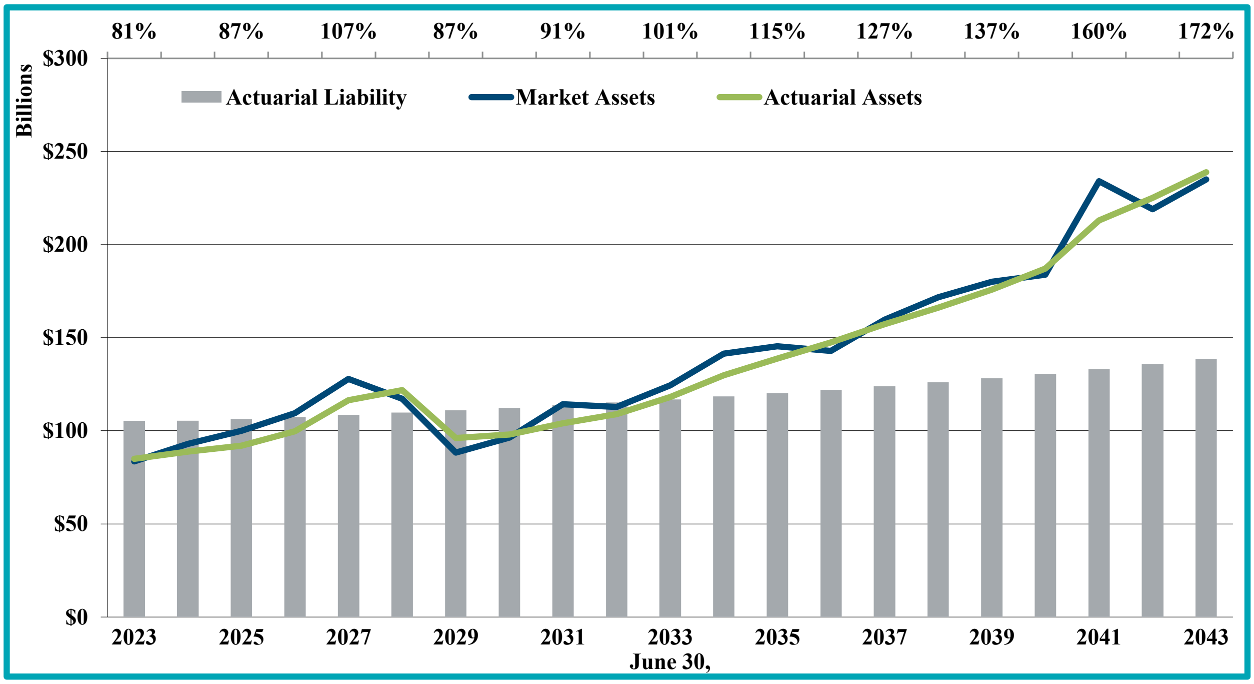
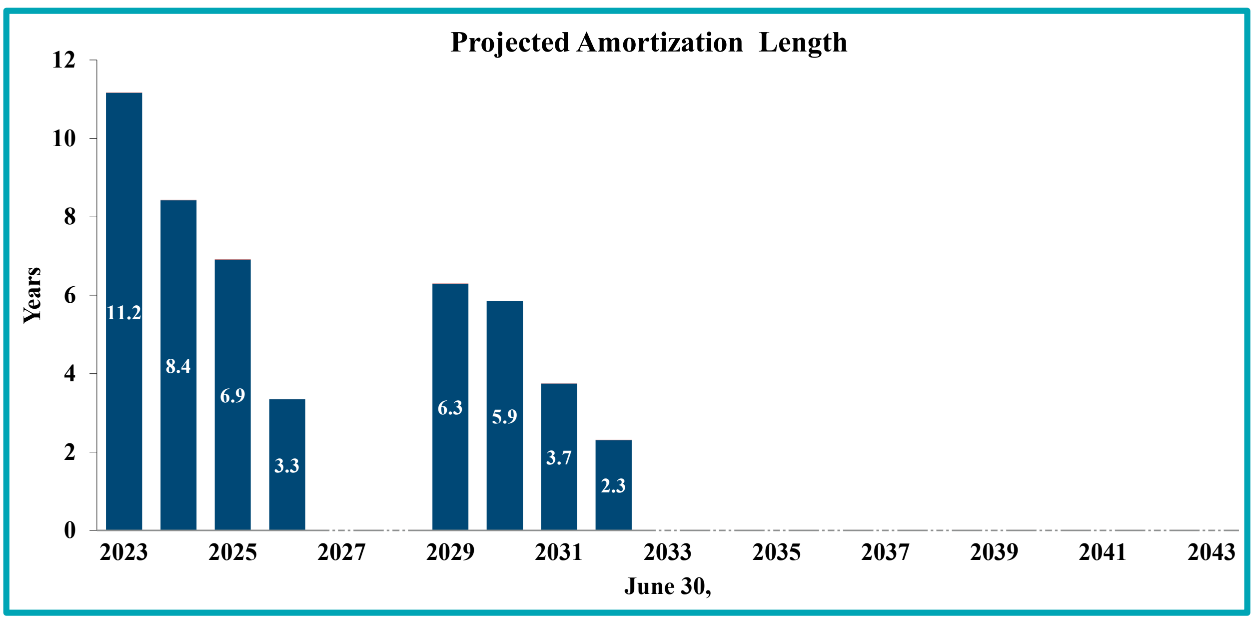


With varying annual earnings, one can see the volatility in the equivalent amortization period in the next chart. Note that this chart reflects an illustrative scenario and is not intended to reflect future expectations as the volatility of the equivalent amortization period will vary with the volatility of the returns.



SECTION II – DISCLOSURES RELATED TO RISK

Assessing a Risk-Free Investment Strategy

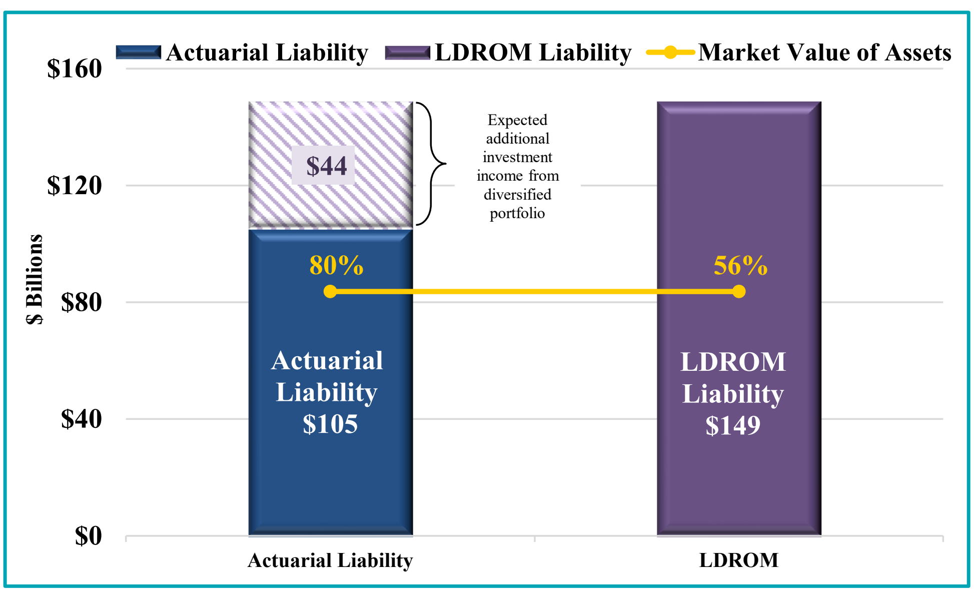
The Plan invests in a diversified portfolio with the objective of maximizing investment returns at a reasonable level of risk. The lowest risk portfolio for a pension plan would be composed entirely of low-default-risk fixed income securities whose cash flows match the benefit cash flows of the Plan. Such a portfolio, however, would have a lower expected rate of return than a diversified portfolio. The Low-Default-Risk Obligation Measure (LDROM) represents what the actuarial liability would be if the Plan invested its assets in such a portfolio. As of June 30, 2023, we estimate that a portfolio composed only of US Treasury securities would have an expected return of 3.91% compared to the Plan's discount rate of 7.00%, and the LDROM would be $149 billion compared to the Actuarial Liability of $105 billion. The $44 billion difference represents the expected value of bearing the risk of investing in the diversified portfolio. Alternatively, it can be seen as the cost of eliminating the investment risk.

Benefit security for members of the Plan relies on a combination of the assets in the Plan, the investment returns generated on those assets, and the promise of future contributions. If the Plan were to invest in the LDROM portfolio, the reported funded status would decrease but it would not change the amount of assets currently in the Plan. However, it would reduce expected future returns on assets as well as the expected volatility of those returns.

The chart below compares assets to:

- The Actuarial Liability using the expected rate of return of 7.00%, and
- The Low-Default-Risk Obligation Measure based on an expected return of 3.91%.

The Actuarial Liability is shown as the blue bar, the LDROM as the purple bar and the Market Value of Assets as the gold line. The resulting funded ratio is shown in the bars. The difference between these liabilities represents the expected savings from investing in a diversified portfolio.



SECTION III – ASSETS

Pension plan assets play a key role in the financial operation of the Plan and in the decisions that the Board may make with respect to future deployment of those assets. The level of assets, the allocation of assets among asset classes, and the methodology used to measure assets will likely impact benefit levels, employer contributions, and the ultimate security of participants' benefits.

In this section, we present detailed information on the Plan assets including:

- **Disclosure** of the Plan assets as of June 30, 2022 and June 30, 2023;
- Statement of the **changes** in market values during the year;
- Development of the **Actuarial Value of Assets**; and
- An assessment of **Investment Performance.**

Disclosure

There are two types of asset values disclosed in this valuation, the Market Value of Assets and the Actuarial Value of Assets. The market value represents a "snap-shot" or "cash-out" value, which provides the principal basis for measuring financial performance from one year to the next. The Actuarial Value of Assets are typically used by plans to smooth volatile market returns in order to provide for less volatile contributions. However, for plans like STRS Ohio that have a fixed contribution rate, the use of an Actuarial Value of Assets is not as relevant.

SECTION III – ASSETS

Table III-1 below discloses and compares each asset value as of June 30, 2023 and June 30, 2022.

Table III-1
Statement of Market Value of Assets as of June 30,

	2023			2022	
	Defined Benefit	Defined Contribution	Total	Total	% Change
Assets					
Cash & Short-Term Investments	$ 1,463,577,120	$ 215,749,405	$ 1,679,326,525	$ 2,602,608,744	(35.48%)
Receivables	1,820,839,817	238,926	1,821,078,743	1,315,891,984	38.39%
Fixed Income	16,695,716,335	268,010,161	16,963,726,496	14,095,267,114	20.35%
Domestic Equities	20,643,366,123	1,572,058,625	22,215,424,748	21,296,441,902	4.32%
International Equities	18,039,893,598	366,950,536	18,406,844,134	17,816,958,940	3.31%
Real Estate	10,510,390,192	156,215,318	10,666,605,510	10,990,823,049	(2.95%)
Alternative Investments	18,002,471,014	0	18,002,471,014	17,364,123,036	3.68%
Invested Securities Lending Capital	409,029,649	0	409,029,649	1,360,523,730	(69.94%)
Capital Assets	264,355,400	0	264,355,400	258,984,476	2.07%
Accumulated Depreciation	(186,064,001)	0	(186,064,001)	(180,742,241)	2.94%
Total Assets	**$ 87,663,575,246**	**$ 2,579,222,971**	**$ 90,242,798,217**	**$ 86,920,880,734**	3.82%
Liabilities					
Securities Purchased and Other Investment Liabilities	$ (1,101,927,884)	$ 0	$ (1,101,927,884)	$ (382,701,408)	187.93%
Debt on Real Estate Investments	(2,320,822,197)	0	(2,320,822,197)	(2,040,925,603)	13.71%
Accrued Expenses and Other Liabilities	(37,396,210)	0	(37,396,210)	(35,099,512)	6.54%
Obligations Under Security Lending Program	(408,714,380)	0	(408,714,380)	(1,360,517,693)	(69.96%)
Net Pension Liability	(125,970,128)	0	(125,970,128)	(67,437,756)	86.79%
Total Liabilities	**$ (3,994,830,799)**	**$ 0**	**$ (3,994,830,799)**	**$ (3,886,681,970)**	2.78%
Market Value of Assets	**$ 83,668,744,447**	**$ 2,579,222,971**	**$ 86,247,967,418**	**$ 83,034,198,764**	**3.87%**

Numbers may not add due to rounding

SECTION III – ASSETS

Actuarial Value of Assets

The Actuarial Value of Assets represents a "smoothed" value developed by the actuary to reduce or eliminate volatile results which could develop from short-term fluctuations in the Market Value of Assets. For this Plan, the Actuarial Value of Assets is based on the Market Value of Assets with a four-year phase-in of actual investment return in excess of (or less than) expected investment income. Expected investment income is determined using the assumed investment return rate and the Actuarial Value of Assets (adjusted for receipts and disbursements during the year). The actual investment return for this purpose is determined net of all investment and administrative expenses. The Actuarial Value is further adjusted, if necessary, to be within 9% of the market value.

The next three tables show how the Actuarial Value of Assets is developed. Table III-2 shows the changes in the market and Actuarial Value of Assets, Table III-3 shows the development of the gain/(loss) on assets for purposes of determining the Actuarial Value of Assets, and Table III-4 shows the development of the Actuarial Value of Assets.

SECTION III – ASSETS

Table III-2
Changes in Value of Assets[1]

		Market Value of Assets		Actuarial Value of Assets
1. **Value of Assets - June 30, 2022**	**$**	**80,860,433,329**	**$**	**82,968,080,151**
2. Calculation of Net Cash Flow				
(a) Member Contributions	$	1,740,169,952	$	1,740,169,952
(b) Employer Contributions		1,829,306,595		1,829,306,595
(c) Transfers between Plans/from Other Ohio Systems		86,481,002		86,481,002
(d) Benefit Payments and Refunds		(7,503,329,640)		(7,503,329,640)
(e) **Net Cash Flow**	**$**	**(3,847,372,091)**	**$**	**(3,847,372,091)**
3. **Value of Assets - June 30, 2023**	**$**	**83,668,744,447**	**$**	**85,001,128,147**
4. Net Investment Income [3. - 1. - 2.(e)]	$	6,655,683,209	$	5,880,420,087
5. Average Value of Assets [1. + 1/2*2.(e)]	$	78,936,747,284	$	81,044,394,106
6. Rate of Return [4. / 5.]		8.43%		7.26%
7. Assumed Rate of Return		7.00%		7.00%
8. Expected Net Investment Income [5. * 7.]	$	5,525,572,310	$	5,673,107,587
9. Investment Gain/(Loss) [4. - 8.]	$	1,130,110,899	$	207,312,500

[1]Only includes assets for the Defined Benefit Plan. Defined Contribution Plan assets are not included.

Numbers may not add due to rounding

SECTION III – ASSETS

Table III-3

Development of Gain/(Loss) on Assets for Smoothing[1]

1. Actuarial Value of Assets at June 30, 2022	$	82,968,080,151
2. Calculation of Net Cash Flow		
(a) Member Contributions		1,740,169,952
(b) Employer Contributions		1,829,306,595
(c) Transfers between Plans/from Other Ohio Systems		86,481,002
(d) Benefit Payments and Refunds		(7,503,329,640)
(e) Net Cash Flow		(3,847,372,091)
3. Average Actuarial Value of Assets [1. + 1/2 * 2.(e)]		81,044,394,106
4. Expected Income		5,673,107,587
5. Actual Income on Market Value of Assets		6,655,683,209
6. Gain/(Loss) for year ended June 30, 2023	$	982,575,622

[1]Only includes assets for the Defined Benefit Plan. Defined Contribution Plan assets are not included.

SECTION III – ASSETS

Table III-4
Development of Actuarial Value of Assets

	Original Gain/(Loss)[1]	Deferred Portion
Defer 0% of 2020 Gain/(Loss)	$ (2,164,173,825)	$ -
Defer 25% of 2021 Gain/(Loss)	12,298,958,069	3,074,739,517
Defer 50% of 2022 Gain/(Loss)	(10,288,109,868)	(5,144,054,934)
Defer 75% of 2023 Gain/(Loss)	982,575,622	736,931,717
Total Deferred Gain/(Loss) for AVA Calculation		$ (1,332,383,700)
Market Value of Assets at June 30, 2023		$ 83,668,744,447
Total Unrecognized Gain/(Loss)		(1,332,383,700)
Preliminary Actuarial Value of Assets at June 30, 2023		$ 85,001,128,147
Adjustment for 91% / 109% corridor		0
Actuarial Value of Pension Assets at June 30, 2023		$ 85,001,128,147
Defined Contribution Plan Assets at June 30, 2023		2,579,222,971
Total Actuarial Value of Assets at June 30, 2023		$ 87,580,351,118
Actuarial Value as a Percent of Market Value		101.5%

[1]Original Gain/(Loss) amounts reflect adjustments in prior years for 91% / 109% corridor

Investment Performance

The Market Value of Assets (MVA) earned 8.43% during the fiscal year ending June 30, 2023, which is more than the assumed 7.00% return for the period ending June 30, 2023. A return of 7.26% was experienced on the Actuarial Value of Assets (AVA), resulting in an actuarial gain for the year. Table III-5 shows the returns over the last 20 years.

Table III-5
Historic Investment Return

Year Ending June 30,	Market Value	Actuarial Value
2023	8.4%	7.3%
2022	-5.4%	6.8%
2021	29.0%	14.6%
2020	3.6%	8.2%
2019	6.6%	7.5%
2018	9.5%	7.1%
2017	14.1%	9.0%
2016	0.4%	8.9%
2015	5.2%	9.5%
2014	16.5%	13.3%
2013	13.5%	12.1%
2012	1.7%	8.5%
2011	22.5%	9.2%
2010	13.5%	6.6%
2009	-22.0%	-17.7%
2008	-5.6%	7.0%
2007	20.6%	18.4%
2006	13.5%	11.0%
2005	11.9%	5.7%
2004	17.2%	9.4%
Average Returns		
Last 5 years:	7.9%	8.8%
Last 10 years:	8.4%	9.2%
Last 15 years:	7.1%	7.1%
Last 20 years:	8.1%	7.9%

SECTION IV – LIABILITIES

In this section, we present detailed information on the Plan liabilities including:

- **Disclosure** of the Plan liabilities as of June 30, 2022 and June 30, 2023, and
- Statement of **changes** in these liabilities during the year.

Disclosure

Two types of liabilities are calculated and presented in this report. Each type is distinguished by the people ultimately using the figures and the purpose for which they are using them.

- **Present Value of Future Benefits:** Used for measuring all future plan obligations, represents the amount of money needed today to fully fund all benefits of the Plan both earned as of the valuation date and those expected to be earned in the future by current plan participants, under the current plan provisions and current assumptions.
- **Actuarial Liability:** Used for funding calculations, this liability is calculated as of the valuation date as the Present Value of Benefits allocated to service prior to that date using the Entry Age Normal cost funding method.

These liability amounts are not appropriate for measuring a settlement of the Plan's liabilities either by purchase of annuities or payment of lump-sums.

Table IV-1, which follows, discloses each of these liabilities for the current and prior valuations.

SECTION IV – LIABILITIES

Table IV-1
Liability Detail

	June 30, 2023			June 30, 2022
	Defined Benefit	Combined	Total	Total
Present Value of Future Benefits				
Active Member Benefits	$ 46,983,396,767	$ 700,207,302	$ 47,683,604,069	$ 45,451,987,043
Reemployed Retiree Benefits	283,407,114	-	283,407,114	276,068,323
Inactive Benefits				
(i) Deferred Annuity	1,328,600,332	20,229,075	1,348,829,407	1,274,461,059
(ii) Contribution Refund	433,883,124	2,178,939	436,062,063	411,510,283
Retiree & Beneficiary Benefits				
(i) Annuity & Pension Reserve Fund	68,180,604,132	68,321,668	68,248,925,800	67,994,503,069
(ii) Survivor's Benefit Fund	1,174,544,874	-	1,174,544,874	1,181,003,950
Present Value of Future Benefits (PVB)[1]	**$ 118,384,436,343**	**$ 790,936,984**	**$ 119,175,373,327**	**$ 116,589,533,727**
Actuarial Liability				
Active Member Benefits	$ 33,302,733,326	$ 409,179,673	$ 33,711,912,999	$ 31,953,012,666
Reemployed Retiree Benefits	283,407,114	-	283,407,114	276,068,323
Inactive Benefits	1,762,483,456	22,408,014	1,784,891,470	1,685,971,342
Retiree & Beneficiary Benefits	69,355,149,006	68,321,668	69,423,470,674	69,175,507,019
Defined Benefit Plan Actuarial Liability	104,703,772,902	499,909,355	105,203,682,257	103,090,559,350
Defined Contribution Account Balances			2,579,222,971	2,173,765,435
Total Actuarial Liability (AL)	**$ 104,703,772,902**	**$ 499,909,355**	**$ 107,782,905,228**	**$ 105,264,324,785**
Actuarial Value of Assets (AVA)			$ 87,580,351,118	$ 85,141,845,586
Net Unfunded/(Surplus) Actuarial Liability (AL-AVA)			**$ 20,202,554,110**	**$ 20,122,479,199**

[1] Excludes the Defined Contribution Account Balances.

Changes in Liabilities

Each of the liabilities disclosed in the prior table are expected to change at each valuation. The components of that change, depending upon which liability is analyzed, can include:

- New hires since the last valuation
- Benefits accrued since the last valuation
- Plan amendments changing benefits
- Passage of time which adds interest to the prior liability
- Benefits paid to retirees since the last valuation
- Participants retiring, terminating, or dying at rates different than expected (demographic experience)
- Participants' salaries increasing at rates different than expected
- A change in actuarial or investment assumptions
- A change in the actuarial funding method

Unfunded Liabilities will change due to the liability changes described above and also from changes in plan assets resulting from:

- Employer contributions differing from expected
- Investment earnings differing from expected
- A change in the method used to measure plan assets

In each valuation, we report on those elements of change which are of particular significance, potentially affecting the long-term financial outlook of the Plan. Below we present key changes in liabilities since the last valuation.

SECTION IV – LIABILITIES

In the table that follows, we show the components of the changes in the Actuarial Liability between June 30, 2022 and June 30, 2023.

Table IV-2
Changes in Defined Benefit Actuarial Liability

Liabilities as of June 30, 2022	$ 103,090,559,350
Liabilities as of June 30, 2023	105,203,682,257
Liability Increase (Decrease)	2,113,122,907
Changes in Liability Due to:	
Method Changes	0
Benefit Changes	885,245,599
Assumption Changes	0
Experience (Gain)/Loss	411,307,521
Benefits Accumulated and Other Sources	816,569,787

The change in Actuarial Liability attributed to Experience (Gain)/Loss can be further broken down by source, as shown in Table IV-3 below.

Table IV-3
Experience (Gain)/Loss by Source as of June 30, 2023

Salary/Service Increase	$	147,018,799
Retirement Experience	$	165,878,166
Retiree Mortality	$	(146,376,045)
New Entrants	$	56,905,235
Data composition and other changes	$	187,881,366
Experience (Gain)/Loss	$	411,307,521

SECTION V – CONTRIBUTIONS

In the process of evaluating the financial condition of any pension plan, as the actuary, we analyze the assets and liabilities to determine what level of contributions is needed to properly maintain (or improve if below 100%) the funded status of the Plan. Typically, the actuarial process will use a funding technique that will result in a pattern of contributions that are both stable and predictable.

Under Chapter 3307 of the Ohio Revised Code, members of the Defined Benefit Plan contribute 14.00% of payroll and members of the Combined Plan contribute 2.00% of payroll toward the Defined Benefit Plan. Employers contribute 14.00% of payroll for members in the Defined Benefit Plan and the Combined Plan. Beginning in fiscal year 2014, the Board allocated the total employer contribution rate towards pension and survivor benefits, and made no allocation to health care. Contributions in excess of the total normal cost are used to fund the Unfunded Actuarial Liability. Table V-1 shows the allocation of the total contribution rates.

Table V-1
Development of Employer Contribution Rate

	2023			2022
	Defined Benefit	Combined	Total	Total
Valuation Results				
Total Actuarial Liability	$107,282,995,873	$ 499,909,355	$ 107,782,905,228	$ 105,264,324,785
Actuarial Value of Pension Assets			87,580,351,118	85,141,845,586
Unfunded Actuarial Liability			$ 20,202,554,110	$ 20,122,479,199
Total Normal Cost	$ 1,304,991,578	$ 24,075,918	$ 1,329,067,496	$ 1,272,649,684
Contribution Rates				
Total Employer Pension Contribution Rate	14.00%	14.00%	14.00%	14.00%
Member Contribution Rate	14.00%	2.00%	13.50%	13.52%
Allocation of Total Contribution Rate				
Normal Cost Rate	10.93%	4.59%	10.66%	10.61%
Unfunded Actuarial Liability Rate	17.07%	11.41%	16.83%	16.90%

SECTION V – CONTRIBUTIONS

In addition to the above-mentioned contributions, employers contribute 2.91% of payroll for members of the Defined Contribution plan and the alternative retirement plan. These contributions are used to fund the Plan's Unfunded Actuarial Liability. Based on the current contribution rates, the valuation indicates that the expected funding period to fully amortize the Unfunded Actuarial Liability is 11.2 years. Table V-2 shows the development of the funding period based on these contributions.

Table V-2

Development of Funding Period Based on Employer Contribution Rate

	2023 Total		2022 Total	
Valuation Results				
Total Defined Benefit Plan Payroll	$	13,128,628,814	$	12,719,286,424
STRS Defined Contribution Plan Payroll	$	610,454,003	$	569,489,445
Alternative Retirement Plan Payroll	$	912,688,063	$	872,944,182
Total Actuarial Liability	$	107,782,905,228	$	105,264,324,785
Actuarial Value of Pension Assets		87,580,351,118		85,141,845,586
Unfunded Actuarial Liability (UAL)	$	20,202,554,110	$	20,122,479,199
UAL Rate for Defined Benefit Plan*		16.83%		16.90%
Defined Benefit Plan UAL Contribution*	$	2,210,111,597	$	2,150,155,530
Defined Contribution Plan UAL Contribution*		17,764,211		16,572,143
Alternative Retirement Plan UAL Contribution*		26,559,223		25,402,676
Total Contribution for UAL*	$	2,254,435,031	$	2,192,130,349
Amortization Period*		11.2 Years		11.5 Years

*Assumes payments are made throughout the year

The Actuarially Determined Contribution, under the Board's current funding policy, contains two components: normal cost and an amortization of the Unfunded Actuarial Liability (UAL). For this purpose, the funding method employed is the Entry Age Normal (EAN) actuarial cost method. Under this funding method, a total normal cost rate is determined as a level percentage of payroll for each active member. The normal cost rate multiplied by payroll equals the total normal cost for each member.

SECTION V – CONTRIBUTIONS

The EAN Actuarial Liability is the difference between the Present Value of Future Benefits and the Present Value of Future Normal Costs. The difference between this EAN Actuarial Liability and the Actuarial Value of Assets is the Unfunded Actuarial Liability (UAL). Under the Board's funding policy, the UAL is amortized over a closed 30-year period that began July 1, 2015 as a level percent of pay, assuming a 3.00% annual payroll growth. As of June 30, 2023, the remaining amortization period is 22 years.

Table V-3 shows the development of an Actuarially Determined Contribution rate and assesses contribution rate sufficiency. Based on this valuation, the Actuarially Determined Contribution rate for Fiscal 2024 is 20.81% of payroll, which is less than the total contribution rate of 27.50% of payroll employers and members are currently contributing for members of the Defined Benefit and Combined Plans in that fiscal year. Therefore, as of this valuation, and assuming all assumptions are realized, the total contribution rate is sufficient to cover the Actuarially Determined Contribution Rate under the Board's funding policy.

Table V-3
Actuarially Determined Contribution and Contribution Rate Sufficiency

	2023 Total	2022 Total
Valuation Results		
Total Defined Benefit Plan Valuation Payroll	$ 13,128,628,814	$ 12,719,286,424
STRS Defined Contribution Plan Payroll	$ 610,454,003	$ 569,489,445
Alternative Retirement Plan Payroll	$ 912,688,063	$ 872,944,182
Total Actuarial Liability	$ 107,782,905,228	$ 105,264,324,785
Actuarial Value of Pension Assets	87,580,351,118	85,141,845,586
Unfunded Actuarial Liability	$ 20,202,554,110	$ 20,122,479,199
Amortization Period	22	23
Amortization Payment	$ 1,376,577,551	$ 1,333,141,379
Offset for Defined Contribution Contribution to UAL*	17,764,211	16,572,143
Offset for Alternative Retirement Plan Contribution to UAL*	26,559,223	39,020,605
UAL Amortization Payment from Defined Benefit Plan*	$ 1,332,254,117	$ 1,277,548,631
Defined Benefit Plan Rate to Amortize UAL	10.15%	10.04%
Normal Cost Rate	10.66%	10.61%
Actuarially Determined Contribution Rate*	**20.81%**	**20.65%**
Total Contribution Rate	27.50%	27.52%
Contribution Sufficiency/(Deficiency)	6.69%	6.87%

*Assumes payments are made throughout the year

The actuarially determined contribution (ADC) in Table V-3 above is a reasonable actuarially determined contribution in accordance with Actuarial Standard of Practice (ASOP) No. 4. The ADC takes into account balancing benefit security, intergenerational equity, and stability of actuarially determined contributions, the demographics of plan members, the funding goals and objectives of the Board, and the need to accumulate assets to make benefit payments when due. The actuarial methods and assumptions are shown in Appendix B of this report.

SECTION VI – ACCOUNTING STATEMENT INFORMATION

GFOA Recommended Information

The Government Finance Officers Association (GFOA) maintains a checklist of items to be included in a public retirement plan's Annual Comprehensive Financial Report in order to receive recognition for excellence in financial reporting.

We have prepared the following exhibits:

- Table VI-1: Analysis of Financial Experience
- Table VI-2: Schedule of Funded Liabilities by Type
- Table VI-3: Actuarial Funded Ratio and Funding Period

Table VI-1
Analysis of Financial Experience (in thousands)
Gains and (Losses) in Unfunded Actuarial Liability During Year Ended June 30
Resulting from Differences Between Assumed Experience and Actual Experience

Type of Activity	2019	2020	2021	2022	2023
Investment income	$ 3,515	$ 532,022	$5,216,481	$ (136,350)	$ 207,313
Payroll growth	N/A	N/A	N/A	N/A	N/A
Salary increases	207,875	177,622	236,539	(103,250)	(147,019)
Retirement and other separation experience	(325,891)	(112,488)	(287,427)	(443,876)	(410,665)
Death after retirement	152,788	110,833	208,369	269,162	146,376
Final plan reselection	N/A	N/A	N/A	N/A	N/A
Gain (or loss) during year	$ 38,287	$ 707,989	$ 5,373,962	$ (414,314)	$ (203,995)
Gain (or loss) due to assumption/method/plan amendment changes	-	-	(4,433,797)	321,382	(885,246)
Composite gain (or loss) during the year	$ 38,287	$ 707,989	$ 940,165	$ (92,932)	$ (1,089,241)

SECTION VI – ACCOUNTING STATEMENT INFORMATION

Table VI-2

Schedule of Funded Liabilities by Type (Dollars in Thousands)*

	Aggregate Actuarial Liabilities for						
Valuation Date June 30,	Active Member Contributions (1)	Retirees & Beneficiaries (2)	Active Members Employer Financed Portion (3)	Actuarial Value of Assets (Excl Healthcare)	Portion of Actuarial Liabilities Covered by Actuarial Value of Assets (1)	(2)	(3)
2023	$ 20,537,294	$ 69,706,878	$ 17,538,733	$ 87,580,351	100%	96%	0%
2022	$ 19,639,924	$ 69,451,575	$ 16,172,825	$ 85,141,846	100%	94%	0%
2021	$ 18,479,943	$ 69,479,780	$ 16,631,683	$ 83,761,394	100%	94%	0%
2020	$ 17,591,257	$ 67,500,051	$ 13,580,980	$ 76,357,681	100%	87%	0%
2019	$ 16,454,187	$ 68,412,083	$ 12,974,674	$ 74,411,836	100%	85%	0%
2018	$ 15,440,336	$ 68,911,073	$ 12,552,648	$ 73,115,358	100%	84%	0%
2017	$ 13,668,834	$ 69,723,394	$ 12,734,213	$ 72,216,212	100%	84%	0%
2016	$ 12,498,469	$ 74,282,592	$ 13,975,362	$ 70,114,637	100%	78%	0%
2015	$ 11,473,309	$ 74,340,699	$ 13,200,646	$ 68,655,999	100%	77%	0%
2014	$ 11,477,457	$ 69,776,259	$ 14,913,341	$ 66,657,175	100%	79%	0%

*Includes Defined Contribution Plan

SECTION VI – ACCOUNTING STATEMENT INFORMATION

Table VI-3
Actuarial Funded Ratio and Funding Period (Dollars in Thousands)

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Liability (b)	Unfunded Actuarial Liability (b) - (a)	Funded Ratio (a) / (b)	Funding Period
6/30/2023	$ 87,580,351	$ 107,782,905	$ 20,202,554	81.3%	11.2 years
6/30/2022	$ 85,141,846	$ 105,264,325	$ 20,122,479	80.9%	11.5 years
6/30/2021	$ 83,761,394	$ 104,591,406	$ 20,830,012	80.1%	14.0 years
6/30/2020	$ 76,357,681	$ 98,672,288	$ 22,314,607	77.4%	14.9 years
6/30/2019	$ 74,411,836	$ 97,840,944	$ 23,429,108	76.1%	16.6 years
6/30/2018	$ 73,115,358	$ 96,904,057	$ 23,788,699	75.5%	17.8 years
6/30/2017	$ 72,216,212	$ 96,126,440	$ 23,910,228	75.1%	18.4 years
6/30/2016	$ 70,114,637	$ 100,756,422	$ 30,641,785	69.6%	26.6 years
6/30/2015	$ 68,655,999	$ 99,014,654	$ 30,358,655	69.3%	28.4 years
6/30/2014	$ 66,657,175	$ 96,167,057	$ 29,509,882	69.3%	29.5 years

**note: Due to rounding, the assets plus the unfunded liabilities may not sum to the total liabilities*

SECTION VII – GASB 67 AND 68 INFORMATION AS OF JUNE 30, 2023

Overview

The purpose of this section is to provide accounting and financial disclosure information under Governmental Accounting Standards Board Statements 67 and 68 (GASB 67 and 68) for the State Teachers Retirement System of Ohio as of June 30, 2023. This information includes:

- Determination of the Discount Rate,
- Change in Net Pension Liability,
- Sensitivity of the Net Pension Liability to changes in the discount rate,
- Schedule of Changes in the Net Pension Liability and Related Ratios,
- Schedule of Employer Contributions,
- Disclosure of Collective Deferred Inflows and Outflows, including a detailed schedule of deferred items, and
- Calculation of Collective Annual Pension Expense.

Following procedures established by STRS Ohio, the information in this section includes both the Defined Benefit and Defined Contribution Plans except where otherwise noted.

The membership data, actuarial assumptions, and plan provisions for the GASB 67 and 68 calculations are the same as those used throughout this valuation, as are described in Appendices A, B and C of this Actuarial Valuation Report.

SECTION VII – GASB 67 AND 68 INFORMATION AS OF JUNE 30, 2023

Determination of Discount Rate

For purposes of determining the discount rate, we have performed a cash flow projection as described under Paragraph 41 of GASB Statement 67. With regard to the employer and employee contributions used for this projection, we have assumed that future employer and employee contributions would be made at the current rates set by State statute and that 100% of the contributions would be made to the pension plan, with none of these future contributions paid to the post-employment health care plan. Based upon these assumptions, the Plan's fiduciary net position was projected to be available to make all future benefit payments for current plan members as of June 30, 2023. Consequently, the single equivalent rate used to determine the Total Pension Liability as of June 30, 2023 is 7.00%, the long-term expected rate-of-return as defined by GASB 67 and 68 as of that date. By comparison, the single equivalent rate used to determine the Total Pension Liability as of June 30, 2022 was also 7.00%.

Note Disclosures

The Table VII-1 shows the changes in the Total Pension Liability (TPL), the Plan Fiduciary Net Position (i.e., fair value of plan assets), and the Net Pension Liability (NPL) during the measurement year.

Table VII-1
Change in Net Pension Liability

	Increase (Decrease)		
	Total Pension Liability (a)	**Plan Fiduciary Net Position (b)**	**Net Pension Liability (a) - (b)**
Balances at 6/30/2022	$ 105,264,324,785	$ 83,034,198,764	$ 22,230,126,021
Changes for the year:			
Service cost	1,272,649,684		1,272,649,684
Interest	7,196,379,473		7,196,379,473
Changes of benefits	885,245,599		885,245,599
Differences between expected and actual experience	755,807,984		755,807,984
Changes of assumptions	0		0
Contributions - employer*		1,980,126,228	(1,980,126,228)
Contributions - member		1,884,375,309	(1,884,375,309)
Net investment income		7,014,835,574	(7,014,835,574)
Benefit payments	(7,591,502,297)	(7,591,502,297)	0
Administrative expense		(74,066,160)	74,066,160
Net changes	2,518,580,443	3,213,768,654	(695,188,211)
Balances at 6/30/2023	$ 107,782,905,228	$ 86,247,967,418	$ 21,534,937,810

** Includes DC Plan Contributions as well as the ARP contributions that are allocated to the DB Plan.*

Benefit changes during the year increased the NPL $0.9 billion.

Favorable investment experience partially offset by liability losses resulted in a decrease in the NPL of $0.7 billion. The NPL remaining as of June 30, 2023 is $21.5 billion.

SECTION VII – GASB 67 AND 68 INFORMATION AS OF JUNE 30, 2023

Changes in the discount rate affect the measurement of the TPL. Lower discount rates produce a higher TPL and higher discount rates produce a lower TPL. Because the discount rate does not affect the measurement of assets, the percentage change in the NPL can be very significant for a relatively small change in the discount rate. The table below shows the sensitivity of the NPL to the discount rate.

Table VII-2
Sensitivity of Net Pension Liability to Changes in Discount Rate

	1% Decrease 6.00%	Discount Rate 7.00%	1% Increase 8.00%
Total Pension Liability	$ 119,363,935,308	$ 107,782,905,228	$ 97,988,522,646
Plan Fiduciary Net Position	86,247,967,418	86,247,967,418	86,247,967,418
Net Pension Liability	$ 33,115,967,890	$ 21,534,937,810	$ 11,740,555,228
Plan Fiduciary Net Position as a Percentage of the Total Pension Liability	72.3%	80.0%	88.0%

A one percent decrease in the discount rate increases the TPL by approximately 10.7% and increases the NPL by approximately 53.8%. A one percent increase in the discount rate decreases the TPL by approximately 9.1% and decreases the NPL by approximately 45.5%.

SECTION VII – GASB 67 AND 68 INFORMATION AS OF JUNE 30, 2023

Required Supplementary Information

The schedules of Required Supplementary Information generally start with one year of information as of the implementation of GASB 67, and eventually build up to 10 years of information. The schedule below only shows the changes in NPL and related ratios required by GASB for the current and prior year.

Table VII-3
Schedule of Changes in Net Pension Liability and Related Ratios

	FYE 2023	FYE 2022
Total Pension Liability		
Service cost	$ 1,272,649,684	$ 1,344,766,774
Interest (includes interest on service cost)	7,196,379,473	7,158,609,659
Changes of benefit terms	885,245,599	2,348,518,165
Differences between expected and actual experience	755,807,984	(42,146,204)
Changes of assumptions	0	(2,669,899,674)
Benefit payments, including refunds of member contributions	(7,591,502,297)	(7,466,930,312)
Net change in total pension liability	**$ 2,518,580,443**	**$ 672,918,408**
Total pension liability - beginning	**105,264,324,785**	**104,591,406,377**
Total pension liability - ending	**$ 107,782,905,228**	**$ 105,264,324,785**
Plan fiduciary net position		
Contributions - employer*	$ 1,980,126,228	$ 1,932,372,091
Contributions - member	1,884,375,309	1,806,217,463
Net investment income	7,014,835,574	(4,976,659,903)
Benefit payments, including refunds of member contributions	(7,591,502,297)	(7,466,930,312)
Administrative expense	(74,066,160)	(66,308,165)
Net change in plan fiduciary net position	**$ 3,213,768,654**	**$ (8,771,308,826)**
Plan fiduciary net position - beginning	**83,034,198,764**	**91,805,507,590**
Plan fiduciary net position - ending	**$ 86,247,967,418**	**$ 83,034,198,764**
Net pension liability - ending	**$ 21,534,937,810**	**$ 22,230,126,021**
Plan fiduciary net position as a percentage of the total pension liability	80.02%	78.88%
Covered payroll*	$ 14,211,882,247	$ 13,624,858,523
Net pension liability as a percentage of covered payroll*	151.53%	163.16%

**Includes Payroll for Defined Contribution and Alternative Retirement Plan Participants.*

SECTION VII – GASB 67 AND 68 INFORMATION AS OF JUNE 30, 2023

If an Actuarially Determined Contribution is calculated, the following schedule is required. An Actuarially Determined Contribution is a contribution amount determined in accordance with Actuarial Standards of Practice.

Table VII-4
Schedule of Employer Contributions

	FYE 2023	FYE 2022	FYE 2021	FYE 2020	FYE 2019
Actuarially Determined Contribution*	$ 871,602,396	$ 1,037,935,445	$ 1,028,798,948	$ 1,081,661,891	$ 1,088,328,150
Contributions in Relation to the Actuarially Determined Contribution*	1,829,306,595	1,776,074,436	1,696,120,572	1,662,016,780	1,614,188,340
Contribution Deficiency/(Excess)	$ (957,704,199)	$ (738,138,991)	$ (667,321,624)	$ (580,354,889)	$ (525,860,190)
Covered Payroll*	$ 12,733,103,542	$ 12,224,437,526	$ 11,610,016,164	$ 11,392,012,792	$ 11,088,784,826
Contributions as a Percentage of Covered Payroll*	14.37%	14.53%	14.61%	14.59%	14.56%

	FYE 2018	FYE 2017	FYE 2016	FYE 2015	FYE 2014
Actuarially Determined Contribution*	$ 1,056,430,306	$ 1,054,862,000	$ 1,178,129,000	$ 1,368,602,000	$ 1,489,734,000
Contributions in Relation to the Actuarially Determined Contribution*	1,565,679,329	1,514,285,000	1,466,938,000	1,449,165,000	1,325,141,000
Contribution Deficiency/(Excess)	$ (509,249,023)	$ (459,423,000)	$ (288,809,000)	$ (80,563,000)	$ 164,593,000
Covered Payroll*	$ 10,775,526,239	$ 10,459,706,000	$ 10,069,269,000	$ 9,985,181,000	$ 9,833,028,000
Contributions as a Percentage of Covered Payroll*	14.53%	14.48%	14.57%	14.51%	13.48%

**Excludes the Defined Contribution and Alternative Retirement Plans.*

SECTION VII – GASB 67 AND 68 INFORMATION AS OF JUNE 30, 2023

The notes below summarize the key methods and assumptions used to determine the Actuarially Determined Contributions (ADC) for FYE 2023.

Notes to Schedule

Valuation Date:	June 30, 2022
Timing:	Actuarially Determined Contributions are calculated based on the actuarial valuation at the beginning of the fiscal year.

Key Methods and Assumptions Used to Determine Contribution Rates

Actuarial Cost Method:	Entry Age Normal cost method
Asset Valuation Method:	4-year smoothed market
Amortization Method:	For ADC - Closed 30-year level percent of pay amortization of Unfunded Actuarial Liability as of July 1, 2015
Discount Rate:	7.00%
Inflation:	2.50%
Salary Increases:	From 2.5% to 8.5% based on service
Mortality:	*Post-Retirement:* Pub-2010 Teachers Healthy Annuitant Mortality Table, adjusted 110% for males, projected forward generationally using mortality improvement scale MP-2020 (Updated effective June 30, 2022). *Pre-Retirement:* Pub-2010 Teachers Employee Table adjusted 95% for females, projected forward generationally using mortality improvement scale MP-2020 (Updated effective June 30, 2022). *Post-Retirement Disabled:* Pub-2010 Teachers Disabled Annuitant Table projected forward generationally using mortality improvement scale MP-2020 (Updated effective June 30, 2022).

A complete description of the methods and assumptions used to Determine Contribution Rates for the year ending June 30, 2023 can be found in the June 30, 2022 Actuarial Valuation Report.

GASB 68 Information

Employers that participate in STRS Ohio were required to implement GASB 68 for their first fiscal year that commenced after June 15, 2014. The amounts reported as of their fiscal year end (their reporting date) must be based on a measurement date up to 12 months and one day prior to their reporting date. Therefore, the GASB 68 schedules in this section, which are based on a June 30, 2023 measurement date, can be used for employers' reporting up until fiscal years ending June 30, 2024.

Because STRS Ohio is a cost-sharing multiple-employer pension fund, each employer participating in STRS Ohio must reflect a portion of the collective net pension liability, pension expense, deferred outflows, and deferred inflows in their financial statements. This section develops the collective amounts that are based on the aggregate of the employers, which will then be allocated to participating employers.

The impact of experience gains or losses and assumption changes on the TPL are recognized in expense over the average expected remaining service life of all active and inactive members of STRS Ohio. As of the measurement date, this recognition period was five years. During the measurement year, there was an experience loss of $755.8 million.

The impact of investment gains or losses is recognized over a period of five years. During the measurement year, there was an investment gain of $1.3 billion.

SECTION VII – GASB 67 AND 68 INFORMATION AS OF JUNE 30, 2023

The following table shows the detail related to the amounts of collective Deferred Outflows and Deferred Inflows for the current and prior years.

Table VII-5
Calculation of Deferred Items Schedule

Experience Year	Recognition Period	Total Amount	Remaining Years	Recognized in Pension Expense	Deferred Resources
Recognition of Experience (Gains) and Losses					
2023	5	$ 755,807,984	5	$ 151,161,597	$ 604,646,387
2022	4	(42,146,204)	3	(10,536,551)	$ (21,073,102)
2021	5	451,180,317	3	90,236,063	$ 180,472,128
2020	5	(133,569,121)	2	(26,713,824)	$ (26,713,825)
2019	5	69,329,945	1	13,865,989	$ 0
Total		**$ 1,100,602,921**		**$ 218,013,274**	**$ 737,331,588**
Recognition of Assumption Changes					
2022	4	$ (2,669,899,674)	3	$ (667,474,919)	$ (1,334,949,836)
2021	5	$ 4,433,796,926	3	$ 886,759,385	$ 1,773,518,771
Total		**$ 1,763,897,252**		**$ 219,284,466**	**$ 438,568,935**
Recognition of Investment (Gains) and Losses					
2023	5	$ (1,333,228,936)	5	$ (266,645,787)	$ (1,066,583,149)
2022	5	11,272,478,990	4	2,254,495,798	$ 6,763,487,394
2021	5	(15,806,273,192)	3	(3,161,254,638)	$ (6,322,509,278)
2020	5	2,805,320,947	2	561,064,189	$ 561,064,191
2019	5	586,060,713	1	117,212,141	$ 0
Total		**$ (2,475,641,478)**		**$ (495,128,297)**	**$ (64,540,842)**

SECTION VII – GASB 67 AND 68 INFORMATION AS OF JUNE 30, 2023

The table below summarizes the current balances of collective Deferred Outflows and Deferred Inflows of resources along with the net recognition over the next five years.

Table VII-6
Schedule of Deferred Inflows and Outflows of Resources

	Deferred Outflows of Resources	Deferred Inflows of Resources
Differences between expected and actual experience	$ 785,118,515	$ 47,786,927
Changes in assumptions	1,773,518,771	1,334,949,836
Net difference between projected and actual earnings on pension plan investments	-	64,540,842
Total	**$ 2,558,637,286**	**$ 1,447,277,605**

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

Measurement year ended June 30:	
2024	(188,908,686)
2025	(723,259,049)
2026	2,139,011,608
2027	(115,484,192)
Thereafter	$ 0

SECTION VII – GASB 67 AND 68 INFORMATION AS OF JUNE 30, 2023

The annual collective pension expense recognized by the participating employers can be calculated two different ways. First, it is the change in the amounts reported on the Statement of Net Position that relate to STRS Ohio and are not attributable to employer contributions. That is, it is the change in NPL plus the changes in Deferred Outflows and Deferred Inflows plus employer contributions.

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

Table VII-7
Calculation of Pension Expense

	Measurement Year Ending	
	2023	2022
Change in Net Pension Liability	$ (695,188,211)	$ 9,444,227,234
Change in Deferred Outflows	1,159,774,847	223,648,031
Change in Deferred Inflows	(640,184,452)	(9,011,676,964)
Employer Contributions	1,980,126,228	1,932,372,091
Pension Expense	**$ 1,804,528,412**	**$ 2,588,570,392**
Pension Expense as % of Payroll*	**12.70%**	**19.00%**
Operating Expenses		
Service cost	$ 1,272,649,684	$ 1,344,766,774
Employee contributions	(1,884,375,309)	(1,806,217,463)
Administrative expenses	74,066,160	66,308,165
Total	$ (537,659,465)	$ (395,142,524)
Financing Expenses		
Interest cost	$ 7,196,379,473	$ 7,158,609,659
Expected return on assets	(5,681,606,638)	(6,295,819,087)
Total	$ 1,514,772,835	$ 862,790,572
Changes		
Benefit changes	$ 885,245,599	$ 2,348,518,165
Recognition of assumption changes	219,284,466	219,284,466
Recognition of liability gains and losses	218,013,274	73,198,068
Recognition of investment gains and losses	(495,128,297)	(520,078,355)
Total	$ 827,415,042	$ 2,120,922,344
Pension Expense	**$ 1,804,528,412**	**$ 2,588,570,392**

**Includes Payroll for Defined Contribution and Alternative Retirement Plan Participants.*

SECTION VIII – PLAN DESIGN LEVER ANALYSIS

Plan design levers are defined by STRS as potential ad-hoc changes to the plan benefits or funding. The current plan design lever analysis includes options in four main categories, all of which are designed to enhance the benefits of members or the security of those benefits. The changes analyzed for this report are:

1. Changes to contributions
   a. An increase of 1% in the employer contribution rate.
   b. A reduction of 1% in the employee contribution rate.
2. COLAs
   a. 3%, 2%, and 1% ongoing annual repeating simple COLAs to current and future eligible members and beneficiaries.
   b. 3%, 2%, and 1% one-time permanent COLAs granted for FY 2025 to current eligible members and beneficiaries.
3. Eligibility for Unreduced Benefits
   a. Service requirements for unreduced benefits for all future years changed to 34, 33, 32, 31 and 30.

Note, legislative action would be required for changes to the employer contribution rate. Also, in accordance with Ohio law, an actuarial analysis would be required before enacting any of these changes.

The current plan design, as well as each plan design lever is measured as of the current valuation date with the expected impact on the June 30, 2024 and June 30, 2034 valuation results shown in the table below. The metrics included in the table are the:

- Change in the Normal Cost rate as of FY 2024
- Change in the Actuarial Liability as of FY 2024
- Expected Funded Ratio, Funding Period, and the STRS Ohio Dashboard Summary Score as of FY 2024
- Expected Funded Ratio, Funding Period, and the STRS Ohio Dashboard Summary Score as of FY 2034

SECTION VIII – PLAN DESIGN LEVER ANALYSIS

		Valuation metrics 6/30/2024		Outlook and funding policy metrics on 6/30/2024			Outlook and funding policy metrics on 6/30/2034		
		If results=assumptions FY2024					*If results=assumptions FY2024-2034*		
Modeled as if FY2024 results exactly matched assumptions		Normal Cost 2024	Actuarial Liability 2024	Funded Ratio 2024	Funding Period 2024	Summary Score 2024	Funded Ratio 2034	Funding Period 2034	Summary Score 2034
	DB Plan, provisions as of FY2023	10.67%	105,341	80.3%	9.7	-1	97.2%	1.1	2
		Change	*Change ($M)*						
Contributions	+1% employer contribution rate	0.00%	-	80.3%	9.7	-1	97.2%	1.1	2
	-1% employee contribution rate	-0.02%	(28)	80.2%	9.8	-1	97.1%	1.2	2
COLA	3% ongoing annual repeating simple COLA, FY2025+	1.69%	20,584	67.2%	33.7	-7	68.8%	27.8	-7
	2% ongoing annual repeating simple COLA, FY2025+	1.13%	13,722	71.1%	22.5	-5	76.7%	15.0	-2
	1% ongoing annual repeating simple COLA, FY2025+	0.56%	6,861	75.4%	15.1	-3	86.1%	6.9	1
	Permanent 3% COLA, FY2025 only	0.00%	1,453	79.2%	10.6	-2	94.8%	2.1	2
	Permanent 2% COLA, FY2025 only	0.00%	969	79.6%	10.3	-1	95.6%	1.8	2
	Permanent 1% COLA, FY2025 only	0.00%	484	80.0%	10.0	-1	96.4%	1.4	2
Eligibility	Unreduced retirement at 34 years	0.18%	702	79.8%	10.3	-2	95.8%	1.7	2
	Unreduced retirement at 33 years	0.40%	1,726	79.0%	11.2	-2	93.7%	2.7	2
	Unreduced retirement at 32 years	0.59%	2,621	78.4%	12.0	-2	92.0%	3.5	2
	Unreduced retirement at 31 years	0.75%	3,314	77.8%	12.6	-2	90.7%	4.3	2
	Unreduced retirement at 30 years	0.86%	3,781	77.5%	13.1	-2	89.8%	4.8	2

These projections assume that all assumptions are met throughout the projection period.

The Summary Score is based on the Cheiron's approximation of the STRS Ohio Dashboard Summary Score and incorporates stochastic projections. The score shown is the sum of the dashboard scores for the current year funded ratio, the prior year funded ratio, the current funding period, the probability of a funded ratio under 50% in the following 10 years, and the probability that the funding period will exceed 100 years in the following 10 years. Cheiron's approximation does not include the two economic considerations that are incorporated into the Board's full dashboard summary score. The expected return of 7.17% and standard deviation of 12.78% used in developing the stochastic projections are based on the STRS Ohio investment consultants' capital market assumptions as of the current valuation date. Note, the summary score in 2034 assumes that the current assumptions are met through FY 2033 and is based on stochastic results from FY 2034 through 2044.

APPENDICES

APPENDIX A – MEMBERSHIP INFORMATION

Table A-1
Ohio State Teachers - Member Status Reconciliation

		Actives	Reemployed Retirees	Inactive Eligible for Allowance	Inactive Eligible for Refunds Only	Retired	Disabled	Beneficiaries	Total
1.	June 30, 2022 Valuation	**174,036**	**17,110**	**20,262**	**144,446**	**132,765**	**4,549**	**18,911**	**512,079**
2.	Additions								
a.	New Entrants	15,136	2,073	-	-	-	-	-	17,209
b.	Total	15,136	2,073	-	-	-	-	-	17,209
3.	Reductions								
a.	Benefits Expired	-	-	-	-	-	-	-	-
b.	Refunds	(2,301)	(2,158)	(951)	(4,394)	-	-	-	(9,804)
c.	Deaths with no Beneficiaries	(51)	(38)	(35)	-	(2,705)	(146)	(1,142)	(4,117)
d.	Total	(2,352)	(2,196)	(986)	(4,394)	(2,705)	(146)	(1,142)	(13,921)
4.	Changes in Status								
a.	Rehired	5,196	(1)	(1,162)	(4,022)	-	(11)	-	-
b.	Inactive Eligible for Allowance	(3,188)	-	3,219	-	-	(31)	-	-
c.	Inactive Eligible for Refunds Only	(10,161)	-	(3)	14,316	-	-	-	4,152
d.	Retired	(3,429)	(82)	(418)	(4)	3,888	(37)	-	(82)
e.	Reemployed Retiree	(6)	9	-	(3)	-	-	-	-
f.	Disabled	(88)	-	(12)	-	-	100	-	-
g.	Death with Beneficiaries	(110)	-	(6)	-	(1,222)	(77)	1,415	-
h.	Plan Reselection	-	-	-	-	-	-	-	-
i.	Data Corrections	(2)	2	47	43	195	20	39	344
j.	Total	(11,788)	(72)	1,665	10,330	2,861	(36)	1,454	4,414
5.	June 30, 2023 Valuation	**175,032**	**16,915**	**20,941**	**150,382**	**132,921**	**4,367**	**19,223**	**519,781**

APPENDIX A – MEMBERSHIP INFORMATION

Table A-2
Summary of Membership Data as of June 30, 2023 ($ in thousands)

		Male	Female	Total
1.	**Defined Benefit Plan Active Members**			
	Number of Members	45,737	121,789	167,526
	Annual Salaries (for period ending June 30, 2023)	$ 3,397,787	$ 8,206,552	$ 11,604,339
	Average Age	45.58	44.11	44.51
	Average Service	13.73	13.41	13.50
2.	**Combined Plan Active Members**			
	Number of Members	1,648	5,858	7,506
	Annual Salaries (for period ending June 30, 2023)	$ 120,000	$ 384,942	$ 504,942
	Average Age	43.96	41.45	42.00
	Average Service	9.48	9.99	9.88
3.	**Total Defined Benefit and Combined Plan Active Members**			
	Number of Members	47,385	127,647	175,032
	Annual Salaries (for period ending June 30, 2023)	$ 3,517,787	$ 8,591,494	$ 12,109,281
	Average Age	45.52	43.99	44.40
	Average Service	13.58	13.25	13.34
4.	**Defined Benefit Inactive Members**			
	Eligible for Allowances	4,842	15,300	20,142
	Eligible for Refunds Only	52,244	96,221	148,465
	Total	57,086	111,521	168,607
5.	**Combined Benefit Inactive Members**			
	Eligible for Allowances	155	644	799
	Eligible for Refunds Only	491	1,426	1,917
	Total	646	2,070	2,716
6.	**Total Inactive Members**			
	Eligible for Allowances	4,997	15,944	20,941
	Eligible for Refunds Only	52,735	97,647	150,382
	Total	57,732	113,591	171,323

APPENDIX A – MEMBERSHIP INFORMATION

Table A-2 Summary of Membership Data as of June 30, 2023 (continued) ($ in thousands)							
			Male		Female		Total
7.	**Retirees**						
	Number of Members		41,857		91,064		132,921
	Annual Allowance	$	2,350,959	$	4,124,385	$	6,475,344
	Average Allowance (in dollars)	$	56,166	$	45,291	$	48,716
8.	**Disabled Retirees**						
	Number of Members		1,280		3,087		4,367
	Annual Allowance	$	56,673	$	118,926	$	175,599
	Average Allowance (in dollars)	$	44,276	$	38,525	$	40,210
9.	**Beneficiaries Receiving Optional Allowances**						
	Number of Members		3,966		9,617		13,583
	Annual Allowance	$	106,665	$	383,393	$	490,058
	Average Allowance (in dollars)	$	26,895	$	39,866	$	36,079
10.	**Survivors' Benefit Fund Beneficiaries**						
	Number of Members		2,627		3,013		5,640
	Annual Allowance	$	51,992	$	76,564	$	128,556
	Average Allowance (in dollars)	$	19,791	$	25,411	$	22,794
11.	**Total Retirees and Beneficiaries**						
	Number of Members		49,730		106,781		156,511
	Annual Allowance	$	2,566,289	$	4,703,268	$	7,269,557
	Average Allowance (in dollars)	$	51,604	$	44,046	$	46,448

* *Annual Allowances reflect the COLA adjustments that come into effect during FYE 2024 for eligible members and beneficiaries.*

APPENDIX A – MEMBERSHIP INFORMATION

Table A-3
Schedule of Valuation Data - Active Members

Fiscal Year Ended June 30,	Number of Active Members	Annualized Salaries*	Annual Average Pay	% Increase in Average Pay
2023	175,032	$ 12,533,620	$ 71,608	2.62%
2022	174,036	$ 12,144,257	$ 69,780	1.83%
2021	166,427	$ 11,404,226	$ 68,524	2.76%
2020	167,838	$ 11,192,069	$ 66,684	4.49%
2019	170,004	$ 10,849,863	$ 63,821	2.73%
2018	170,327	$ 10,581,345	$ 62,124	6.12%
2017	168,132	$ 9,842,388	$ 58,540	3.59%
2016	169,212	$ 9,562,236	$ 56,510	2.90%
2015	164,925	$ 9,057,095	$ 54,916	1.62%
2014	169,295	$ 9,148,438	$ 54,038	0.72%
2013	169,945	$ 9,118,036	$ 53,653	-0.50%

*In thousands.

Table A-4
Schedule of Valuation Data - Retirees/Beneficiaries

Fiscal Year Ended June 30,	Number of Benefit Recipients	Annual Allowances (in thousands)	Annual Average Allowances	% Increase in Annual Allowances
2023	156,511	$ 7,269,556	$ 46,448	1.4%
2022	156,225	$ 7,167,927	$ 45,882	2.3%
2021	156,921	$ 7,009,421	$ 44,668	0.6%
2020	156,907	$ 6,970,697	$ 44,426	0.0%
2019	157,418	$ 6,971,155	$ 44,284	0.3%
2018	157,422	$ 6,949,422	$ 44,145	-0.1%
2017	158,039	$ 6,955,309	$ 44,010	0.9%
2016	157,938	$ 6,896,162	$ 43,664	1.4%
2015	158,116	$ 6,801,181	$ 43,014	6.3%
2014	152,208	$ 6,397,535	$ 42,032	3.3%
2013	149,221	$ 6,190,182	$ 41,483	6.4%

* *Annual Allowances displayed for FYE 2022 and 2023 reflect the COLA adjustments that come into effect during FYE 2023 and 2024 for eligible members and beneficiaries.*

APPENDIX A – MEMBERSHIP INFORMATION

Table A-5
Schedule of Valuation Data - Retirees/Beneficiaries

Fiscal Year Ended June 30,	Beginning Number of Benefit Recipients	Beginning Annual Allowances	Benefit Recipients Added	Payments Added	Benefit Recipients Removed	Payments Removed	Ending Number of Benefit Recipients	Ending Annual Allowance
2023	156,225	$ 7,167,927	5,657	$ 295,082	5,371	$ 193,453	156,511	$ 7,269,556
2022	156,921	$ 7,009,421	4,995	$ 350,311	5,691	$ 191,805	156,225	$ 7,167,927
2021	156,907	$ 6,970,697	5,524	$ 225,426	5,510	$ 186,702	156,921	$ 7,009,421
2020	157,418	$ 6,971,155	4,363	$ 165,151	4,874	$ 165,609	156,907	$ 6,970,697
2019	157,422	$ 6,949,422	4,894	$ 178,255	4,898	$ 156,522	157,418	$ 6,971,155
2018	158,039	$ 6,955,309	3,847	$ 128,494	4,464	$ 134,381	157,422	$ 6,949,422
2017	157,938	$ 6,896,162	3,254	$ 155,702	3,153	$ 96,555	158,039	$ 6,955,309
2016	158,116	$ 6,801,181	2,675	$ 177,665	2,853	$ 82,684	157,938	$ 6,896,162
2015	152,208	$ 6,397,535	9,027	$ 490,598	3,119	$ 86,952	158,116	$ 6,801,181
2014	149,221	$ 6,190,182	5,550	$ 283,768	2,563	$ 76,415	152,208	$ 6,397,535
2013	143,256	$ 5,815,407	8,493	$ 441,942	2,528	$ 67,167	149,221	$ 6,190,182

* *Annual Allowances displayed for FYE 2022 and 2023 reflect the COLA adjustments that come into effect during FYE 2023 and 2024 for eligible members and beneficiaries.*

APPENDIX A – MEMBERSHIP INFORMATION

Table A-6
Benefit Payments by Type as of June 30, 2023

Age Last Birthday	Number	Annual Allowance (in thousands)	Average Annual Allowance
Retirees			
Under 60	3,403	$ 193,412	$ 56,836
60-64	10,177	498,393	48,972
65-69	23,502	1,139,789	48,498
70-74	35,519	1,811,521	51,001
75-79	28,758	1,460,591	50,789
Over 79	31,562	1,371,638	43,459
Total	**132,921**	**$ 6,475,344**	**$ 48,716**
Disabled Retirees			
Under 60	854	$ 31,138	$ 36,462
60-64	589	24,243	41,160
65-69	495	21,674	43,786
70-74	866	37,593	43,410
75-79	794	33,649	42,379
Over 79	769	27,301	35,502
Total	**4,367**	**$ 175,599**	**$ 40,210**
Beneficiaries Receiving Optional Allowances			
Under 60	7	$ 332	$ 47,470
60-64	105	4,323	41,169
65-69	462	19,867	43,002
70-74	1,432	62,765	43,830
75-79	2,264	96,099	42,447
Over 79	9,313	306,672	32,929
Total	**13,583**	**$ 490,058**	**$ 36,079**
Survivors' Benefit Fund Beneficiaries			
Under 60	1,316	$ 18,765	$ 14,259
60-64	372	8,373	22,507
65-69	511	12,949	25,340
70-74	892	24,242	27,177
75-79	834	22,331	26,776
Over 79	1,715	41,897	24,430
Total	**5,640**	**$ 128,556**	**$ 22,794**
Grand Total	**156,511**	**$ 7,269,557**	**$ 46,448**

* *Annual Allowances reflect the COLA adjustments that come into effect during FYE 2024 for eligible members and beneficiaries.*

APPENDIX A – MEMBERSHIP INFORMATION

Table A-7
Benefit Payments by Type as of June 30, 2023

Amount of Monthly Benefit	Total	Service	Disability	Survivor
NULL	34	2	30	2
$ 1 - $ 250	2,425	1,501	3	921
$ 251 - $ 500	4,317	3,597	13	707
$ 501 - $ 750	4,196	3,114	19	1,063
$ 751 - $ 1,000	4,015	2,709	24	1,282
$ 1,001 - $ 1,250	3,966	2,580	63	1,323
$ 1,251 - $ 1,500	3,818	2,499	73	1,246
$ 1,501 - $ 1,750	3,895	2,612	131	1,152
$ 1,751 - $ 2,000	4,185	2,994	220	971
Greater then $ 2,000	125,660	111,313	3,791	10,556
Grand Total	**156,511**	**132,921**	**4,367**	**19,223**

* *Monthly Benefits reflect the COLA adjustments that come into effect during FYE 2024 for eligible members and beneficiaries.*

APPENDIX B – SUMMARY OF ASSUMPTIONS AND METHODS

A. Actuarial Assumptions

1. Mortality Rates

Post-Retirement: Pub-2010 Teachers Healthy Annuitant Mortality Table, adjusted 110% for males, projected forward generationally using mortality improvement scale MP-2020 (Updated effective June 30, 2022).

Sample mortality rates prior to improvements are as follows:

Age	Male	Female
50	0.11%	0.07%
55	0.25%	0.19%
60	0.39%	0.29%
65	0.65%	0.45%
70	1.18%	0.77%
75	2.23%	1.46%
80	4.23%	2.82%
85	7.96%	5.39%
90	14.59%	10.09%
95	24.55%	18.03%
100	35.87%	28.16%

Pre-Retirement: Pub-2010 Teachers Employee Table adjusted 95% for females, projected forward generationally using mortality improvement scale MP-2020 (Updated effective June 30, 2022).

Sample mortality rates prior to improvement are as follows:

Age	Male	Female
25	0.02%	0.01%
30	0.02%	0.01%
35	0.03%	0.02%
40	0.04%	0.03%
45	0.07%	0.05%
50	0.11%	0.07%
55	0.17%	0.10%
60	0.26%	0.15%

APPENDIX B – SUMMARY OF ASSUMPTIONS AND METHODS

Post-Retirement Disabled: Pub-2010 Teachers Disabled Annuitant Table projected forward generationally using mortality improvement scale MP-2020 (Updated effective June 30, 2022).

Sample mortality rates prior to improvement are as follows:

Age	Male	Female
45	1.01%	0.99%
50	1.61%	1.48%
55	2.11%	1.74%
60	2.50%	1.96%
65	3.04%	2.26%
70	3.90%	2.86%
75	5.19%	4.00%

2. Active Retirement Rates

The following rates of retirement are assumed for members eligible to retire with a reduced benefit (Updated effective June 30, 2022).

Defined Benefit Plan – Reduced Rates						
Age	Male	Female		Age	Male	Female
50-51	2.0%	2.0%		59	11.0%	10.0%
52	3.0%	3.0%		60	6.5%	9.0%
53	5.0%	5.0%		61	8.0%	10.0%
54	9.0%	9.0%		62	8.0%	11.0%
55	12.0%	13.0%		63	10.0%	12.0%
56-57	10.0%	11.0%		64	15.0%	25.0%
58	8.0%	10.0%				

APPENDIX B – SUMMARY OF ASSUMPTIONS AND METHODS

The following rates of retirement are assumed for members once they are eligible to retire with an unreduced benefit (Updated effective June 30, 2022).

Defined Benefit Plan – Unreduced Rates						
Age	Male	Female		Age	Male	Female
55	23%	18%		66	23%	28%
56	20%	20%		67	22%	26%
57	18%	20%		68	20%	25%
58	22%	22%		69	21%	25%
59	23%	26%		70-71	22%	25%
60	21%	28%		72	24%	25%
61-62	20%	28%		73	20%	25%
63	20%	30%		74	23%	28%
64	24%	30%		75+	100%	100%
65	28%	36%				

Combined Plan Retirement Rates		
Age	Male	Female
60	10%	10%
61-63	10%	15%
64	18%	20%
65	25%	30%
66	10%	25%
67-68	10%	15%
69-74	15%	15%
75	100%	100%

3. Inactive Vested Retirement Rates

5% at each early retirement age through age 64 and 100% at age 65, or the first age at which unreduced benefits are available. (The assumed rates were adopted effective June 30, 2017 and reaffirmed effective June 30, 2022.)

APPENDIX B – SUMMARY OF ASSUMPTIONS AND METHODS

4. Disability Rates

Select rates are shown below (Updated Rates effective June 30, 2022):

Age	Unisex Rates
Under 30	0.007%
30	0.007%
35	0.021%
40	0.035%
45	0.070%
50	0.126%
55	0.154%
60	0.175%
65 and Over	0.175%

5. Termination Rates

Termination rates based on service, for causes other than death, disability, or retirement (Updated Rates effective June 30, 2022).

Vested Terminations*		
Age	**Male**	**Female**
20	6.00%	6.00%
25	6.00%	6.00%
30	2.70%	3.55%
35	2.05%	2.00%
40	1.75%	1.40%
45	1.60%	1.25%
50	1.95%	1.60%
55	4.00%	3.60%
60	4.00%	3.60%

*Termination rates stop at first retirement eligibility.

Non-Vested Terminations		
Service	**Male**	**Female**
Under 1 Year	40.00%	35.00%
1 to 2 Years	16.00%	15.00%
2 to 3 Years	12.00%	8.00%
3 to 5 Years	9.00%	8.00%

APPENDIX B – SUMMARY OF ASSUMPTIONS AND METHODS

6. Percent Electing a Deferred Termination Benefit

80% of future terminating members of the Defined Benefit and Combined Plans are assumed to elect a deferred termination benefit. The remaining 20% are assumed to take an immediate lump-sum. (Updated effective June 30, 2022).

95% of current terminated vested members of the Defined Benefit and Combined Plans are assumed to elect a deferred termination benefit. The remaining 5% are assumed to take a lump-sum on the valuation date. (Updated effective June 30, 2022).

7. Percent Married:

For valuation purposes, 80% of male members and 60% of female members are assumed to be married. Male members are assumed to be three years older than their spouses, and female members are assumed to be one year younger than their spouses. (The assumed age difference adopted effective June 30, 2017 and reaffirmed effective June 30, 2022.)

8. Dependents for Survivor's Benefit

The spouse is the only assumed beneficiary for the survivor's benefit.

9. Missing Data

Where data was missing, the field was populated with the prior year's data, if available, or the average value of similar members.

10. Investment Return Rate

7.00% per annum, compounded annually and net of all expenses.

11. LDROM Discount Rate

3.91% per annum based on matching cash flows for the System against US Treasury securities.

APPENDIX B – SUMMARY OF ASSUMPTIONS AND METHODS

12. Salary Increase Rates

Total salary increases, as shown below for selected attained service (Updated effective June 30, 2022).

Service	Rate
<1	8.50%
1	8.20%
2	8.00%
3	7.00%
4	6.50%
5	6.30%
10	5.50%
15	4.50%
20	3.50%
25	3.00%
30+	2.50%

13. Payroll Growth Rates

3.00% per annum (Adopted effective June 30, 2017 and reaffirmed effective June 30, 2022).

14. Defined Contribution Plan

The Defined Contribution account balance is added to the Actuarial Liability and the Actuarial Value of Assets. If a member retires and elects to have the Defined Contribution Account balance paid as an annuity, then the account balance is transferred to the Defined Benefit Plan and the annuity is valued as part of the Defined Benefit Plan.

15. Changes in Assumptions Since Last Valuation

None.

16. Rationale for Assumptions

For rationale on the current assumptions, please refer to the Experience Study Report, dated March 11, 2022. In our professional judgment, the combined effect of the assumptions has no significant bias.

APPENDIX B – SUMMARY OF ASSUMPTIONS AND METHODS

B. Actuarial Methods

1. Actuarial Value of Assets

The Actuarial Value of Assets is based on the Market Value of Assets with a four-year phase-in of actual investment return in excess of (or less than) expected investment income. Expected investment income is determined using the assumed investment return rate and the Actuarial Value of Assets (adjusted for receipts and disbursements during the year). The actual investment return for this purpose is determined net of all investment and administrative expenses. The actuarial value is further adjusted, if necessary, to be within 9% of the market value.

2. Actuarial Funding Method

The funding method used for the valuation of both the Actuarial Liability and the LDROM liability is the Entry Age Normal (EAN) method. Under this funding method, a normal cost rate is determined as a level percentage of pay for each active participant. The normal cost rate multiplied by payroll equals the total normal cost for each participant. The normal cost contributions (Employer and Participant) will pay for projected benefits at retirement for each active participant.

The Actuarial Liability is the difference between the Present Value of Future Benefits and the Present Value of Future Normal Costs. The difference between this Actuarial Liability and the Actuarial Value of Assets is the Unfunded Actuarial Liability (UAL).

The portion of the actuarial liability in excess of plan assets, the UAL, is amortized to develop an additional cost that is added to each year's employer normal cost. Under this funding method, actuarial gains and losses are directly reflected in the size of the Unfunded Actuarial Liability. The amortization method is described below.

3. Amortization Method

The Actuarially Determined Contribution (ADC) is determined as the sum of (a) the employer normal cost rate, and (b) a level percentage of payroll required to amortize the Unfunded Actuarial Liability over the 30-year closed period that began July 1, 2015.

4. Disclosure Regarding Modeling

Cheiron utilizes ProVal, an actuarial valuation software leased from Winklevoss Technologies (WinTech) to calculate the liabilities, normal costs and projected benefit payments. We have relied on WinTech as the developer of ProVal. We have reviewed ProVal and have a basic understanding of it and have used ProVal in accordance with its original intended purpose. We are not aware of any material inconsistencies, unreasonable output resulting from the aggregation of assumptions, material limitations or known weaknesses that would affect this report.

APPENDIX B – SUMMARY OF ASSUMPTIONS AND METHODS

Projections in this report were developed using P-scan, our proprietary tool for the intended purpose of developing projections. The projections shown in this report cover multiple individual scenarios and the variables are not necessarily correlated. We are not aware of any material inconsistencies, unreasonable output resulting from aggregation of assumptions, material limitations or known weaknesses that would affect the projections shown in this report.

APPENDIX C – SUMMARY OF PLAN PROVISIONS

Defined Benefit Plan

1. Eligibility for Membership

Immediate upon commencement of employment

2. Service Retirement

Eligibility: Age 65 with five years of service, or age 55 with 25 years of service, or 30 years of service regardless of age. Age and service requirements increased effective August 1, 2015.

Effective July 1, 2023, service credit requirements for retirement with an unreduced benefit increased as follows:

Unreduced Benefit for Retirement Between:	Minimum Age and Years of Service
Through 7/1/2015	Any age and 30 years; or age 65 and 5 years
8/1/2015–7/1/2017	Any age and 31 years; or age 65 and 5 years
8/1/2017–7/1/2019	Any age and 32 years; or age 65 and 5 years
8/1/2019–7/1/2021	Any age and 33 years; or age 65 and 5 years
8/1/2021–7/1/2028	Any age and 34 years; or age 65 and 5 years
8/1/2028 and later	Any age and 35 years; or age 65 and 5 years

Amount: For members eligible to retire on or before July 1, 2015 (i.e., age 60 with 5 years of service, age 55 with 25 years of service, or 30 years of service regardless of age), the annual amount is equal to the greater of (a) 2.2% of final average salary for the three highest years of earnings, multiplied by years of total Ohio service credit, or 2.5% of final average salary for the three highest years of earnings if the member has 35 or more years of service credit, multiplied by years of total Ohio service credit up to 30 years of service. For years of Ohio contributing service credit in excess of 30 years, the following percentages will apply:

APPENDIX C – SUMMARY OF PLAN PROVISIONS

Years of Service	Percentage
31	2.5%
32	2.6
33	2.7
34	2.8
35	2.9
36	3.0
37	3.1
38	3.2
39	3.3

or (b) $86 multiplied by years of service credit.

Effective August 1, 2015, the annual amount is equal to 2.2% of final average salary for the five highest years of earnings, multiplied by all years of service.

For members who were eligible to retire on July 1, 2015, the annual amount is greater of:

a. the benefit amount calculated upon retirement under the new benefit formula, or
b. the benefit amount the member would have received if he/she retired on July 1, 2015.

Annual salary is subject to the limit under IRC Section 401(a)(17).

For retirements prior to August 1, 2015, if the member has less than 30 years of service at retirement and is younger than age 65, the following reduction factors apply:

Attained Age	or	Years of Ohio Service Credit	% of Base Amount
58		25	75%
59		26	80
60		27	85
61			88
		28	90
62			91
63			94
		29	95
64			97
65		30 or more	100

APPENDIX C – SUMMARY OF PLAN PROVISIONS

For retirements on or after August 1, 2015, the age and service credit requirements for an actuarially reduced benefit are as follows:

Actuarially Reduced Benefit for Retirement Between:	Minimum Age and Years of Service
Through 7/1/2015	Age 55 and 25 years; or age 60 and 5 years
8/1/2015–7/1/2017	Any age and 30 years; or age 55 and 26 years; or age 60 and 5 years
8/1/2017–7/1/2019	Any age and 30 years; or age 55 and 27 years; or age 60 and 5 years
8/1/2019–7/1/2021	Any age and 30 years; or age 55 and 28 years; or age 60 and 5 years
8/1/2021–7/1/2023	Any age and 30 years; or age 55 and 29 years; or age 60 and 5 years
8/1/2023 and later	Any age and 30 years; or age 60 and 5 years

The actuarially reduced benefit reflects a reduction for each year that the member retirees before meeting eligibility for an unreduced benefit.

The benefits as a percentage of final average salary, which reflect the early retirement reduction, are shown in the booklet entitled *Service Retirement and Plans of Payment for members enrolled in the Defined Benefit Plan 2017/2018.*

3. Disability Retirement

Eligibility: Membership before July 30, 1992, and election of this benefit, completion of five or more years of service, under age 60 and permanently incapacitated for the performance of duty.

Amount:

1. Annuity with a reserve equal to the member's accumulated contributions, plus

2. The difference between (1) and the greater of 2% of the average salary during the three highest years of earnings times total service plus years and months from date of disability to age 60. Maximum allowance is 75% of final average salary. Minimum allowance is 30% of final average salary.

APPENDIX C – SUMMARY OF PLAN PROVISIONS

4. Disability Allowance

Eligibility: Membership after July 29, 1992, or membership before July 30, 1992, and election of this benefit, completion of five or more years of qualifying service and permanently incapacitated for the performance of duty. For membership on and after July 1, 2013, completion of ten years of qualifying service and permanently incapacitated for the performance of duty.

Amount: The greater of 2.2% of the average salary times total service. Maximum allowance is 60% of final average salary. Minimum allowance is 45% of final average salary. The disability allowance payment terminates at age 65 (or later if payment begins after age 60). After termination of the disability allowance, the member may apply for service retirement.

5. Death after Retirement

Lump-sum payment of $1,000 upon death after service or disability retirement.

6. Survivor's Benefit

Eligibility: Upon death after at least 1½ years of service credit for Ohio service with at least 1/4 year of such service in the 2½ years preceding death or upon death of a disability retiree. For membership on or after July 1, 2013, upon death after at least five years of service credit for Ohio service and died not later than one year after the date service terminated.

Qualified survivors will receive the highest benefit from among the following for which they are eligible: dependent-based benefit, service-based benefit, and retirement-based benefit.

Qualified beneficiaries are the spouse, dependent children, and/or dependent parents over age 65.

Dependent-Based Benefit: Monthly survivor benefits are determined according to the number of qualified survivors. These benefits are payable as a percentage of final average salary. The percentages are as follows:

Number of Qualified Dependents	% of Final Average Salary
1	25%
2	40
3	50
4	55
5 or more	60

APPENDIX C – SUMMARY OF PLAN PROVISIONS

Service – Based Benefit: If a member has 20 or more years of service before death, monthly survivor benefits are determined according to the number of years of service credit. These benefits are payable as a percentage of final average salary. The percentages are as follows:

Years of Service	% of Final Average Salary
20	29%
21	33
22	37
23	41
24	45
25	48
26	51
27	54
28	57
29 or more	60

Retirement–Based Benefit: If a member dies after meeting service retirement eligibility, the monthly survivor benefit is determined as if the member had actually retired and provided a 100% Joint and Survivor benefit to the qualified survivor. Early retirement reduction applies if the member is not eligible for unreduced benefit.

The primary beneficiary may withdraw the deceased member's account in lieu of receiving monthly benefits if there are no children who are qualified survivors.

7. Lump - Sum Withdrawal Option

In lieu of any other pension or survivor benefits, a member who leaves the System can receive his/her member contributions with interest in a lump-sum according to the following schedule:

Credit Service	Lump-Sum
Less than 3 Years	Member Contributions with 2% Interest
3 or More Years and Less than 5 Years	Member Contributions with 3% Interest
5 Years or More	150% of Member Contributions with 3% Interest

The Board has the authority to modify the interest credited to member contributions.

APPENDIX C – SUMMARY OF PLAN PROVISIONS

8. Plans of Payments

Benefits can be paid under the following forms of payment:

- Single Life Annuity;
- Joint and Survivor Annuity -100%, 50% or other; with or without reversion to Single Life Annuity; with one or multiple beneficiaries;
- Annuity certain and;
- Partial lump-sum option – from six to 36 times the monthly Single Life Annuity as a lump-sum with the remainder as an annuity.

9. Cost-of-Living Benefits

The benefit is increased each year by 2% of the base benefit. For members retiring on or after August 1, 2013, the 2% COLA would be paid beginning on the fifth anniversary of the retirement benefit. Future annual increases are calculated on the base benefit and are not compounded.

Effective July 1, 2017, the COLA has been reduced to zero.

Effective July 1, 2022, a one-time ad-hoc COLA of 3% of the base benefit was granted to eligible benefit recipients to begin on the anniversary of their retirement benefit in fiscal year 2023 as long as they retired prior to July 1, 2018.

Effective July 1, 2023, a one-time ad-hoc COLA of 1% of the base benefit was granted to eligible benefit recipients to begin on the anniversary of their retirement benefit in fiscal year 2024 as long as they retired prior to July 1, 2019.

10. Contributions

By Members:	14% of salary.
By Employers:	14% of salaries of their employees who are members.
Rehired Retirees:	Rehired retirees who return to employment after retirement and their employers both contribute to the System. These contributions fund an additional benefit payable after termination of employment. The contributions and interest are paid as a lump-sum or converted to an additional annuity.

Combined Plan

1. Eligibility for Membership

New members hired on or after July 1, 2001, may elect in writing to participate in the Combined Plan.

2. Service (Normal) Retirement

Eligibility:	Age 60 with five years of service.
Amount:	The balance in the member's Defined Contribution account plus an annual amount equal to 1% of final average salary for the three highest paid years multiplied by years of total Ohio service credit. Effective August 1, 2015, final average salary will be average of the member’s five highest salary years. Annual salary is subject to the limit under IRC Section 401(a)(17).

3. Early Retirement

Eligibility:	Before age 60 with five years of service
Amount:	The normal retirement benefit commencing at age 60. At age 50 or later, a member who elects to withdraw the full value of the member's Defined Contribution account may receive the withdrawal value of the formula benefit in a single sum, or leave the formula benefit on account for a benefit payable at age 60.

4. Vesting

Eligibility:	Completion of five years of service credit for the Defined Benefit portion. Member contributions and earnings are 100% vested at all times.
Amount:	A member who terminates with five or more years of service credit can receive the actuarial equivalent present value of the Defined Benefit formula. Prior to age 50, a withdrawal must include both the Defined Benefit and Defined Contribution portions of the account.

APPENDIX C – SUMMARY OF PLAN PROVISIONS

5. Late Retirement

Eligibility: After age 60 with five years of service.

Amount: The formula benefit described in the normal retirement section based on service credit and final average salary at termination without any actuarial adjustments.

6. Disability Allowance

Eligibility: Completion of five or more years of service and permanently incapacitated for the performance of duty. For membership on or after July 1, 2013, completion of ten years of qualifying service credit with STRS Ohio.

Amount: Members have the option of receiving disability benefits under the disability allowance program of the Defined Benefit Plan. All contributions and investment gains in the member's Defined Contribution account are used to fund the benefit. At age 65, the disability allowance converts to a service retirement benefit based on the 2.2% formula. Alternatively, the member can withdraw his/her Defined Contribution account in lieu of receiving the disability allowance.

7. Survivor's Benefit

Eligibility: Upon death after at least 1½ years of credit for Ohio service with at least 1/4 year of such service in the 2½ years preceding death or upon death of a disability retiree. For membership on or after July 1, 2013, upon death at least five years of qualifying service credit.

Amount: Qualified survivors have the option of receiving dependent-based, service-based, or retirement-based benefits described under the Defined Benefit plan. Both employer contributions and the member's contributions and any investment gains in the member's Defined Contribution account are used to fund the benefit. Survivors also have the option to withdraw the Defined Contribution and Defined Benefit portions of the Combined Plan account in lieu of receiving a monthly benefit.

APPENDIX C – SUMMARY OF PLAN PROVISIONS

8. Forms of Payment of Defined Benefit Portion

If the member withdraws his/her Defined Contribution account prior to age 50, then the formula Defined Benefit must be paid in a lump-sum. If the member is at least age 50, then the benefit can be paid as a Single Life Annuity, a Joint and Survivor Annuity as described under the Defined Benefit Plan, or as a lump-sum. All alternative forms of payment are the actuarially equivalent of the Single Life Annuity benefit payable at age 60.

9. Forms of Payment of Member's Defined Contribution Account

If the member withdraws his/her Defined Contribution account prior to age 50, then the account must be paid in a lump-sum. If the member is at least age 50, then the member can elect that the actuarial equivalent of the Defined Contribution account be paid as a Single Life Annuity or a Joint and Survivor Annuity as described under the Defined Benefit plan.

10. Cost-of-Living Benefits

Not available on the service retirement benefit. For disability and survivor benefits, the basic benefit is increased by the increase in the Consumer Price Index each year, but not to exceed 2% of the original base benefit. Effective July 1, 2017, the COLA has been reduced to zero.

11. Contributions

By Members:	14% of salary. 12.0% of salary is deposited into the member's Defined Contribution account and 2.0% is applied to the Defined Benefit portion of the Combined Plan.
By Employers:	14% of salary is used to fund the Defined Benefit formula.

APPENDIX C – SUMMARY OF PLAN PROVISIONS

Defined Contribution Plan

1. Eligibility for Membership

New members hired on or after July 1, 2001, may elect in writing to participate in the Defined Contribution Plan.

2. Service (Normal) Retirement

Eligibility:	Termination after age 50.
Amount:	The balance in the member’s Defined Contribution account.

3. Early Retirement

Eligibility:	Termination before age 50.
Amount:	The balance in the member's Defined Contribution account.

4. Vesting

Eligibility:	Members become vested at a rate of 20% per year in employer contributions and all gains and losses on those contributions. Member contributions and earnings are 100% vested immediately.
Amount:	The balance in the member's Defined Contribution account.

5. Disability Allowance

Eligibility:	Permanently incapacitated for the performance of duty and termination of employment.
Amount:	The balance in the member's Defined Contribution account. At age 50, other payment options are available, but employment must first be terminated.

6. Survivor’s Benefit

Eligibility:	Upon death.
Amount:	The balance in the member's Defined Contribution account. A spouse may either continue to manage the member's Defined Contribution account or withdraw the account.

APPENDIX C – SUMMARY OF PLAN PROVISIONS

7. Optional Forms of Payment

The actuarial equivalent of the member's Defined Contribution account can be paid on or after age 50 as a Single Life Annuity or as a Joint and Survivor Annuity as described in the Defined Benefit Plan.

8. Cost-of-Living Benefits

Not available.

9. Contributions

By Members:	14% of salary is deposited into the member's Defined Contribution account.
By Employers:	Effective July 1, 2022, 11.09% of salary is deposited into the member's Defined Contribution account. 2.91% of salaries are used to amortize the Unfunded Actuarial Liability of the Defined Benefit Plan. In addition, 2.91% of salary of the salaries of Alternative Retirement Plan members is used to fund the Unfunded Actuarial Liability of the Defined Benefit Plan.

APPENDIX D – GLOSSARY OF TERMS

Funding

1. **Actuarial Assumptions**

   Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disability, and retirement; changes in compensation; inflation; rates of investment earnings, and asset appreciation or depreciation; and other relevant items.

2. **Actuarial Cost Method**

   A procedure for determining the Actuarial Present Value of pension plan benefits and expenses and for developing an allocation of such value to each year of service, usually in the form of a normal cost and an Actuarial Liability.

3. **Actuarial Gain/(Loss)**

   A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions during the period between two Actuarial Valuation dates, as determined in accordance with a particular actuarial cost method.

4. **Actuarial Liability**

   The portion of the Actuarial Present Value of Projected Benefits which will not be paid by future normal costs. It represents the value of the past normal costs with interest to the valuation date.

5. **Actuarial Present Value (Present Value)**

   The value as of a given date of a future amount or series of payments. The Actuarial Present Value discounts the payments to the given date at the assumed investment return and includes the probability of the payment being made. As a simple example: assume you owe $100 to a friend one year from now. Also, assume there is a 1% probability of your friend dying over the next year, in which case you will not be obligated to pay him. If the assumed investment return is 10%, the Actuarial Present Value is:

Amount		Probability of Payment		1/(1+Investment Return)	
$100	x	(1 - .01)	x	1/(1+.1)	= $90

6. **Actuarial Valuation**

   The determination, as of a specified date, of the normal cost, Actuarial Liability, Actuarial Value of Assets, and related \ for a pension plan.

APPENDIX D – GLOSSARY OF TERMS

7. **Actuarial Value of Assets**

   The value of cash, investments and other property belonging to a pension plan as used by the actuary for the purpose of an actuarial valuation. The purpose of an Actuarial Value of Assets is to smooth out fluctuations in market values. This way long-term costs are not distorted by short-term fluctuations in the market.

8. **Actuarially Equivalent**

   Of equal Actuarial Present Value, determined as of a given date with each value based on the same set of actuarial assumptions.

9. **Amortization Payment**

   The portion of the pension plan contribution which is designed to pay interest and principal on the Unfunded Actuarial Liability in order to pay for that liability in a given number of years.

10. **Entry Age Normal Actuarial Cost Method**

    A method under which the Actuarial Present Value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis over the earnings of the individual between Entry Age and assumed exit ages.

11. **Funded Percentage**

    The ratio of the Actuarial Value of Assets to the Actuarial Liabilities.

12. **Investment Return Assumption**

    The assumed interest rate used for projecting dollar related values in the future.

13. **Mortality Table**

    A set of percentages which estimate the probability of death at a particular point in time. Typically, the rates are annual and based on age and sex.

14. **Normal Cost**

    That portion of the Actuarial Present Value of pension plan benefits and expenses, which is allocated to a valuation year by the actuarial cost method.

APPENDIX D – GLOSSARY OF TERMS

15. Projected Benefits

Those pension plan benefit amounts which are expected to be paid in the future under a particular set of actuarial assumptions, taking into account such items as the effect of advancement in age and increases in future compensation and service credits.

16. Unfunded Actuarial Liability

The excess of the Actuarial Liability over the Actuarial Value of Assets.

GASB

1. Actuarially Determined Contribution

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

2. Actuarial Valuation Date

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

3. Deferred Inflow of Resources

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

4. Deferred Outflow of Resources

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

APPENDIX D – GLOSSARY OF TERMS

5. **Entry Age Actuarial Cost Method**

   The actuarial cost method required for GASB 67 and 68 calculations. Under this method, the Actuarial Present Value of the Projected Benefits of each individual included in an actuarial valuation is allocated on a level basis over the earnings of the individual between Entry Age and assumed exit ages. The portion of this Actuarial Present Value allocated to a valuation year is called the service cost. The portion of this Actuarial Present Value not provided for at a valuation date by the Actuarial Present Value of future service costs is called the Total Pension Liability.

6. **Measurement Date**

   The date as of which the Total Pension Liability and Plan Fiduciary Net Position are measured. The Total Pension Liability may be projected from the actuarial valuation date to the measurement date. The measurement date must be the same as the reporting date for the Plan.

7. **Net Pension Liability**

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

8. **Plan Fiduciary Net Position**

   The fair or Market Value of Assets.

9. **Reporting Date**

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

10. **Service Cost**

    The portion of the Actuarial Present Value of Projected Benefit payments that is attributed to the current period of employee service in conformity with the requirements of GASB 67 and 68. The service cost is the normal cost calculated under the Entry Age actuarial cost method.

11. **Total Pension Liability**

    The portion of the Actuarial Present Value of Projected Benefit payments that is attributed to past periods of employee service in conformity with the requirements of GASB 67 and 68. The Total Pension Liability is the Actuarial Liability calculated under the Entry Age actuarial cost method. This measurement generally is not appropriate for estimating the cost to settle the Plan's liabilities.