Public Employees' Retirement System of the State of Montana Long-Term Disability Plan

Actuarial Valuation Report

Prepared as of June 30, 2024

September 26, 2024

Public Employees' Retirement Board
100 North Park, Suite 200
Helena, MT 59620-0139

Members of the Board:

In this report are submitted the results of the annual valuation of the assets and liabilities of the Public Employees' Retirement System of the State of Montana Long-Term Disability Plan under the Defined Contribution Retirement Plan (DCRP), prepared as of June 30, 2024.

The purpose of this report is to provide a summary of the funded status of the Plan as of June 30, 2024. While not verifying the data at source, the actuary performed tests for consistency and reasonability. The valuation indicates that the plan is over 100% funded.

The promised benefits of the Plan are included in the actuarially calculated contribution rates which are developed using the Entry Age Normal Cost Method. Gains and losses are reflected in the unfunded accrued liability that is being amortized by regular annual contributions as a level percentage of payroll, on the assumption that payroll will increase by 3.25% annually. The assumptions recommended by the actuary and adopted by the Board are, in the aggregate, reasonably related to the experience under the Fund and to reasonable expectations of anticipated experience under the Fund.

In order to prepare the results in this report, we have utilized actuarial models that were developed to measure liabilities and develop actuarial costs. These models include tools that we have produced and tested, along with commercially available valuation software that we have reviewed to confirm the appropriateness and accuracy of the output. In utilizing these models, we develop and use input parameters and assumptions about future contingent events along with recognized actuarial approaches to develop the needed results.

This is to certify that the undersigned are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein. This also certifies that the undersigned have experience in performing valuations for public retirement systems, that the valuation was prepared in accordance with principles of practice prescribed by the Actuarial Standards Board, and that the actuarial calculations were performed by qualified actuaries in accordance with accepted actuarial procedures, based on the current provisions of the Plan and on actuarial assumptions that are internally consistent and reasonably based on the actual experience of the Plan.

Future actuarial results may differ significantly from the current results presented in this report 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; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. Since the potential impact of such factors is outside the scope of a normal annual actuarial valuation, an analysis of the range of results is not presented herein.

The Table of Contents, which immediately follows, outlines the material contained in the report.

Respectfully submitted,

Todd B. Green, ASA, EA, FCA, MAAA
President

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Consulting Actuary

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Senior Actuary

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SECTION 1 – SUMMARY OF RESULTS

For convenience of reference, the principal results of the valuation and a comparison with the preceding year's results are summarized below:

VALUATION DATE	June 30, 2024	June 30, 2023
Participant Counts		
Active members	3,577	3,406
Disabled Members	6	7
Retirees and Beneficiaries	0	0
Terminated Vested Members	0	0
Terminated Non-Vested Members	0	0
Total	3,583	3,413
Covered Payroll of Active Members	$ 230,030,167	$ 211,858,746
Average Salaries from Covered Payroll	$ 64,308	$ 62,202
Annual Retirement Allowances for Disabled Members	$ 69,985	$ 78,750
Assets		
Market Value	$ 10,443,239	$ 8,604,097
Actuarial Accrued Liability (AAL)	$ 1,282,139	$ 1,501,873
Unfunded Actuarial Accrued Liability (UAAL)	$ (9,161,100)	$ (7,102,224)
Funded Ratio	814.52%	572.89%
Market Value Rate of Return	13.79%	11.58%
Annual Cost		
Statutory Funding Rate	0.30%	0.30%
Total Normal Rate	0.06%	0.05%
Employee Contribution Rate	0.00%	0.00%
Employer Normal Rate	0.06%	0.05%
Employer Contribution Rate		
Normal Rate	0.06%	0.05%
UAAL Rate	0.24%	0.25%
Total Rate	0.30%	0.30%
Amortization Period	0 years	0 years
Employer Contribution Rate Necessary to Amortize UAAL over 30 Years		
Normal Rate	0.06%	0.05%
UAAL Rate (30-Year Rate)	(0.23)%	(0.19)%
Total Rate	(0.17)%	(0.14)%
Shortfall/(Surplus)	(0.47)%	(0.44)%

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SECTION 1 – SUMMARY OF RESULTS

As a result of this actuarial valuation of the benefits in effect under the DCRP Long-Term Disability Plan as of June 30, 2024, the Funded Ratio is 814.52%.

Calculations based on the Market Value of Assets

MCA 19-2-407 requires this report to show how market performance is affecting the actuarial funding of the Plan. This report uses the market value of assets for all calculations.

Additional Details

MCA 19-3-2117 requires each employer to contribute 0.30% of total compensation paid to the long-term disability plan trust fund.

The actuarial costs are calculated using the entry age actuarial cost method. This is the method used by most public plans. It is designed to provide a stable contribution rate as a percent of member pay. This actuarial valuation measures the adequacy of the contribution rates set in Montana State Law.

Based on the current statutory funding rate, the amortization period as of the valuation date is 0 years. Contributions are developed with the intent of being level as a percentage of covered payroll, assuming the number of active members remains stable. Furthermore, the funding policy is expected to accumulate sufficient assets to make all future benefit payments as they become due, if all assumptions are met. Actuarial Standard of Practice Number 4 (ASOP 4) requires the disclosure of a reasonable actuarial determined contribution rate. The current statutory funding rate is expected to fully fund the plan and reduce the unfunded actuarial accrued liability each year. While there are potentially other reasonable actuarial determined contribution rates, in our professional judgement, the current statutory funding rate meets the guidelines of ASOP 4.

Investment Experience

The market assets earned 13.79% net of investment and operating expenses, which is 6.49% greater than the actuarial assumption of 7.30%. The chart below shows the annual returns for the past ten years.

Year	Market Return	Assumed Rate of Return	Market Return over Assumption
7/1/2014 to 6/30/2015	0.13%	3.50%	(3.37)%
7/1/2015 to 6/30/2016	0.38%	3.50%	(3.12)%
7/1/2016 to 6/30/2017	0.02%	3.50%	(3.48)%
7/1/2017 to 6/30/2018	7.24%	3.50%	3.74%
7/1/2018 to 6/30/2019	6.77%	3.50%	3.27%
7/1/2019 to 6/30/2020	3.86%	3.50%	0.36%
7/1/2020 to 6/30/2021	26.36%	3.50%	22.86%
7/1/2021 to 6/30/2022	(13.58)%	3.50%	(17.08)%
7/1/2022 to 6/30/2023	11.58%	7.30%	4.28%
7/1/2023 to 6/30/2024	13.79%	7.30%	6.49%

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Asset gains or losses result when the return on the actuarial value of assets differs from the assumed actuarial investment return.

The Plan earned $319,939 more than anticipated by the 7.30% assumption in the year ended June 30, 2023, and $577,915 more than anticipated by the 7.30% assumption in the year ended June 30, 2024.

Amortization of the UAAL

Since the plan is over 100% funded, a contribution is not required to amortize the unfunded liability.

Funding and Benefits Policy

The Montana Public Employees' Retirement Board has adopted a Funding and Benefits Policy to provide general guidelines to help ensure decisions are made based on sound, consistent, and thoroughly examined criteria. The Funding and Benefits Policy includes guidance on the following topics:

1) Funding Requirement

    a) The Funding and Benefits Policy states:

        1. The Entry Age Normal Cost Method shall be applied to the projected benefits in determining the Normal Cost and Actuarial Accrued Liability.

        2. The unfunded actuarial accrued liability should be amortized over a reasonable period of time and should not exceed 30 years on a rolling basis. Generally, the funding period should be constant or decreasing.

    b) Analysis: The liabilities of the Plan are determined using the Entry Age Normal Cost Method and are compared to the market value of assets. The contributions provided for in statute are sufficient to fully amortize the unfunded actuarial accrued liability within a 0-year period. The current statutory rate is adequate to keep the System's funding within Board policy guidelines.

2) Funding Objectives

    a) The Funding and Benefits Policy states: "The primary objectives are to: 1) ensure that the systems are financially sound and pay all benefits promised using assets accumulated from required employer and member contributions and investment income; and 2) achieve a well-funded status with a range of safety to absorb market volatility without creating a UAAL."

    b) Analysis: The contributions provided for in statute are sufficient to fully amortize the unfunded actuarial accrued liability within a 0 year period. This ensures that the System is financially sound and will be able to pay all promised benefits and achieve a well-funded status with a range of safety to absorb market volatility without creating a UAAL.

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3) Benefit Enhancements

   a) The Funding and Benefits Policy states: "Proposals must provide funding from sufficient to cover future costs. Unfunded liabilities created by the proposal must be amortized over a period of time appropriate to the retirement system, but not more than 30 years."

   b) Analysis: Without supplemental funding, a benefit enhancement would increase the amortization period of the unfunded actuarial accrued liability and further delay the goal of achieving a well-funded status with a range of safety to absorb market volatility without creating a UAAL.

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SECTION 1 – SUMMARY OF RESULTS

Sensitivity to Future Experience

The valuation results are projections based on the actuarial assumptions. Actual experience will differ from these assumptions, either increasing or decreasing the ultimate cost. The following illustrations provide simple analyses on how the costs are sensitive to changes in the assumed rate of return.

Investment Return – The investment return generally has the largest impact on the funding of the Plan.

Impact of Assuming 1.0% Higher Investment Return			
	Funded Ratio	Amortization Period	Actuarially Determined Employer Contribution (Millions $)*
Current Assumption 7.30%	814.52%	0 Years	$0.7
Higher Assumption 8.30%	861.55%	0 Years	0.7
Increase / (Decrease)	47.03%	0 Years	$0.0
Impact of Assuming 0.5% Higher Investment Return			
	Funded Ratio	Amortization Period	Actuarially Determined Employer Contribution (Millions $)*
Current Assumption 7.30%	814.52%	0 Years	$0.7
Higher Assumption 7.80%	837.64%	0 Years	0.7
Increase / (Decrease)	23.12%	0 Years	$0.0
Impact of Assuming 0.5% Lower Investment Return			
	Funded Ratio	Amortization Period	Actuarially Determined Employer Contribution (Millions $)*
Current Assumption 7.30%	814.52%	0 Years	$0.7
Lower Assumption 6.80%	792.18%	0 Years	0.7
Increase / (Decrease)	(22.34%)	0 Years	$0.0
Impact of Assuming 1.0% Lower Investment Return			
	Funded Ratio	Amortization Period	Actuarially Determined Employer Contribution (Millions $)*
Current Assumption 7.30%	814.52%	0 Years	$0.7
Lower Assumption 6.30%	770.63%	0 Years	0.7
Increase / (Decrease)	(43.89%)	0 Years	$0.0

*Amounts reflect estimated increase/(decrease) in FY2025 employer contributions in order to maintain 0 year amortization.

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SECTION 1 – SUMMARY OF RESULTS

The future funding status of the Plan will be determined by the Plan's experience. The Plan's actual asset returns and retirement rates, as well as member longevity, salary increases, withdrawal rates, disability rates and future legislation will all impact the funding status of the Plan. The entry age normal cost method will help to provide a more orderly funding of the Plan's liabilities, but will not change the actual experience. The amortization period of the UAAL is not likely to decrease by the expected 1.0 year with each passing actuarial valuation. Instead, the amortization period is expected to decrease more or less than 1.0 years each year, reflecting gains and losses due to experience different than the actuarial assumptions.

Assumption Changes

There have been no assumption changes since the previous valuation.

Benefit Changes

There have been no benefit changes since the previous valuation.

Contribution Changes

There have been no contribution changes since the previous valuation.

Method Changes

There have been no method changes since the previous valuation.

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Impact of Changes

The following table summarizes how experience has changed the UAAL since the June 30, 2023 Actuarial Valuation. Further detail can be found in Tables 9 & 10.

Changes in the Unfunded Actuarial Accrued Liability (UAAL)

June 30, 2023 Valuation UAAL	($7,102,224)
Normal Cost	84,702
Contributions	(709,634)
Interest	(538,181)
Expected June 30, 2024 UAAL	(8,265,337)
Experience (Gain)/Loss on Actuarial Liabilities	($317,848)
Experience (Gain)/Loss on Actuarial Assets	(577,915)
Assumption & Method Changes	0
Plan Changes	0
Total (Gain) / Loss	(895,763)
June 30, 2024 Valuation UAAL	(9,161,100)

Summary

* The Plan's investment return of 13.79% for the year ended June 30, 2024 is greater than the actuarial assumption of 7.30%. This represents an asset gain of $577,915 due to investment return being greater than anticipated. As of June 30, 2024, both the market value of assets and actuarial value of assets was $10,443,239.

* Contributions are not sufficient to fund the normal cost. Currently the Plan has a funding surplus, therefore contributions are not necessary to fund the unfunded actuarial accrued liability.

* The funding of the Plan will be impacted by future experience which will sometimes be more favorable than the actuarial assumptions and sometimes less favorable. In particular, investment returns larger and smaller than the 7.30% assumption are expected to have significant impacts on the Plan's funding progress. In the long term, the favorable experience is needed to offset the less favorable experience.

In many respects, an actuarial valuation can be regarded as an inventory process. The inventory is taken as of the actuarial valuation date, which for this valuation is June 30, 2024. On that date, the assets available for the payment of benefits are appraised. These assets are compared with the actuarial liabilities. The actuarial process thus leads to a method of determining what contributions by members and their employers are needed to strike a balance.

The asset valuation method being used is the market value of assets. Table 1 lists the assets held and their market value for the past two years. Table 2 summarizes the fund's activity during the past two years. Table 3 summarizes historical asset returns for the last 5 years including which was greater or less than the actuarial investment return assumption. Table 4 summarizes the historical asset values on a market value basis, to the extent it was available. Additional data can be included in this table for future reports, if provided by the Plan.

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Table 1:
Statement of Fiduciary Net Position
Fiscal Year Ended June 30,

		2024		2023
ASSETS				
Cash and Short Term Investments	$	980,868	$	736,669
Securities Lending Collateral	$	32,943	$	-
Receivables:				
Interest Receivable	$	4,151	$	3,194
Accounts Receivable		5,772		4,429
Due from Other Funds		-		-
Due from Primary Government		-		-
Notes Receivable		-		-
Total Receivables	$	9,923	$	7,623
Investments, at fair value:				
Investment Pools		9,452,451		7,859,807
Other Investments		-		-
Total Investments	$	9,452,451	$	7,859,807
Capital Assets				
Property and Equipment, at cost,				
net of Accumulated Depreciation	$	-	$	-
Intangibe Assets, at cost,				
net of Amortization Expense		-		-
Total Capital Assets	$	-	$	-
TOTAL ASSETS	$	10,476,185	$	8,604,099
LIABILITIES				
Securities Lending Liability	$	32,943	$	-
Accounts Payable		-		-
Contributions Received in Advance		3		2
Due to Other Funds		-		-
Due to Primary Government		-		-
OPEB Implicit Rate Subsidy LT		-		-
TOTAL LIABILITIES	$	32,946	$	2
NET POSITION - RESTRICTED				
FOR PENSION BENEFITS	$	10,443,239	$	8,604,097

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Table 2:
Statement of Changes in Fiduciary Net Position
Fiscal Year Ended June 30,

	2024	2023
ADDITIONS		
Contributions:		
Employer	$ 709,634	$ 649,751
Plan Member	-	-
Other	-	-
Total Contributions	$ 709,634	$ 649,751
Misc Income	$ -	$ 455
Investment Income:		
Net Appreciation/(Depreciation) in Fair Value of Investments	$ 1,192,429	$ 846,968
Investment Earnings	41,180	21,945
Security Lending Income	-	-
Investment Income/(Loss)	$ 1,233,609	$ 868,913
Investment Expense	(5,299)	(4,846)
Security Lending Expense	-	-
Net Investment Income/(Loss)	$ 1,228,310	$ 864,067
Total Additions	$ 1,937,944	$ 1,514,273
DEDUCTIONS		
Benefit Payments	$ 98,802	$ 90,699
Refunds/Distributions	-	-
Refunds to Other Plans	-	-
Transfers to DCRP	-	-
Transfers to MUS-RP	-	-
OPEB Expense	-	-
Administrative Expense	-	-
Total Deductions	$ 98,802	$ 90,699
NET INCREASE (DECREASE) IN PLAN NET ASSETS	$ 1,839,142	$ 1,423,574
NET POSITION - RESTRICTED FOR PENSION BENEFITS BEGINNING OF YEAR	$ 8,604,097	$ 7,180,523
ADJUSTMENT	-	-
END OF YEAR	$10,443,239	$ 8,604,097

Table 3:
Historical Investment Returns*

Fiscal Year Ending	Market Returns	Assumed Rate of Return	Market Return Over Assumption
June 30, 2015	0.13%	3.50%	(3.37)%
June 30, 2016	0.38%	3.50%	(3.12)%
June 30, 2017	0.02%	3.50%	(3.48)%
June 30, 2018	7.24%	3.50%	3.74%
June 30, 2019	6.77%	3.50%	3.27%
June 30, 2020	3.86%	3.50%	0.36%
June 30, 2021	26.36%	3.50%	22.86%
June 30, 2022	(13.58)%	3.50%	(17.08)%
June 30, 2023	11.58%	7.30%	4.28%
June 30, 2024	13.79%	7.30%	6.49%
10 Year Average	5.18%		0.95%

* Returns reflect all investment returns, including investment income and realized and unrealized investment gains and losses, and are net of investment expenses and administrative expenses paid by the Plan.

Table 4:
Market Value of Assets
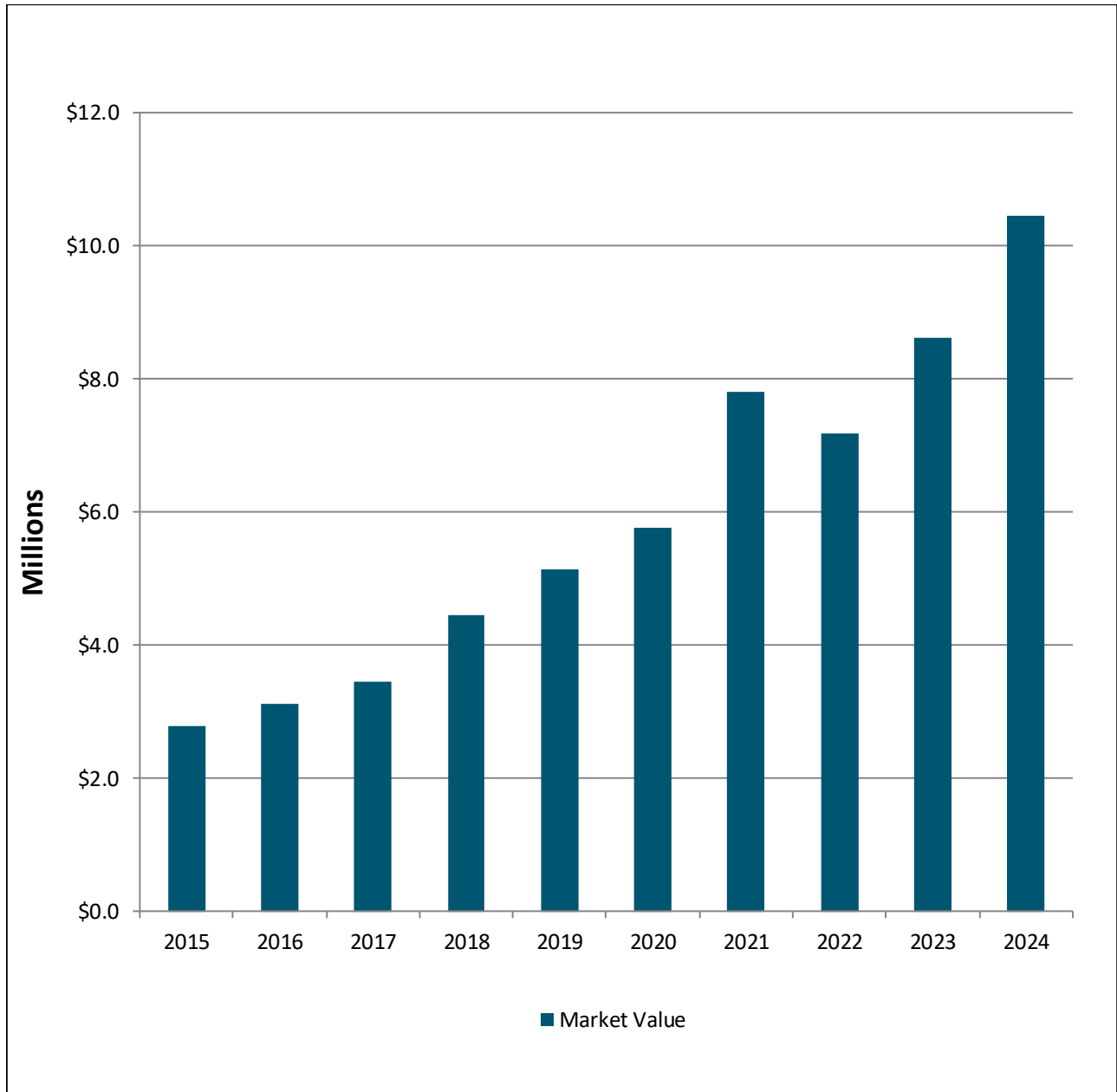
In the previous section, an actuarial valuation was related to an inventory process, and an analysis was given of the inventory of assets of the Plan as of the valuation date. In this section, the discussion will focus on the commitments of the Plan, which will be referred to as its actuarial liabilities.

Table 5 contains an analysis of the actuarial present value of all future benefits for contributing members, for retirees, and for beneficiaries. The analysis is given by type of benefit.

The actuarial liabilities summarized in Table 5 include the actuarial present value of all future benefits expected to be paid with respect to each member covered as of the valuation date. For an active member, this value includes a measure of both benefits already earned and future benefits to be earned. Thus, for all members, active and retired, the value extends over benefits earnable and payable to age 65 for disabilities occurring prior to age 60, and for five years for disabilities occurring after age 60, or normal retirement age (age 65). PERS DC members hired after July 1, 2011 will be eligible for a disability benefit until they reach age 70.

The actuarial valuation does not recognize liabilities for employees who become members and participate in the Plan after the valuation date.

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Table 5:
Actuarial Present Value of Future Benefits for Active Members,
Retirees, and Beneficiaries

	June 30, 2024 Total	June 30, 2023 Total
A. Active Members Liability Due to Probability of		
Retirement	$ -	$ -
Disability	2,492,575	1,798,247
In-Service Death	-	-
Termination	-	-
Total	$ 2,492,575	$ 1,798,247
B. Inactive Members and Annuitants		
Service Retirement	$ -	$ -
Disability Retirement	410,545	431,447
Beneficiaries	-	-
Vested Terminated Members	-	-
Refund of Member Contributions	-	-
Total	$ 410,545	$ 431,447
C. Grand Total	$ 2,903,120	$ 2,229,694

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In the previous two sections, attention has been focused on the assets and the present value of all future benefits of the Plan. A comparison of Tables 2 and 5 indicates that there is a shortfall in current assets to meet the present value of all future benefits for current members and beneficiaries.

In an active system, there will always be a difference between the assets and the present value of all future benefits. An actuarial valuation sets a schedule of future contributions that will deal with this funding in an orderly fashion.

The method used to determine the incidence of the contributions in various years is called the actuarial cost method. For this valuation, the entry age actuarial cost method has been used. A description of the entry age actuarial cost method is provided in Appendix A. Under this method, or essentially any actuarial cost method, the contributions required to meet the difference between current assets and the present value of all future benefits are allocated each year between two elements:

- A normal cost amount, which ideally is relatively stable as a percentage of salary over the years;

- An amount which is used to amortize the UAAL.

The two items described above, normal cost and UAAL, are the keys to understanding the actuarial cost method. Let us first discuss the normal cost.

The normal cost is the theoretical contribution rate, which will meet the ongoing costs of a group of average new employees. Suppose that a group of new employees were covered under a separate fund from which all benefits and to which all contributions and associated investment return were to be paid. Under the entry age actuarial cost method, the normal cost contribution rate is that level percentage of pay which would be exactly right to maintain this fund on a stable basis. If experience were to follow the actuarial assumptions exactly, the fund would be completely liquidated with the last payment to the last survivor of the group.

The assumed investment rate of return is 7.30%, net of investment and operating expenses.

We have determined the normal cost rates separately by type of benefit under the Plan. These are summarized in Table 6. In Table 6 we also provide a summary of the member and employer statutory contributions.

The term "fully funded" is often applied to a system where contributions for everyone at the normal cost rate will fully pay for the benefits of existing as well as new employees. Often, systems are not fully funded, either because of benefit improvements in the past that have not been completely paid for or actuarial deficiencies that have occurred because experience has not been as anticipated. Under these circumstances, a UAAL exists.

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Table 7 shows how the UAAL was derived for the Plan. Lines A and B show, respectively, the total present value of future benefits and the portion of the future liability that is expected to be paid from future normal cost contributions, both employer and employee. The future normal cost contributions are the portion of the present value of future benefits that are attributed to future years of service that have not been earned yet by the active membership. Line C shows the actuarial accrued liability. Line D shows the amount of assets available for benefits. Line E shows the UAAL.

The UAAL at any date after establishment of a system is affected by any actuarial gains or losses arising when the actual experience of the system varies from the experience anticipated by the actuarial assumptions used in the valuations. To the extent actual experience as it develops differs from the assumptions used, so also will the actual emerging costs differ from the estimated costs. The impact of these differences in actual experience from the assumptions is included in Section 1, the Summary of Results.

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Table 6:
Normal Cost Contribution Rates
As Percentages of Salary

	June 30, 2024 Total	June 30, 2023 Total
Service retirement	0.00%	0.00%
Disability retirement	0.06%	0.05%
Survivors' benefits	0.00%	0.00%
Vested retirement	0.00%	0.00%
Total Normal Rate	0.06%	0.05%
Employee Normal Rate	0.00%	0.00%
Employer Normal Rate	0.06%	0.05%
Rate Available to Amortize the Unfunded Accrued Actuarial Liability	0.24%	0.25%
Statutory Rate	0.30%	0.30%

Table 7:
Unfunded Actuarial Accrued Liability

	June 30, 2024	June 30, 2023
A. Actuarial present value of all future benefits for present members and retirees and their survivors (Table 5)	$ 2,903,120	$ 2,229,694
B. Less actuarial present value of total future normal costs for present members	$ 1,620,981	$ 727,821
C. Actuarial accrued liability	$ 1,282,139	$ 1,501,873
D. Less assets available for benefits	$ 10,443,239	$ 8,604,097
E. Unfunded actuarial accrued liability	$ (9,161,100)	$ (7,102,224)

The fundamental equation for funding a retirement system is that benefits and administrative expenses must be provided for by contributions (past and future) and investment income. When a retirement system matures, benefits and administrative expenses often exceed contributions. In this case we say the system has a "negative cash flow." Mature systems are characterized by negative cash flows and large pools of assets. This is natural. Actuarial funding is designed to accumulate large pools of assets which will in turn provide investment income and finance negative cash flows when systems mature. If the fund is looked at as a whole, investment income is usually larger than the difference between contributions and benefit payments. The retirement system's investment strategy should maximize potential returns at a prudent level of risk while providing for needed cash flows.

Table 8 shows the Plan had a positive cash flow for the year ended June 30, 2024. The Plan's total cash flow including contributions, benefit payments, administrative expenses and investment earnings was $1,839.1 thousand. Of the $1,839.1, $1,228.3 was due to investment returns.

As long as the Plan had a positive cash flow, there was no need to plan where the funds would come from to pay benefits since benefits could be paid by incoming contributions. A negative cash flow, as defined above, requires planning what funds will be used to pay the difference between benefits and contributions. We are providing these projections to aid in developing the investment strategy for the Plan's assets.

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Table 8:
Cash Flow History
(Dollar amounts in thousands)
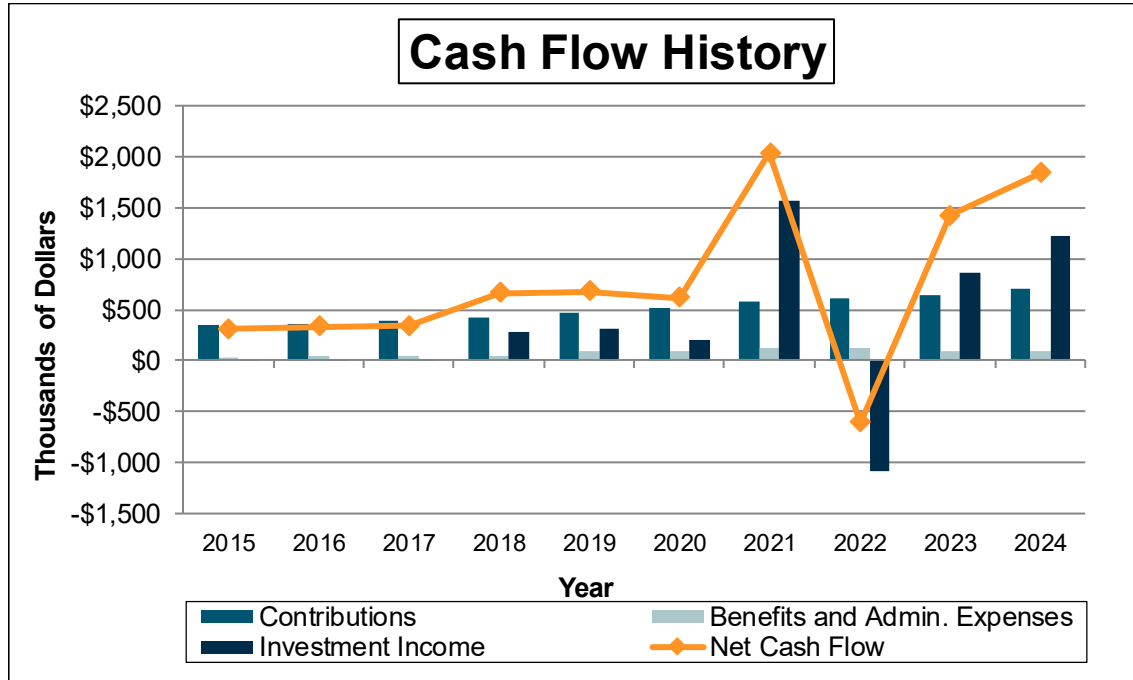
Year Ended June 30	Contributions	Benefits & Administrative Expenses	Investment Income	Net Cash Flow
		Historical Cash Flows		
2015	$ 343.4	$ 35.4	$ 3.4	$ 311.4
2016	$ 368.0	$ 41.8	$ 11.1	$ 337.3
2017	$ 392.1	$ 54.1	$ 0.6	$ 338.6
2018	$ 430.7	$ 52.4	$ 288.0	$ 666.3
2019	$ 464.7	$ 97.1	$ 314.2	$ 681.8
2020	$ 511.0	$ 101.4	$ 206.2	$ 615.8
2021	$ 582.8	$ 121.0	$ 1,577.8	$ 2,039.6
2022	$ 607.0	$ 128.9	$ (1,090.7)	$ (612.6)
2023	$ 649.8	$ 90.7	$ 864.1	$ 1,423.2
2024	$ 709.6	$ 98.8	$ 1,228.3	$ 1,839.1

An analysis of actuarial gains or losses is performed in conjunction with all regularly scheduled valuations.

The developments of the gains or losses related to the actuarial liability and the assets are shown in Table 9. The results of our analysis of the financial experience of the System in the three most recent regular actuarial valuations are presented in Table 10. Each gain or loss shown represents our estimate of how much the given type of experience caused the Unfunded Actuarial Accrued Liability or Funding Reserve to change in the period since the previous actuarial valuation.

Gains and losses shown due to demographic sources are approximate. Demographic experience is analyzed in greater detail in our periodic assumption studies.

Non-recurring gains and losses result from changes in the actuarial assumptions and benefit improvements.

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Table 9:
Analysis of Actuarial (Gains) or Losses*

A. ACTUARIAL ACCRUED LIABILITY (GAIN) / LOSS ANALYSIS

1. Actual Actuarial Accrued Liability as of June 30, 2023:	$	1,501,873
2. Normal Cost for this Plan Year:		84,702
3. Interest on items 1 and 2 [(1+2) x 7.30%]:		115,820
4. Benefit Payments for this Plan Year:		(98,802)
5. Interest on item [4 x 7.30% x .5]:		(3,606)
6. Expected Actuarial Accrued Liability as of June 30, 2024:	$	1,599,987
7. Changes due to:		
a. Assumption Changes:		0
b. Plan Amendments:		0
c. Funding Method:		0
d. Actuarial (Gain) / Loss:	$	(317,848)
8. Actual Actuarial Accrued Liability as of June 30, 2024:	$	1,282,139

9. Items Affecting Calculation of Actuarial Accrued Liability:

  a. Benefit provisions reflected in the actuarial accrued liability (see Appendix C)
  b. Actuarial assumptions and methods used to determine actuarial accrued liability (see Appendix B)

B. ASSET (GAIN) / LOSS ANALYSIS

1. Actuarial Value of Assets as of June 30, 2023:	$	8,604,097
2. Interest on item [1 x 7.30%]:		628,099
3. Contributions for this Plan Year:		709,634
4. Interest on item [3. x 7.30% x .5]:		25,902
5. Benefit Payments for this Plan Year:		(98,802)
6. Interest on item [5. x 7.30% x .5]:		(3,606)
7. Expected Actuarial Value of Assets as of June 30, 2024:	$	9,865,324
8. Actuarial Value of Assets as of June 30, 2024:	$	10,443,239
9. (Gain) / Loss	$	(577,915)

C. UNFUNDED ACTUARIAL ACCRUED LIABILITY (GAIN) / LOSS ANALYSIS

1. Actual Unfunded Actuarial Accrued Liability as of June 30, 2023:	$	(7,102,224)
2. Normal Cost for this Plan Year:		84,702
3. Contributions for this Plan Year:		(709,634)
4. Interest on items 1 - 3: [(1+2) x 7.30% + (3 x 7.30% x .5)]:		(538,181)
5. Expected Unfunded Actuarial Accrued Liability as of June 30, 2024:	$	(8,265,337)
6. Changes due to:		
a. Assumption Changes:		-
b. Plan Amendments:		-
c. Funding Method:		-
d. Actuarial (Gain) / Loss:	$	(895,763)
7. Actual Unfunded Actuarial Accrued Liability as of June 30, 2024:	$	(9,161,100)

* Effects related to gains are shown in parentheses. Numerical results are expressed as a (decrease) increase in the Unfunded Actuarial Accrued Liability (UAAL). Gains decrease the UAAL and losses increase the UAAL.

Table 10:
Historical Actuarial (Gains) or Losses*

	UAAL (Gain)/Loss		
	June 30, 2024	June 30, 2023	June 30, 2022
Investment Income Investment income was (greater) less than expected based on actuarial value of assets.	$ (577,915)	$ (319,939)	$ 1,371,447
Pay Increases Pay increases were (less) greater than expected.	$ 28,824	$ 57,773	$ (47,430)
Age & Service Retirements Members retired at (older) younger ages or with (less) greater final average pay than expected	$ (15)	$ (3,924)	$ (35,994)
Disability Retirements Disability claims were (less) greater than expected	$ (31,473)	$ (115,716)	$ (409,198)
Death-in-Service Benefits Survivor claims were (less) greater than expected	$ 941	$ 862	$ 8,119
Withdrawal From Employment (More) less reserves were released by withdrawals than expected	$ 1,369	$ (17,860)	$ (179,536)
Death After Retirement Retirees (died younger) lived longer than expected	$ (68,293)	$ (141,951)	$ 4,136
Data Adjustments and Benefit Payment Timing Service purchases, data corrections, etc.	$ (249,201)	$ 4,504	$ 147,957
Other Miscellaneous (gains) and losses	$ -	$ -	$ -
Total (Gain) or Loss During Period From Financial Experience	$ (895,763)	$ (536,251)	$ 859,501
Non-Recurring Items. Changes in actuarial assumptions and methods	$ -	$ -	$ (4,249,121)
Changes in benefits caused a (gain) loss	$ -	$ -	$ -
Composite (Gain) Loss During Period	$ (895,763)	$ (536,251)	$ (3,389,620)

*   Effects related to gains are shown in parentheses. Numerical results are expressed as a (decrease) increase in the Unfunded Actuarial Accrued Liability (UAAL). Gains decrease the UAAL and losses increase the UAAL.

A typical retirement plan faces many different risks, but the greatest risk is the inability to make benefit payments when due. If plan assets are depleted, benefits may not be paid which could create legal and litigation risk or the plan could become "pay as you go". The term "risk" is most commonly associated with an outcome with undesirable results. However, in the actuarial world, risk can be translated as uncertainty. The actuarial valuation process uses many actuarial assumptions to project how future contributions and investment returns will meet the cash flow needs for future benefit payments. Of course, we know that actual experience will not unfold exactly as anticipated by the assumptions and that uncertainty, whether favorable or unfavorable, creates risk. ASOP 51 defines risk as the potential of actual future measurements to deviate from expected results due to actual experience that is different than the actuarial assumptions.

The various risk factors for a given plan can have a significant impact – positive or negative – on the actuarial projection of liability and contribution rates.

There are a number of risks inherent in the funding of a defined benefit plan. These include:
- economic risks, such as investment return and price inflation;
- demographic risks such as mortality, payroll growth, aging population including impact of baby boomers, and retirement ages;
- contribution risk, i.e., the potential for contribution rates to be too high for the plan sponsor/employer to pay and
- external risks such as the regulatory and political environment.

There is a direct correlation between healthy, well-funded retirement plans and consistent contributions equal to the full actuarial contribution rate each year. The System is primarily funded by member and employer contributions to the trust fund, together with the earnings on these accumulated contributions. These contributions fund benefit accruals for current active members and administrative expenses. The remainder of the contributions amortizes the unfunded actuarial accrued liability. The contribution rates are set by state statute and intended to provide the needed amounts to fund the system over time. The purpose of the valuation is to determine if the fixed employer and member contributions are sufficient to fund the Plan. Due to the fixed nature of the contributions actuarial gains and losses are reflected in the amortization period. Generally, the largest source of actuarial gains and losses are caused by investment volatility. In addition, the unfunded liability is amortized as a level percentage of pay assuming payroll will grow by 3.25% per year. A key risk factor to the System's funding is that over time, the Statutory Contribution Rates will be insufficient to accumulate enough funds, with investment income, to fund the promised benefits. The funding insufficiency can be caused by amortization periods that are too long or by payroll not growing at the assumed rate.

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The other significant risk factor for the System is investment return because of the volatility of returns and the size of plan assets compared to payroll. This is to be expected, given the underlying capital market assumptions and the System's asset allocation. To the extent market rates of interest affect the expected return on assets, there is a risk of change to the discount rate which determines the present value of liabilities and actuarial valuation results. Please see the summary of results of this report which demonstrates the sensitivity of valuation results to differing discount rates.

Under the revised Actuarial Standards of Practice (ASOP) No. 4 effective for valuations after February 15, 2023, we include a low-default-risk obligation measure of the System's liability in our funding valuation report. This is an informational disclosure as described below and would not be appropriate for assessing the funding progress or health of the plan. This measure uses the unit credit cost method and reflects all the assumptions and provisions of the funding valuation except that the discount rate is derived from considering low-default-risk fixed income securities. We considered the FTSE Pension Discount Curve based on market bond rates published by the Society of Actuaries as of June 30, 2024 and with the 30-year spot rate used for all durations beyond 30. Using these assumptions, we calculate a liability of $1,209 thousand. This amount approximates the termination liability if the plan (or all covered employment) ended on the valuation date and all of the accrued benefits had to be paid with cash-flow matched bonds. This assurance of funded status and benefit security is typically more relevant for corporate plans than for governmental plans since governments rarely have the need or option to completely terminate a plan.

A key demographic risk for the Retirement System is improvements in mortality (longevity) greater than anticipated. While the actuarial assumptions reflect a margin for improvement in mortality experience these assumptions are refined every experience study, the risk arises because there is a possibility of some sudden shift, perhaps from a significant medical breakthrough that could quickly increase liabilities. Likewise, there is some possibility of a significant public health crisis that could result in a significant number of additional deaths in a short time period, which would also be significant, although more easily absorbed. While either of these events could happen, it represents a small probability and thus represents much less risk than the volatility associated with investment returns.

The exhibits on the following pages summarize some historical information that helps indicate how certain key risk metrics have changed over time. Many are due to the maturing of the retirement system.

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Historical Asset Volatility Ratios

As a retirement system matures, the size of the market value of assets increases relative to the covered payroll of active members, on which the System is funded. The size of the plan assets relative to covered payroll, sometimes referred to as the asset volatility ratio, is an important indicator of the contribution risk for the System. The higher this ratio, the more sensitive a plan's contribution rate is to investment return volatility. In other words, it will be harder to recover from investment losses with increased contributions.

Actuarial Valuation Date	Market Value of Assets	Plan Year Payroll	Asset Volatility Ratio
6/30/2015	$ 2,781,120	$ 106,518,524	0.03
6/30/2016	3,118,397	114,883,091	0.03
6/30/2017	3,456,936	129,157,695	0.03
6/30/2018	4,455,481	139,065,638	0.03
6/30/2019	5,137,296	149,924,251	0.03
6/30/2020	5,753,289	165,358,585	0.03
6/30/2021	7,792,719	188,710,324	0.04
6/30/2022	7,180,523	196,004,056	0.04
6/30/2023	8,604,097	211,858,746	0.04
6/30/2024	10,443,239	230,030,167	0.05

The assets at June 30, 2024 are 5% of payroll, so underperforming the investment return assumption by 1.00% (i.e., earn 6.30% for one year) is equivalent to 0.05% of payroll.

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Historical Cash Flows

Plans with negative cash flows will experience increased sensitivity to investment return volatility. Cash flows, for this purpose, are measured as contributions less benefit payments and administrative expenses.   If the System has negative cash flows and then experiences returns below the assumed rate, there are fewer assets to be reinvested to earn the higher returns that typically follow. While any negative cash flow will produce such a result, it is typically a negative cash flow of more than 5% of MVA that may cause significant concerns. The System's cash flow has been positive over the recent nine years. There is no immediate concern regarding negative cash flow.

Year End	Market Value of Assets (MVA)	Contributions	Benefit Payments	Net Cash Flow	Net Cash Flow as a Percent of MVA
6/30/2015	$ 2,781,120	$ 343,426	$ 35,366	$ 308,060	11.08%
6/30/2016	3,118,397	368,019	41,809	326,210	10.46%
6/30/2017	3,456,936	392,100	54,135	337,965	9.78%
6/30/2018	4,455,481	430,725	52,383	378,342	8.49%
6/30/2019	5,137,296	464,674	97,076	367,598	7.16%
6/30/2020	5,753,289	510,981	101,436	409,545	7.12%
6/30/2021	7,792,719	582,826	121,015	461,811	5.93%
6/30/2022	7,180,523	606,998	128,859	478,139	6.66%
6/30/2023	8,604,097	649,751	90,699	559,052	6.50%
6/30/2024	10,443,239	709,634	98,802	610,832	5.85%

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Liability Maturity Measurement

Most public sector retirement systems have been in operation for many years. As a result, they have aging plan populations, and in some cases declining active populations, resulting in an increasing ratio of retirees to active members and a growing percentage of retiree liability. The retirement of the remaining baby boomers over the next decade is expected to further exacerbate the aging of the retirement system population. With more of the total liability residing with retirees, investment volatility has a greater impact on the funding of the system since it is more difficult to restore the system financially after losses occur when there is comparatively less payroll over which to spread costs. Below are two tables which demonstrate the ratio of the System's retiree liability compared to the total accrued liability and the ratio of the number of retirees and beneficiaries to the number of active members.

Year End	Retiree Liability (a)	Total Actuarial Accrued Liability (b)	Retiree Percentage (a) / (b)
6/30/2015	$ 404,891	$ 3,235,065	12.5%
6/30/2016	400,785	3,591,249	11.2%
6/30/2017	214,931	3,967,262	5.4%
6/30/2018	506,826	4,354,320	11.6%
6/30/2019	821,849	4,896,028	16.8%
6/30/2020	765,343	5,202,583	14.7%
6/30/2021	820,944	5,778,856	14.2%
6/30/2022	633,362	1,610,180	39.3%
6/30/2023	431,447	1,501,873	28.7%
6/30/2024	410,545	1,282,139	32.0%

Historical Member Statistics

Valuation Date June 30,	Number of Active	Number of Retired	Active/ Retired
2015	2,284	6	380.67
2016	2,409	6	401.50
2017	2,541	3	847.00
2018	2,690	8	336.25
2019	2,871	10	287.10
2020	3,100	9	344.44
2021	3,311	10	331.10
2022	3,386	10	338.60
2023	3,406	7	486.57
2024	3,577	6	596.17

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The assumptions and methods utilized in the valuation were developed in the five-year experience study for the period ending 2021.

Tables B-3 and B-4 give rates of decrement for service retirement and other terminations of employment.

Actuarial Cost Method

The actuarial valuation was prepared using the entry age actuarial cost method. Under this method, the actuarial present value of the projected benefits of each individual included in the valuation is allocated as a level percentage of the individual's projected compensation between entry age and assumed exit. The portion of this actuarial present value allocated to a valuation year is called the normal cost. The normal cost was first calculated for each individual member. The normal cost rate is defined to equal the total of the individual normal costs, divided by the total pay rate.

The portion of this actuarial present value not provided for at a valuation date by the sum of (a) the actuarial value of the assets and (b) the actuarial present value of future normal costs is called the UAAL. The UAAL is amortized as a level percentage of the projected salaries of present and future members of the System.

Records and Data

The data used in the valuation consist of financial information; records of age, sex, service, salary, contribution rates, and account balances of contributing members; and records of age, sex, and amount of benefit for retired members and beneficiaries. All of the data was supplied by the System and has been accepted for valuation purposes without audit.

Valuation of Assets

Market value of assets

Investment Earnings

The annual rate of investment earnings of the assets of the System is assumed to be 7.30% per year net of investment and administrative expenses, compounded annually.

Postretirement Benefit Increases

None.

Future Salaries

The rates of annual salary increase assumed for the purpose of the valuation are illustrated in Table B-2. In addition to increases in salary due to merit and longevity, this scale includes an assumed 3.50% annual rate of increase in the general wage level of the membership.

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Service Retirement

Table B-3 shows the annual assumed rates of retirement among members eligible for service retirement. Separate rates are used when a member is eligible for reduced benefits, for the first year a member is eligible for full benefits, and for the years following the first year a member is eligible for full benefits.

Disablement

The rates of disablement used in this valuation are based on 10% of the rates of disablement used for the PERS-DB plan.

Mortality

A written description of each table used is included in Table B-1.

Other Terminations of Employment

The rates of assumed future withdrawal from active service for reasons other than death, disability or retirement are shown for representative ages in Table B-4.

Records with no Birth Date

New records with no birth date are assumed to be 37 years old. Records that are not new and have no birth date used the same birth date as the prior year's valuation.

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Table B-1

Summary of Valuation Assumptions

I.	Economic assumptions		
	A.	General wage increases	3.50%
	B.	Investment return	7.30%
	C.	Price inflation assumption	2.75%
	D.	Growth in membership	0.00%
II.	Demographic assumptions		
	A.	Individual salary increase due to promotion and longevity	Table B-2
	B.	Retirement	Table B-3
	C.	Mortality among Active Participants	
		PUB-2010 General Amount Weighted Employee Mortality projected to 2021 for males and females. Projected generationally using MP-2021.	
	D.	Mortality among Disabled pensioners	
		PUB-2010 General Amount Weighted Disabled Retiree mortality table set forward 1 year for both males and females.	
	E.	Mortality among Contingent Survivor pensioners	
		PUB-2010 Amount Weighted Contingent Survivor Mortality projected to 2021 with ages set forward 1 year for males and females. Projected generationally using MP-2021.	
	F.	Mortality among Healthy pensioners	
		PUB-2010 General Amount Weighted Healthy Retiree Mortality Table projected to 2021, with ages set forward one year and adjusted 104% for males and 103% for females. Projected generationally using MP-2010.	
	G.	Other terminations of employment	Table B-4

Table B-2

Future Salaries

Years of Service	(a) Individual Merit & Longevity	(b) General Wage Increase	(1+(a))*(1+(b)) Total Salary Increase
0	4.80%	3.50%	8.47%
1	3.80	3.50	7.43
2	2.80	3.50	6.40
3	2.00	3.50	5.57
4	1.40	3.50	4.95
5	0.80	3.50	4.33
6	0.40	3.50	3.91
7	0.00	3.50	3.50
8 & Up	0.00	3.50	3.50

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Table B-3
Retirement Annual Rates

Age	Less than 30 Years of Service	30 Years or more of Service and age 60 with 25 Years of Service
Less than 45		10.0%
45		10.0
46		10.0
47		10.0
48		10.0
49		10.0
50	4.5%	15.8
51	4.5	15.8
52	4.5	15.8
53	4.5	15.8
54	4.5	15.8
55	5.5	15.8
56	6.0	15.8
57	6.0	15.8
58	6.0	15.8
59	7.0	15.8
60	9.0	15.8
61	9.0	15.8
62	15.0	22.0
63	15.0	22.0
64	15.0	22.0
65	30.0	35.0
66	30.0	35.0
67	25.0	35.0
68	25.0	30.0
69	25.0	30.0
70 & Over	100.0	100.0

Members hired before July 1, 2001 are assumed to retire at the assumed rates once reaching the earlier of age 50 with five years of service or age 65 regardless of service.

Members hired on or after July 1, 2001 are assumed to retire at the assumed rates once reaching the earlier of age 55 with five years of service or age 70 regardless of service.

These rates are the same as the retirement rates used in the PERS-DB actuarial valuation for members not eligible for unreduced retirement benefits.

Table B-4

**Other Terminations of Employment
Among Members Not Eligible to Retire
Annual Rates**

Years of Service	All Members
0	35.0%
1	27.0
2	18.0
3	14.0
4	11.0
5	11.0
6	10.0
7	9.0
8	8.0
9	7.0
10	6.0
11	6.0
12	5.0
13	5.0
14	4.5
15 & Over	3.0

Type of Plan	• Multiple-employer cost sharing OPEB
Membership eligibility	• Employees of the State and local governments that have contracted for PERS coverage.
	• Certain employees of the university system and school districts, not covered by a separate retirement system governed by Title 19 of Montana Code Annotated.
	• Employees must have elected to be a member of the defined contribution retirement plan.
Member contributions	• None
Employer contributions	• 0.30% of each eligible member's compensation, for those employers participating in the PERS-DCRP
Compensation period used in benefit calculation	• HAC = Highest Average Compensation
	• Hired **prior to** July 1, 2011: HAC is average of the highest 36 consecutive months (or shorter period of total service) of compensation paid by member.
	• Hired **on or after** July 1, 2011: HAC is average of the highest 60 consecutive months (or shorter period of total service) of compensation paid to member.
	• Hired **on or after** July 1, 2013: 110% annual cap on compensation considered as part of a member's HAC

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Disability eligibility and benefit	• 5 years membership service

For members hired **on or before** June 30, 2011, **or** hired **on or before** February 24, 1991 **and** so elected:

- **Less than 25 years** of membership service:
  1.785% of HAC multiplied by service credit, or
- **At least 25 years** of membership service:
  2% of HAC multiplied by service credit; and
- Benefit is payable to the later of age 65 or for five years.

For members hired **on or after** July 1, 2011:

- **Between 5 and 10 years** of membership service:
  1.5% of HAC x years of service credit; or
- **Between 10 and 30 years** of membership service:
  1.785% of HAC x years of service credit; or
- **30 years** of membership service **or more**:
  2% of HAC x years of service credit; and
- Benefit is payable to age 70 for disabilities occurring prior to age 65, or no more than five years for disabilities occurring after age 65.

Members cannot receive distributions from their individual defined contribution account while receiving payments from the PERS-DCRP Disability OPEB. Participants may choose to receive a distribution from their individual account instead of applying for and receiving a disability benefit.

Survivor's benefit	• Disability benefits cease after death of a member, and their beneficiary is entitled to death benefits only as provided from the member's vested defined contribution account balance.
Form of payment	• Normal form of payment is an annuity • No other forms of payment are available
Post retirement benefit increases	• None
Changes since last valuation	• None

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APPENDIX D – VALUATION DATA

This valuation is based upon the membership of the Plan as of June 30, 2024. Membership data was supplied by the Plan and has been accepted for valuation purposes without audit. However, tests were performed to ensure that the data is sufficiently accurate for valuation purposes.

The salaries used in the tables and charts which follow are different than the salaries used for the Summary of Results on page 1. The valuation projected salaries to be paid for the following fiscal year, whereas the Summary of Results, salaries are applicable in the year ending on the valuation date.

Active Members	Number	Valuation Projected Salaries
Full-Time Members	2,753	$ 206,387,171
Part-Time Members	823	$ 21,825,659
Total Active Members	3,576	$ 228,212,830

Table D-1 contains summaries of the data for active members. For full-time members, values shown in the tables are the numbers of members and their total and average annual salaries. For part-time members, only the numbers of members are shown.

Table D-2 presents distributions of the following:

- Members receiving service retirement benefits.
- Members receiving disability retirement benefits.
- Survivors of deceased retired members receiving benefits.
- Survivors of deceased active members.
- Terminated vested members.

Table D-3 is a reconciliation of membership data from June 30, 2023 to June 30, 2024.

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The following is a summary of retired members and beneficiaries currently receiving benefits:

Type of Annuitant	Number	Annual Benefits	Average Annual Benefits
Service Retirement	0	$ -	$ -
Survivors and Beneficiaries	0	-	-
Total Retirees and Beneficiaries	0	$ -	$ -
Disability Retirement	6	69,985	11,664
Total Annuitants	6	$ 69,985	$ 11,664

Terminated Members with Contributions Not Withdrawn	Number
Vested Terminated Members	0
Non-Vested Terminated Members	0
Total Terminated Members	0

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Table D-1:
Active Members Distribution of
Full-Time Employees and Salaries
as of June 30, 2024

Number of Employees

Age	0	1	2	3 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40+	Totals
<25	17	35	10	2	1								65
25 to 29	22	51	54	56	32								215
30 to 34	31	44	54	77	115	8							329
35 to 39	25	37	52	72	128	38	7						359
40 to 44	12	29	29	59	130	69	52	7					387
45 to 49	9	22	22	45	90	45	67	19	2				321
50 to 54	9	26	31	58	97	54	58	37	21	3			394
55 to 59	12	22	21	41	85	34	52	30	14	7			318
60 to 64	5	16	13	30	71	43	44	12	12	5	2		253
65 to 69	5	3	3	12	18	22	9	9	4				85
70 and up	1	2	2	6	7	4	3	2					27
Totals	148	287	291	458	774	317	292	116	53	15	2	-	2,753

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Table D-1:
Active Members Distribution of
Full-Time Employees and Salaries
as of June 30, 2024

Annual Salaries in Thousands

Age	0	1	2	3 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40+	Totals
<25	965	1,736	652	114	63								3,528
25 to 29	1,381	2,766	3,258	3,870	2,291								13,566
30 to 34	2,208	2,274	3,567	5,542	8,340	606							22,538
35 to 39	1,792	2,603	4,043	5,290	10,016	3,133	448						27,325
40 to 44	623	1,640	1,747	4,588	10,666	6,511	4,742	690					31,207
45 to 49	563	1,276	1,621	3,151	7,427	3,739	6,069	1,850	179				25,876
50 to 54	482	1,347	2,589	4,099	7,229	4,351	5,652	3,567	2,048	218			31,580
55 to 59	834	1,260	1,414	3,052	5,797	2,676	4,743	2,498	1,406	575			24,256
60 to 64	277	1,004	849	2,078	5,004	3,171	3,408	1,117	964	449	120		18,440
65 to 69	268	244	210	666	1,167	1,707	714	671	452				6,100
70 and up	57	106	366	373	386	261	282	139					1,971
Totals	9,450	16,256	20,315	32,822	58,385	26,156	26,059	10,534	5,049	1,241	120	-	206,387

The salary shown in the above chart was used for valuation purposes and assumes pay increases for the year.

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Table D-1:
Active Members Distribution of
Full-Time Employees and Salaries
as of June 30, 2024

Average Annual Salary

Age	0	1	2	3 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40+	Totals
<25	56,751	49,590	65,176	56,758	62,678								54,283
25 to 29	62,757	54,236	60,341	69,105	71,586								63,096
30 to 34	71,226	51,684	66,056	71,977	72,522	75,800							68,504
35 to 39	71,691	70,344	77,745	73,472	78,253	82,450	63,950						76,114
40 to 44	51,906	56,543	60,225	77,767	82,046	94,365	91,198	98,629					80,639
45 to 49	62,609	58,000	73,701	70,022	82,520	83,094	90,584	97,382	89,581				80,612
50 to 54	53,502	51,808	83,514	70,666	74,524	80,569	97,452	96,411	97,502	72,624			80,153
55 to 59	69,531	57,287	67,315	74,451	68,202	78,707	91,206	83,279	100,416	82,090			76,275
60 to 64	55,307	62,758	65,311	69,262	70,473	73,736	77,453	93,070	80,327	89,768	60,242		72,884
65 to 69	53,592	81,264	69,963	55,501	64,837	77,609	79,368	74,577	113,077				71,764
70 and up	57,480	53,243	183,001	62,093	55,100	65,241	94,161	69,671					73,001
Totals	63,851	56,641	69,812	71,665	75,433	82,510	89,242	90,807	95,260	82,756	60,242		74,968

The salary shown in the above chart was used for valuation purposes and assumes pay increases for the year.

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Table D-1:
Active Members Distribution of
Part-Time Employees
as of June 30, 2024

Number of Employees

Age	0	1	2	3 to 4	5 to 9	Completed Years of Service 10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40+	Totals
<25	16	15	1		1								33
25 to 29	16	15	6	10	1								48
30 to 34	11	10	13	14	13								61
35 to 39	10	16	11	14	23	4	1						79
40 to 44	14	10	12	16	23	10	6						91
45 to 49	8	13	14	15	17	13	3	4					87
50 to 54	11	8	17	18	25	8	8	2	1				98
55 to 59	10	11	10	15	15	11	12	5	5				94
60 to 64	7	10	10	25	24	5	6	10	3				100
65 to 69	8	8	5	17	23	12	7	9	1				90
70 and up	5	3	6	4	12	5	6		1				42
Totals	116	119	105	148	177	68	49	30	11	-	-	-	823

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Table D-2:
Distribution of Inactive Lives

Members Receiving Disability Retirement Benefits as of June 30, 2024

		Disability Retirement		
Age	Number of Persons		Annual Benefits	Average Annual Benefits
<50				
50 to 54	2	$	24,186	12,093
55 to 59	4	$	45,799	11,450
60 to 64				
65 to 69				
70 to 74				
75 to 79				
80 to 84				
85 to 89				
90 and up				
Totals	6	$	69,985	$ 11,664

Table D-3:
Data Reconciliation

The following table shows a reconciliation of the participants used in the previous valuation to this valuation. This chart reflects the counts used for valuation purposes and for the Annual Financial Report.

	Active Members	Disabled Members
June 30, 2023 Valuation	3,406	7
Terminations	(382)	
Service Retirements		
Disability Retirements	(1)	1
Deaths		
New Entrants	483	
Rehires	70	
Payment Stopped		(2)
Other		
June 30, 2024 Valuation	3,576	6

APPENDIX E – COMPARATIVE SCHEDULES

This section contains tables that summarize the experience of the Plan shown in present and past valuation reports.

Table E-1 shows a summary of the active members covered as of the various valuation dates.

Table E-2 shows a summary of the retired and inactive members as of the various valuation dates.

Table E-3 summarizes the contribution rates determined by each annual actuarial valuation.

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Table E-1:
Active Membership Data

Valuation Date June 30,	Actives	Annual Salaries	Average Annual Salary	Average Age	Average Years of Service	Average Hire Age
2024	3,577	$ 230,030,167	$ 64,308	46.7	7.5	39.2
2023	3,406	211,858,746	62,202	46.8	7.4	39.3
2022	3,386	196,004,056	57,887	46.5	7.3	39.2
2021	3,311	188,710,324	56,995	46.6	7.3	39.3
2020	3,100	165,358,585	53,341	46.6	7.3	39.3
2019	2,871	149,924,251	52,220	46.5	7.3	39.2
2018	2,690	139,065,638	51,697	46.4	7.4	39.0
2017	2,541	129,157,695	50,829	46.3	7.4	38.9
2016	2,409	114,883,091	47,689	46.1	6.8	39.3
2015	2,284	106,518,524	46,630			

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Table E-2:
Disabled Membership Data

Valuation Date June 30,	Number	Annual Benefits	Average Annual Benefit	Average Current Age
2024	6	$ 69,985	$11,664	56.5
2023	7	78,750	11,250	57.5
2022	10	120,618	12,062	59.8
2021	10	120,618	12,062	58.8
2020	9	100,636	11,182	57.6
2019	10	110,240	11,024	56.8
2018	8	81,392	10,174	57.7
2017	3	25,829	8,610	51.8
2016	6	49,269	8,212	53.2
2015	6	43,296	7,216	

Table E-3:
Contribution Rates

Valuation Date June 30,	Contribution Rates			Normal Cost Rate	UAAL Rate*
	Employee	Employer	Total		
2024	0.00 %	0.30 %	0.30 %	0.06 %	0.24 %
2023	0.00	0.30	0.30	0.05	0.25
2022	0.00	0.30	0.30	0.05	0.25
2021	0.00	0.30	0.30	0.29	0.01
2020	0.00	0.30	0.30	0.29	0.01
2019	0.00	0.30	0.30	0.30	0.00
2018	0.00	0.30	0.30	0.30	0.00
2017	0.00	0.30	0.30	0.28	0.02
2016	0.00	0.30	0.30	0.30	0.00
2015	0.00	0.30	0.30	0.32	(0.02)
2014	0.00	0.30	0.30	0.33	(0.03)

* The UAAL rate is the amount available to amortize the UAAL. It is equal to the total contribution rate, minus the normal cost rate.

The information presented in the required supplementary schedules was determined as part of the actuarial valuation as of June 30, 2024. Additional information as of the latest actuarial valuation follows.

Valuation date	June 30, 2024
Actuarial cost method	Entry Age Normal
Amortization method	Open
Remaining amortization period	0 Years
Asset valuation method	Market Value
Actuarial assumptions:	
Investment rate of return*	7.30%
General wage growth*	3.50%
Merit salary increases	0.0% - 4.8%
*Includes inflation	2.75%

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			Schedule of Funding Progress (expressed in thousands)				
Valuation Date June 30,	Actuarial Value of Assets	Actuarial Accrued Liability (AAL)	Funded Ratio	Unfunded AAL (UAAL)	Covered Payroll		UAAL as a Percentage of Covered Payroll
2024	$ 10,443	$ 1,282	815%	$ (9,161)	$ 230,030		(3.98)%
2023	8,604	1,502	573%	(7,102)	211,859		(3.35)%
2022	7,181	1,610	446%	(5,570)	196,004		(2.84)%
2021	7,793	5,779	135%	(2,014)	188,710		(1.07)%
2020	5,753	5,203	111%	(551)	165,359		(0.33)%
2019	5,137	4,896	105%	(241)	149,924		(0.16)%
2018	4,455	4,354	102%	(101)	139,066		(0.07)%

			Solvency Test Aggregate Accrued Liabilities for (expressed in thousands)				
Valuation Date June 30,	Active Member Contributions (1)	Retirees & Beneficiaries (2)	Active Member Employer Financed Contributions (3)	Actuarial Value of Reported Assets	Portion of Accrued Liability Covered by Reported Assets (1)	(2)	(3)
2024	$ -	$ 411	$ 872	$ 10,443	100%	100%	1151%
2023	-	431	1,070	8,604	100%	100%	763%
2022	-	633	977	7,181	100%	100%	670%
2021	-	821	4,958	7,793	100%	100%	141%
2020	-	765	4,437	5,753	100%	100%	112%
2019	-	822	4,074	5,137	100%	100%	106%
2018	-	507	3,847	4,455	100%	100%	103%

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APPENDIX G – GLOSSARY

The following definitions are largely excerpts from a list adopted in 1981 by the major actuarial organizations in the United States. In some cases the definitions have been modified for specific applicability to the Public Employees' Retirement System of Montana (PERS) Long-Term disability plan under the Defined Contribution Retirement Plan. Defined terms are capitalized throughout this Appendix.

Accrued Benefit

The amount of an individual's benefit (whether or not vested) as of a specific date, determined in accordance with the terms of a pension plan and based on compensation and service to that date.

Actuarial Accrued Liability

That portion, as determined by a particular Actuarial Cost Method, of the Actuarial Present Value of pension plan benefits and expenses which is not provided for by future Normal Costs.

Actuarial Assumptions

Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disablement, and retirement; changes in compensation, rates of investment earnings, and asset appreciation or depreciation; procedures used to determine the Actuarial Value of Assets; and other relevant items.

Actuarial Cost Method

A procedure for determining the Actuarial Present Value of pension plan benefits and expenses and for developing an actuarially equivalent allocation of such value to time periods, usually in the form of a Normal Cost and an Actuarial Accrued Liability.

Actuarial Gains and Losses

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.

Actuarial Present Value

The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions.

Actuarial Valuation

The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a pension plan.

Actuarially Equivalent

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

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Amortization Payment

That portion of the pension plan contribution which is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability.

Entry Age 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. The portion of this Actuarial Present Value allocated to a valuation year is called the Normal Cost. The portion of this Actuarial Present Value not provided for at a valuation date by the Actuarial Present Value of future Normal Costs is called the Actuarial Accrued Liability.

Market Value of Assets

The fair value of cash, investments and other property belonging to a pension plan that could be acquired by exchanging them on the open market.

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.

Projected Benefits

Those pension plan benefit amounts which are expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age and past and anticipated future compensation and service credits.

Unaccrued Benefit

The excess of an individual's Projected Benefits over the Accrued Benefits as of a specified date.

Unfunded Actuarial Accrued Liability

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