State Teachers Retirement System of Ohio

Actuarial Valuation Report as of June 30, 2022

Produced by Cheiron

October 2022

Classic Values, Innovative Advice

Celebrating 20 years

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Classic Values, Innovative Advice

October 20, 2022

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, 2022 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 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. 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.

We certify that the valuation was performed in accordance with generally accepted actuarial principles and practices. 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.

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
  - Schedule of Valuation Data – Active Members
  - Schedule of Valuation Data – Retirees/Beneficiaries
  - Benefit Recipients Added to and Removed from the Rolls
  - Solvency Test
  - Analysis of Financial Experience
- Statistical
  - Actuarial Funded Ratio & Funding Period
  - Selected Funding Information – Defined Benefit Plan

Celebrating 20 years

- 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.

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

This report was prepared for 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

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

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

Bonnie Rightnour, FSA, 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, 2022 Actuarial Valuation is as follows:

- The Unfunded Actuarial Liability (UAL) decreased from $20.8 billion as of June 30, 2021 to $20.1 billion as of June 30, 2022.
- 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 11.5 years.
- The STRS Ohio funded ratio, the ratio of the Actuarial Value of Assets over Actuarial Liabilities increased from 80.1% as of June 30, 2021 to 80.9% as of June 30, 2022.
- Demographic assumptions were reviewed and adopted by the Board on February 17, 2022 as part of an experience study performed (report dated and accepted March 11, 2022) covering the period from July 1, 2015 through June 30, 2021, with changes going into effect June 30, 2022. The result of the assumption changes decreased liabilities by $ 2.7 billion.
- The Board approved a one-time 3% COLA effective on the anniversary of a benefit recipient's retirement date for those eligible during Fiscal Year 2023 and eliminated the age 60 requirement to receive unreduced retirement that was scheduled to go into effect August 1, 2026. The result of these plan changes increased liabilities by $ 2.3 billion.

SECTION I – BOARD SUMMARY

- There was a net actuarial experience loss of $ 0.4 billion and a composite loss of $ 0.1 billion when factoring in the assumption changes and plan changes.
  - During the year ending June 30, 2022, the Plan's assets earned -5.40% (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 6.83% (as compared to 7.00% assumed for the fiscal year ending June 30, 2022). This resulted in an actuarial loss on investments of $ 136 million.
  - On the liability side, the Plan experienced an actuarial experience loss of $ 278 million.
  - Combining both the investment loss and liability loss, the Plan experiences a net experience loss of $ 414 million.

We have incorporated a Plan Design Lever Analysis as Section VIII to this report to allow the Board and its actuary 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 in concurrent with the economic assumption analysis.

SECTION I – BOARD SUMMARY

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, 2022			June 30, 2021	%
	Defined Benefit	Combined	Total	Total	change
Counts					
Active Members					
(i) Defined Benefit	166,695	7,341	174,036	166,427	4.57%
(ii) Defined Contribution			10,829	9,940	8.94%
Reemployed Retirees	17,110	-	17,110	17,734	(3.52%)
Inactive Members					
(i) Eligible for Allowances	19,554	708	20,262	20,513	(1.22%)
(ii) Eligible for Refunds Only	142,749	1,697	144,446	143,708	0.51%
(iii) Defined Contribution			5,420	5,443	(0.42%)
Retirees and Beneficiaries	155,745	480	156,225	156,921	(0.44%)
Total	**501,853**	**10,226**	**528,328**	**520,686**	1.47%
Total Payroll					
(i) Defined Benefit Plan Members	$ 11,742,724,530	$ 481,712,996	$ 12,224,437,526	$ 11,610,016,164	5.29%
(ii) Defined Contribution Plan Members			552,902,374	491,553,457	12.48%
(iii) Alternative Retirement Plan Members			847,518,623	828,273,857	2.32%
Total			$ 13,624,858,523	$ 12,929,843,478	5.38%
Annual Allowances	$ 7,160,762,541	$ 7,164,302	$ 7,167,926,843	$ 7,009,420,670	2.26%
Assets and Liabilities					
Actuarial Liability (AL)[1]	$ 104,787,460,865	$ 476,863,920	$ 105,264,324,785	$ 104,591,406,376	0.64%
Actuarial Value of Assets (AVA)			85,141,845,586	83,761,394,182	1.65%
Unfunded Actuarial Liability (UAL)			$ 20,122,479,199	$ 20,830,012,194	(3.40%)
Funded Ratio (AVA basis)			80.9%	80.1%	
Market Value of Assets (MVA)			$ 83,034,198,764	$ 91,805,507,590	(9.55%)
Funded Ratio (MVA basis)			78.9%	87.8%	
Funding Period			11.5 years	14.0 years	(17.74%)
Contribution Rates			**Fiscal Year 2022**	**Fiscal Year 2021**	
Normal Cost	10.86%	4.58%	10.61%	11.76%	(9.80%)
Unfunded Actuarial Accrued Liability	17.14%	11.42%	16.91%	15.77%	7.22%
Total Contribution Rate	28.00%	16.00%	27.52%	27.53%	(0.05%)
Allocation of Total Contribution Rate					
Total Employer Pension Contribution	14.00%	14.00%	14.00%	14.00%	0.00%
Member Contribution Rate	14.00%	2.00%	13.52%	13.53%	(0.11%)

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

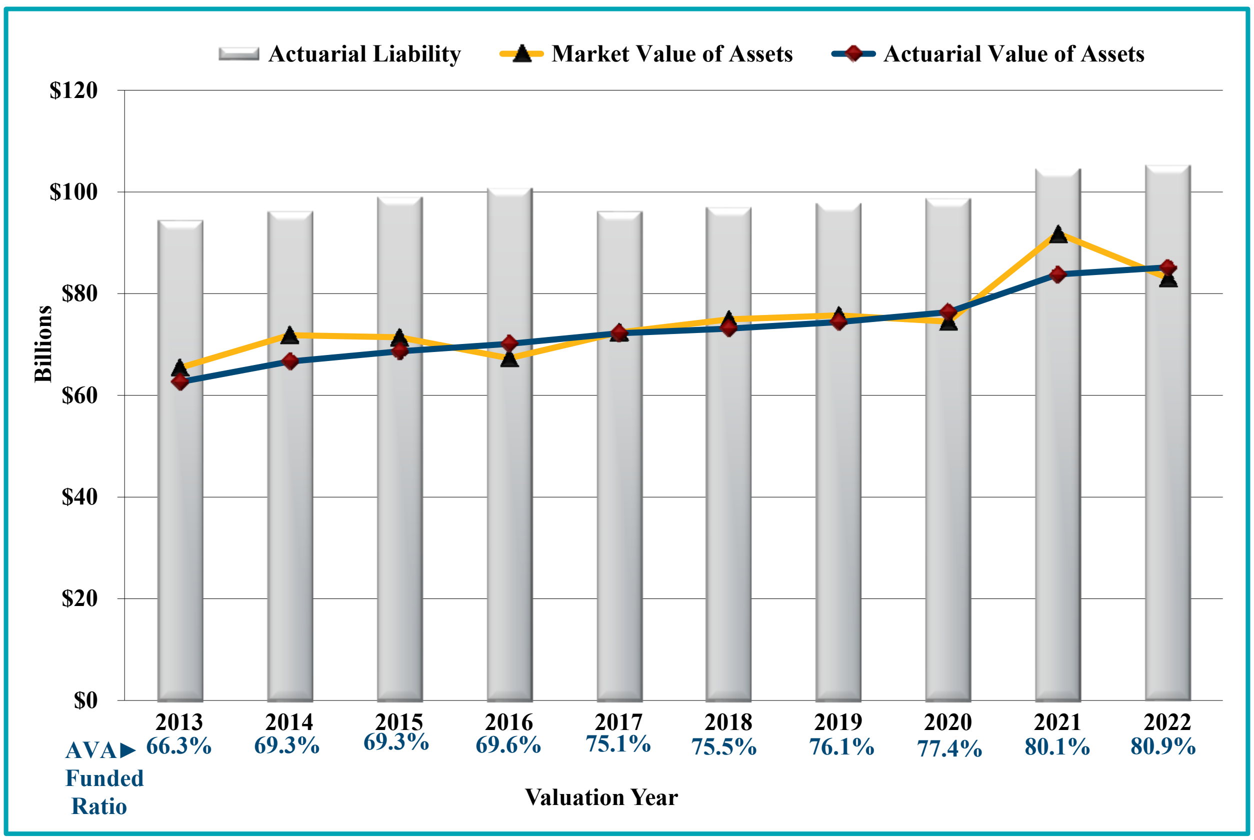
Historical Trends

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

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 2013, 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% in 2017. The increase in liability shown in 2021 is largely attributable to the change in the discount rate from 7.45% to 7.00%. In 2022 the liabilities reflect both the changes to assumptions and the one-time 3% COLA. The Plan experienced unfavorable investment experience during the 2022 fiscal year, which offset the favorable investment experience during the 2021 fiscal year, and the funded ratio increased only slightly.



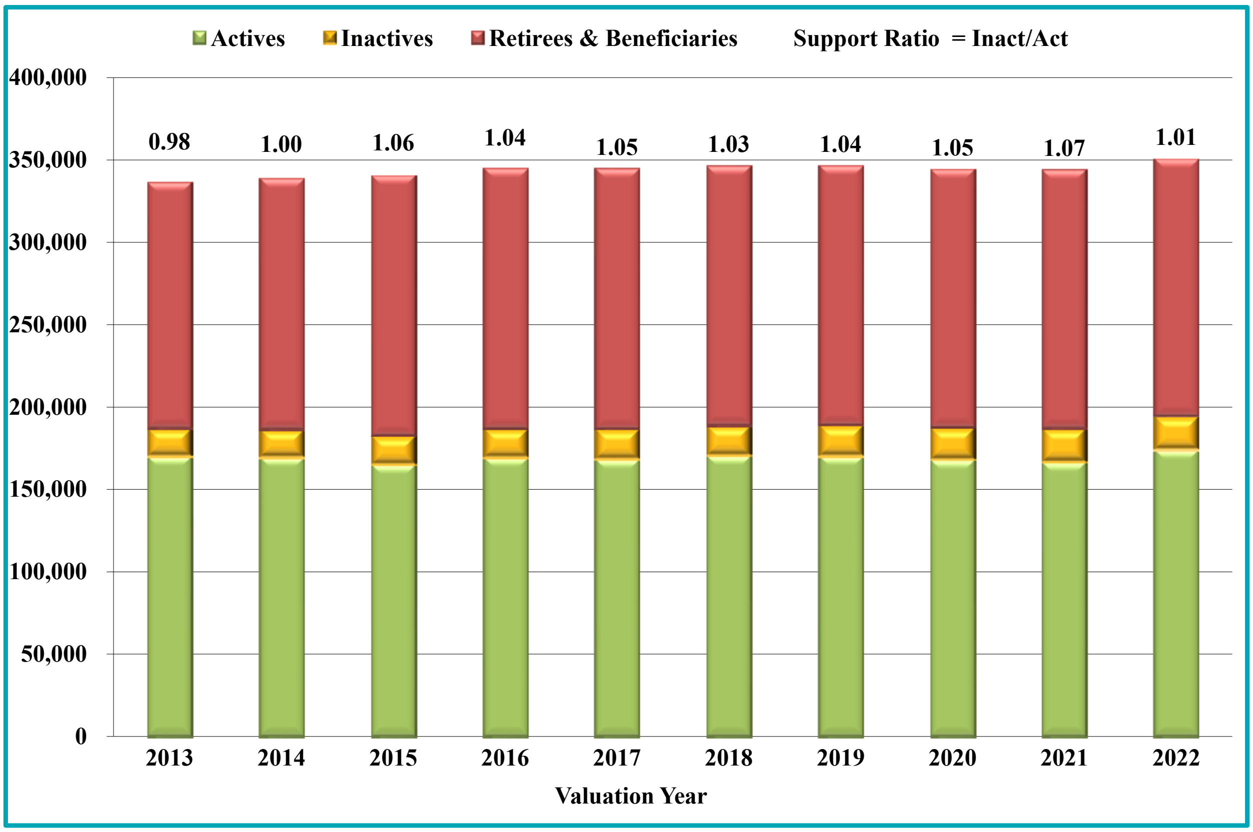
SECTION I – BOARD SUMMARY

Participant Trends

The chart below shows the membership counts of the Plan at successive valuations. The numbers which appear above each bar represent the ratio of the number 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 contribution increases.

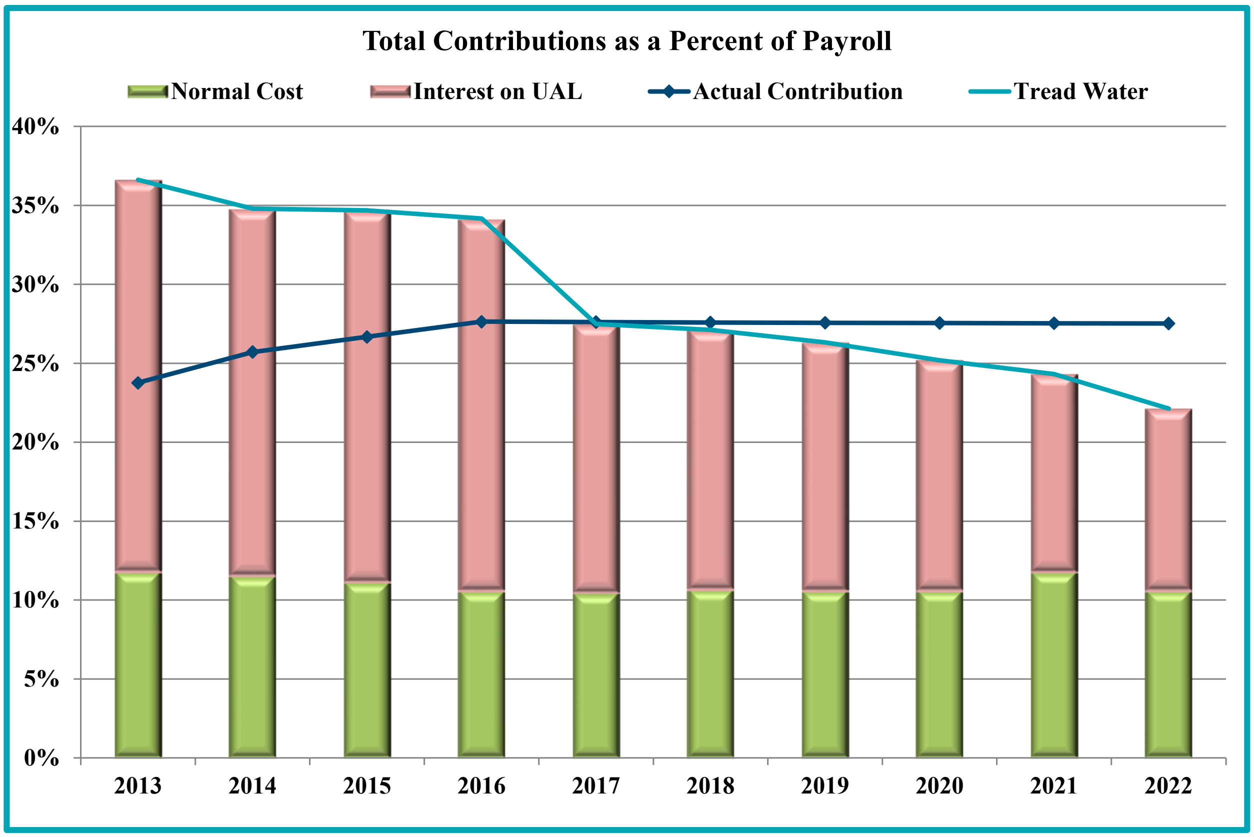
The support ratio had been generally flat from 2013 to 2021. The ratio had a notable decrease in 2022 to 1.01 due to an increase in the active population.



Contributions versus Tread Water

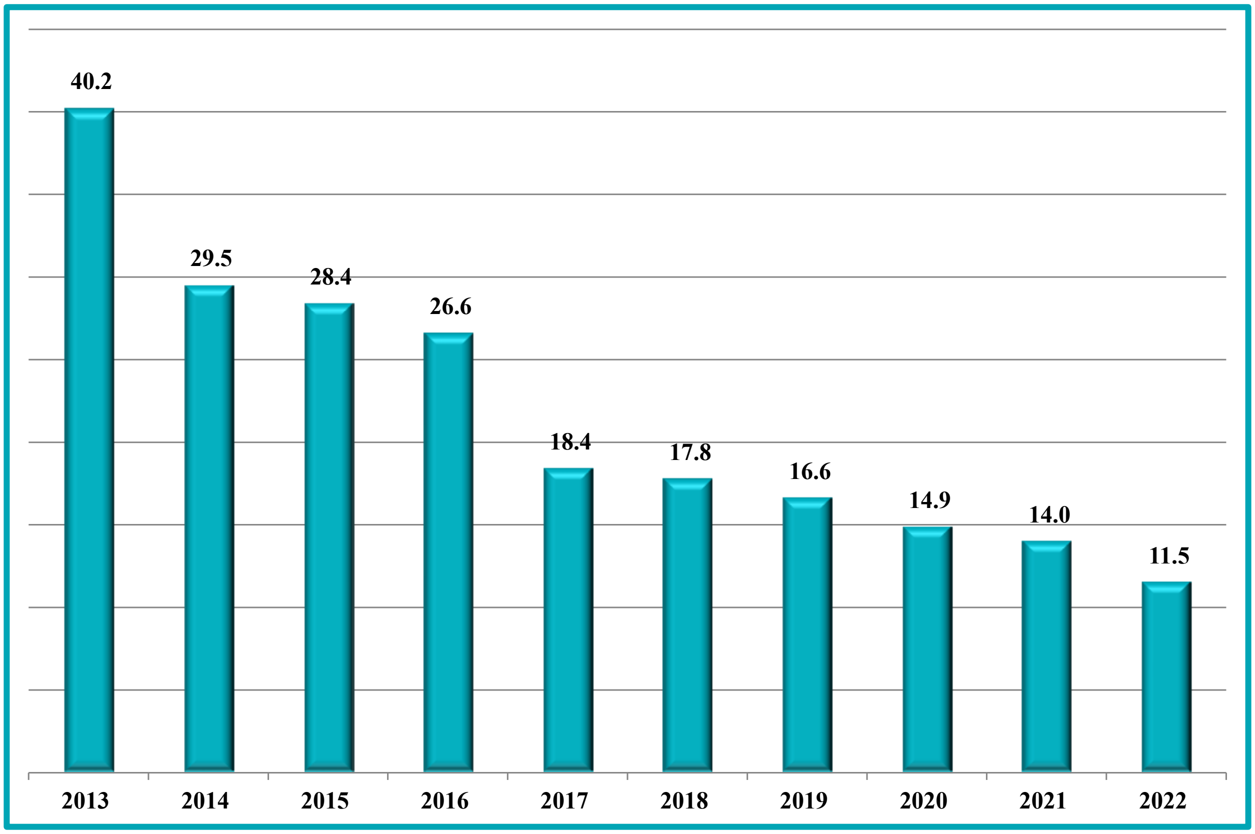
The next chart compares the fixed employer contribution rate to a rate we refer to as the tread water rate. The tread water rate is that rate of payroll which, if contributed, would result in the UAL remaining the same in the following year if all experience exactly matched the assumptions. The tread 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 in the chart was well below the tread water rate prior to 2017. Then, starting in 2017, the fixed employer contribution rate has exceeded the tread water rate and the excess has continued to grow slightly the past five years 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. Since 2013 the effective amortization period has been steadily decreasing. The pension reform changes in 2014 and 2017 have contributed to the decrease in the amortization period.



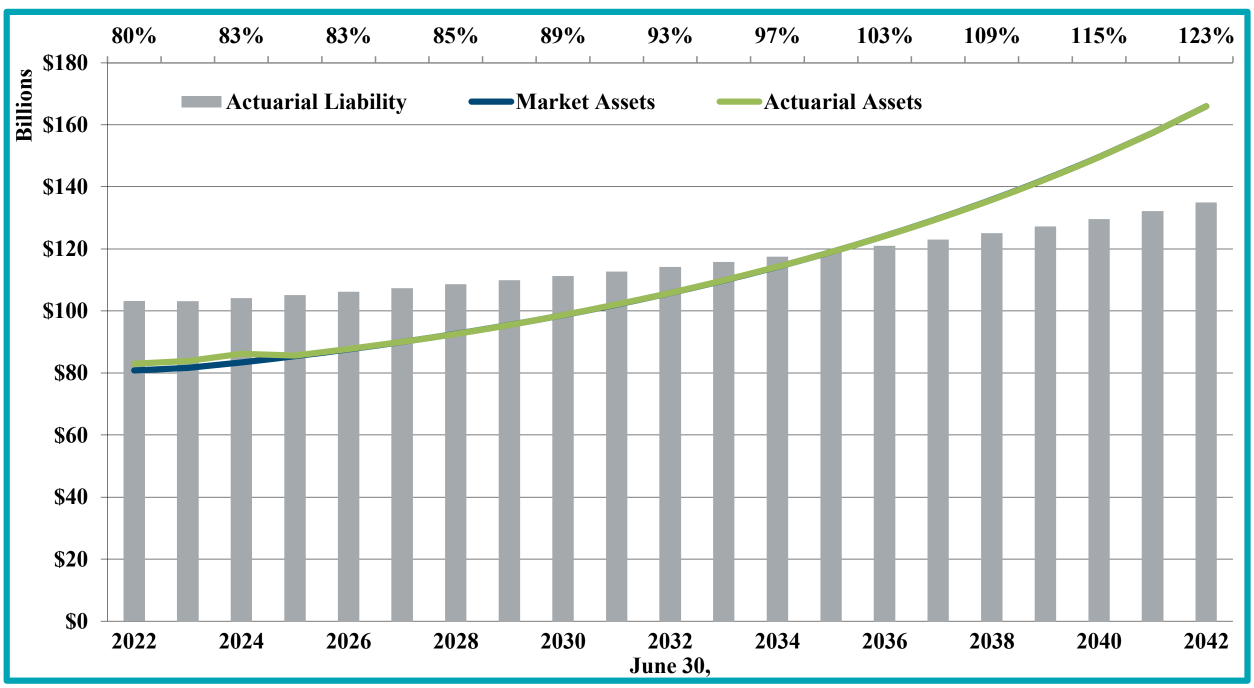
Future Expected Financial Trends

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. Our baseline projection that follows 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 80% to 123% by the 2042 valuation and is projected to reach 100% funded in 2035. The current funded ratio of 80% differs from that shown in Table I-1 because these projections do not include Defined Contribution account balances.

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 which follows, we show several projections of the plan'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 pension 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.

SECTION II – DISCLOSURES RELATED TO RISK

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.

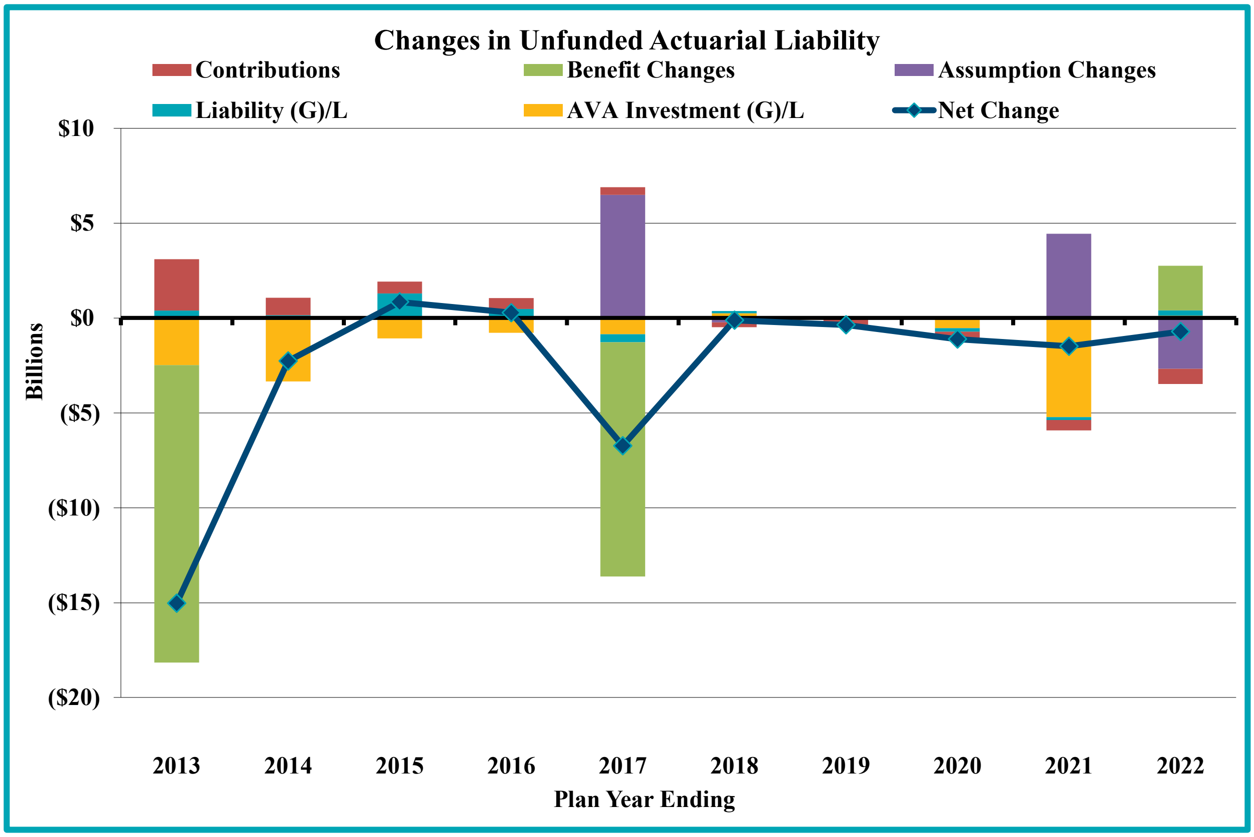
Contribution Risk is the potential for actual future contributions to deviate from expected future contributions, or that the anticipated contributions will be inadequate to fund the Plan benefits. There are different sources of contribution risk ranging from the sponsor choosing to not make contributions 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. An experience study was performed before this year's valuation which modified many assumptions. 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.

SECTION II – DISCLOSURES RELATED TO RISK

Historical Review

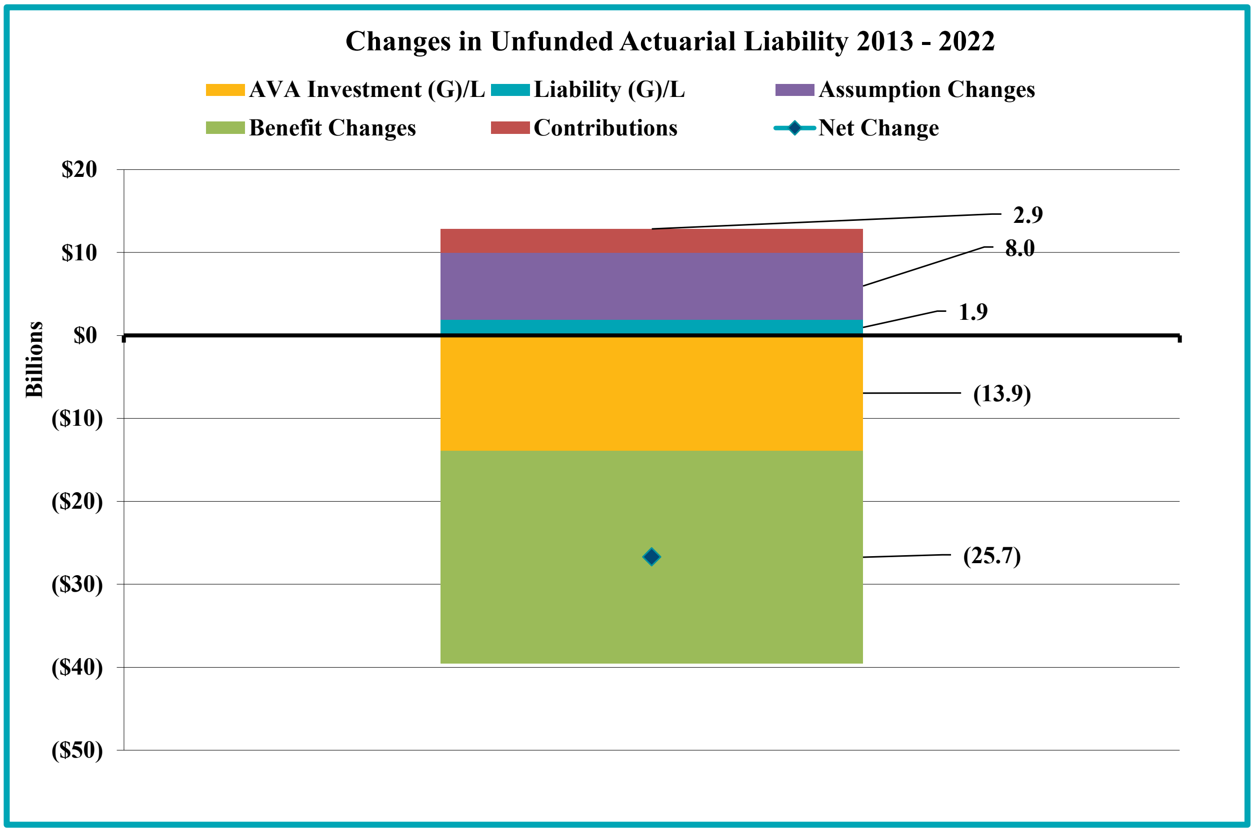
In understanding the impact of some of these risks, it is useful to look at what factors contributed to the Plan's changes in Unfunded Actuarial Liability (UAL). These factors consist of annual actuarial experience gains and losses, assumption changes, benefit changes, and contribution shortfalls or excesses. The following chart shows how these factors have contributed, at each valuation date, to the change in the Plan's UAL.



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. The next two most significant factors are the investment gains and losses and the fixed contribution shortfalls or excesses.

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, benefit changes and investment gains served to decrease the Unfunded Actuarial Liability by $39.6 billion while contribution shortfalls, assumption changes, and liability losses served to increase the Unfunded Actuarial Liability by $12.8 billion, resulting in a net reduction in the UAL of $26.8 billion over this period. This decrease in the UAL from 2013 to 2022 has resulted in a decrease in the funding period from 2013 to 2022 as well as improvement of the funded status.

SECTION II – DISCLOSURES RELATED TO RISK

Plan Maturity Measures

As pension plans become more mature, the identified risks become of more significant concern. As a result, it has become increasingly 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

One of the more important plan maturity measures 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 percent of payroll. The following example demonstrates this.

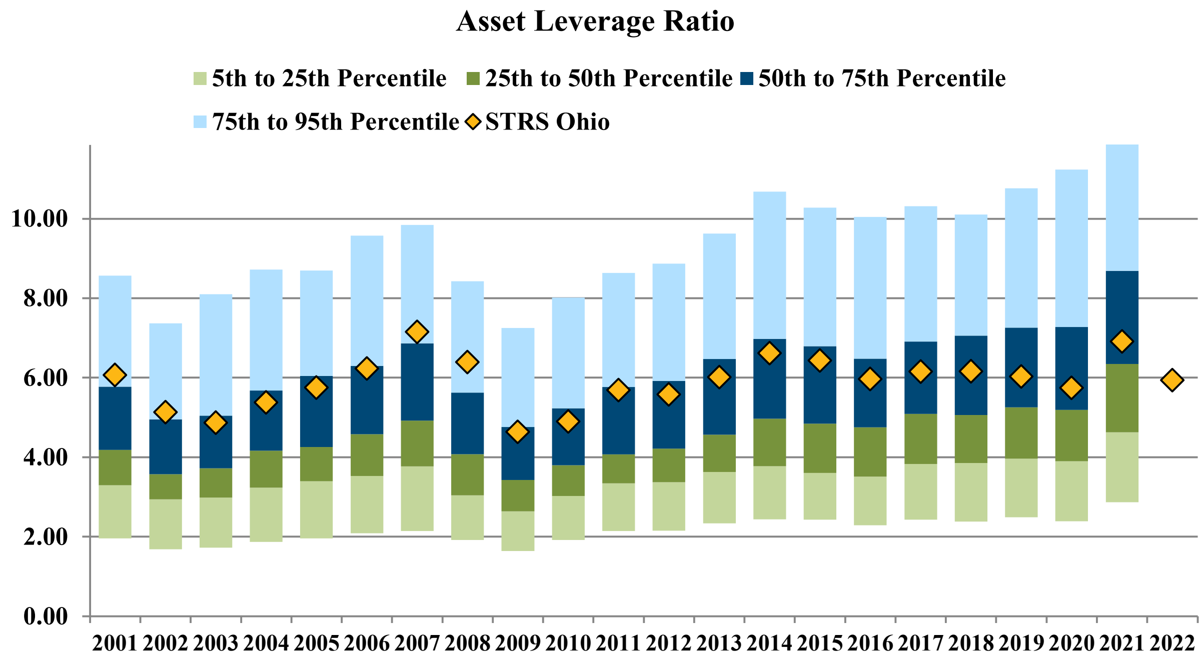
($ in millions)		
	Plan A	**Plan B**
Plan Assets	$ 5,000	$ 5,000
Payroll	$500	$1000
Asset Leverage Ratio	10.0	5.0
10% Investment Loss	$500.0	$500.0

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 on-going 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 indication as to how the much 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.

SECTION II – DISCLOSURES RELATED TO RISK

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. The public plan data for FY22 is not available at this time but you can see a decrease in the ratio for STRS Ohio based on this valuation. This is a result of the low investment returns experienced by the Plan and we would anticipate a similar decrease for most plans in the database.



Survey Data from Public Plans Data as of 7/21/2022

Net Cash Flow Ratio

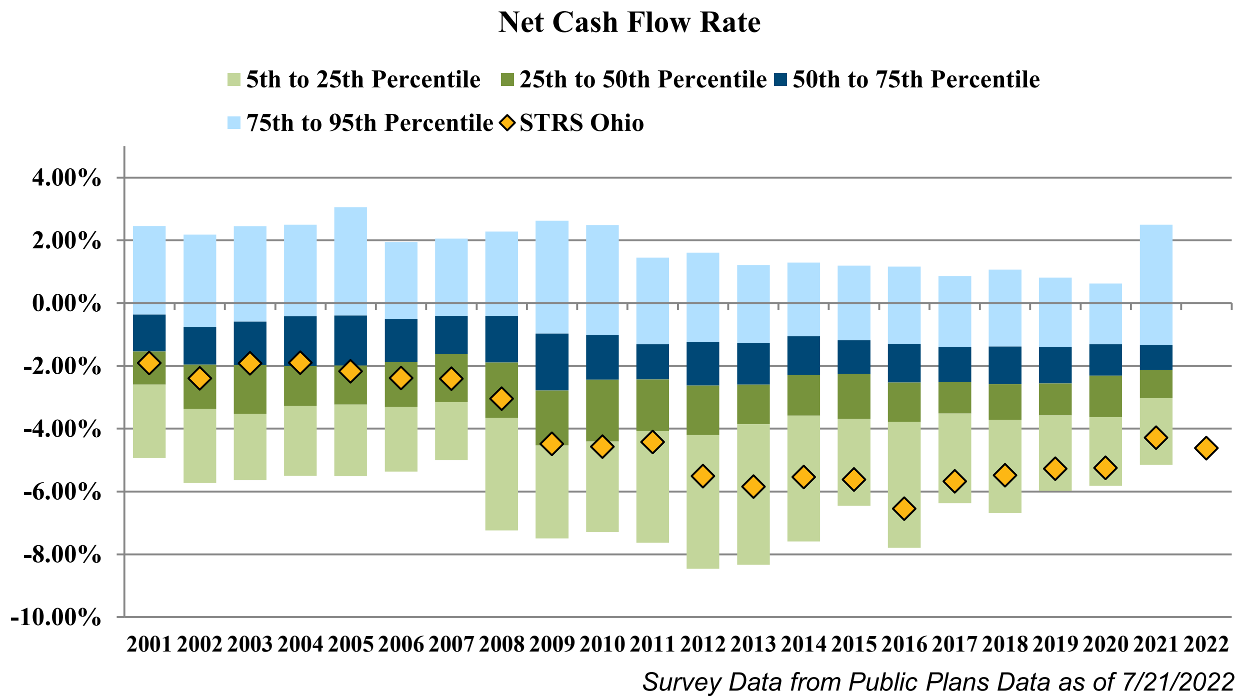
Another measure of plan maturity is the ratio of the net cash flow (contributions minus benefits and expenses) divided by the market value of plan assets. With shrinking workforces, aging Baby Boomers, and increasing life expectancies, plans pay out more in benefits than they receive in contributions,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

When plans with negative net cash flows suffer investment losses, they need to liquidate assets to pay for 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 from 2001 through 2021. In 2020 STRS Ohio's negative cash flow was -5.2% which

SECTION II – DISCLOSURES RELATED TO RISK

places the Plan in the bottom quartile of the Public Plan database. This demonstrates that on this measure STRS Ohio is maturing at a pace faster than other large public pension plans. Due to the higher market values in 2021, the negative cash flow increased to -4.2% but due to the low investment returns in 2022 has increased to -4.6%. When the data becomes available, we anticipate other plans will have similar movements.



SECTION II – DISCLOSURES RELATED TO RISK

Assessment of Future Risks

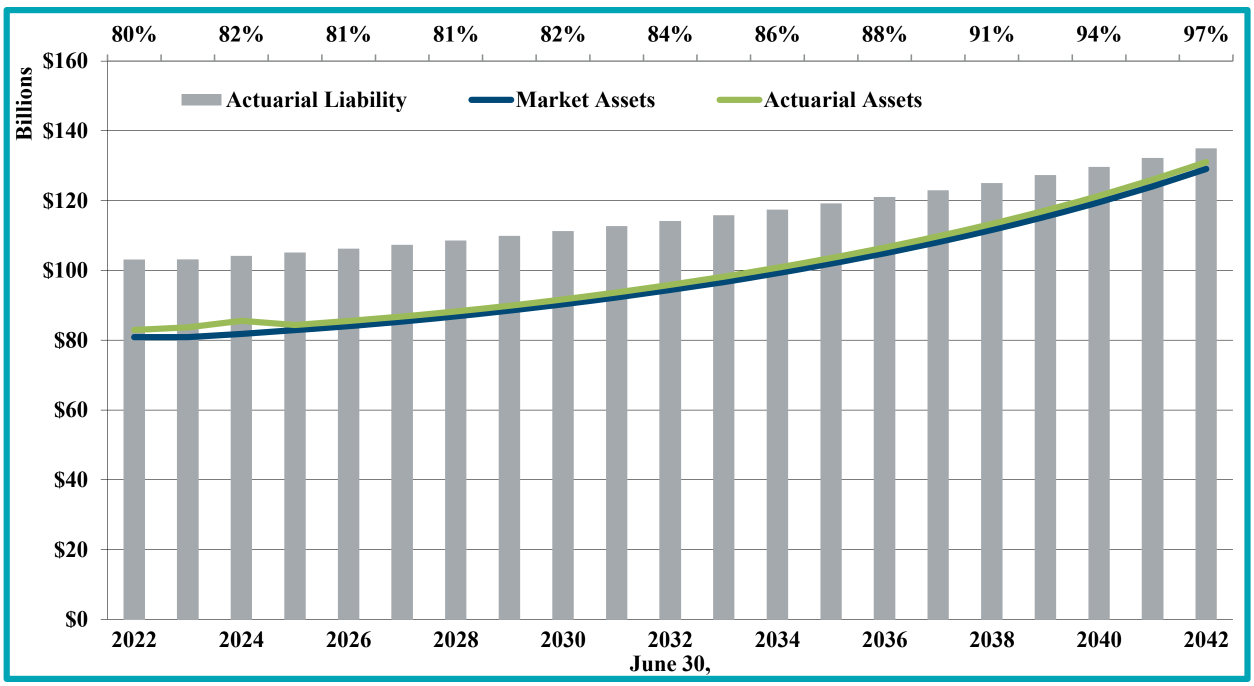
The fundamental risk to the Plan is that contributions will not adequately fund Plan benefits. In assessing this risk, we perform stress testing on the Plan's funded status and contribution adequacy.

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.

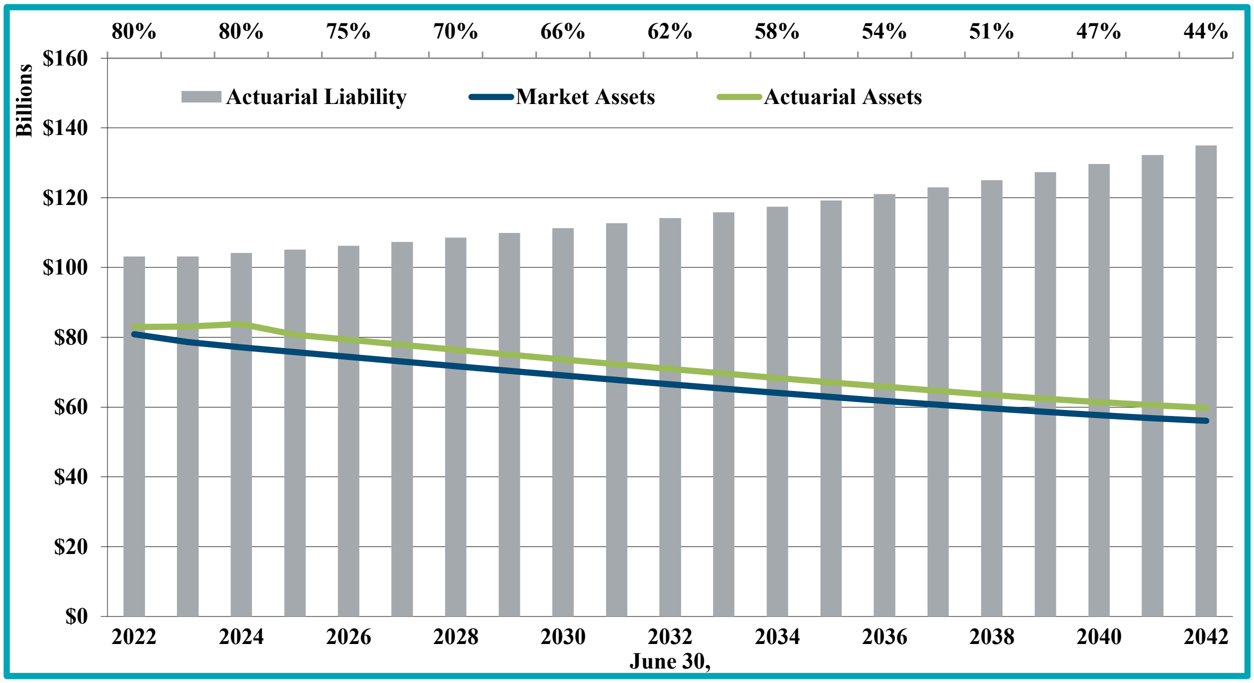
In Callan's March 2022 Capital Market Assumptions report, they reported a 10-year median expected return of 6.0%, a 25th percentile return of 3.1% and 75th percentile return of 8.9%. The following three graphs project returns using these expectations for the next 20 years and can be compared with the baseline projection graph shown on page 8 to provide a sense of the risk associated with investment returns.

If we assume the median 6.0% return on the Market Value of Assets instead of the 7.0% assumption for our 20-year projection, the funded ratio in 2042 is expected to be 97% compared to 123% in the baseline projection.

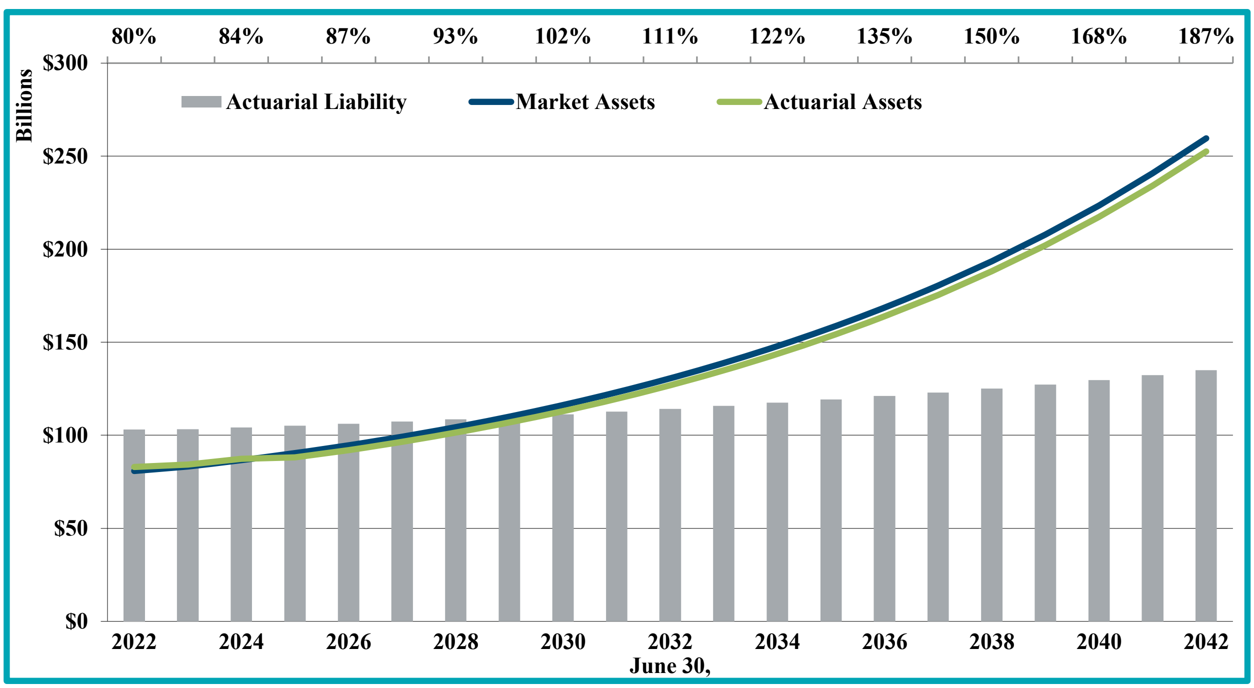


SECTION II – DISCLOSURES RELATED TO RISK

Assuming an annual return each year of 3.1%, Callan's 25th percentile return as of March 2022, results in the funded ratio being 44% in 2042.



Assuming an annual return each year of 8.9%, Callan's 75th percentile return as of March 2022, results in the funded ratio being 187% in 2042.



SECTION II – DISCLOSURES RELATED TO RISK

Stress Testing the Plan's Contribution Adequacy

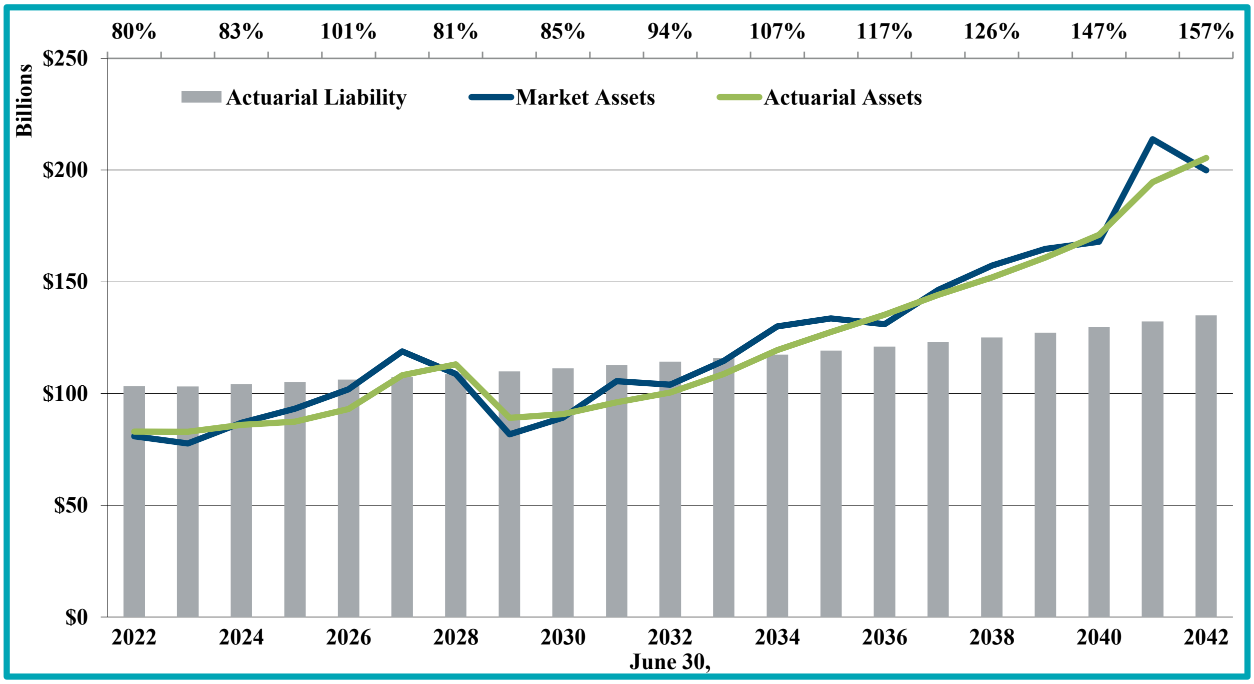
In assessing contribution risk, it is important to assess the adequacy of contributions, particularly in a plan with a fixed contribution rate. One way to assess adequacy is to compare the contributions to the Plan's tread water cost. As shown on page 6, the Plan's tread water rate has decreased in recent years due to the change in the benefits provided by the Plan. In addition, the contributions allocated to the pension Plan have increased so now the contribution rate is 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.

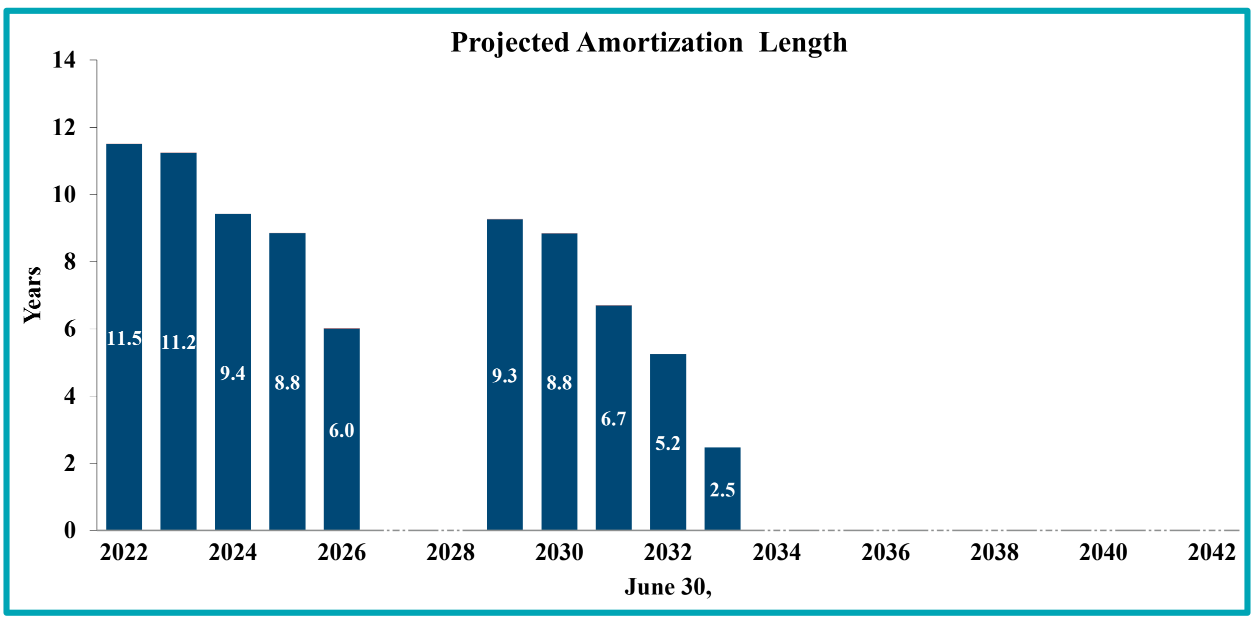
Assessing the future risk that the expected measurements produced by the actuarial valuations will deviate from the actual values over time is complex and can never be exactly known.

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, 2022, shown in Table III-5 on page 26. This results in an average return of 7.8% over the next 20 years, which is above the current assumed return.

SECTION II – DISCLOSURES RELATED TO RISK



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 III – ASSETS

Pension plan assets play a key role in the financial operation of the Plan and in the decisions that the Trustees 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, 2021 and June 30, 2022;
- 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, 2022 and June 30, 2021.

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

	2022			2021	
	Defined Benefit	Defined Contribution	Total	Total	% Change
Assets					
Cash & Short-Term Investments	$ 2,406,441,564	$ 196,167,180	$ 2,602,608,744	$ 1,492,177,831	74.42%
Receivables	1,315,666,240	225,744	1,315,891,984	1,147,478,335	14.68%
Fixed Income	13,838,393,445	256,873,669	14,095,267,114	17,347,638,102	(18.75%)
Domestic Equities	20,015,165,430	1,281,276,472	21,296,441,902	25,591,390,283	(16.78%)
International Equities	17,528,699,329	288,259,611	17,816,958,940	20,295,251,212	(12.21%)
Real Estate	10,839,860,290	150,962,759	10,990,823,049	9,464,683,632	16.12%
Alternative Investments	17,364,123,036	0	17,364,123,036	18,893,805,228	(8.10%)
Invested Securities Lending Capital	1,360,523,730	0	1,360,523,730	612,491,394	122.13%
Capital Assets	258,984,476	0	258,984,476	252,737,779	2.47%
Accumulated Depreciation	(180,742,241)	0	(180,742,241)	(174,822,367)	3.39%
Total Assets	**$ 84,747,115,299**	**$ 2,173,765,435**	**$ 86,920,880,734**	**$ 94,922,831,430**	(8.43%)
Liabilities					
Securities Purchased and Other Investment Liabilities	$ (382,701,408)	$ 0	$ (382,701,408)	$ (402,309,782)	(4.87%)
Debt on Real Estate Investments	(2,040,925,603)	0	(2,040,925,603)	(1,969,380,414)	3.63%
Accrued Expenses and Other Liabilities	(35,099,512)	0	(35,099,512)	(32,124,793)	9.26%
Obligations Under Security Lending Program	(1,360,517,693)	0	(1,360,517,693)	(612,240,111)	122.22%
Net Pension Liability	(67,437,756)	0	(67,437,756)	(101,268,739)	(33.41%)
Total Liabilities	**$ (3,886,681,970)**	**$ 0**	**$ (3,886,681,970)**	**$ (3,117,323,840)**	24.68%
Market Value of Assets	**$ 80,860,433,329**	**$ 2,173,765,435**	**$ 83,034,198,764**	**$ 91,805,507,590**	**(9.55%)**

Numbers may not add due to rounding

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, 2021**	**$**	**89,379,037,867**	**$**	**81,334,924,459**
2. Calculation of Net Cash Flow				
(a) Member Contributions	$	1,672,407,061	$	1,672,407,061
(b) Employer Contributions		1,776,074,436		1,776,074,436
(c) Transfers between Plans/from Other Ohio Systems		128,164,843		128,164,843
(d) Benefit Payments and Refunds		(7,367,892,120)		(7,367,892,120)
(e) **Net Cash Flow**	**$**	**(3,791,245,780)**	**$**	**(3,791,245,780)**
3. **Value of Assets - June 30, 2022**	**$**	**80,860,433,329**	**$**	**82,968,080,151**
4. Net Investment Income [3. - 1. - 2.(e)]	$	(4,727,358,758)	$	5,424,401,472
5. Average Value of Assets [1. + 1/2*2.(e)]	$	87,483,414,977	$	79,439,301,569
6. Rate of Return [4. / 5.]		-5.40%		6.83%
7. Assumed Rate of Return		7.00%		7.00%
8. Expected Net Investment Income [5. * 7.]	$	6,123,839,048	$	5,560,751,110
9. Investment Gain/(Loss) [4. - 8.]	$	(10,851,197,806)	$	(136,349,638)

[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, 2021	$ 81,334,924,459
2. Calculation of Net Cash Flow	
(a) Member Contributions	1,672,407,061
(b) Employer Contributions	1,776,074,436
(c) Transfers between Plans/from Other Ohio Systems	128,164,843
(d) Benefit Payments and Refunds	(7,367,892,120)
(e) Net Cash Flow	(3,791,245,780)
3. Average Actuarial Value of Assets [1. + 1/2 * 2.(e)]	79,439,301,569
4. Expected Income	5,560,751,110
5. Actual Income on Market Value of Assets	(4,727,358,758)
6. Gain/(Loss) for year ended June 30, 2022	$ (10,288,109,868)

[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 2019 Gain/(Loss)	$ (392,072,927)	$ -
Defer 25% of 2020 Gain/(Loss)	(2,164,173,825)	(541,043,456)
Defer 50% of 2021 Gain/(Loss)	12,298,958,069	6,149,479,035
Defer 75% of 2022 Gain/(Loss)	(10,288,109,868)	(7,716,082,401)
Total Deferred Gain/(Loss) for AVA Calculation		$ (2,107,646,822)
Market Value of Assets at June 30, 2022		$ 80,860,433,329
Total Unrecognized Gain/(Loss)		(2,107,646,822)
Preliminary Actuarial Value of Assets at June 30, 2022		$ 82,968,080,151
Adjustment for 91% / 109% corridor		0
Actuarial Value of Pension Assets at June 30, 2022		$ 82,968,080,151
Defined Contribution Plan Assets at June 30, 2022		2,173,765,435
Total Actuarial Value of Assets at June 30, 2022		$ 85,141,845,586
Actuarial Value as a Percent of Market Value		102.5%

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

Investment Performance

The Market Value of Assets (MVA) earned -5.40% during the fiscal year ending June 30, 2022, which is less than the assumed 7.00% return for the period ending June 30, 2022. A return of 6.83% was experienced on the Actuarial Value of Assets (AVA), resulting in an actuarial loss 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
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%
2003	1.8%	1.6%
Average Returns		
Last 5 years:	8.1%	8.8%
Last 10 years:	8.9%	9.7%
Last 15 years:	6.2%	7.1%
Last 20 years:	7.8%	7.6%

SECTION IV – LIABILITIES

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

- **Disclosure** of the Plan liabilities as of June 30, 2021 and June 30, 2022, 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, 2022			June 30, 2021
	Defined Benefit	Combined	Total	Total
Present Value of Future Benefits				
Active Member Benefits	$ 44,804,296,892	$ 647,690,151	$ 45,451,987,043	$ 45,849,138,014
Reemployed Retiree Benefits	276,068,323	-	276,068,323	281,191,638
Inactive Benefits				
(i) Deferred Annuity	1,257,765,914	16,695,145	1,274,461,059	1,581,607,913
(ii) Contribution Refund	408,973,352	2,536,931	411,510,283	396,638,951
Retiree & Beneficiary Benefits				
(i) Annuity & Pension Reserve Fund	67,911,806,764	82,696,305	67,994,503,069	68,033,693,019
(ii) Survivor's Benefit Fund	1,181,003,950	-	1,181,003,950	1,164,895,687
Present Value of Future Benefits (PVB)[1]	**$ 115,839,915,195**	**$ 749,618,532**	**$ 116,589,533,727**	**$ 117,307,165,222**
Actuarial Liability				
Active Member Benefits	$ 31,578,077,127	$ 374,935,539	$ 31,953,012,666	$ 30,706,909,445
Reemployed Retiree Benefits	276,068,323	-	276,068,323	281,191,638
Inactive Benefits	1,666,739,266	19,232,076	1,685,971,342	1,978,246,864
Retiree & Beneficiary Benefits	69,092,810,714	82,696,305	69,175,507,019	69,198,588,706
Defined Benefit Plan Actuarial Liability	102,613,695,430	476,863,920	103,090,559,350	102,164,936,653
Defined Contribution Account Balances			2,173,765,435	2,426,469,723
Total Actuarial Liability (AL)	**$ 102,613,695,430**	**$ 476,863,920**	**$ 105,264,324,785**	**$ 104,591,406,376**
Actuarial Value of Assets (AVA)			$ 85,141,845,586	$ 83,761,394,182
Net Unfunded/(Surplus) Actuarial Liability (AL-AVA)			**$ 20,122,479,199**	**$ 20,830,012,194**

[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, 2021 and June 30, 2022.

Table IV-2

Changes in Defined Benefit Actuarial Liability

Liabilities as of June 30, 2021	$ 102,164,936,653
Liabilities as of June 30, 2022	103,090,559,350
Liability Increase (Decrease)	925,622,697
Changes in Liability Due to:	
Method Changes	0
Benefit Changes	2,348,518,165
Assumption Changes	(2,669,899,674)
Experience (Gain)/Loss	277,965,062
Benefits Accumulated and Other Sources	969,039,144

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, 2022

Salary/Service Increase	$	103,250,362
Retirement Experience	$	208,556,383
Retiree Mortality	$	(269,161,540)
New Entrants	$	47,707,125
Data composition and other changes	$	187,612,732
Experience (Gain)/Loss	$	277,965,062

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. 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 development of the employer contribution rates.

Table V-1
Development of Employer Contribution Rate

	2022			2021
	Defined Benefit	Combined	Total	Total
Valuation Results				
Total Actuarial Liability	$ 104,787,460,865	$ 476,863,920	$ 105,264,324,785	$ 104,591,406,376
Actuarial Value of Pension Assets			85,141,845,586	83,761,394,182
Unfunded Actuarial Liability			$ 20,122,479,199	$ 20,830,012,194
Total Normal Cost	$ 1,250,234,195	$ 22,415,489	$ 1,272,649,684	$ 1,344,766,774
Contribution Rates				
Normal Cost Rate	10.86%	4.58%	10.61%	11.76%
Unfunded Actuarial Liability Rate	17.14%	11.42%	16.90%	15.77%
Allocation of Total Contribution Rate				
Total Employer Pension Contribution Rate	14.00%	14.00%	14.00%	14.00%
Member Contribution Rate	14.00%	2.00%	13.52%	13.53%

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. This rate is a decrease from the rate of 4.47% that applied through FYE 2022. These contributions are also used to fund the Plan's Unfunded Actuarial Liability. Based on these contributions, the valuation indicates that the expected funding period to fully amortize the Unfunded Actuarial Liability is 11.5 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

	2022 Total	2021 Total
Valuation Results		
Total Defined Benefit Plan Payroll	$ 12,719,286,424	$ 11,979,686,300
STRS Defined Contribution Plan Payroll	$ 569,489,445	$ 506,300,061
Alternative Retirement Plan Payroll	$ 872,944,182	$ 853,122,073
Total Actuarial Accrued Liability	$ 105,264,324,785	$ 104,591,406,376
Actuarial Value of Pension Assets	85,141,845,586	83,761,394,182
Unfunded Actuarial Liability (UAL)	$ 20,122,479,199	$ 20,830,012,194
UAL Rate for Defined Benefit Plan*	16.90%	15.77%
Defined Benefit Plan UAL Contribution*	$ 2,150,155,530	$ 1,888,960,155
Defined Contribution Plan UAL Contribution*	16,572,143	22,631,613
Alternative Retirement Plan UAL Contribution*	25,402,676	38,134,557
Total Contribution for UAL*	$ 2,192,130,349	$ 1,949,726,324
Amortization Period*	11.5 Years	14.0 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, 2022, the remaining amortization period is 23 years.

Table V-3 shows the development of an Actuarially Determined Contribution rate and contribution rate sufficiency. Based on this valuation, the Actuarially Determined Contribution rate for Fiscal 2023 is 20.65% of payroll, which is less than the total contribution rate of 27.52% 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

	2022 Total	2021 Total
Valuation Results		
Total Defined Benefit Plan Valuation Payroll	$ 12,719,286,424	$ 11,979,686,300
STRS Defined Contribution Plan Payroll	$ 569,489,445	$ 506,300,061
Alternative Retirement Plan Payroll	$ 872,944,182	$ 853,122,073
Total Actuarial Accrued Liability	$ 105,264,324,785	$ 104,591,406,376
Actuarial Value of Pension Assets	85,141,845,586	83,761,394,182
Unfunded Actuarial Liability	$ 20,122,479,199	$ 20,830,012,194
Amortization Period	23	24
Amortization Payment	$ 1,333,141,379	$ 1,344,174,756
Offset for Defined Contribution Contribution to UAL*	16,572,143	22,631,613
Offset for Alternative Retirement Plan Contribution to UAL*	39,020,605	38,134,557
UAL Amortization Payment from Defined Benefit Plan*	$ 1,277,548,631	$ 1,283,408,586
Defined Benefit Plan Rate to Amortize UAL	10.04%	10.71%
Normal Cost Rate	10.61%	11.76%
Actuarially Determined Contribution Rate*	**20.65%**	**22.47%**
Total Contribution Rate	27.52%	27.53%
Contribution Sufficiency/(Deficiency)	6.87%	5.06%

*Assumes payments are made throughout the year

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	2018	2019	2020	2021	2022
Investment income	$ (253,993)	$ 3,515	$ 532,022	$ 5,216,481	$ (136,350)
Payroll growth	N/A	N/A	N/A	N/A	N/A
Salary increases	180,810	207,875	177,622	236,539	(103,250)
Retirement and other separation experience	(285,353)	(325,891)	(112,488)	(287,427)	(443,876)
Death after retirement	(9,495)	152,788	110,833	208,369	269,162
Final plan reselection	N/A	N/A	N/A	N/A	N/A
Gain (or loss) during year	$ (368,031)	$ 38,287	$ 707,989	$ 5,373,962	$ (414,314)
Gain (or loss) due to assumption/method/plan amendment changes	236,418	-	-	(4,433,797)	321,382
Composite gain (or loss) during the year	$ (131,613)	$ 38,287	$ 707,989	$ 940,165	$ (92,932)

SECTION VI – ACCOUNTING STATEMENT INFORMATION

Table VI-2
Schedule of Funded Liabilities by Type (Dollars in Thousands)*

Valuation Date June 30,	Aggregate Actuarial Liabilities for: 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)
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%
2013	$ 10,962,886	$ 68,075,440	$ 15,328,367	$ 62,590,786	100%	76%	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
6/30/2022	$ 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
6/30/2013	$ 62,590,786	$ 94,366,694	$ 31,775,908	66.3%	40.2 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, 2022

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, 2022. 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.

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, 2022

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, 2022. Consequently, the single equivalent rate used to determine the Total Pension Liability as of June 30, 2022 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, 2021 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 6/30/2021	$ 104,591,406,377	$ 91,805,507,590	$ 12,785,898,787
Changes for the year:			
Service cost	1,344,766,774		1,344,766,774
Interest	7,158,609,659		7,158,609,659
Changes of benefits	2,348,518,165		2,348,518,165
Differences between expected and actual experience	(42,146,204)		(42,146,204)
Changes of assumptions	(2,669,899,674)		(2,669,899,674)
Contributions - employer*		1,932,372,091	(1,932,372,091)
Contributions - member		1,806,217,463	(1,806,217,463)
Net investment income		(4,976,659,903)	4,976,659,903
Benefit payments	(7,466,930,312)	(7,466,930,312)	0
Administrative expense		(66,308,165)	66,308,165
Net changes	672,918,408	(8,771,308,826)	9,444,227,234
Balances at 6/30/2022	$ 105,264,324,785	$ 83,034,198,764	$ 22,230,126,021

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

Assumption changes as a result of the experience study resulted in a decrease in the NPL of $2.7 billion. Benefit changes during the year increased the NPL $2.3 billion.

Unfavorable investment experience more than offset the decreases from assumption changes and resulted in an increase in the NPL of $ 9.4 billion. The NPL remaining as of June 30, 2022 is $22.2 billion.

SECTION VII - GASB 67 AND 68 INFORMATION AS OF JUNE 30, 2022

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	$ 116,615,826,270	$ 105,264,324,785	$ 95,664,468,891
Plan Fiduciary Net Position	83,034,198,764	83,034,198,764	83,034,198,764
Net Pension Liability	$ 33,581,627,506	$ 22,230,126,021	$ 12,630,270,127
Plan Fiduciary Net Position as a Percentage of the Total Pension Liability	71.2%	78.9%	86.8%

A one percent decrease in the discount rate increases the TPL by approximately 10.8% and increases the NPL by approximately 51.1%. A one percent increase in the discount rate decreases the TPL by approximately 9.1% and decreases the NPL by approximately 43.2%.

SECTION VII - GASB 67 AND 68 INFORMATION AS OF JUNE 30, 2022

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 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 2022	FYE 2021
Total Pension Liability		
Service cost	$ 1,344,766,774	$ 1,189,663,517
Interest (includes interest on service cost)	7,158,609,659	7,171,679,614
Changes of benefit terms	2,348,518,165	0
Differences between expected and actual experience	(42,146,204)	451,180,317
Changes of assumptions	(2,669,899,674)	4,433,796,926
Benefit payments, including refunds of member contributions	(7,466,930,312)	(7,327,202,069)
Net change in total pension liability	**$ 672,918,408**	**$ 5,919,118,305**
Total pension liability - beginning	**104,591,406,377**	**98,672,288,072**
Total pension liability - ending	**$ 105,264,324,785**	**$ 104,591,406,377**
Plan fiduciary net position		
Contributions - employer*	$ 1,932,372,091	$ 1,803,178,224
Contributions - member	1,806,217,463	1,706,817,117
Net investment income	(4,976,659,903)	21,212,679,374
Benefit payments, including refunds of member contributions	(7,466,930,312)	(7,327,202,069)
Administrative expense	(66,308,165)	(65,811,335)
Net change in plan fiduciary net position	**$ (8,771,308,826)**	**$ 17,329,661,311**
Plan fiduciary net position - beginning	**91,805,507,590**	**74,475,846,279**
Plan fiduciary net position - ending	**$ 83,034,198,764**	**$ 91,805,507,590**
Net pension liability - ending	**$ 22,230,126,021**	**$ 12,785,898,787**
Plan fiduciary net position as a percentage of the total pension liability	78.88%	87.78%
Covered payroll*	$ 13,624,858,523	$ 12,929,843,478
Net pension liability as a percentage of covered payroll	163.16%	98.89%

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

SECTION VII - GASB 67 AND 68 INFORMATION AS OF JUNE 30, 2022

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 2022	FYE 2021	FYE 2020	FYE 2019	FYE 2018
Actuarially Determined Contribution*	$ 1,037,935,445	$ 1,028,798,948	$ 1,081,661,891	$ 1,088,328,150	$ 1,056,430,306
Contributions in Relation to the Actuarially Determined Contribution*	1,776,074,436	1,696,120,572	1,662,016,780	1,614,188,340	1,565,679,329
Contribution Deficiency/(Excess)	$ (738,138,991)	$ (667,321,624)	$ (580,354,889)	$ (525,860,190)	$ (509,249,023)
Covered Payroll*	$ 12,224,437,526	$ 11,610,016,164	$ 11,392,012,792	$ 11,088,784,826	$ 10,775,526,239
Contributions as a Percentage of Covered Payroll	14.53%	14.61%	14.59%	14.56%	14.53%

	FYE 2017	FYE 2016	FYE 2015	FYE 2014	FYE 2013
Actuarially Determined Contribution*	$ 1,054,862,000	$ 1,178,129,000	$ 1,368,602,000	$ 1,489,734,000	$ 2,910,537,000
Contributions in Relation to the Actuarially Determined Contribution*	1,514,285,000	1,466,938,000	1,449,165,000	1,325,141,000	1,327,862,000
Contribution Deficiency/(Excess)	$ (459,423,000)	$ (288,809,000)	$ (80,563,000)	$ 164,593,000	$ 1,582,675,000
Covered Payroll*	$ 10,459,706,000	$ 10,069,269,000	$ 9,985,181,000	$ 9,833,028,000	$ 9,917,911,000
Contributions as a Percentage of Covered Payroll	14.48%	14.57%	14.51%	13.48%	13.39%

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

SECTION VII - GASB 67 AND 68 INFORMATION AS OF JUNE 30, 2022

The notes below summarize the key methods and assumptions used to determine the Actuarially Determined Contributions (ADC) for FYE 2022.

Notes to Schedule

Valuation Date:	June 30, 2021
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 12.5% based on age
Mortality:	*Post-Retirement:* RP-2014 Annuitant Mortality Table with 50% of rates through age 69, 70% of rates between ages 70 and 79, 90% of rates between ages 80 and 84, and 100% of rates thereafter, projected forward generationally using mortality improvement scale MP-2016. *Pre-Retirement:* RP-2014 Employee Mortality Table, projected forward generationally using mortality improvement scale MP-2016. *Post-Retirement Disabled:* RP-2014 Disabled Mortality Table with 90% of rates for males and 100% of rates for females, projected forward generationally using mortality improvement scale MP-2016.

A complete description of the methods and assumptions used to Determine Contribution Rates for the year ending June 30, 2022 can be found in the June 30, 2021 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, 2022 measurement date, can be used for employers' reporting up until fiscal years ending June 30, 2023.

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 four years. During the measurement year, there was an experience gain of $42.1 million and an assumption gain of $2.7 billion due to the experience study changes.

The impact of investment gains or losses is recognized over a period of five years. During the measurement year, there was an investment loss of $11.3 billion.

SECTION VII - GASB 67 AND 68 INFORMATION AS OF JUNE 30, 2022

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					
2022	4	$ (42,146,204)	4	$ (10,536,551)	$ (31,609,653)
2021	5	451,180,317	4	90,236,063	$ 270,708,191
2020	5	(133,569,121)	3	(26,713,824)	$ (53,427,649)
2019	5	69,329,945	2	13,865,989	$ 13,865,989
2018	5	31,731,963	1	6,346,391	$ 0
Total		**$ 376,526,900**		**$ 73,198,068**	**$ 199,536,878**
Recognition of Assumption Changes					
2022	4	$ (2,669,899,674)	4	$ (667,474,919)	$ (2,002,424,755)
2021	5	$ 4,433,796,926	4	$ 886,759,385	$ 2,660,278,156
Total		**$ 1,763,897,252**		**$ 219,284,466**	**$ 657,853,401**
Recognition of Investment (Gains) and Losses					
2022	5	$ 11,272,478,990	5	$ 2,254,495,798	$ 9,017,983,192
2021	5	(15,806,273,192)	4	(3,161,254,638)	$ (9,483,763,916)
2020	5	2,805,320,947	3	561,064,189	$ 1,122,128,380
2019	5	586,060,713	2	117,212,143	$ 117,212,141
2018	5	(1,457,979,231)	1	(291,595,847)	$ 0
Total		**$ (2,600,391,773)**		**$ (520,078,355)**	**$ 773,559,797**

SECTION VII - GASB 67 AND 68 INFORMATION AS OF JUNE 30, 2022

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	$ 284,574,180	$ 85,037,302
Changes in assumptions	2,660,278,156	2,002,424,755
Net difference between projected and actual earnings on pension plan investments	773,559,797	0
Total	**$ 3,718,412,133**	**$ 2,087,462,057**

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

Measurement year ended June 30:	
2023	57,653,633
2024	(73,424,496)
2025	(607,774,859)
2026	2,254,495,798
Thereafter	$ 0

SECTION VII - GASB 67 AND 68 INFORMATION AS OF JUNE 30, 2022

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 2022	Measurement Year Ending 2021
Change in Net Pension Liability	$ 9,444,227,234	$ (11,410,543,006)
Change in Deferred Outflows	223,648,031	(1,412,212,173)
Change in Deferred Inflows	(9,011,676,964)	10,944,419,289
Employer Contributions	1,932,372,091	1,803,178,224
Pension Expense	**$ 2,588,570,392**	**$ (75,157,666)**
Pension Expense as % of Payroll	**19.00%**	**-0.58%**
Operating Expenses		
Service cost	$ 1,344,766,774	$ 1,189,663,517
Employee contributions	(1,806,217,463)	(1,706,817,117)
Administrative expenses	66,308,165	65,811,335
Total	$ (395,142,524)	$ (451,342,265)
Financing Expenses		
Interest cost	$ 7,158,609,659	$ 7,171,679,614
Expected return on assets	(6,295,819,087)	(5,406,406,182)
Total	$ 862,790,572	$ 1,765,273,432
Changes		
Benefit changes	$ 2,348,518,165	$ 0
Recognition of assumption changes	219,284,466	2,185,640,982
Recognition of liability gains and losses	73,198,068	35,870,186
Recognition of investment gains and losses	(520,078,355)	(3,610,600,001)
Total	$ 2,120,922,344	$ (1,389,088,833)
Pension Expense	**$ 2,588,570,392**	**$ (75,157,666)**

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 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 simple COLAs to current and future eligible members and beneficiaries.
   b. 3%, 2%, and 1% One-time COLAs granted for FY 2024 to current eligible members and beneficiaries.
3. Eligibility for Unreduced Benefits
   a. In addition to current eligibilities for unreduced retirement benefits, a points-based eligibility would be introduced. Points are determined as the sum of the current age and years of benefit service achieved by members. The point eligibilities included are at 90, 92, and 94 points.
4. Combinations of the above changes
   a. A 2% ongoing simple COLA combined with an increase in the employer contribution rate. The employer contribution rate is determined in a manner such that the expected funded ratio on June 30, 2033 would be the same as the current baseline projection. The total level of annual employer contributions required to achieve the same funded status is 25.77%.
   b. A 1% one-time COLA granted for FY 2024 as well as a reduction in the employee contribution rate of 1%.
   c. A 2% one-time COLA granted for FY 2024 as well as a reduction in the employee contribution rate of 2%.

Note, additional legislative, legal, and actuarial analysis may be required for points-based eligibility 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, 2023 and June 30, 2033 valuation results shown in the table below. The metrics included in the table are the:

- Change in the Normal Cost rate as of FY 2023
- Increase in the Actuarial Liability as of FY 2023
- Expected Funded Ratio, Funding Period, and the STRS Ohio Dashboard Summary Score as of FY 2023
- Expected Funded Ratio, Funding Period, and the STRS Ohio Dashboard Summary Score as of FY 2033

SECTION VIII – PLAN DESIGN LEVER ANALYSIS

		Valuation metrics 6/30/2023		Outlook and funding policy metrics 6/30/2023			Outlook and funding policy metrics on 6/30/2033		
		If results=assumptions FY2023					*If results=assumptions FY2023-2033*		
		Normal Cost 2023	Actuarial Liability 2023	Funded Ratio 2023	Funding Period 2023	Summary Score 2023	Funded Ratio 2033	Funding Period 2033	Summary Score 2033
Baseline	**DB Plan - Provisions as of FY2022**	**10.61%**	**$ 103,188**	**79.1%**	**10.6**	**-2**	**94.9%**	**2.1**	**-1**
		Change	*Change ($M)*						
Contributions	**+1% employer contribution rate**	**0.00%**	**$ -**	**79.3%**	**9.8**	**-2**	**96.9%**	**1.2**	**0**
	-1% employee contribution rate	**0.00%**	**$ -**	**79.0%**	**11.4**	**-2**	**92.9%**	**3.1**	**-1**
COLA	**3% ongoing simple COLA, FY2024+**	**1.68%**	**$ 20,294**	**66.1%**	**36.6**	**-7**	**66.8%**	**31.4**	**-7**
	2% ongoing simple COLA, FY2024+	**1.12%**	**$ 13,530**	**70.0%**	**24.2**	**-7**	**74.7%**	**17.0**	**-4**
	1% ongoing simple COLA, FY2024+	**0.56%**	**$ 6,765**	**74.3%**	**16.3**	**-4**	**83.9%**	**8.2**	**-3**
	One-time 3% COLA, FY2024 only	**0.00%**	**$ 1,466**	**78.0%**	**11.6**	**-2**	**92.4%**	**3.1**	**-1**
	One-time 2% COLA, FY2024 only	**0.00%**	**$ 978**	**78.4%**	**11.2**	**-2**	**93.2%**	**2.8**	**-1**
	One-time 1% COLA, FY2024 only	**0.00%**	**$ 489**	**78.8%**	**10.9**	**-2**	**94.1%**	**2.4**	**-1**
Eligibility	**Add unreduced eligibility at 90 points**	**0.72%**	**$ 3,020**	**76.9%**	**13.4**	**-3**	**88.8%**	**5.2**	**-1**
	Add unreduced eligibility at 92 points	**0.48%**	**$ 2,015**	**77.6%**	**12.4**	**-2**	**90.8%**	**4.1**	**-1**
	Add unreduced eligibility at 94 points	**0.27%**	**$ 1,135**	**78.3%**	**11.6**	**-2**	**92.6%**	**3.2**	**-1**
Combinations	**2% ongoing COLA offset by an increase to a 25.77% total employer contribution rate***	**1.12%**	**$ 13,530**	**71.3%**	**10.6**	**-2**	**94.9%**	**1.5**	**1**
	1% one-time COLA and ongoing -1% employee contribution rate	**0.00%**	**$ 489**	**78.7%**	**11.8**	**-2**	**92.1%**	**3.5**	**-1**
	2% one-time COLA and ongoing -2% employee contribution rate	**0.00%**	**$ 978**	**78.2%**	**13.3**	**-3**	**89.3%**	**5.1**	**-1**

*** Solve for the contribution rate increase such that the projected funded ratio in 2033 is approximately equal to the baseline expected funded ratio (94.9%).**

The projections above assume that all assumptions are met over 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 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 6.01% and standard deviation of 12.69% 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 2033 is based on stochastic results from 2023 through 2043.

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, 2021 Valuation	**166,427**	**17,734**	**20,513**	**143,708**	**133,532**	**4,789**	**18,600**	**505,303**
2.	Additions								
	a. New Entrants	15,727	2,046	-	-	-	-	-	17,773
	b. Total	15,727	2,046	-	-	-	-	-	17,773
3.	Reductions								
	a. Benefits Expired	-	-	-	-	-	-	-	-
	b. Refunds	(1,938)	(2,713)	(888)	(4,633)	-	-	-	(10,172)
	c. Deaths with no Beneficiaries	(76)	(29)	(34)	-	(2,688)	(167)	(1,332)	(4,326)
	d. Total	(2,014)	(2,742)	(922)	(4,633)	(2,688)	(167)	(1,332)	(14,498)
4.	Changes in Status								
	a. Rehired	6,090	-	(1,506)	(4,576)	-	(8)	-	-
	b. Inactive Eligible for Allowance	(2,595)	-	2,652	-	-	(11)	-	46
	c. Inactive Eligible for Refunds Only	(6,716)	-	(3)	10,507	-	-	-	3,788
	d. Retired	(2,597)	(192)	(449)	(8)	3,092	(46)	-	(200)
	e. Reemployed Retiree	(38)	262	-	(179)	-	-	-	45
	f. Disabled	(96)	-	(7)	-	-	103	-	-
	g. Death with Beneficiaries	(152)	-	(23)	-	(1,325)	(114)	1,614	-
	h. Plan Reselection	-	-	-	-	-	-	-	-
	i. Data Corrections	-	2	7	(373)	154	3	29	(178)
	j. Total	(6,104)	72	671	5,371	1,921	(73)	1,643	3,501
5.	June 30, 2022 Valuation	**174,036**	**17,110**	**20,262**	**144,446**	**132,765**	**4,549**	**18,911**	**512,079**

APPENDIX A – MEMBERSHIP INFORMATION

Table A-2
Summary of Membership Data as of June 30, 2022 ($ in thousands)

		Male	Female	Total
1.	**Defined Benefit Plan Active Members**			
	Number of Members	45,715	120,980	166,695
	Annual Salaries (for period ending June 30, 2022)	$ 3,291,630	$ 7,908,975	$ 11,200,606
	Average Age	45.39	43.96	44.35
	Average Service	13.69	13.40	13.48
2.	**Combined Plan Active Members**			
	Number of Members	1,596	5,745	7,341
	Annual Salaries (for period ending June 30, 2022)	$ 111,143	$ 360,039	$ 471,182
	Average Age	43.51	41.28	41.76
	Average Service	9.30	9.73	9.64
3.	**Total Defined Benefit and Combined Plan Active Members**			
	Number of Members	47,311	126,725	174,036
	Annual Salaries (for period ending June 30, 2022)	$ 3,402,773	$ 8,269,014	$ 11,671,787
	Average Age	45.33	43.84	44.24
	Average Service	13.54	13.23	13.32
4.	**Defined Benefit Inactive Members**			
	Eligible for Allowances	4,743	14,811	19,554
	Eligible for Refunds Only	50,926	91,823	142,749
	Total	55,669	106,634	162,303
5.	**Combined Benefit Inactive Members**			
	Eligible for Allowances	137	571	708
	Eligible for Refunds Only	445	1,252	1,697
	Total	582	1,823	2,405
6.	**Total Inactive Members**			
	Eligible for Allowances	4,880	15,382	20,262
	Eligible for Refunds Only	51,371	93,075	144,446
	Total	56,251	108,457	164,708

APPENDIX A – MEMBERSHIP INFORMATION

Table A-2
Summary of Membership Data as of June 30, 2022 (continued) ($ in thousands)

			Male		Female		Total
7.	**Retirees**						
	Number of Members		42,276		90,489		132,765
	Annual Allowance	$	2,349,966	$	4,044,819	$	6,394,785
	Average Allowance (in dollars)	$	55,586	$	44,700	$	48,166
8.	**Disabled Retirees**						
	Number of Members		1,351		3,198		4,549
	Annual Allowance	$	58,958	$	121,570	$	180,528
	Average Allowance (in dollars)	$	43,640	$	38,014	$	39,685
9.	**Beneficiaries Receiving Optional Allowances**						
	Number of Members		3,761		9,438		13,199
	Annual Allowance	$	97,613	$	367,157	$	464,770
	Average Allowance (in dollars)	$	25,954	$	38,902	$	35,213
10.	**Survivors' Benefit Fund Beneficiaries**						
	Number of Members		2,662		3,050		5,712
	Annual Allowance	$	51,383	$	76,461	$	127,844
	Average Allowance (in dollars)	$	19,302	$	25,069	$	22,382
11.	**Total Retirees and Beneficiaries**						
	Number of Members		50,050		106,175		156,225
	Annual Allowance	$	2,557,920	$	4,610,007	$	7,167,927
	Average Allowance (in dollars)	$	51,107	$	43,419	$	45,882

* *Annual Allowances reflect the COLA adjustments that come into effect during FYE 2023 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
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%
2012	173,044	$ 9,330,845	$ 53,922	-0.18%

*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
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%
2012	143,256	$ 5,815,407	$ 40,595	7.8%

* *Annual Allowances displayed for FYE 2022 reflect the COLA adjustments that come into effect during FYE 2023 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
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
2012	138,088	$ 5,393,372	8,761	$ 512,952	3,593	$ 90,917	143,256	$ 5,815,407

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

APPENDIX A – MEMBERSHIP INFORMATION

Table A-6
Benefit Payments by Type as of June 30, 2022

Age Last Birthday	Number	Annual Allowance (in thousands)	Average Annual Allowance
Retirees			
Under 60	3,488	$ 190,438	$ 54,598
60-64	10,745	523,719	48,741
65-69	25,613	1,253,533	48,941
70-74	36,655	1,861,111	50,774
75-79	26,811	1,333,074	49,721
Over 79	29,453	1,232,910	41,860
Total	**132,765**	**$ 6,394,785**	**$ 48,166**
Disabled Retirees			
Under 60	924	$ 33,566	$ 36,327
60-64	588	23,751	40,393
65-69	595	25,771	43,313
70-74	958	41,136	42,940
75-79	746	31,026	41,590
Over 79	738	25,277	34,251
Total	**4,549**	**$ 180,528**	**$ 39,685**
Beneficiaries Receiving Optional Allowances			
Under 60	12	$ 569	$ 47,442
60-64	106	4,526	42,701
65-69	489	20,748	42,430
70-74	1,558	67,260	43,171
75-79	2,217	91,988	41,492
Over 79	8,817	279,677	31,720
Total	**13,199**	**$ 464,770**	**$ 35,213**
Survivors' Benefit Fund Beneficiaries			
Under 60	1,347	$ 18,671	$ 13,861
60-64	360	8,066	22,406
65-69	590	14,925	25,296
70-74	901	24,152	26,806
75-79	870	22,885	26,305
Over 79	1,644	39,145	23,811
Total	**5,712**	**$ 127,844**	**$ 22,382**
Grand Total	**156,225**	**$ 7,167,927**	**$ 45,882**

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

APPENDIX A – MEMBERSHIP INFORMATION

Table A-7
Benefit Payments by Type as of June 30, 2022

Amount of Monthly Benefit	Total	Service	Disability	Survivor
NULL	36	1	33	2
$ 1 - $ 250	2,465	1,543	3	919
$ 251 - $ 500	4,400	3,672	16	712
$ 501 - $ 750	4,264	3,166	18	1,080
$ 751 - $ 1,000	4,083	2,745	28	1,310
$ 1,001 - $ 1,250	4,028	2,604	72	1,352
$ 1,251 - $ 1,500	3,923	2,549	87	1,287
$ 1,501 - $ 1,750	3,932	2,648	151	1,133
$ 1,751 - $ 2,000	4,272	3,087	235	950
Greater then $ 2,000	124,822	110,750	3,906	10,166
Grand Total	**156,225**	**132,765**	**4,549**	**18,911**

* *Monthly Benefits reflect the COLA adjustments that come into effect during FYE 2023 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.

APPENDIX B – SUMMARY OF ASSUMPTIONS AND METHODS

11. 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%

12. Payroll Growth Rates

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

13. 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.

14. Changes in Assumptions Since Last Valuation

Demographic assumptions were reviewed and adopted by the Board on February 17, 2022 as part of an experience study performed (report dated and accepted March 11, 2022) covering the period from July 1, 2015 to June 30, 2021, with changes going into effect June 30, 2022. For a description of the prior assumptions, refer to the Actuarial Valuation Report as of June 30, 2021 dated October 2021.

15. Rationale for Assumptions

For rationale on the current assumptions, please refer to the Experience Study Report, dated March 11, 2022.

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 for the valuation of liabilities used for this valuation 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 Accrued 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 August 1, 2015, 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
8/1/2021–7/1/2023	Any age and 34 years; or age 65 and 5 years
8/1/2023 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.

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.

APPENDIX C – SUMMARY OF PLAN PROVISIONS

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 vest 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.