CHEIRON

Classic Values, Innovative Advice

Cincinnati Retirement System

Actuarial Valuation
as of December 31, 2024

Produced by Cheiron

April 2025

www.cheiron.us 1.877.CHEIRON (243.4766)

TABLE OF CONTENTS

Section ***Page***

Letter of Transmittal i

Section I Board Summary 1

Section II Identification and Assessment of Risk 12

Section III Assets 28

Section IV Liabilities 34

Section V Contributions 38

Section VI Accounting Statement Information 40

Appendices

Appendix A Membership Information 42

Appendix B Actuarial Assumptions and Methods 47

Appendix C Summary of Plan Provisions 54

Appendix D Glossary of Terms 64

April 16, 2025

Board of Trustees
Cincinnati Retirement System
801 Plum Street, Suite 328
Cincinnati, Ohio 45202

Re: Cincinnati Retirement System
Actuarial Valuation as of December 31, 2024

Dear Members of the Board,

At your request, we have conducted our annual actuarial valuation of the Cincinnati Retirement System (CRS or System) as of December 31, 2024. The results of the valuation are contained in this report. The purpose of this report is to present the annual actuarial valuation of the Cincinnati Retirement System. This report is for the use of the Cincinnati Retirement System Board of Trustees and its auditors in preparing financial reports in accordance with applicable law and accounting requirements.

The results of this report are only applicable to the Fiscal Year Ending June 30, 2026, and rely on future plan experience conforming to the underlying assumptions. To the extent that actual plan experience deviates from the underlying assumptions, the results would vary accordingly.

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

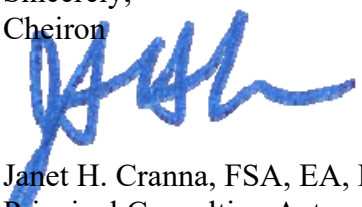
The actuarial assumptions are the same as those used in the December 31, 2023 valuation. The demographic and economic (other than the investment return) actuarial assumptions are based on the recommended assumptions from the January 1, 2017 to December 31, 2021 Experience Study, approved by the Board of Trustees on March 23, 2023. An investment return assumption of 7.50% was used as prescribed by item 29 of the Collaborative Settlement Agreement (CSA) signed October 5, 2015.

In preparing our report, we relied on information (some oral and some written) supplied by the Cincinnati Retirement System. This information includes, but is not limited to, 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 Standards of Practice No. 23, *Data Quality*.

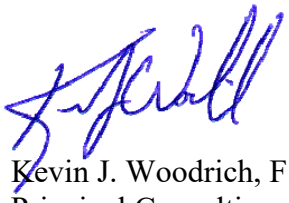
This report was prepared exclusively for the Cincinnati Retirement System for the purpose described herein. Other users of this report are not intended users as defined in the Actuarial Standards of Practice, and Cheiron assumes no duty or liability to any such other users.

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 opinions 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.

Sincerely,
Cheiron



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



Kevin J. Woodrich, FSA, EA, MAAA
Principal Consulting Actuary

cc: Jon Salstrom
Robert Murray, Cheiron

SECTION I – BOARD SUMMARY

Cheiron has performed the actuarial valuation of the Cincinnati Retirement System as of December 31, 2024. The purpose of this report is to disclose the following as of the valuation date:

1) The financial condition of the System;
2) Past trends in the financial progress of the System;
3) Compare the City's current contribution rate of 17.75% of payroll to the City's Actuarially Determined Contribution (ADC) rate based on this valuation for Fiscal Year Ending June 30, 2026;
4) Identify and assess the risks to the System; and
5) Provide specific information and documentation required for the System's financial reporting.

An actuarial valuation establishes and analyzes the System's assets and liabilities on a consistent basis and traces the progress of both from one year to the next. It includes measurement of the System's investment performance as well as an analysis of actuarial liability gains and losses.

This report does not include calculations under GASB Statements Nos. 67 and 68 which are provided in separate reports.

Results shown in this report for years prior to December 31, 2018 were provided by the prior actuary.

Valuation Basis

The December 31, 2024 actuarial valuation results were based on the same actuarial methods and assumptions as used in the December 31, 2023 actuarial valuation. The demographic and economic assumptions (other than the investment return) were based on the January 1, 2017 to December 31, 2021 Experience Study. The results were presented to the Board at the March 2, 2023 meeting and later adopted by the Board on March 23, 2023. A detailed list of these assumptions can be found in Appendix B of this report. An investment return assumption of 7.50% was used as prescribed by item 29 of the Collaborative Settlement Agreement (CSA) signed October 5, 2015.

SECTION I – BOARD SUMMARY

Key Results

The following Table I-1 summarizes 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 year.

Table I-1
Key Results

Valuation as of:	December 31, 2023	December 31, 2024	% Change
Membership Counts			
a) Full Time Actives	2,823	2,900	2.7%
b) Part Time Actives[1]	1,270	1,427	12.4%
c) Terminated Vesteds	282	298	5.7%
d) Members in Pay Status[2]	4,263	4,234	(0.7%)
e) Total	8,638	8,859	2.6%
f) Annual Salaries of Full Time Actives	$ 223,059,661	$ 239,916,648	7.6%
g) Annual Salaries of DROP Members[2]	$ 12,672,076	$ 10,367,713	(18.2%)
h) Annual Retirement Allowances	$ 190,059,353	$ 193,592,145	1.9%
Assets and Liabilities			
i) Present Value of Future Benefits	$ 2,884,673,296	$ 2,925,908,766	1.4%
j) Actuarial Liability	$ 2,643,382,463	$ 2,667,823,053	0.9%
k) Actuarial Value of Assets (AVA)	$ 1,819,308,605	$ 1,820,976,645	0.1%
l) Unfunded Actuarial Liability (UAL) [(j) - (k)]	$ 824,073,858	$ 846,846,408	2.8%
m) Funded Ratio on AVA basis [(k) ÷ (j)]	68.8%	68.3%	(0.5%)
n) Market Value of Assets (MVA)	$ 1,763,884,000	$ 1,805,588,000	2.4%
o) Funded Ratio on MVA basis [(n) ÷ (j)]	66.7%	67.7%	1.0%
City's Actuarially Determined Contribution (ADC)	FYE June 30, 2025	FYE June 30, 2026	
p) Gross Normal Cost Rate	12.24%	12.10%	(0.14%)
q) Plan Changes - ERIP[3]	1.13%	1.06%	(0.07%)
r) UAL Amortization Rate (excluding ERIP)	27.29%	26.47%	(0.82%)
s) Administrative Expenses	0.80%	0.80%	0.00%
t) Expected Employee Contributions	(9.00%)	(9.00%)	0.00%
u) City's ADC as % of Payroll [(p) + (q) + (r) + (s) + (t)]	32.46%	31.43%	(1.03%)

[1] *As of December 31, 2024, 364 of the 1,427 Part Time actives had reported last pay periods before December 2024.*

[2] *Includes 96 and 143 members as of December 31, 2024 and 2023 respectively currently participating in DROP.*

[3] *The City is currently contributing the remaining annual payments of $2.7 million by July 31 of each year, with the last contribution due by July 31, 2035.*

SECTION I – BOARD SUMMARY

Below we highlight significant results of this valuation.

- The return on the Market Value of Assets was 9.73% for the year ended December 31, 2024 which was higher than the assumed rate of return of 7.50%. In dollars, the total actuarial investment gain (the difference between actual and expected returns on a market value basis) was $38.0 million.

- For various purposes, the System uses an Actuarial Value of Assets which smooths annual actuarial investment gains and losses over a period of five years. This means the $38.0 investment gain described above will be phased in at a rate of approximately $7.6 million per year over the next five years. The smoothed Actuarial Value of Assets is $1,821.0 million (101% of the market value of $1,805.6 million). The $15.4 million difference between the Market Value of Assets and the Actuarial Value of Assets represents a net deferred investment loss that will be recognized in the future.

- The return on the Actuarial Value of Assets was 7.15%, resulting in an actuarial investment loss of $6.2 million. This return is lower than the return on the Market Value of Assets primarily due to the 2022 investment loss not being fully recognized in the Actuarial Value of Assets.

- The Actuarial Liability increased from $2,643.4 million as of December 31, 2023 to $2,667.8 million as of December 31, 2024. During the year, there was a small liability experience loss of $8.1 million (0.30% of liabilities).

- The funded ratio based on the Actuarial Value of Assets decreased from 68.8% to 68.3% and the Unfunded Actuarial Liability (UAL) increased from $824.1 million to $846.8 million. However, based on the Market Value of Assets, the funded ratio increased from 66.7% to 67.7%.

- The City currently contributes 17.75% of payroll on behalf of full-time active members and members participating in the Deferred Retirement Option Program (DROP). The City contributes 3% of payroll for part-time active members. Based on these fixed contribution rates, the UAL is currently projected to be paid off by 2061 if all assumptions are realized, including an investment return of 7.50% each year. However, under some investment scenarios, the System is projected to go insolvent. Detailed projections of the System's funded status and contributions are presented later in this section and in Section II.

- As elected by the Board, the System also calculates the City's Actuarially Determined Contribution (ADC) rate, using an open 30 year amortization method in accordance with the Board's funding benchmark. It was calculated to be 31.43% of payroll for Fiscal Year ending June 30, 2026. As a result of the fixed contribution rate of 17.75% being less than the City's Actuarial Determined Contribution rate, the UAL is not projected to be paid off over the same 30-year period. The ADC is a snapshot measurement which does not take into account expected future increases in total payroll over the next 30 years, the continued recognition of the net deferred investment loss or the expected decrease in the projected value of benefits (i.e., normal cost) accrued by actives in the future due to new entrants earning a benefit under Group G.

SECTION I – BOARD SUMMARY

Recent Trends

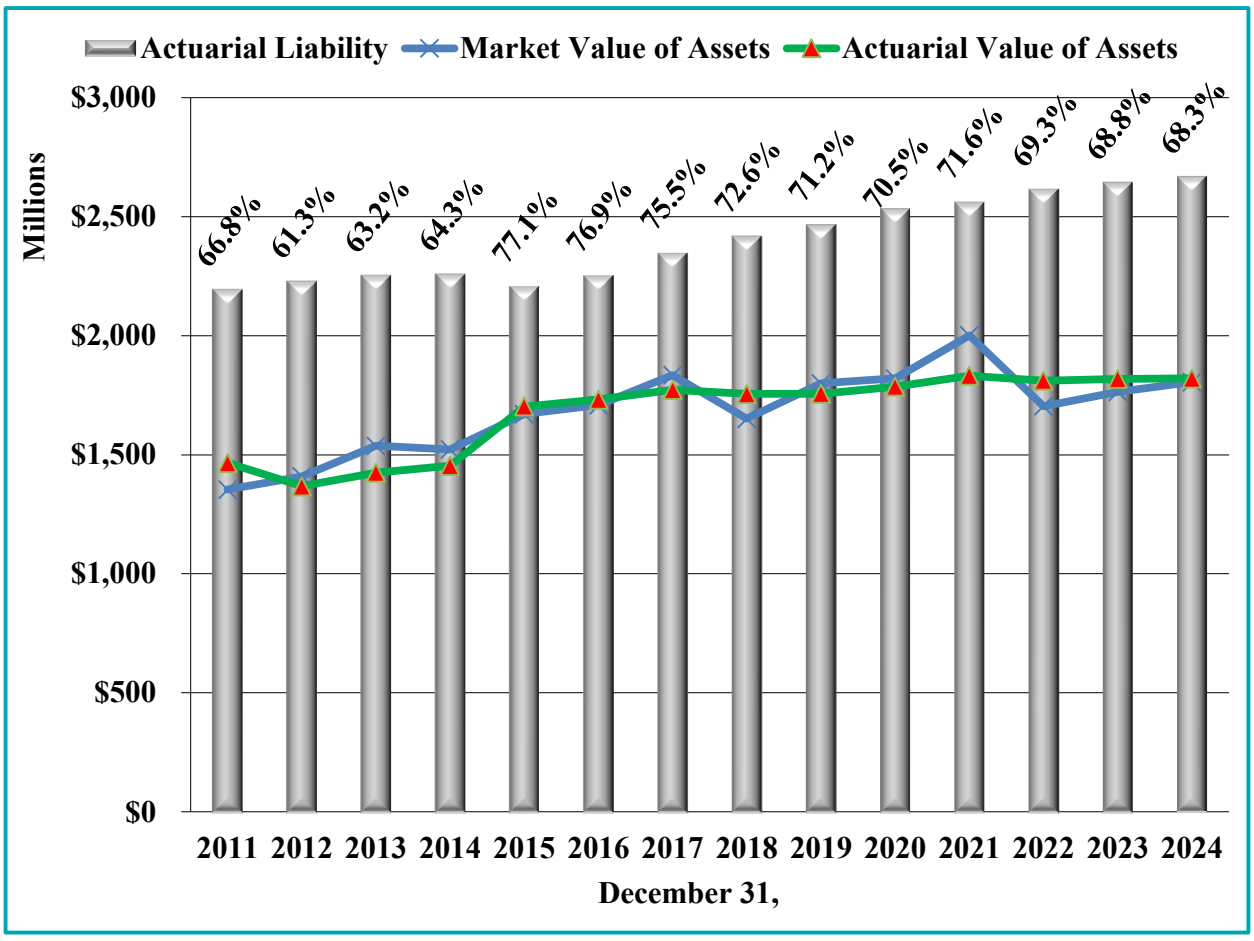
Although most of the attention given to the valuation reflects the most recently computed unfunded actuarial liability, funded ratio, and contribution amounts, each valuation is merely a snapshot of the long-term progress of a pension fund. It is important to take a step back from the current year results and view them in the context of the System's recent history as well as trends expected into the future. Beginning on the following page, we present a series of graphs that display historical trends for key factors in the valuations of the last 14 years.

SECTION I – BOARD SUMMARY

Assets and Liabilities

The gray bars represent the Actuarial Liability (AL). The blue line is the Market Value of Assets (MVA) and the green line is the Actuarial Value of Assets (AVA). The System's funded ratio (ratio of actuarial assets to actuarial liability) is shown along the top of the bars.

The sharp increase in the funded ratio from December 31, 2014 to December 31, 2015 was due primarily to $220 million in additional monies transferred from the healthcare assets to the pension assets as a result of the Collaborative Settlement Agreement. With the exception of 2021, the plan had experienced a gradual decline in the funded ratio since December 31, 2015 due to the System's experience as well as the City not making contributions sufficient to pay off the UAL. In 2021, the funded ratio increased slightly due to the strong investment performance.

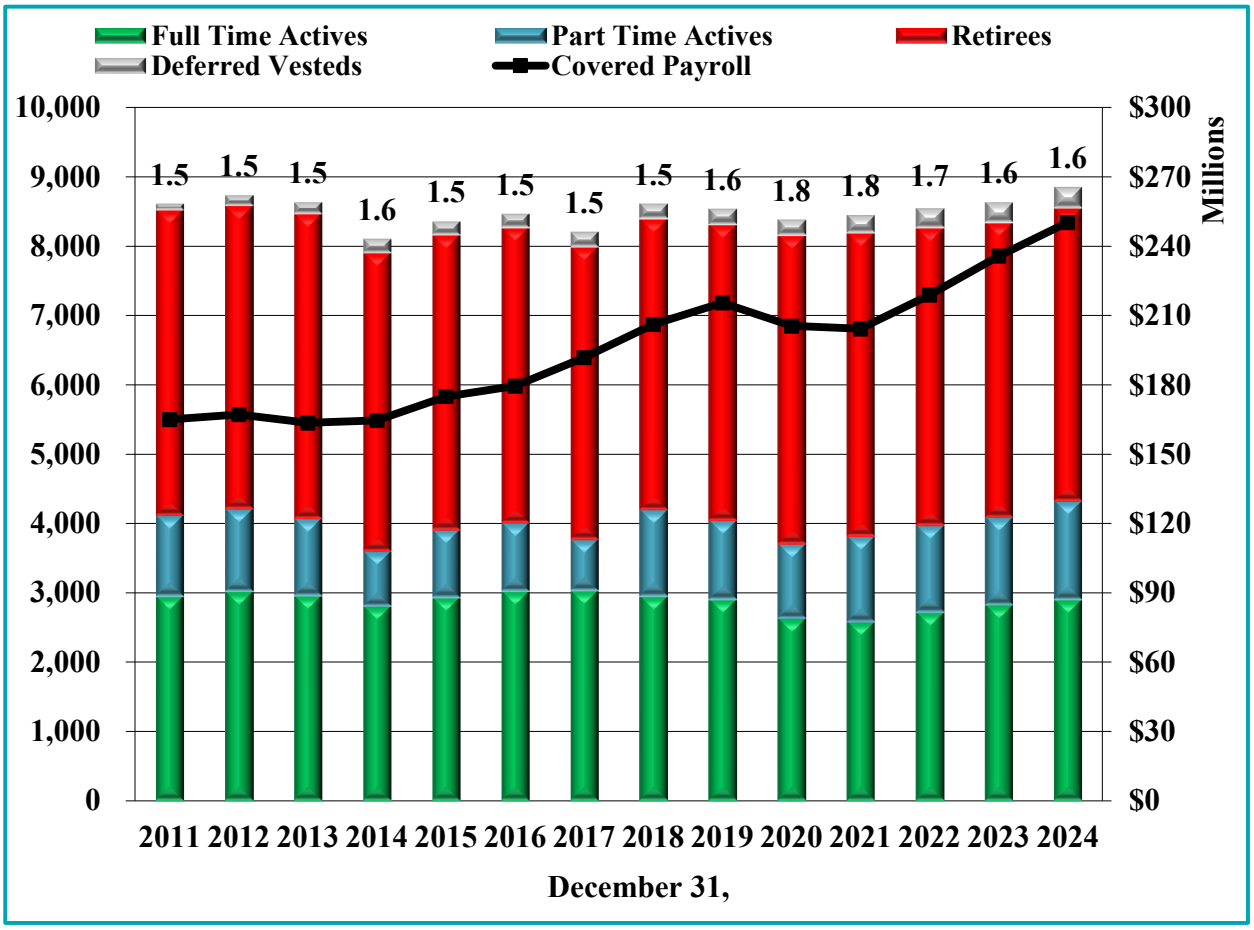


SECTION I – BOARD SUMMARY

Membership Trends

The graph below shows the membership counts of the System for the last fourteen valuations. The numbers which appear at the top of each bar (the "support ratio") represent the ratio of the number of inactive members, including DROP members, to full time active contributing members at each valuation date, and provide a measure of the maturity of the System. The support ratio peaked at 1.8 for 2020 and 2021 but has slightly decreased in recent years due to an increase in full-time active employees. As the System matures, it will be subject to higher risk exposure from market volatility. This is because the impact of investment losses will have to be offset by future contributions. These contributions, in turn, are only made on behalf of proportionately fewer active members compared to the total number of members.

The black line represents the payroll for active members over the period, and it corresponds with the scale on the right. The payroll for the part-time actives of $17.9 million was not included since the City does not contribute the full 17.75% of payroll for part-time actives.

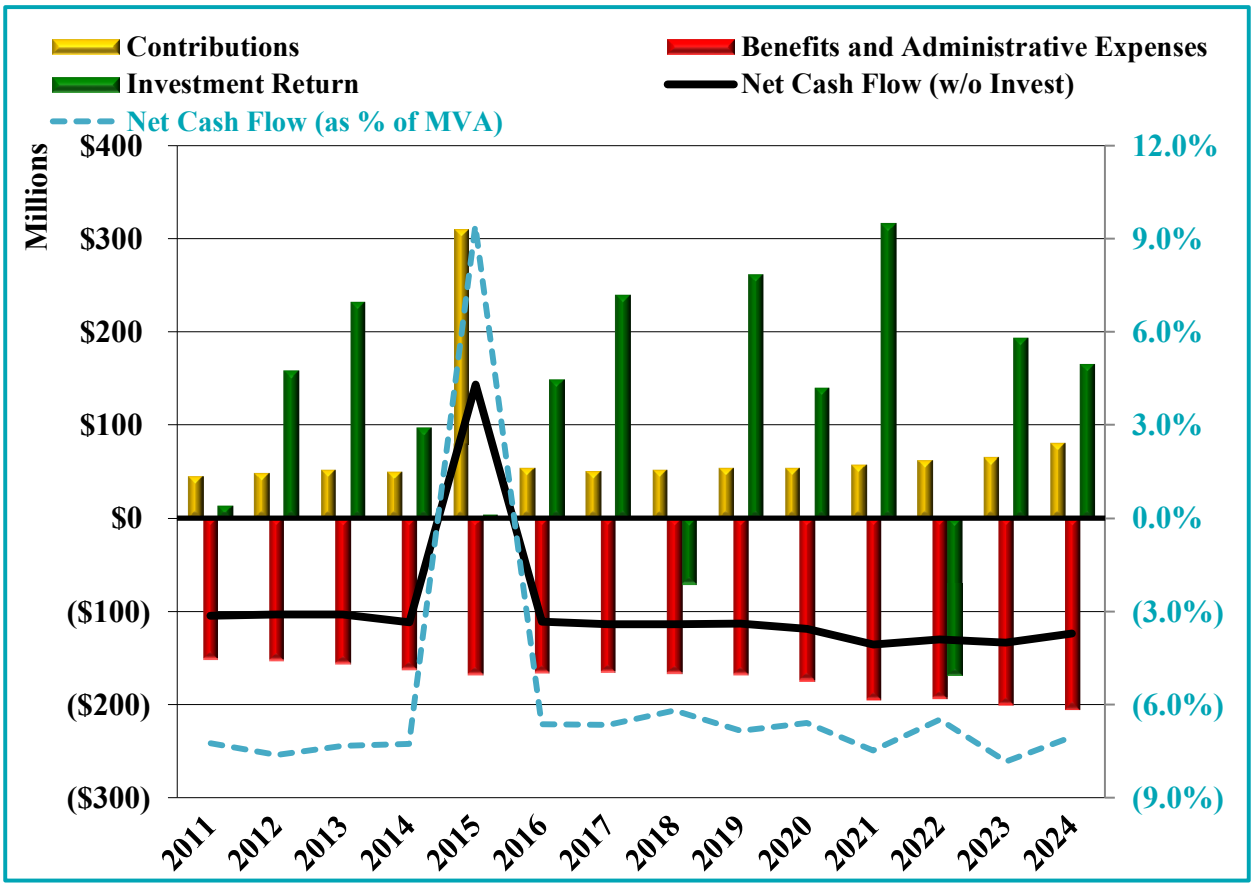


SECTION I – BOARD SUMMARY

Cash Flows

The following graph shows the System's net cash flow (contributions less benefit payments and expenses) at the end of each plan year. For the entire period shown, the net cash flow excluding investments has been negative except for 2015 when $220 million was transferred into the System pursuant to the Collaborative Settlement Agreement. This illustrates that contributions have not been sufficient to cover benefits and expenses in any year over the past decade. A major implication of negative cash flow is that the difference each year must be met first from cash generated by investments and then paid out of the principal assets, representing additional risk for the System if investments need to be sold in a down market to cover benefit payments.

The dotted line shows the net cash flow as a percent of the market assets and goes with the axis on the right. For the 14-year period shown (ignoring 2015) the net cash flow as a percent of assets has ranged between -8% and -6%. This indicates that a plan is expected to defund with an increased risk of insolvency if the contributions do not catch up to cover a higher portion of the benefit payments and expenses.



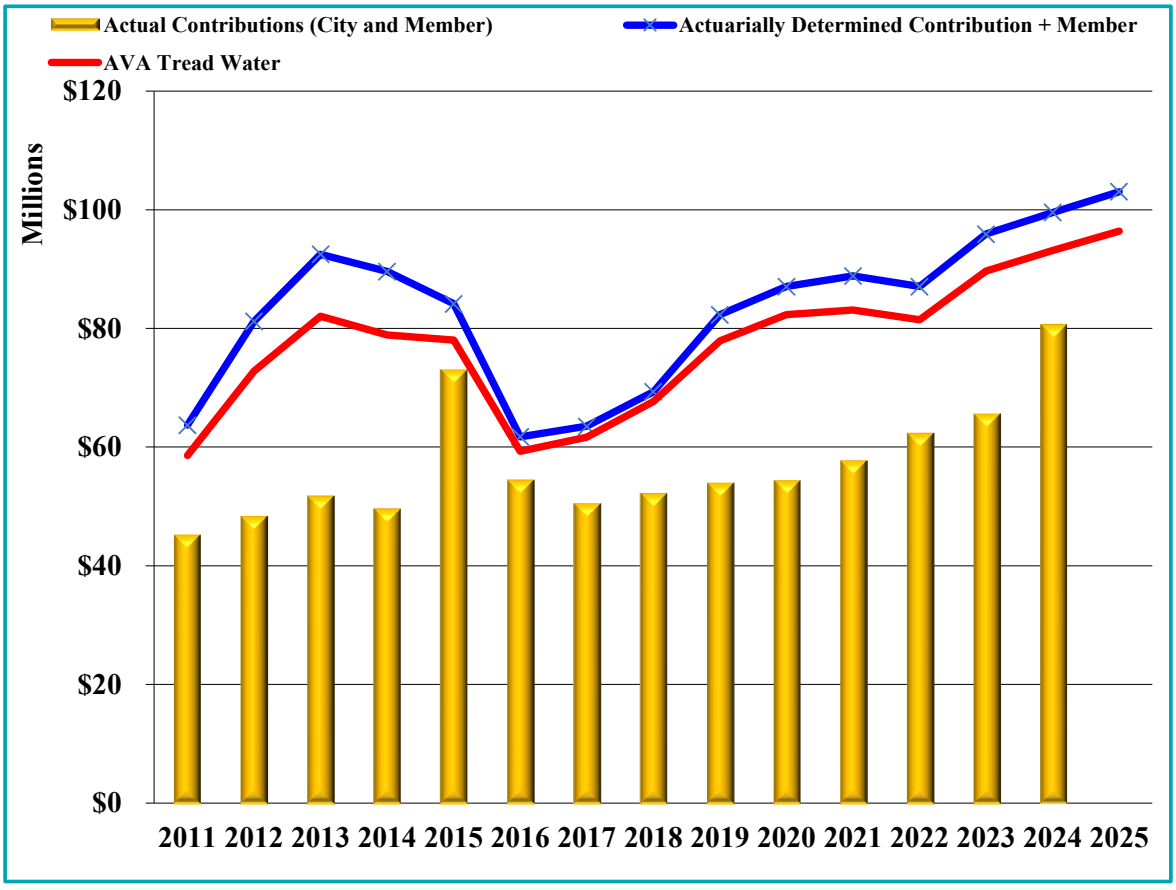
SECTION I – BOARD SUMMARY

Contributions

This graph shows the historical trends for the actual contribution amounts made by both the City and members (yellow bars). The blue line shows the actuarially determined contributions over the period. The Actuarially Determined Contribution (ADC), based on the Board's Funding Benchmark, is comprised of four components: normal cost which represents the value of the benefits expected to be earned for the upcoming year, assumed administrative expenses, ongoing contributions for the ERIP and an open 30-year level dollar amortization of any unfunded actuarial liability (net of the present value of future amounts expected to be contributed for the ERIP).

The red line is the **Tread Water** line, which is the normal cost plus the interest on the UAL based on an actuarial value of assets basis. The tread water line shows the minimum contributions needed to avoid an increase in the UAL.

The graph shows that not only has the City been making contributions less than the Actuarially Determined Contribution, but that the contributions are significantly below the tread water line. When contributions are lower than the normal cost plus interest on the UAL, the unfunded actuarial liability can normally be expected to grow from one year to the next. Please refer to the projections on the next page for more details, and to Section II for illustrations of the sensitivity of the System's funded status to investment returns.



SECTION I – BOARD SUMMARY

Projected Future Outlook

The analysis of the projected financial trends is perhaps the most important component of the valuation. The graphs presented in this section show the expected progress of the System's funded status over the next 30 years, measured in terms of the expected funded ratios, and the projected contributions made by the members (9% of payroll) and by the City (17.75% of payroll for full-time active members and DROP members; 3.0% for part-time members). In addition, we have assumed that the City will continue to make a contribution of $2.7 million by July 31 each year with the last payment due by July 2035 to pay for the increase in liabilities due to the ERIP. The System also received contributions of $2 million and $4 million from the General Fund in April and October 2024. However, we have not assumed any future amounts from the General Fund in our projections.

While the experience will not conform exactly to the assumptions every year, the trends reflect reasonable expectations. As a result, in addition to the baseline projection, we provided additional **stress testing** based on varying investment returns in the future. These scenarios are shown in Section II.

The projections assume a constant active population. As members retire, terminate, and die based on the current valuation assumptions, it is assumed that new members will replace them based on characteristics (age/gender/salary) similar to recent new members.

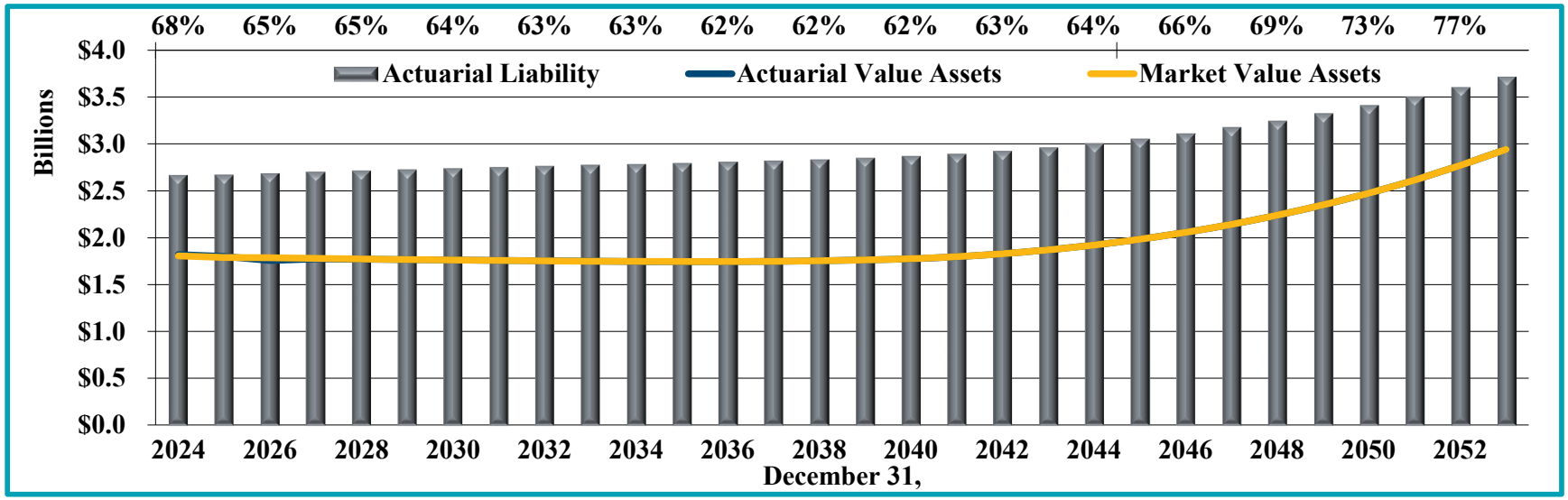
SECTION I – BOARD SUMMARY

Baseline Scenario

The baseline projection shows the outcome if all actuarial assumptions, including the long-term rate of return assumption of 7.50%, are exactly met.

The first graph compares the Market Value of Assets (gold line) and the Actuarial or smoothed Value of Assets (blue line) to the System's Actuarial Liabilities (gray bars). In addition, at the top of the graph, 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 shown in the graph signify the valuation date as of December 31 of the labeled year.

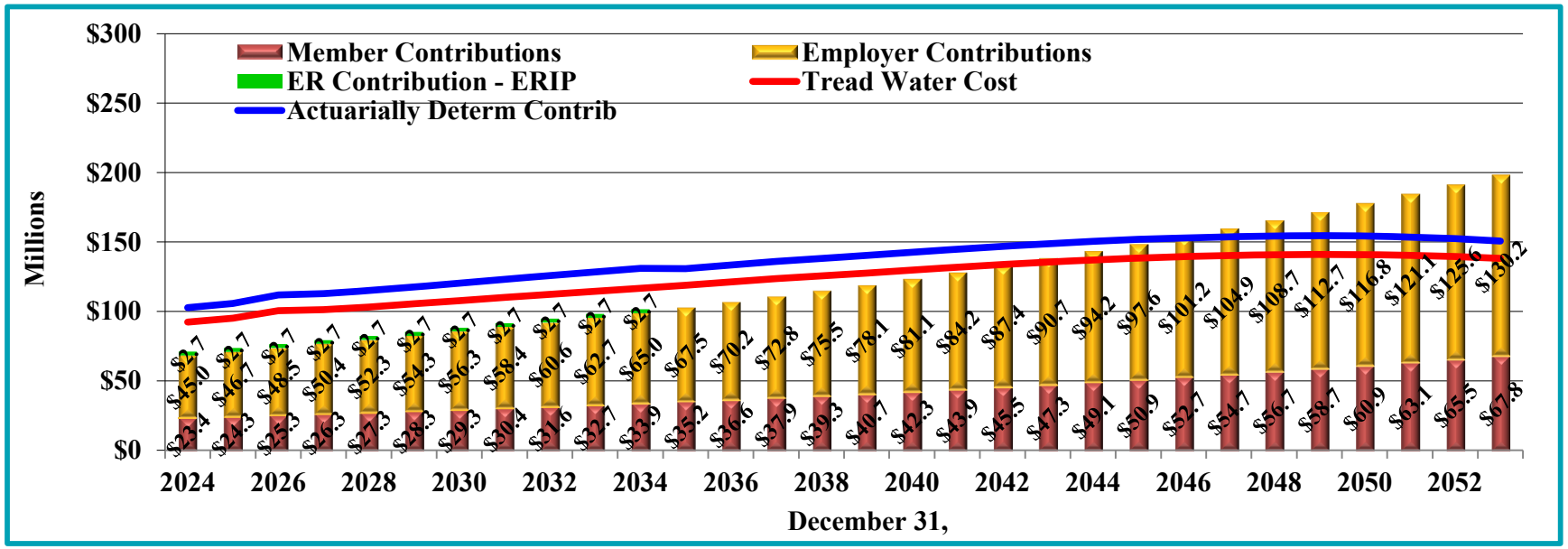
As shown in the graph below, the System's funded ratio on an Actuarial Value of Assets basis is projected to decrease to 62% by 2026 before increasing to 77% over the next 30 years. The System is expected to be 100% funded by 2061.



SECTION I – BOARD SUMMARY

The second graph below shows the projected contributions compared to the actuarially determined contributions shown in dollars. The member contributions are in maroon and the City's contributions are in gold. Similar to the historical graph before, the red line represents the Tread Water cost necessary to avoid decreasing funded status.

As shown below, total contributions are expected to increase throughout the projection period as total payroll is expected to increase. Without additional contributions or plan changes, the City's Actuarially Determined Contributions and the Tread Water Cost are expected to increase. For purposes of the projection, we assumed that the active population would remain constant. Projected payroll is based on the number of members valued as actives for this valuation and assumes that their positions are filled upon leaving employment with a new hire with an average starting salary of $65,000 (indexed by wage inflation for years beyond 2025).



Please see Section II for additional scenarios illustrating the sensitivity of these projections under various economic scenarios.

SECTION II – IDENTIFICATION AND ASSESSMENT OF RISK

Actuarial valuations are based on a set of assumptions about future economic and demographic experience. These assumptions represent a reasonable estimate of future experience, but the actual future experience will undoubtedly be different and may be significantly different. This section of the report is intended to identify the primary risks to the System, provide some background information about those risks, and provide an assessment of those risks.

Identification of Risks

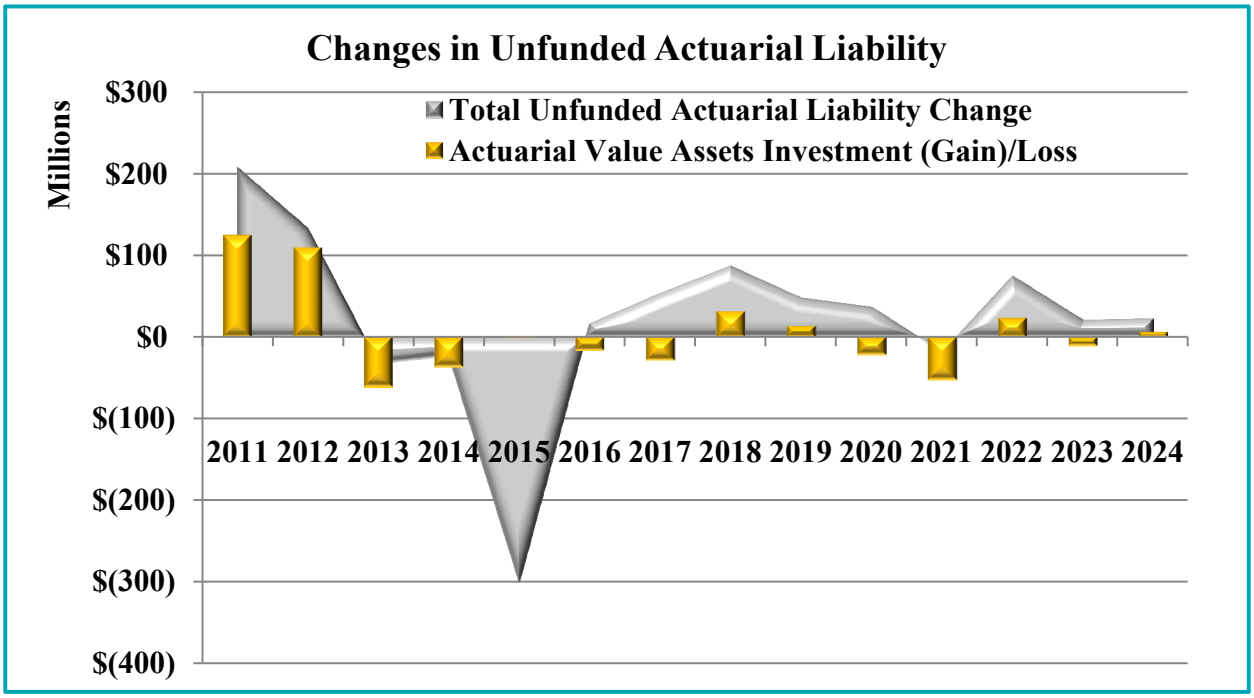
As we have discussed with the Board, the fundamental risk to the System is that the contributions needed to pay the benefits become unaffordable. While there are a number of factors that could lead to contribution amounts becoming unaffordable, we believe the primary risks are:

- Investment risk,
- Interest rate risk,
- Longevity and other demographic risks,
- Contribution risk; and
- Assumption change risk.

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

SECTION II – IDENTIFICATION AND ASSESSMENT OF RISK

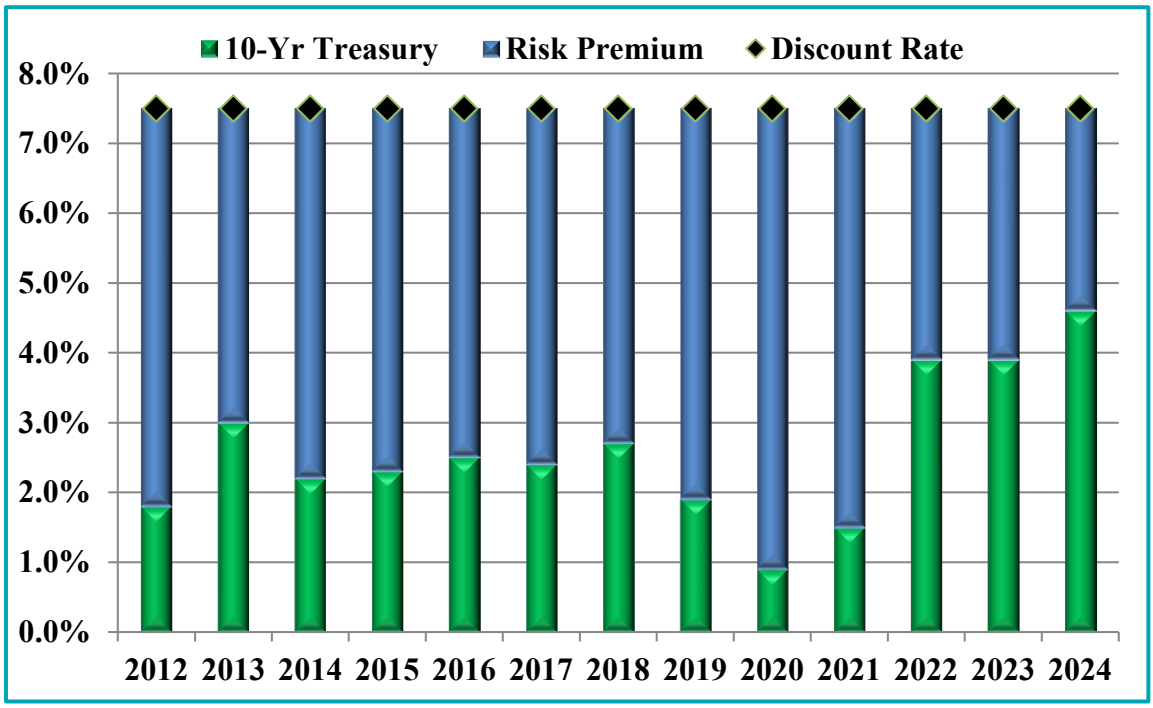
Investment Risk is the potential for investment returns to be different than expected. Lower investment returns than anticipated will increase the Unfunded Actuarial Liability necessitating higher contributions in the future unless there are other gains that offset these investment losses. The potential volatility of future investment returns is determined by the System's asset allocation and the affordability of the investment risk is determined by the amount of assets invested relative to the size of the plan sponsor or other contribution base.



The graph above shows the impact of investment gains and losses on the smoothed Actuarial Value of Assets over the last 14 years compared to the System's total change in Unfunded Actuarial Liability. There was a small actuarial investment loss this year due to the lower than 7.50% assumed return.

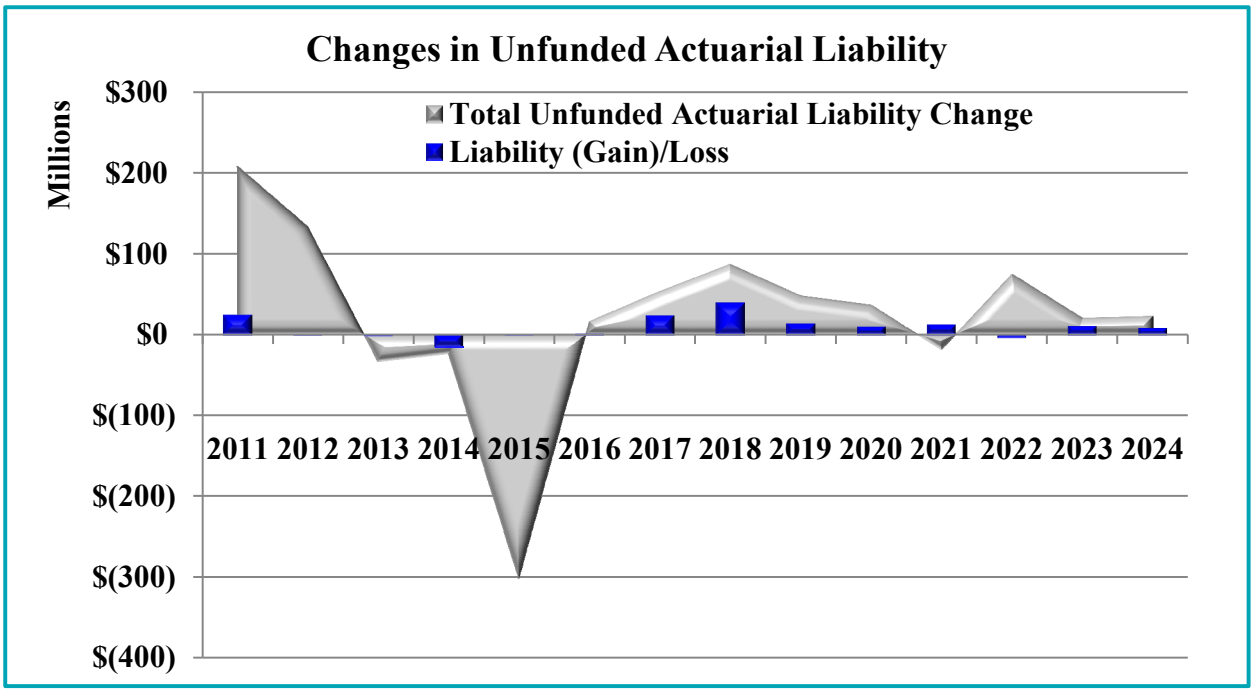
SECTION II – IDENTIFICATION AND ASSESSMENT OF RISK

Interest rate risk is the potential for interest rates to be different than expected. For public plans, short-term fluctuations in interest rates have little or no effect as the Plan's liability is usually measured based on the expected return on assets. Longer-term trends in interest rates, however, can have a powerful effect. The chart below shows the yield on a 10-year Treasury security compared to the System's assumed rate of return. The difference is a simple measure of the amount of investment risk taken. As illustrated below, the yield on a 10-year Treasury security was the lowest in 2020 (0.9%) while the yield for 2024 was the highest (4.6%).



SECTION II – IDENTIFICATION AND ASSESSMENT OF RISK

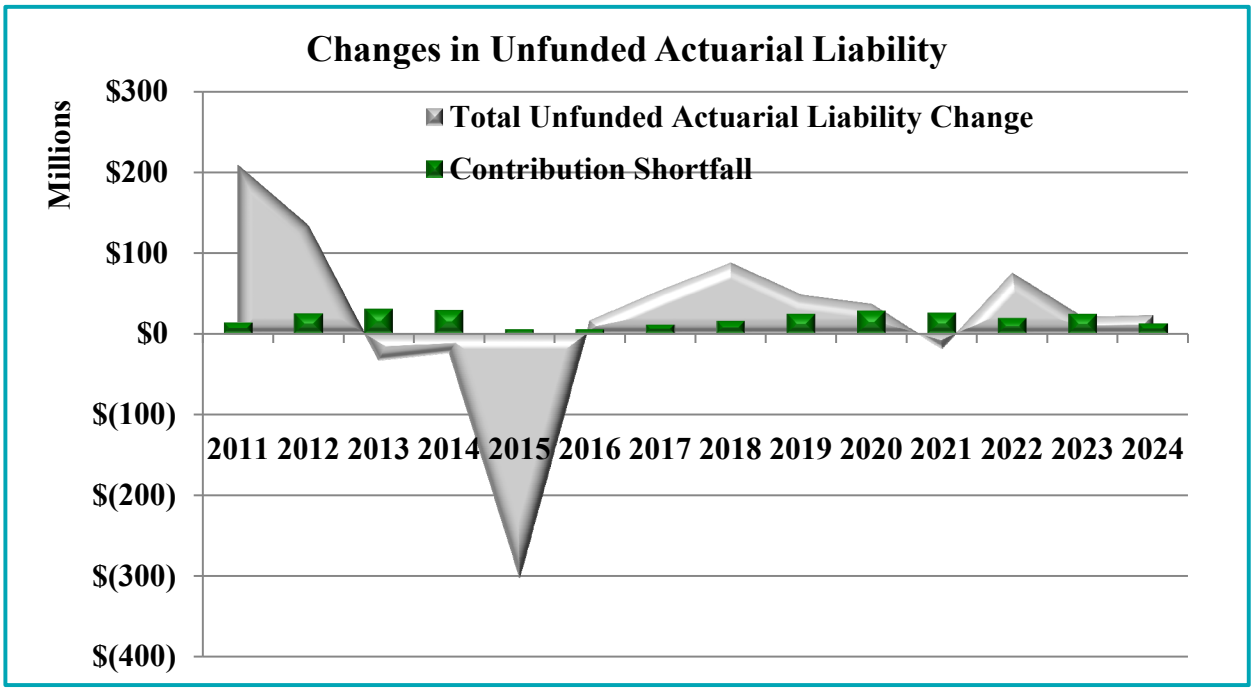
Longevity and other demographic risks are the potential for mortality or other demographic experience to be different than expected. Generally, longevity and other demographic risks emerge slowly over time and are often dwarfed by other changes, particularly those due to investment returns. The following graph shows the demographic gains and losses over the last 14 years compared to the total change in the UAL for each year. The big decrease in the UAL from 2014 to 2015 was due to the changes resulting from the Collaborative Settlement Agreement. There was a small liability loss for the 2024 experience.



Contribution risk is the potential for actual future contributions to deviate from expected future contributions. 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 can collect.

The normal cost plus the interest on the Unfunded Actuarial Liability is referred to as the "Tread Water Cost" because if contributions are less than the Tread Water Cost, the UAL is expected to grow; and if contributions are greater than the Tread Water Cost, the UAL is expected to decline. For this System, the City has consistently contributed less than the Tread Water Cost which has added to the growing UAL in the past. The following graph shows the contribution shortfall, which is the tread water cost over the actual contributions, compared to the change in the UAL.

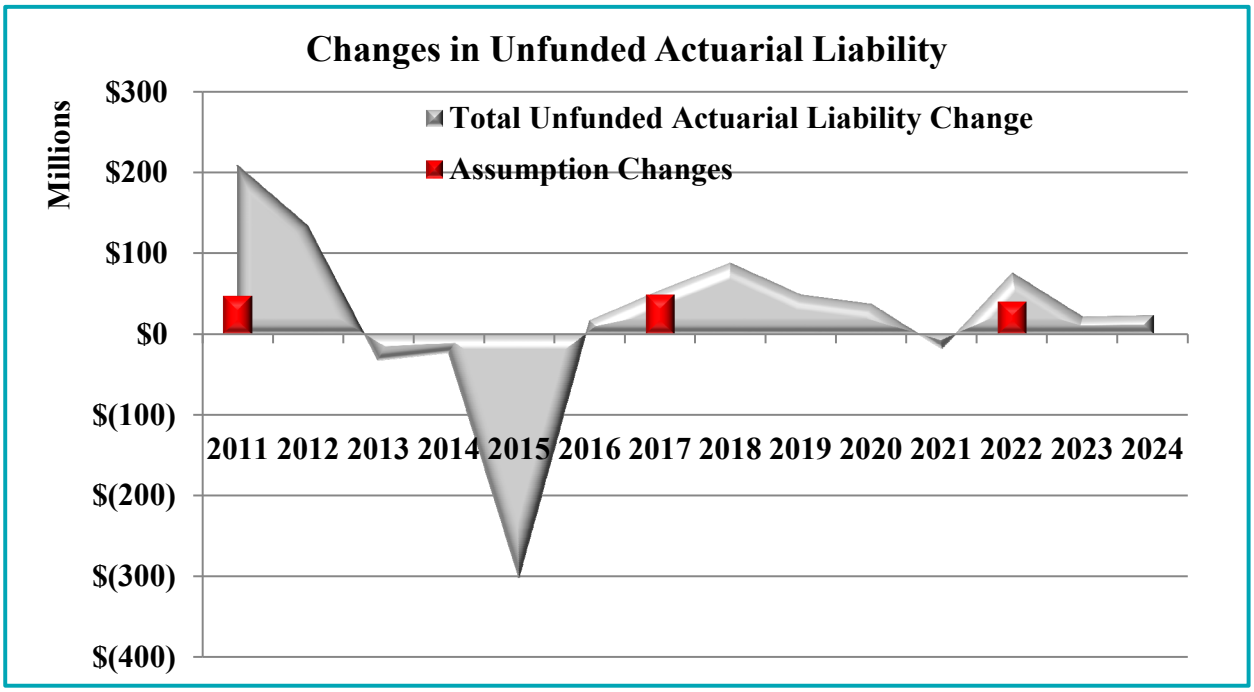
SECTION II – IDENTIFICATION AND ASSESSMENT OF RISK



Assumption change risk is the potential for the environment to change such that future valuation assumptions are different than the current assumptions. For example, declines in interest rates over the last three decades resulted in higher investment returns for fixed-income investments but lower expected future returns necessitating either a change in investment policy, a reduction in discount rate, or some combination of the two. Assumption change risk is an extension of the other risks identified, but rather than capturing the risk as it is experienced, it captures the cost of recognizing a change in environment when the current assumption is no longer reasonable.

As shown in the following graph, the assumption changes in 2011, 2017 and 2022 had a significant impact on the measure of the UAL. It is important to note that some of these changes include a downward revision to the estimate of future investment earnings and ultimately costs will be determined by actual investment earnings. As a result, future expectations of investment returns may continue to decline necessitating a reduction in the discount rate.

SECTION II – IDENTIFICATION AND ASSESSMENT OF RISK



SECTION II – IDENTIFICATION AND ASSESSMENT OF RISK

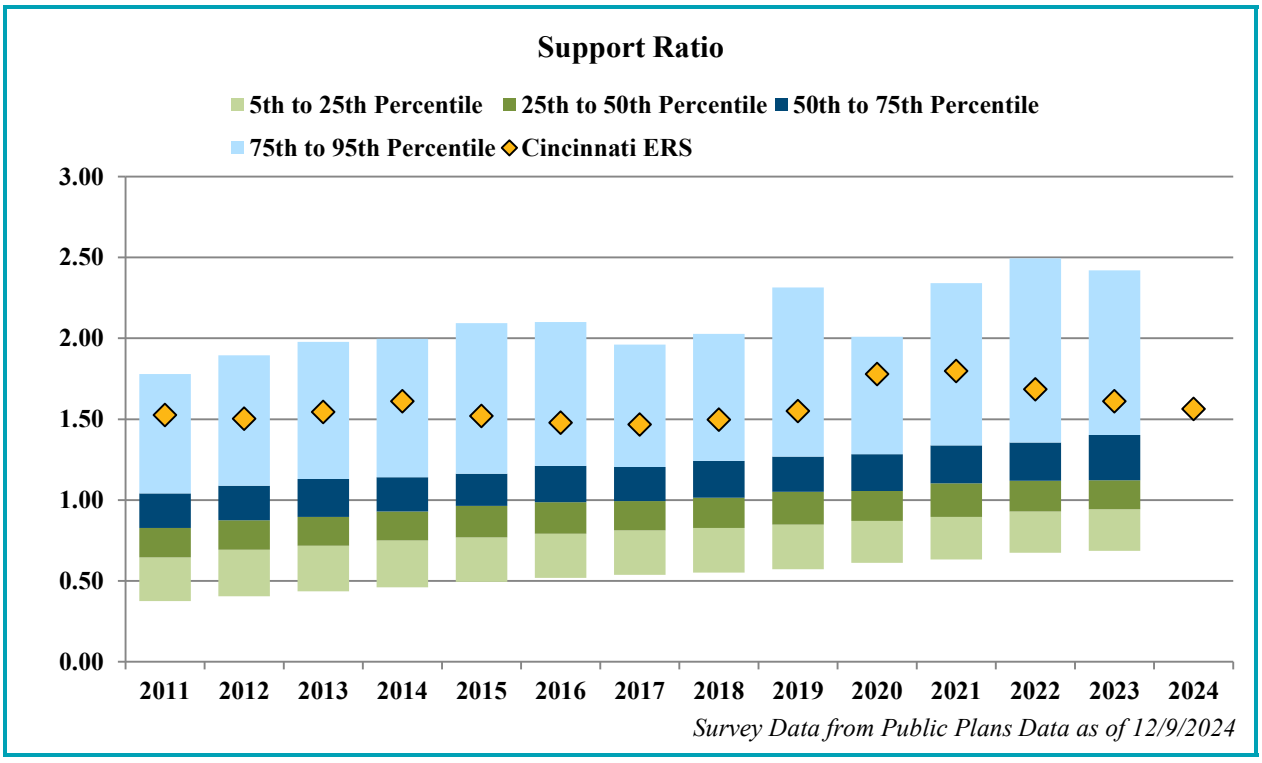
Plan Maturity Measures

The future financial condition of a mature pension plan is more sensitive to each of the risks identified above than a less mature plan. Before assessing each of these risks, it is important to understand the maturity of this System compared to other plans and how the maturity has changed over time.

Plan maturity can be measured in a variety of ways, but they all get at one basic dynamic - the larger the plan is compared to the contribution or revenue base that supports it, the more sensitive the plan will be to risk. The measures below have been selected as the most important in understanding the primary risks identified for this System.

Inactives per Active (Support Ratio)

One simple measure of plan maturity is the ratio of the number of inactive members (those receiving benefits, participating in DROP or entitled to a deferred benefit) to the number of active members. The revenue base supporting the plan is usually proportional to the number of active members, so a relatively high number of inactives compared to actives indicate a larger plan relative to its revenue base as well.

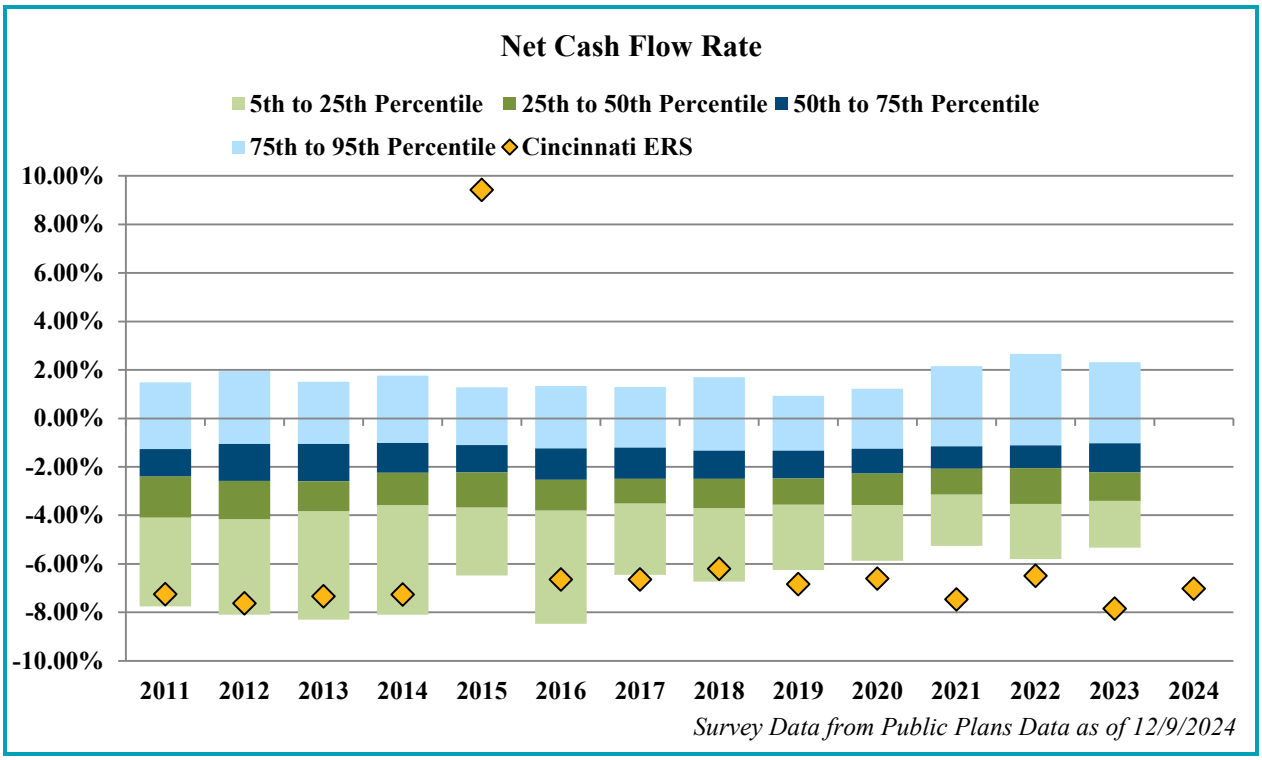


The graph above shows the distribution from the 5th to 95th percentile of support ratios for the plans in the Public Plans Database. The gold diamonds show how the Cincinnati Retirement System compares to the other plans. Whereas the support ratios for the plans as a whole have increased over the period as they mature, Cincinnati's support ratio has remained relatively stable over the last decade prior to the past five years and continues to be in the upper quartile.

SECTION II – IDENTIFICATION AND ASSESSMENT OF RISK

Net Cash Flow

The net cash flow of the plan as a percentage of the beginning of year assets indicates the sensitivity of the plan to short-term investment returns. Net cash flow is equal to contributions less benefit payments and administrative expenses. Mature plans can have large amounts of benefit payments compared to contributions, particularly if they are well funded. Investment losses in the short-term are compounded by the net withdrawal from the plan leaving a smaller asset base to try to recover from the investment losses. Large negative cash flows can also create liquidity issues.



The graph above shows how the Cincinnati Retirement System's negative net cash flow as a percent of assets has compared to the other public plans in the database. With the exception of 2015, which reflects the large amount of monies transferred pursuant to the Collaborative Settlement Agreement, the System has been amongst the top 5 percentile in having the largest negative cash flow. This higher negative cash flow subjects the System to a higher amount of investment risk since assets must earn more to avoid the System's assets from decreasing from one year to the next. In periods of market underperformance, the impact on the System is greater due to this higher negative cash flow.

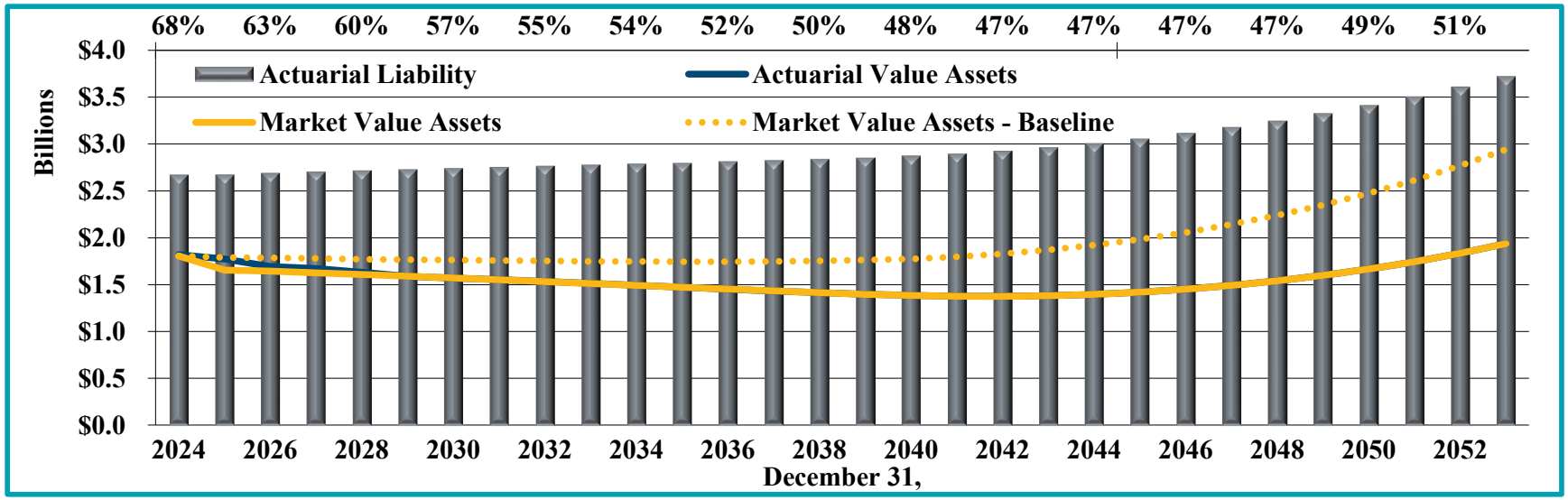
SECTION II – IDENTIFICATION AND ASSESSMENT OF RISK

Deterministic Scenarios/Stress Testing

We developed several hypothetical scenarios to illustrate the impact actual investment returns may have on future funded status and contribution rates. The scenarios are balanced between positive and negative scenarios and are intended to illustrate the importance of both the return itself as well as the timing of such returns.

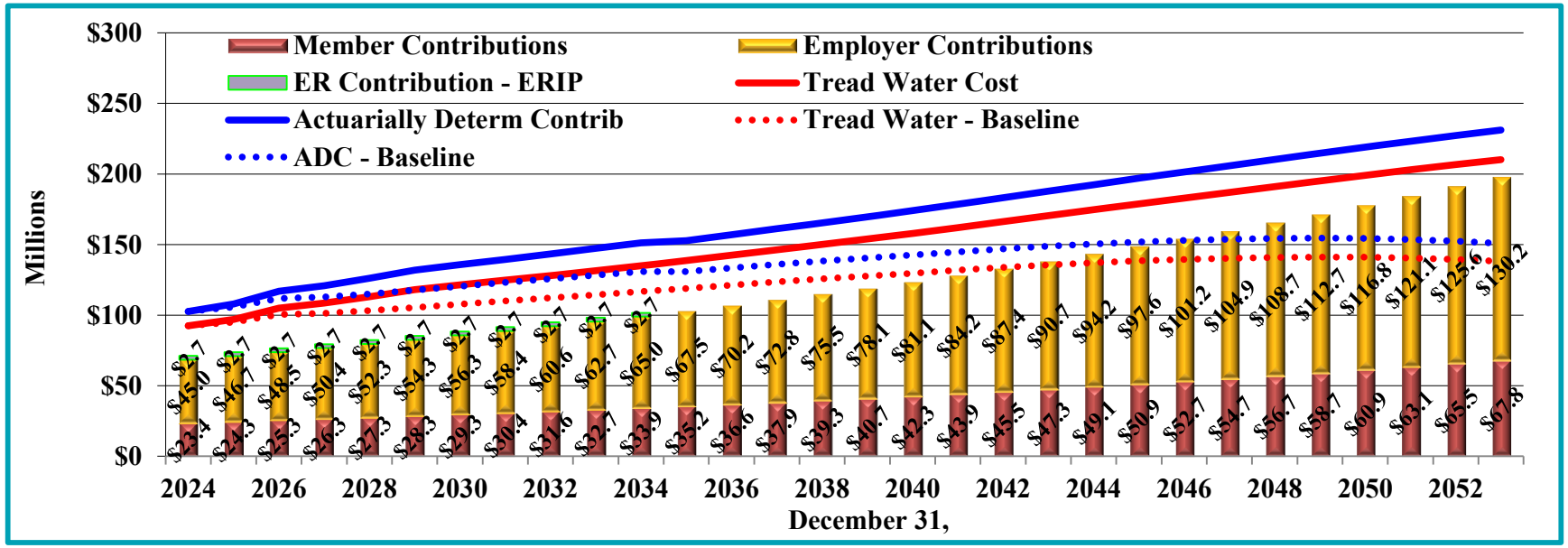
The graphs on the following pages show the projections under each of these theoretical scenarios. The asset/liability graphs include a gold dotted line representing the baseline market value of assets and the contribution graphs include a blue dotted line representing the baseline ADC projections to facilitate the comparison between the particular scenario and the projections assuming all assumptions are met. The baseline projections are shown in the Board Summary.

Investment Return of 0% for 2025 followed by 7.5% per year thereafter



As illustrated above, one year of a flat return (0%) for the Plan year ending December 31, 2025 followed by a 7.5% return per year thereafter has a significant impact on the solvency projection of the System. Under this projection, the System is projected to reach 100% funded in 2074 compared to 2061 if the System's return was 7.5% for 2025 and all years thereafter.

SECTION II – IDENTIFICATION AND ASSESSMENT OF RISK



Under this scenario, the City's Actuarially Determined Contribution and Tread Water Cost are expected to increase over the next 30 years. The contributions (bars) are the same as the baseline since the City's contributions are currently made based on a fixed rate regardless of its funded status.

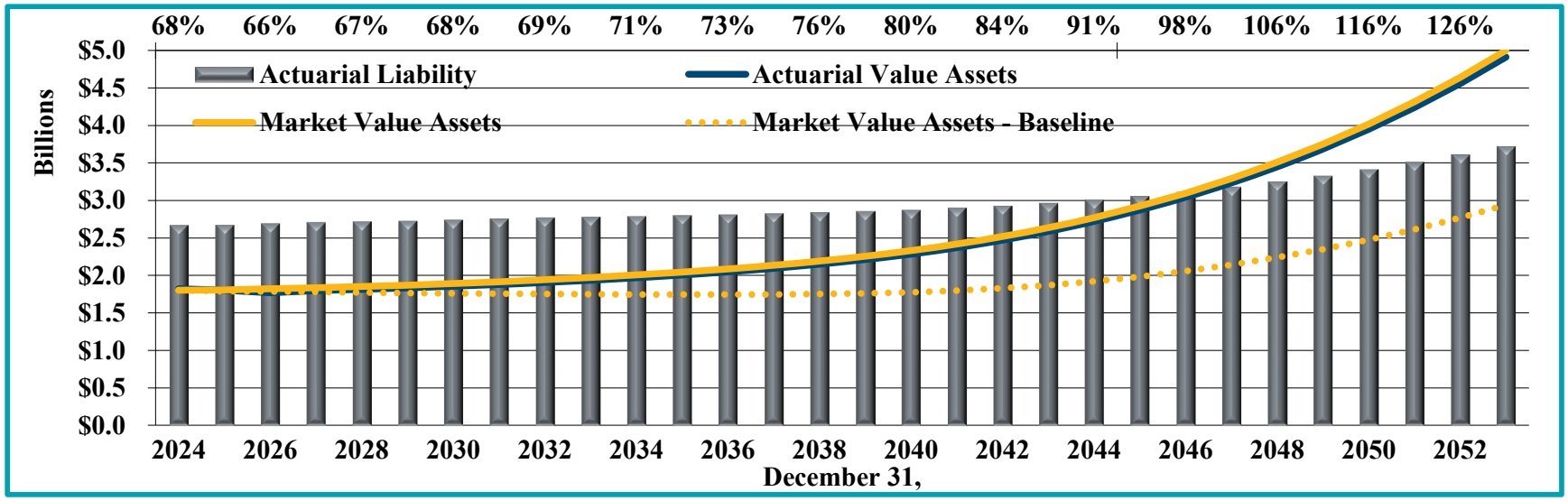
SECTION II – IDENTIFICATION AND ASSESSMENT OF RISK

The table below further illustrates the impact that various investment returns for the year ending December 31, 2025 would have on the projected insolvency of the System's assets assuming no changes to benefits or contribution rates and all assumptions are realized. All future years beyond 2025 were assumed to have an investment return of 7.5%.

Assumed 2025 Investment Return	Projected Insolvency Year	Projected to be 100% Funded
15.0%	None	2052
7.5%	None	2061
0.0%	None	2074
(7.5%)	None	Beyond 2100
(15.0%)	2052	None

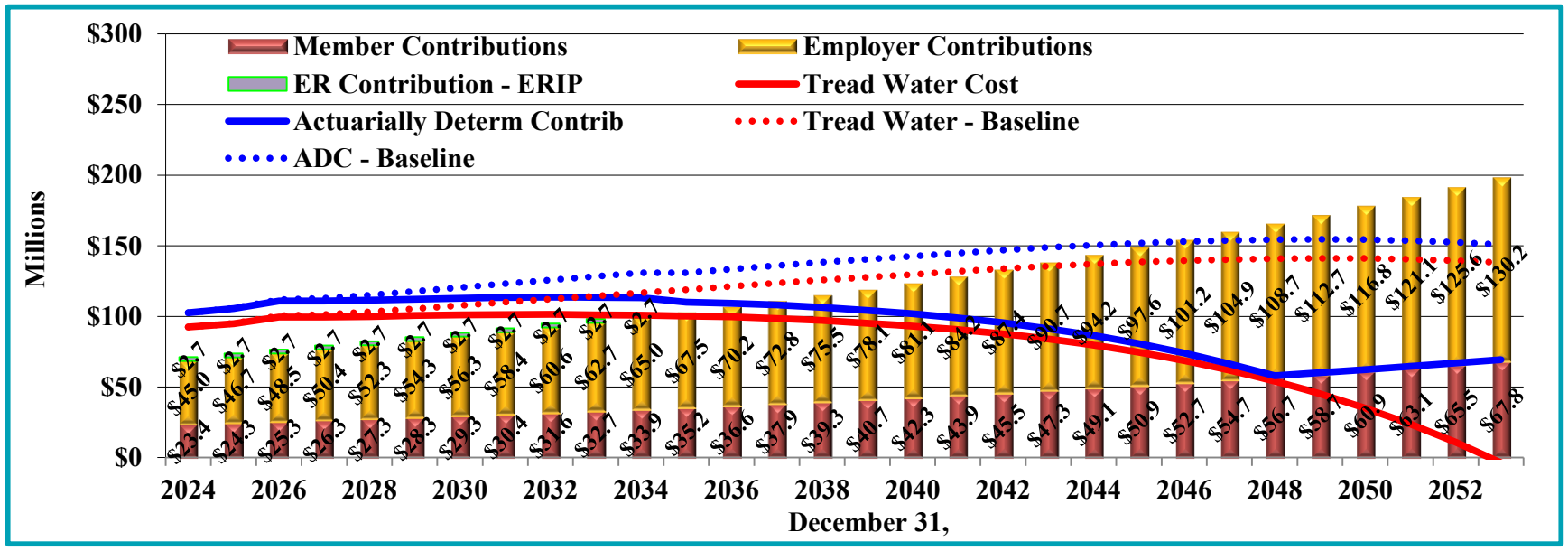
SECTION II – IDENTIFICATION AND ASSESSMENT OF RISK

Investment Return of 8.5% per year



Conversely, the chart above shows the impact on the System's projected assets if all future years' investment returns are 8.5% per year. As shown above, the funded percentage has increased from 77% to 126% by December 31, 2052.

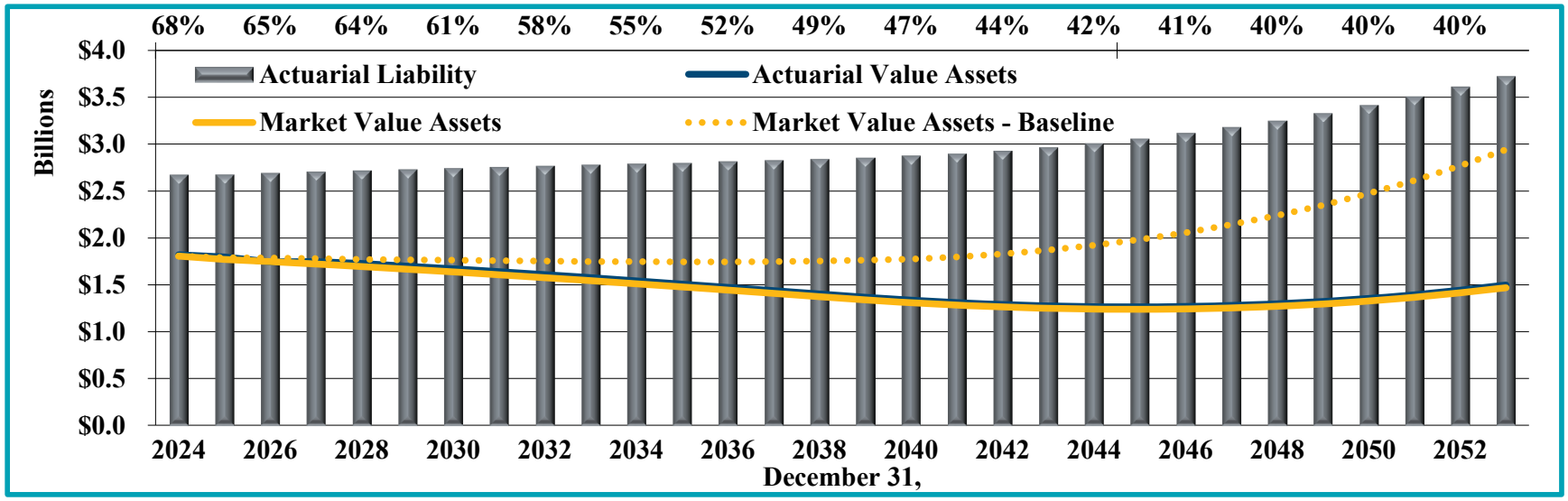
SECTION II – IDENTIFICATION AND ASSESSMENT OF RISK



As anticipated, both the City's Actuarially Determined Contribution and Tread Water Cost are materially lower than if the assets were to return the assumed 7.5% per year.

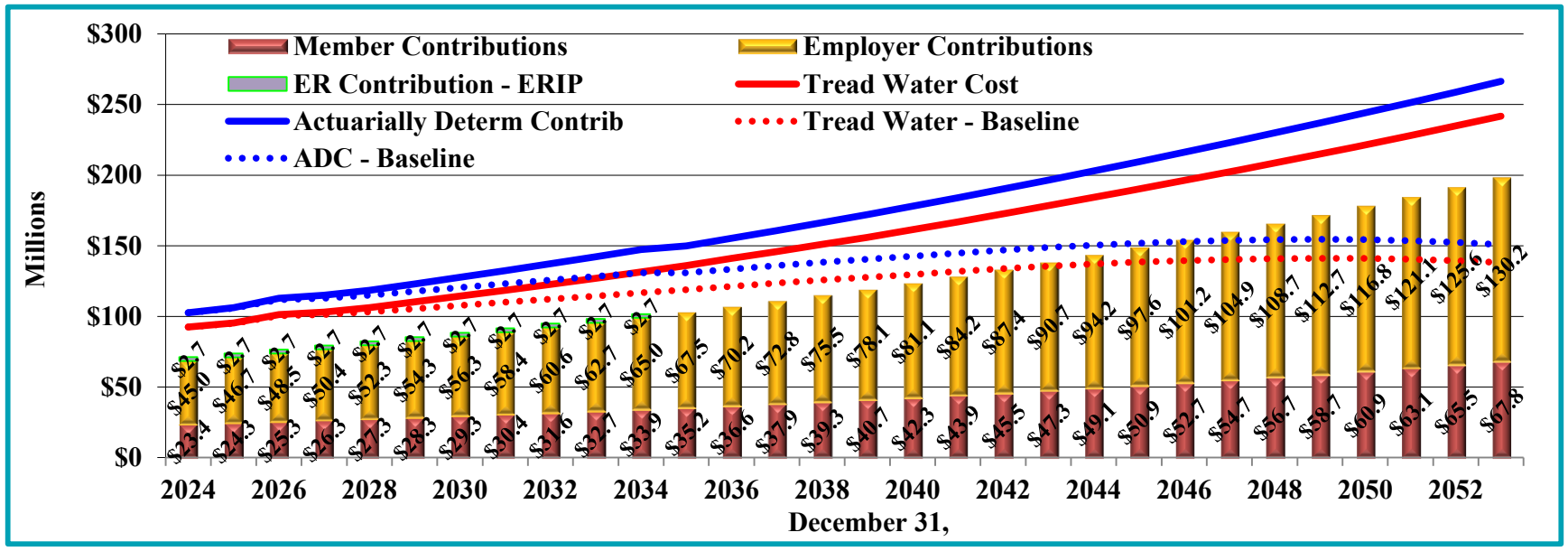
SECTION II – IDENTIFICATION AND ASSESSMENT OF RISK

Investment Return of 6.5% per year



If the assets were to return 6.5% per year (1% less than the assumed 7.5%), the funded percentage would decline to 40% by December 31, 2052.

SECTION II – IDENTIFICATION AND ASSESSMENT OF RISK



As anticipated, both the City's Actuarially Determined Contribution and Tread Water Cost are higher than if the assets were to return the assumed 7.5% per year.

The scenarios shown above represent deterministic projections. These types of projections show the financial impact on the System under a set of fixed returns. Alternatively, stochastic projections graph the probability of the key metrics such as funded status based on a large number of scenarios (e.g., 1,000) based on the expected long-term return and risk characteristics of the portfolio. Whereas we have not included a stochastic analysis in this report, we would be happy to share this analysis if requested.

More Detailed Assessment

A more detailed assessment is always valuable to enhance the understanding of the risks identified above. While more detail would provide some additional value, we do not believe it is necessary to perform an in-depth analysis every year. We recommend the Board review the analysis provided above annually and consider a more detailed analysis periodically and when there is a substantial change in the financial position or maturity of the System.

SECTION II – IDENTIFICATION AND ASSESSMENT OF RISK

Low-Default-Risk Obligation Measure (LDROM)

The System invests in a diversified portfolio to achieve the best possible return at an acceptable level of risk. The lowest investment risk portfolio for a pension plan would be composed entirely of low-default-risk fixed income securities whose cash flows approximately match the cash flow needs of the System. However, such a portfolio would have a lower expected rate of return (5.49% as of December 31, 2024) than the diversified portfolio (7.50%). Low-Default-Risk Obligation Measure (LDROM) represents what the Actuarial Liability would be if the System's assets were invested in such a portfolio. As of December 31, 2024 the LDROM is $3.265 billion[1] compared to the Actuarial Liability of $2.668 billion for the System. The $0.597 billion difference can be viewed as the expected savings from taking on the investment risk of the diversified portfolio. Alternatively, it can be viewed as the potential cost of eliminating the investment risk of the non-fixed income allocations of the diversified portfolio.

If the System were to invest in the LDROM portfolio, the funded ratios would decrease. The security of the System's pension benefits relies on the current assets, future investment earnings, and the ability and willingness of the City to make future contributions. If the City were to invest in the LDROM portfolio, it would not change the current assets, but it would reduce future investment earnings and reduce the funded ratio. However, the range of future investment earnings would narrow significantly.

[1] Assumes a 5.49% discount rate which is based on the December 31, 2024 FTSE Pension Liability Yield Curve , and all other assumptions and methods as used to calculate the Actuarial Liability.

SECTION III – ASSETS

The System uses and discloses two different asset measurements which are presented in this section of the report: market value and actuarial value of assets. The market value represents the value of the assets if they were liquidated on the valuation date. The actuarial value of assets is a value that smooths annual investment returns to reduce annual investment volatility and is used in determining the actuarial determined contribution.

In this section, we present detailed information on the System's assets including:

- Statement of the cash flow during the year,
- Disclosure of investment performance for the year, and
- Development of the actuarial value of assets.

Changes in Market Value

The components of asset change from one year to the next include contributions (both City and Member), benefit payments, expenses, and investment income (realized and unrealized.)

The specific changes during 2024 are presented on the next page.

SECTION III – ASSETS

Table III-1
Reconciliation of the Market Value of Assets

Market Value of Assets - December 31, 2023	$	1,763,884,000
Additions		
Contributions		
Employer	$	46,597,950
Early Retirement Incentive Program Contribution		2,760,050
General Fund		6,000,000
Member		25,327,000
Total Contributions	$	80,685,000
Gross Investment Income		172,304,000
Investment Expenses		(6,679,000)
Total Additions	$	246,310,000
Deductions		
Benefits Paid	$	202,083,000
Net Transfers		255,000
Administrative Expenses		2,268,000
Total Deductions	$	204,606,000
Net Increase(Decrease)	$	41,704,000
Market Value of Assets - December 31, 2024	$	1,805,588,000

SECTION III – ASSETS

Investment Performance

The following table calculates the investment gain/loss and the return for the plan year on a Market Value basis. The return is an appropriate measure for comparing the actual asset performance to the long-term 7.50% assumption.

Table III-2
Market Value Investment Gains/(Losses)

Market Value of Assets - December 31, 2023	$	1,763,884,000
Contributions	$	80,685,000
Benefits Paid		(202,083,000)
Net Transfers		(255,000)
Administrative Expenses		(2,268,000)
Expected Investment Earnings (7.50%)		127,623,284
Expected Market Value of Assets - December 31, 2024	$	1,767,586,284
Investment Gain / (Loss)	$	38,001,716
Market Value of Assets - December 31, 2024	$	1,805,588,000
Return		9.73%

SECTION III – ASSETS

Actuarial Value of Assets

To determine on-going funding requirements, most pension systems utilize an actuarial value of assets that differs from the market value of assets. The actuarial value of assets represents an asset value based on averaging or smoothing year-to-year market value returns for purposes of reducing contribution volatility. For this System, the actuarial value of assets recognizes a portion of the difference between the actual market value of assets and the expected market value of assets. The amount recognized each year is 20% of the difference between actual market value and expected market value. The expected market value is determined using the System's actual cash flows and assumed actuarial rate of return. The actuarial value of assets is constrained so that it cannot exceed 120% of the market value and cannot be less than 80% of the market value. The asset valuation method is described more fully in Appendix B.

The following table illustrates the calculation of the actuarial value of assets for the December 31, 2024 valuation.

Table III-3
Development of December 31, 2024 Actuarial Value of Assets

a)	Market Value of Assets - December 31, 2024				$ 1,805,588,000
b)	Deferred Gains or (Losses)				
	Plan Year	Market Value Gain or (Loss)	Percent Recognized	Percent Deferred	Amount Deferred
	2024	$ 38,001,716	20%	80%	$ 30,401,373
	2023	70,737,859	40%	60%	42,442,715
	2022	(313,114,757)	60%	40%	(125,245,903)
	2021	185,065,851	80%	20%	37,013,170
	2020	9,138,110	100%	0%	0
				Total Deferred:	$ (15,388,645)
c)	Preliminary Actuarial Value of Assets - December 31, 2024 [(a) - (b)]				$ 1,820,976,645
d)	Corridor for Actuarial Value of Assets				
	80% of Market Value of Assets				$ 1,444,470,400
	120% of Market Value of Assets				$ 2,166,705,600
e)	Actuarial Value of Assets - December 31, 2024				$ 1,820,976,645
f)	Actuarial Value of Assets as a % of Market Value of Assets [(e) ÷ (a)]				101%

SECTION III – ASSETS

Asset Gains / (Losses) on Actuarial Value Basis

The following table calculates the actuarial investment gain/loss and the return for the plan year on an Actuarial Value basis. This actuarial gain/loss is one component of the System's overall actuarial experience gain/loss.

The Actuarial Value of Assets returned 7.15% resulting in a $6.2 million actuarial investment loss when compared to the 7.50% expected return as shown below. Since the Market Value of Assets currently lags the Actuarial Value of Assets by $15.4 million, this represents a net deferred investment loss that will continue to be recognized over the next four years and mitigate the impact of any favorable returns in the future.

Table III-4
Actuarial Value Investment Gains/(Losses)

Actuarial Value of Assets - December 31, 2023	$	1,819,308,605
Contributions	$	80,685,000
Benefits Paid		(202,083,000)
Net Transfers		(255,000)
Administrative Expenses		(2,268,000)
Expected Investment Earnings (7.50%)		131,780,129
Expected Actuarial Value of Assets - December 31, 2024	$	1,827,167,734
Investment Gain / (Loss)	$	(6,191,089)
Actuarial Value of Assets - December 31, 2024	$	1,820,976,645
Return		7.15%

SECTION III – ASSETS

Investment Performance

The market value of assets (MVA) returned 9.73% during 2024, which is more than the assumed 7.50% return. A return of 7.15% on the actuarial value of assets (AVA) is primarily the result of the asset smoothing method being utilized for the calculation of the actuarial value of assets. Since only 20% of this year's gain from the performance of the System is recognized in a given year, in periods of very favorable performance, the AVA will not increase as rapidly as the MVA. In a period of unfavorable returns, the AVA will not decrease as fast as the MVA.

Table III-5
Annual Rates of Return

Plan Year	Investment Return Assumption	Market Value	Actuarial Value
2015	7.50%	(0.11%)	7.51%
2016	7.50%	9.24%	8.50%
2017	7.50%	14.51%	9.19%
2018	7.50%	(3.93%)	5.66%
2019	7.50%	16.40%	6.69%
2020	7.50%	8.03%	8.78%
2021	7.50%	18.06%	10.55%
2022	7.50%	(8.67%)	6.18%
2023	7.50%	11.81%	8.12%
2024	7.50%	9.73%	7.15%
10-Year Compound Average		**7.16%**	**7.82%**
5-Year Compound Average		**7.40%**	**8.14%**

SECTION IV – LIABILITIES

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

- **Disclosure** of System liabilities at December 31, 2023 and December 31, 2024, 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 Benefits:** Used for analyzing the financial outlook of the System. This represents the amount of money needed today to fund all future benefits and expenses of the System, assuming members continue to accrue benefits and all assumptions are met.
- **Actuarial Liability:** Used for funding calculations. This liability is calculated taking the present value of benefits above and subtracting the present value of future member contributions and future employer normal costs under an acceptable actuarial funding method. This method is referred to as the **Entry Age Normal** funding method.

None of the liability figures disclosed in this report is meant to be a measure of the System's settlement liability.

The following table discloses each of these liabilities for the current and prior valuations. With respect to the Actuarial Liability, a subtraction of the Actuarial Value of Assets yields a **net surplus** or an **unfunded liability**.

SECTION IV – LIABILITIES

Table IV-1
Liabilities/Net (Surplus)/Unfunded

	December 31, 2023	December 31, 2024
Present Value of Benefits		
Active Participants (Full Time)	$ 764,949,003	$ 805,155,737
Active Participants (Part Time)	5,871,183	6,488,057
Deferred Vesteds	26,487,632	27,881,066
Retirees	2,087,365,478	2,086,383,906
Present Value of Benefits (PVB)	**$ 2,884,673,296**	**$ 2,925,908,766**
City's Normal Cost*	$ 9,011,610	$ 9,356,749
Actuarial Liability		
Active Participants (Full Time)	$ 523,658,170	$ 547,070,024
Active Participants (Part Time)	5,871,183	6,488,057
Deferred Vesteds	26,487,632	27,881,066
Retirees	2,087,365,478	2,086,383,906
Actuarial Liability (AL)	**$ 2,643,382,463**	**$ 2,667,823,053**
Actuarial Value of Assets (AVA)	1,819,308,605	1,820,976,645
Net (Surplus)/Unfunded (AL – AVA)	**$ 824,073,858**	**$ 846,846,408**
Funded Status (AVA basis)	**68.8%**	**68.3%**

* *Includes administrative expense and net of Employee Contributions*

SECTION IV – LIABILITIES

Changes in Liabilities

Each of the liabilities disclosed in the prior table is 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
- Members retiring, terminating, or dying at rates different than expected
- A change in actuarial or investment assumptions
- A change in the actuarial funding method

Unfunded liabilities will change because of all of the above and due to changes in the System's assets resulting from the following:

- Employer contributions less than the full actuarial contribution
- Investment earnings different than expected
- A change in the method used to measure system assets

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

Table IV-2
Change in Liabilities

	Present Value of Benefits	Actuarial Liability
Liabilities as of 12/31/2023	$ 2,884,673,296	$ 2,643,382,463
Liabilities as of 12/31/2024	$ 2,925,908,766	$ 2,667,823,053
Liability Increase (Decrease)	$ 41,235,470	$ 24,440,590
Change Due to:		
Assumption Change	$ 0	$ 0
Plan Changes	0	0
Actuarial (Gain)/Loss	NC	8,089,450
Benefits Accumulated and Other Sources	41,235,470	16,351,140

NC = not calculated

SECTION IV – LIABILITIES

Table IV-3 shows the components of the actuarial liability experience (gain)/loss. In total, the System had a small liability loss equating to just 0.3% of liabilities.

Table IV-3
Sources of Actuarial Liability (Gain)/Loss
($ in Thousands)

Source		(Gain) / Loss Amount	% of Liability
1. Salary	$	3,358.0	0.1%
2. Active experience (retirements, termination, etc.)		338.2	0.0%
3. New entrants		5,507.2	0.2%
4. Inactive mortality		(5,766.2)	(0.2%)
5. Inactive experience		(1,707.6)	(0.1%)
6. Rehired inactives		123.9	0.0%
7. Benefit payments different than expected		9,291.1	0.4%
8. DROP experience		(2,697.2)	(0.1%)
9. Miscellaneous / Change in Account Balances		(357.9)	0.0%
10. Total Liability (Gain) / Loss	$	8,089.5	0.3%

SECTION V – CONTRIBUTIONS

In the process of evaluating the financial condition of any pension system, the actuary analyzes the assets and liabilities to determine what level (if any) of contributions is needed to properly maintain the funding status of the system. Typically, the actuarial process will use a funding technique that will result in a pattern of contributions that is both stable and predictable.

For this system, the funding method employed is the **Entry Age Actuarial Cost Method**. Under this method, there are three key components to calculating the City's Actuarially Determined Contribution (ADC): the **normal cost rate**, the **unfunded actuarial liability rate** (UAL rate), and the **administrative expense rate**. The normal cost rate represents the value of benefits being earned by the active members, as a percent of pay, for the upcoming year. The City's normal cost rate is calculated by taking the total normal cost rate for full-time actives less the member contribution rate of 9%. Based on the Board's funding benchmark, the unfunded actuarial liability rate represents the amount necessary, as a level dollar amount, to pay off the unfunded liability over an open 30-year period. The final piece of the ADC is the administrative expense rate of 0.80% of pay.

However, the City does not contribute based on the City's Actuarially Determined Contribution rate, nor should the ADC rate be construed as a recommended contribution rate. If the City were to contribute based on the City's ADC, the unfunded liability would not be expected to be fully paid off based on the open 30-year amortization period. The City currently contributes 17.75% of pay for full-time active and DROP members. A contribution totaling 3.00% of pay is made on behalf of part-time actives.

Lastly, we have assumed that the City will contribute $2.7 million by July 31 of each year, with the last payment made by July 31, 2035, to pay for the increase in liabilities due to the Early Retirement Incentive Program (ERIP).

SECTION V – CONTRIBUTIONS

Table V-1
Development of Actuarially Determined Contribution Rate

		December 31, 2023 (for Fiscal Year ending June 30, 2025)	December 31, 2024 (for Fiscal Year ending June 30, 2026)
1.	**Actuarial Liability**		
	a. Active Employees (Full Time)	$ 523,658,170	$ 547,070,024
	b. Active Employees (Part Time)	5,871,183	6,488,057
	c. Vested Terminated Members	26,487,632	27,881,066
	d. Retired Members and Inactive Members	2,087,365,478	2,086,383,906
	e. Total Present Value	$ 2,643,382,463	$ 2,667,823,053
2.	**Actuarial Value of Assets**	$ 1,819,308,605	$ 1,820,976,645
3.	**Unfunded Actuarial Liability (UAL) (1) - (2)**	$ 824,073,858	$ 846,846,408
4.	**Gross Normal Cost Rate**	12.24%	12.10%
5.	**Amortization of Prior Plan Changes**		
	a. Present Value of Remaining Amortization Payments for ERIP	$ 21,619,091	$ 20,445,653
	b. Years of Amortization Payments Remaining	12	11
	c. ERIP Amortization Payment[1]	2,711,907	2,711,907
	d. Total Active Payroll[2]	240,111,029	254,934,004
	e. Total Amortization Payment (as % of Payroll) [5c. ÷ 5d.]	1.13%	1.06%
6.	**UAL Amortization Payment**		
	a. UAL not due to Plan Changes	$ 802,454,767	$ 826,400,755
	b. 30-Year UAL Amortization Payment[3]	65,531,819	67,487,350
	c. Total Active Payroll[2]	240,111,029	254,934,004
	d. Total Amortization Payment (as % of Payroll) [6b. ÷ 6c.]	27.29%	26.47%
7.	**Administrative Expenses**	0.80%	0.80%
8.	**Expected Employee Contributions**	(9.00%)	(9.00%)
9.	**City's Actuarial Determined Contribution Rate [4. + 5e. + 6d. + 7. + 8.]**	32.46%	31.43%
10.	**City's Estimated ADC in Dollars [5d. x 9.]**	$ 77,940,000	$ 80,126,000

[1] Adjusted with interest to July 31.

[2] Adjusted with interest to mid-year based on General Wage Inflation of 3.75%.

[3] Adjusted with interest to mid-year.

SECTION VI – ACCOUNTING STATEMENT INFORMATION

Table VI-1 shows the history of gains and losses and Table VI-2 shows the Schedule of Funding Progress.

Table VI - 1
Gain or (Loss) for Year Ending December 31,
($ in Thousands)

Type of Activity	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Investment Income	$ 413	$ 16,400	$ 28,361	$ (31,660)	$ (13,917)	$ 21,573	$ 52,277	$ (23,354)	$ 10,691	$ (6,191)
Combined Liability Experience	(777)	(1,424)	(23,609)	31,318	(14,043)	(10,191)	(12,922)	3,553	(11,020)	(8,089)
Total Gain (Loss)	$ (364)	$ 14,976	$ 4,752	$ (342)	$ (27,960)	$ 11,382	$ 39,355	$ (19,801)	$ (329)	$ (14,280)
Non-Recurring Items	345,573	(27,754)	(48,308)	(39,236)	0	(24,671)	0	(39,821)	0	0
Composite Gain (Loss) during Year	$ 345,209	$ (12,778)	$ (43,556)	$ (39,578)	$ (27,960)	$ (13,289)	$ 39,355	$ (59,622)	$ (329)	$ (14,280)

Table VI - 2
Schedule of Funding Progress
($ in Thousands)

Actuarial Valuation Date	(a) Actuarial Value of Assets	(b) Entry Age Actuarial Liability	(b) - (a) Unfunded Actuarial Liability	(a) ÷ (b) Funded Ratio	(c) Covered Payroll	[(b) - (a)] ÷ (c) UAL as a % of Covered Payroll
12/31/2015	$ 1,703,002	$ 2,207,484	$ 504,482	77.1%	$ 174,963	288.3%
12/31/2016	1,732,053	2,252,875	520,822	76.9%	179,463	290.2%
12/31/2017	1,772,494	2,346,906	574,412	75.5%	191,806	299.5%
12/31/2018	1,755,861	2,417,515	661,654	72.6%	206,122	321.0%
12/31/2019	1,756,533	2,466,349	709,816	71.2%	215,460	329.4%
12/31/2020	1,786,650	2,533,247	746,597	70.5%	205,439	363.4%
12/31/2021	1,831,955	2,560,259	728,304	71.6%	204,223	356.6%
12/31/2022	1,811,291	2,614,702	803,411	69.3%	218,835	367.1%
12/31/2023	1,819,309	2,643,383	824,074	68.8%	235,732	349.6%
12/31/2024	1,820,977	2,667,823	846,846	68.3%	250,284	338.4%

SECTION VI – ACCOUNTING STATEMENT INFORMATION

Additional information as of December 31, 2024:

Valuation Date	December 31, 2024
Actuarial Cost Method	Entry Age
Amortization Method	Level Dollar Open
Amortization Period	30 Years
Asset Valuation Method	Five Year Smoothed Market Value
Actuarial Assumptions	
Investment Return (includes inflation)	7.50%
Projected Salary Increases (includes inflation)	3.75% - 8.75%
Inflation	2.75%
Cost-of-Living Adjustments	3.00%

APPENDIX A – MEMBERSHIP INFORMATION

The data for this valuation was provided electronically by the Cincinnati Retirement System staff. Cheiron did not perform a formal audit of the data. However, we did perform checks of the data for reasonableness and consistency in accordance with Actuarial Standards of Practice No. 23, *Data Quality*.

Data reported in this Appendix is as of December 31, 2024.

APPENDIX A – MEMBERSHIP INFORMATION

Status Reconciliation of Participating Members							
	Active Full-Time	Active Part-Time	Terminated Vested	Retired	Disabled	Beneficiary	Total
As of December 31, 2023	2,823	1,270	282	3,505	116	642	8,638
New Hires	68	700					768
To Active Part-Time	(35)	35					0
To Active Full-Time	211	(211)					0
Terminated Vested	(34)	(11)	45				0
Terminated Non-Vested	(65)	(329)					(394)
Refund of Contributions							0
Retired	(69)		(11)	80			0
Disabled	(1)				1		0
Deceased with Beneficiary				(39)		39	0
Deceased without Beneficiary			(16)	(68)	(6)	(36)	(126)
Return to Active Status	2		(2)				
Miscellaneous Changes	0	(27)	0	0	0		(27)
As of December 31, 2024	2,900	1,427	298	3,478	111	645	8,859

APPENDIX A – MEMBERSHIP INFORMATION

Active Member Count by Age and Service as of December 31, 2024										
	Years of Service									
Age	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Over	Total Count
Under 25	60	7	0	0	0	0	0	0	0	67
25-29	165	39	13	0	0	0	0	0	0	217
30-34	163	114	23	7	0	0	0	0	0	307
35-39	143	121	68	32	4	0	0	0	0	368
40-44	129	114	83	68	42	3	0	0	0	439
45-49	86	98	59	56	52	35	4	0	0	390
50-54	77	87	61	70	64	68	4	0	0	431
55-59	43	56	45	44	75	62	7	3	0	335
60-64	29	45	36	30	45	37	9	6	1	238
65-69	15	16	12	12	17	8	4	3	1	88
70 & Over	1	4	3	1	4	3	1	1	2	20
Total Count	911	701	403	320	303	216	29	13	4	2,900

Average Service: 11.2

APPENDIX A – MEMBERSHIP INFORMATION

Average Compensation of Active Members by Age and Service as of December 31, 2024										
	Years of Service									
Age	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Over	Avg. Comp.
Under 25	$56,255	$58,500	$0	$0	$0	$0	$0	$0	$0	$56,490
25-29	69,176	66,063	68,806	0	0	0	0	0	0	68,594
30-34	72,724	80,048	73,647	76,847	0	0	0	0	0	75,607
35-39	74,192	83,636	86,544	90,576	90,196	0	0	0	0	81,178
40-44	79,033	90,308	92,283	95,680	81,745	65,199	0	0	0	87,210
45-49	75,022	81,483	81,125	87,174	97,279	94,549	88,393	0	0	84,171
50-54	80,418	85,632	89,650	99,022	95,031	92,064	83,684	0	0	89,836
55-59	75,880	84,275	80,554	89,119	86,883	93,655	97,808	78,175	0	85,882
60-64	86,834	84,942	87,964	92,278	83,712	86,990	73,270	91,438	111,574	86,474
65-69	79,750	89,063	78,525	92,597	81,921	80,863	90,219	96,845	60,764	84,392
70 & Over	38,006	80,626	92,225	77,277	72,480	68,649	111,309	66,920	82,294	77,657
Average	73,663	83,097	85,356	92,606	88,780	90,941	86,365	87,739	84,232	82,730

APPENDIX A – MEMBERSHIP INFORMATION

Summary of Inactive Membership Data as of December 31, 2024			
Group	Count	Total Annual Benefit	Average Annual Benefit
Retirees	3,478	$ 170,790,311	$ 49,106
Disableds	111	$ 2,253,425	$ 20,301
Survivor	645	$ 20,548,409	$ 31,858
Total	4,234	$ 193,592,145	$ 45,723

Annual Benefits by Age as of December 31, 2024			
Attained Age	Number of Members	Total Annual Benefits	Average Annual Benefit
< 40	2	$ 91,823	$ 45,912
40 - 44	2	37,027	18,513
45 - 49	3	79,995	26,665
50 - 54	53	2,728,568	51,482
55 - 59	257	12,281,826	47,789
60 - 64	595	26,459,603	44,470
65 - 69	807	36,408,959	45,116
70 - 74	931	44,772,513	48,091
75 - 79	737	35,769,851	48,534
80 - 84	422	18,971,050	44,955
85 - 89	271	10,977,432	40,507
90 - 94	110	3,605,433	32,777
95 - 99	37	1,281,057	34,623
100+	7	127,008	18,144
Total	**4,234**	**$ 193,592,145**	**$ 45,723**

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

A. Actuarial Assumptions

Rationale for Economic and Demographic Assumptions
The actuarial assumptions were adopted by the Board of Trustees on March 23, 2023 based on an experience study performed for the period January 1, 2017 to December 31, 2021. The results of this study were presented to the Board on March 2, 2023 and are incorporated into this report by reference. An investment return assumption of 7.50% was used as prescribed by item 29 of the Collaborative Settlement Agreement (CSA) signed October 5, 2015. In conjunction with the most recent experience study, the investment consultant reported an annual expected return of 7.58% based on the System's portfolio and their most recent capital market assumptions.

1. Investment Rate of Return

7.50% per year, net of investment expenses

2. Inflation Assumption

2.75% per annum

3. Expenses

Estimated budgeted administrative expenses of 0.80% of payroll are added to the normal cost rate

4. Salary Increases

Salary increases are assumed to vary by service. Representative rates are as follows:

Service	Annual Increase
0	8.75%
1	8.25
2	7.75
3	7.25
4	6.75
5	6.25
6	5.75
7	5.25
8-14	4.75
15-20	4.25
21+	3.75

5. Mortality Rates

Active Members: Pub-2010 General Employees Amount-Weighted Mortality Table [*PubG-2010 Employee*] as published by the Society of Actuaries (SOA), and with future improvement from the base year of 2010 on a generational basis using SOA's Scale MP-2021.

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

Healthy Inactive Members: Pub-2010 General Healthy Retirees Amount-Weighted Mortality Table [*PubG-2010 Healthy Retiree*] as published by the SOA with a 110% adjustment for males and 115% adjustment for females, and with future improvement from the base year of 2010 on a generational basis using SOA's Scale MP-2021.

Disabled Inactive Members: Pub-2010 Non-Safety Disabled Retirees Amount-Weighted Mortality Table [*PubNS-2010 Disabled Retiree*] as published by the SOA, and with future improvement from the base year of 2010 on a generational basis using SOA's Scale MP-2021.

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

6. Retirement Rates

Annual Rates of Retirement Groups C, E, and F				
Age	5 Years of Service	6 – 24 Years of Service	25 – 28 Years of Service	29+ Years of Service
50-54				60.0%
55-56			6.0%	60.0
57			6.0	70.0
58			6.0	80.0
59			10.0	80.0
60	12.5%	12.5%	12.5	60.0
61	12.5	12.5	12.5	40.0
62-63	12.5	12.5	12.5	50.0
64	12.5	12.5	12.5	60.0
65	12.5	20.0	20.0	80.0
66	12.5	12.5	12.5	80.0
67	12.5	35.0	35.0	80.0
68-69	12.5	20.0	20.0	80.0
70	100.0	100.0	100.0	100.0

Annual Rates of Retirement Group G					
Age	5 Years of Service	6 – 14 Years of Service	15 – 28 Years of Service	29-30 Years of Service	31+ Years of Service
57			6.0%	6.0%	6.0%
58			6.0	6.0	6.0
59			10.0	10.0	10.0
60			10.0	10.0	10.0
61			10.0	10.0	10.0
62			10.0	60.0	50.0
63			10.0	60.0	50.0
64			10.0	70.0	60.0
65			10.0	80.0	80.0
66			10.0	80.0	80.0
67	12.5%	35.0%	35.0	60.0	80.0
68	12.5	20.0	20.0	80.0	80.0
69	12.5	20.0	20.0	80.0	80.0
70	100.0	100.0	100.0	100.0	100.0

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

7. Termination Rates

Sample termination rates are as follows:

Annual Rates of Termination Years of Service	Rate of Withdrawal
< 1	15.00%
1	10.00
2	8.00
3	7.00
4	6.50
5	6.00
6	5.00
7	4.00
8	3.00
9-14	2.50
15+	2.00

60% of vested members who terminate elect to leave their contributions in the Plan in order to be eligible for a benefit at their normal retirement; 40% of members elect to withdraw their contributions

8. Disability Rates

Sample disability rates are as follows:

Age	Annual Rates of Disability[1]
20	0.0025%
25	0.0050%
30	0.0075%
35	0.0125%
40	0.0225%
45	0.0375%
50	0.0675%
55	0.1050%
60	0.1250%
64	0.1250%

[1] Rates are 0% when member is eligible for normal retirement

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

9. Part-time Active Members

All part-time active members are assumed to receive a refund of their employee contributions with interest upon leaving the System.

10. DROP Participation

30% of eligible CSA Employee members eligible for DROP benefits are assumed to decline participation and 70% are assumed to elect participation. Those electing to participate are assumed to remain in DROP for three years.

11. DROP Crediting Rate

3.25% per annum

12. Percent Married

60% of members are assumed to be married for the purpose of valuing pre-retirement survivor benefits.

13. Spouse Age Difference

Unless otherwise reported in the data, the male spouse is assumed to be three years older than the female spouse.

14. Changes Since Last Valuation

None

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

B. Methods

1. 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 member. The normal cost rate multiplied by payroll equals the total normal cost for each member. The normal cost contributions (Employer and Member) will pay for projected benefits at retirement for each active member.

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's 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.

2. Amortization Method

The City's actuarially determined contribution (ADC) is determined as the sum of (a) the employer's normal cost rate, (b) the administrative expense rate, and (c) the UAL rate. Based on the Board's Funding Benchmark, the UAL rate represents the amount necessary to amortize the UAL (excluding liabilities due to the ERIP) over a 30-year open period as a level dollar amount. If the City were to contribute based on this ADC, the unfunded liability would not be expected to be fully paid off based on the open 30-year amortization period.

In addition, the City is paying for the Early Retirement Incentive Program in 15 level annual amounts. The first contribution for the ERIP was made in December 2021. The City will make the remaining contributions by July 31 of each future year, with the last contribution to be paid July 2035.

3. Actuarial Value of Assets

The actuarial value of assets recognizes a portion of the difference between the actual market value of assets and the expected market value of assets, based on the assumed valuation rate of return. The amount recognized each year is 20% of the difference between actual market value and expected market value. In addition, the actuarial value of assets cannot be less than 80%, or more than 120%, of the market value of assets.

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

4. ASOP No. 4 Disclosure

ASOP No. 4 requires the disclosure of a reasonable actuarially determined contribution (ADC), which includes the use of an amortization method that produces amortization payments that fully amortize the unfunded actuarial liability within a reasonable time period or reduces the outstanding balance by a reasonable amount each year. The Board's current Funding Benchmark (or City's ADC) described in item 2 above does not meet these criteria. For purposes of this disclosure requirement only, we have calculated a reasonable ADC based on amortizing the unfunded actuarial liability (excluding the ERIP) over a closed 20-year level dollar layered amortization method first effective December 31, 2023. This results in a reasonable ADC of 36.32% as a percent of payroll, compared to the Board's Funding Benchmark (City's ADC) of 31.43% as shown in Table I-1.

The actuarial methods used to determine the reasonable ADC described above have been selected to balance benefit security, intergenerational equity, and stability of contributions. The selection of the actuarial methods has taken into account the demographics of plan members, the funding goals and objectives of the City, and the need to accumulate assets to make benefit payments when due. The methods used are not the only methods that would result in a reasonable ADC. There are a range of methods that would result in reasonable ADCs.

5. Valuation Software

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 have not identified any material inconsistencies in assumptions or output of ProVal that would affect this actuarial valuation.

6. Projection Model

This report includes deterministic projections of future contributions, assets, and funded status for the purpose of assisting the Board and CRS staff with the management of the System. We have used Cheiron's *P-Scan* model to develop these projections. The model is also used to stress test the impact of volatile asset returns over the projection period.

The *P-Scan* projection uses standard roll-forward techniques that implicitly assume a stable active population. Changes in the demographic characteristics of the active population will lead to different results.

APPENDIX C – SUMMARY OF PLAN PROVISIONS

1. Membership

All employees of the City of Cincinnati shall be members of the System except for the following:

- Members of the Police and Fireman's Disability and Pension Fund of Ohio,
- Elected City officials,
- Employees for whom the City contributes to the Ohio Public Employees Retirement System,
- Members of the faculties, teaching staffs, research staffs, and administrative staff of the University of Cincinnati appointed to positions covered by the Teachers Insurance and Annuity Association Social Security Plan,
- Persons becoming employees after June 1, 1961, who are employed in any of the following employment classifications: bricklayer, carpenter, carpenter foreman, cement finisher, electrician, electrician foreman, painter, painter foreman, plasterer, plumber, sign painter, steamfitter and pipefitter, tinsmith, or composition roofer,
- Persons hired as police recruits who are not currently enrolled as a member of the System prior to their date of hire, and
- Current contributing members of the Ohio School Employees Retirement System (SERS) or the Ohio State Teachers Retirement System (STRS) are hired by the City on a seasonal, temporary, or part-time basis.

Members of the System are divided into the following groups:

Group	Criteria
A, B	Any member who has retired prior to 7/1/2011
C	Any member who, as of June 30, 2011, was an active or deferred vested member and had either: a) Completed at least 30 years of service, or b) Reached age 60 and completed at least 5 years of service
D	Any active member who, between July 1, 2011 and December 31, 2013: 1) Either a) Completed at least 30 years of service, or b) Reached age 60 and completed at least 5 years of service; and 2) Retired prior to January 1, 2014
E	Any active member who: 1) Between July 1, 2011 and December 31, 2013 either: a) Completed at least 30 years of service, or b) Reached age 60 and completed at least 5 years of service; and 2) Retires on or after January 1, 2014
F	Any active member whose most recent membership enrollment date was prior to January 1, 2010 and who is not in groups A through E Any deferred vested member whose most recent membership enrollment date was prior to January 1, 2010, is not in groups A through E, and has at least five years of service prior to the date separated from employment

APPENDIX C – SUMMARY OF PLAN PROVISIONS

Group	Criteria
G	Any member whose most recent membership enrollment date is on or after January 1, 2010, or Any member rehired on or after January 1, 2010, who has fewer than five years of service as of June 30, 2011, or Any retiree of the System who is receiving service retirement allowance and is re-employed on or after April 1, 2013

Members in the System are further classified as follows:

Class	Criteria
CSA Retiree (CSA participants corresponding to Retirees Class)	Group A and B members and their designated optionees
CSA Employee (CSA participants corresponding to Current Employees Class)	Group C, D, E and F members (and their designated optionees) that were vested and employed on July 1, 2011
CMC Employee (Non-CSA participants)	Group E and F members (and their designated optionees) that were either vested or employed on July 1, 2011 and no break in employment service since January 1, 2010 and prior to becoming vested
Non-CSA	Group G members and their designated optionees

APPENDIX C – SUMMARY OF PLAN PROVISIONS

2. Service Retirement Benefit

Groups A, B, C and D

Normal Retirement Eligibility	Age 60 with 5 years of service or 30 years of service
Early Retirement Eligibility	Age 55 with 25 years of service
Benefit Formula Multiplier	Members hired prior to July 12, 1998 were given a one-time irrevocable option to choose either the benefit formula using a 2.22% multiplier or the benefit formula using a 2.50% multiplier. For members hired on or after July 12, 1998, benefits are calculated using a 2.50% multiplier
Average Highest Compensation	Average of the highest three consecutive years of compensation
Years of Service	Years or fractional years of full-time service rendered to the plan sponsor
Benefit	a) An annuity which is actuarially equivalent to the accumulated contributions of the member at the time of retirement b) A pension which together with the annuity produces a total annual retirement allowance equal to the product of the applicable benefit formula multiplier, the member's average highest compensation and the number of years of service Early Retirement Benefit is actuarially reduced from normal retirement age

Group E

Normal Retirement Eligibility	Age 60 with 5 years of service or 30 years of service
Early Retirement Eligibility	Age 55 with 25 years of service

Retirement benefit is composed of as many as three components:

Part A Benefit
For service earned through December 31, 2013

Part B Benefit
For service earned on and after January 1, 2014 up to a combined (Part A and Part B) 20 years of service

APPENDIX C – SUMMARY OF PLAN PROVISIONS

	Part C Benefit For service earned on and after January 1, 2014 in excess of a combined (Part A and Part B) 20 years of service
Benefit Formula Multiplier	*Part A Benefit* Members hired prior to July 12, 1998 were given a one-time irrevocable option to choose either the benefit formula using a 2.22% multiplier or the benefit formula using a 2.50% multiplier. For members hired on or after July 12, 1998, benefits are calculated using a 2.50% multiplier *Part B Benefit* Members hired prior to July 12, 1998 were given a one-time irrevocable option to choose either the benefit formula using a 2.22% multiplier or the benefit formula using a 2.50% multiplier. For members hired on or after July 12, 1998, benefits are calculated using a 2.50% multiplier *Part C Benefit* 2.20% multiplier
Average Highest Compensation	*Part A Benefit* Average of the highest three consecutive years of compensation *Part B Benefit* Average of the highest five consecutive years of compensation *Part C Benefit* Average of the highest five consecutive years of compensation
Years of Service	Years or fractional years of full-time service rendered to the plan sponsor

APPENDIX C – SUMMARY OF PLAN PROVISIONS

Benefit	a) An annuity which is actuarially equivalent to the accumulated contributions of the member at the time of retirement b) A pension which together with the annuity produces a total annual retirement allowance equal to the sum of Part A, Part B, and Part C benefits each of which is the product of the applicable benefit formula multiplier, the applicable average highest compensation, and the applicable number of years of service Early Retirement Benefit is actuarially reduced from normal retirement age

Group F

Normal Retirement Eligibility	Age 60 with 5 years of service or 30 years of service
Early Retirement Eligibility	Age 55 with 25 years of service

Retirement benefit is composed of as many as three components:

Part A Benefit
For service earned through June 30, 2011

Part B Benefit
For service earned on and after July 1, 2011 up to a combined (Part A and Part B) 20 years of service

Part C Benefit
For service earned on and after July 1, 2011 in excess of a combined (Part A and Part B) 20 years of service

Benefit Formula Multiplier	*Part A Benefit* Members hired prior to July 12, 1998 were given a one-time irrevocable option to choose either the benefit formula using a 2.22% multiplier or the benefit formula using a 2.50% multiplier. For members hired on or after July 12, 1998, benefits are calculated using a 2.50% multiplier

APPENDIX C – SUMMARY OF PLAN PROVISIONS

	Part B Benefit Members hired prior to July 12, 1998 were given a one-time irrevocable option to choose either the benefit formula using a 2.22% multiplier or the benefit formula using a 2.50% multiplier. For members hired on or after July 12, 1998, benefits are calculated using a 2.50% multiplier
	Part C Benefit 2.20% multiplier
Average Highest Compensation	*Part A Benefit* Average of the highest three consecutive years of compensation
	Part B Benefit Average of the highest five consecutive years of compensation
	Part C Benefit Average of the highest five consecutive years of compensation
Years of Service	Years or fractional years of full-time service rendered to the plan sponsor
Benefit	a) An annuity which is actuarially equivalent to the accumulated contributions of the member at the time of retirement b) A pension which together with the annuity produces a total annual retirement allowance equal to the sum of Part A, Part B, and Part C benefits each of which is the product of the applicable benefit formula multiplier, the applicable average highest compensation, and the applicable number of years of service
	Early Retirement Benefit is actuarially reduced from normal retirement age
Group G	
Normal Retirement Eligibility	Age 67 with 5 years of service or age 62 with 30 years of service
Early Retirement Eligibility	Age 57 with 15 years of service

APPENDIX C – SUMMARY OF PLAN PROVISIONS

Benefit Formula Multiplier	Benefit is calculated using a 2.20% multiplier for all years of service up to 30 years and a 2.00% multiplier for all service in excess of 30 years
Average Highest Compensation	Average of the highest five consecutive years of compensation
Years of Service	Years or fractional years of full-time service rendered to the plan sponsor
Benefit	a) An annuity which is actuarially equivalent to the accumulated contributions of the member at the time of retirement b) A pension which together with the annuity produces a total annual retirement allowance equal to the product of the applicable benefit formula multiplier, the member's average highest compensation and the number of years of service Early Retirement Benefit is actuarially reduced from normal retirement age

All Groups

In no event shall the retirement allowance be greater than 90% of a member's average highest compensation.

In no event shall the retirement allowance be greater than that permitted by Section 415 of the Internal Revenue Code.

The average highest compensation used in the calculation of benefits depends on which benefit formula applies to the member. The formula that uses the 2.22% multiplier includes overtime compensation and the lump sum payment for unused vacation and sick pay. The formulas that use all other multipliers do not include overtime or the lump sum payment.

3. Disability Retirement Benefit

Eligibility	5 years of service
Benefit	90% of normal retirement benefit at disability date but not less than the smaller of: a) 25% of the average highest compensation b) 90% of the retirement benefit the member would have become entitled to had he continued in service to normal retirement age without further change in average highest compensation

APPENDIX C – SUMMARY OF PLAN PROVISIONS

4. Deferred Vested Retirement Benefit

Eligibility	5 years of service
Benefit	Normal retirement benefit beginning at normal retirement age

5. Pre-retirement Death Benefit

1) Contributions with interest

2) Survivor Benefits according to the type of survivors if the member has at least 18 months of service

6. Post-retirement Death Benefit

1) $5,000 lump sum for Groups A and B

2) If no Joint and Survivor Option is selected, the balance of member contributions not received back in retirement benefit payments prior to death

7. Optional Forms of Benefit

1) Joint and 100% Survivor Payment
2) Joint and 50% Survivor Payment
3) 66 2/3% Joint and Survivor Payment
4) 80% Joint and Survivor Payment

8. Cost-of-Living Adjustments (COLA)

Groups A and B	3% simple COLA based on the member's benefit on January 1, 2016 including all previously granted COLAs. Effective January 1, 2016, the COLA will be suspended for a 3-year period In the 3rd year of the COLA suspension (calendar year 2018), members will receive a one-time payment that is the lesser of 3% of their base pension benefit or $1,000. This payment will be made on January 1, or the anniversary date of the member's retirement according to when the member normally receives a COLA
Groups C, D, E, F and G	3% simple COLA based on the initial gross monthly benefit with a 3-year delay following each member's date of retirement
Poverty Exception	Any member of the Retirees Class or Current Employees

APPENDIX C – SUMMARY OF PLAN PROVISIONS

	Class who retired or retires with at least 5 years of service and whose household income is below 150% of federal poverty guidelines will receive a 3% compounding COLA until such time income exceeds 150% of federal poverty guidelines, at which time the member will receive a 3% simple COLA

9. Contributions

Members	Each member, commencing January 1, 1978, contributes at a rate of 7.0% of the salary used to compute retirement benefits until retirement. Beginning January 1, 2010, the employee contribution rate was increased 0.5% per year over 4 years to reach 9.0% of pay. The CSA establishes that the contribution rate for members shall not exceed 9.0% of pay for the term of the agreement
Employers	The sponsoring employer makes annual contributions based on members' salaries so that, when members become eligible for benefits, reserves will have been accumulated to provide the pension and other benefits payable by the plan on account of creditable service

10. Deferred Retirement Option Plan (DROP)

Eligibility	Current Employees Class members with at least 30 years of service
Maximum Participation Period	5 years
Minimum Participation Period	Participation in DROP for less than 2 years results in forfeiture of all interest earnings credited to the member's DROP account
Benefit	Monthly pension benefit calculated as if the eligible member actually retired on their DROP effective date, including any adjustments for an assigned optionee. The monthly pension benefit will be contributed to the member's DROP account in the CRS Pension Trust and paid out as a lump sum upon termination from the DROP
Employee Contributions	Members continue to contribute 9.0% of pay while participating in DROP. 75% of the contribution is credited to the member's DROP account and the remaining 25% of the contribution is paid to the CRS Pension Trust to offset the costs of administering the DROP

APPENDIX C – SUMMARY OF PLAN PROVISIONS

Employer Contributions	Employer contributions to the CRS Pension Trust continue to apply in the same manner as for other actively employed members who are not participating in the DROP. Employer contributions are not credited to the member's DROP account
Interest	DROP account balances are credited each month at a rate equal to the 10-year U.S. Treasury Note Business Day Series adjusted quarterly with a cap of 5% but not less than 0%

11. Changes Since Last Valuation

None

APPENDIX D – GLOSSARY OF TERMS

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 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 Actuarial Present Values 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 Cost Method

A method under which the Actuarial Liability is calculated as the Actuarial Present Value of the Projected Benefits allocated to periods prior to the valuation year.

11. Funded Ratio

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.

CHEIRON

Classic Values, Innovative Advice