Gallagher

Retirement Plan for Chicago Transit Authority Employees

Actuarial Valuation Report as of January 1, 2024, including supplementary disclosure information for GASB Statement Nos. 67 and 68

August 2024

100 Galleria Parkway, SE
Suite 1060
Atlanta, GA 30339

August 30, 2024

Board of Trustees and Executive Director
Retirement Plan for Chicago Transit Authority Employees
55 West Monroe St., Suite 1950
Chicago, IL 60603

Ladies and Gentlemen:

This report presents the results of the annual valuation of the assets and liabilities of The Retirement Plan for Chicago Transit Authority Employees (Plan) as of January 1, 2024, prepared in accordance with 40 ILCS 5/22-101(e). In addition, it includes disclosure information as of December 31, 2023, required under Governmental Accounting Standards Board Statement Nos. 67 and 68. The actuarial valuation of the Plan is performed annually and Gallagher was retained to perform the valuation as of January 1, 2024. This valuation has been conducted in accordance with all applicable Actuarial Standards of Practice issued by the Actuarial Standards Board.

The actuarial valuation is based on unaudited financial and member data provided by the staff of the Plan and summarized in this report. The benefits considered are those delineated in the Plan and are governed by legislation contained in the Illinois Compiled statutes, particularly Chapter 40, as amended and restated effective December 31, 2012. The actuary did not verify the data submitted but did perform tests for consistency and reasonableness. The accuracy of the results contained in this report is dependent upon the accuracy of the data.

Contribution rates were determined in accordance with 40 ILCS 5/22-101(e) using the projected unit credit cost method and, under the actuarial assumptions used in the valuation, are expected to produce a funded ratio of at least 60 percent no later than ten years after the valuation year through fiscal year end 2039. Contribution rates reflect the issuance of bond or notes by the Chicago Transit Authority (Authority), as defined in 70 ILCS 3605/12c. Authority contribution rates are adjusted by a debt service credit, for debt service paid in the prior year, of up to six percent of compensation per year from 2009 to 2040, as defined in 40 ILCS 5/22-101(e)(2).

Results of this valuation deviated from those that would have been projected based on the results of the January 1, 2023 actuarial valuation for a number of reasons including market returns of approximately 10.00% compared to the 8.25% assumed rate of return, demographic experience, updated participant data, and salary increases that were greater than expected. The Board adopted the recommended changes to the demographic and economic assumptions effective with the January 1, 2024 actuarial valuation. However, the plan is still projected to meet the funding ratio standards set forth in ILCS 5/22-101(e) and, therefore, there is no need to increase authority and employee contribution rates to comply with 40 ILCS 5/22-101(e). The rates will remain as follows:

Annual Contributions to the Plan (Percentage of Compensation)		
Fiscal Year	Authority	Employees
2025 to 2040	21.590%	13.795%

Based on these rates, the sum of current assets, net bond proceeds, future contributions and investment earnings, less benefit payments and expenses, assets held by the Plan are projected to be equal to at least 60 percent of actuarial liabilities by 2030 and through fiscal year end 2040, if these contributions, expressed as a percentage of compensation, are made to the Plan and the Plan experiences no net actuarial losses in the future.

40 ILCS 5/22-101(e)(4) provides for a minimum contribution, determined either by the Board of Trustees or the Auditor General, to bring the funded ratio of the Plan "up to" or "to no less than" 90% by December 31, 2059.

While not required by 40 ILCS 5/22-101(e)(3), for informational purposes, Gallagher has provided a contribution amount equal to the Actuarial Math Contribution:

- Fund 100% of the entry age normal cost method
- Fund the expected administrative expenses for the fiscal year
- Pay off the unfunded liability over 20 years and as a level percentage of payroll

Under this method, a contribution of approximately 30.75% of payroll (total contribution) is appropriate.

The results documented in this report are estimated based on data that may be imperfect and on assumptions about future events. Assumptions may have been made about participant data or other factors. Reasonable efforts were made in this valuation to ensure that items that were significant in the context of the actuarial liabilities or costs are treated appropriately and not excluded or included inappropriately. We believe that the use of approximation in our calculations, if any, has not resulted in a significant difference relative to the results we would have obtained using more detailed calculations.

A range of results, different from those presented in this report could be considered reasonable. The numbers are not rounded, but this is for convenience only and should not imply precision, which is not inherent in actuarial calculations.

Experience studies are performed once in every five-year period. This valuation was prepared on the basis of the demographic and economic assumptions that were recommended on the basis of an Experience Review covering the period from January 1, 2018 through December 31, 2022 and adopted by the Board of Trustees at their July 2024 meeting, which include an 8.25% per annum rate of investment return. These assumptions will remain in effect for valuation purposes until such time as the Board of Trustees adopts revised assumptions.

We believe that the economic and demographic assumptions adopted in accordance with the recent experience study are reasonable and appropriate for the purposes of this valuation. The assumptions and methods used for financial reporting and all supporting schedules fulfill the requirements of GASB Statement Nos. 67 and 68.

Historical valuation results presented in this report represent results taken from prior actuarial reports, and results shown for some years may reflect funding methods and techniques used by the prior

actuary. Our report/certification does not apply to those results, other than to represent that our report has presented accurate information developed by prior actuaries.

Where presented, the “funded ratio”, “funded status” and “unfunded accrued liability” typically are measured using the actuarial value of assets. It should be noted that use of the market value of assets would result in different values of the funded ratio, funded status, and unfunded accrued liability. Moreover, the funded ratio presented is appropriate for evaluating the need and level of future contributions but not for assessment of the funded status of the Plan if it were to settle (i.e., purchase annuities to cover) a portion or all of its liabilities.

Where presented, the “net pension liability” is measured on a market value of assets basis. This item presented may not be appropriate for evaluating the need and level of future contributions and make no assessment regarding the cost to settle (i.e., purchase annuities to cover) any portion of the Plan’s liabilities.

Future actuarial measurements may differ significantly from the current measurement presented in this report due to such factors as: plan experience different from that anticipated by the economic and demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements; and changes in plan provisions or applicable law. An analysis of the potential range of such future measurements is beyond the scope of this report, but a description of future risks to the plan is provided in Section 7.

Use of this report for any other purpose, or by anyone other than the Board of Trustees or the Plan’s staff or its auditors, may not be appropriate and may result in mistaken conclusions because of failure to understand applicable assumptions, methods, or inapplicability of the report for that purpose. Gallagher should be asked to review any statement to be made on the basis of the results contained in this report. Gallagher will accept no liability for any such statement made without prior review by Gallagher.

Actuarial Standards of Practice Nos. 27 and 35 require the actuary to identify the economic and demographic assumptions that have a significant effect on the measurement and, for those that are prescribed by another party, to provide the information and analysis the actuary performed to determine that the assumption does not significantly differ from what the actuary deems reasonable for the purpose of the measurement. The mortality assumption used in this valuation reflects the Society of Actuaries’ most recently published tables of public sector pension plan rates. In the case of the sponsor’s selection of expected return on assets (“EROA”), the signing actuary used economic information provided by Gallagher’s Financial Risk Management (“FRM”) practice. A spreadsheet tool created by the FRM team converts averages, standard deviations, and correlations from Gallagher’s Capital Markets Assumptions (“CMA”) that are used for stochastic forecasting into approximate percentile ranges for the arithmetic and geometric average returns. Percentiles are based on standard matrix multiplication and normal approximations. This simplified model (disclosed here under ASOP 56) ignores inter-period dependence and the skewed nature of single year returns. As such it is intended to suggest possible reasonable ranges for EROA without attempting to predict or select a specific best estimate rate of return. However, it does take into account the duration (horizon) of investment and the approximate allocation of assets in the portfolio to various asset classes with different expected returns, standard deviations, and correlations to other asset classes. Under current calibrations, the EROA tool will tend to show higher expected returns for longer durations, and will

show a greater divergence between arithmetic and geometric average returns the higher the standard deviation of portfolio return. Based on the actuary's analysis, including consistency with other assumptions used in the valuation, and the percentiles generated by the spreadsheet described above, the actuary believes the EROA together with the System's other economic and demographic assumptions do not conflict with what, in the actuary's professional judgment, is reasonable for the purpose of the measurement.

Actuarial Standard of Practice No. 56 provides guidance to actuaries when performing actuarial services with respect to designing, developing, selecting, modifying, using, reviewing, or evaluating models. Gallagher uses third-party software in the performance of annual actuarial valuations and projections. The model is intended to calculate the liabilities associated with the provisions of the plan using data and assumptions as of the measurement date under the funding methods specified in this report. The output from the third-party software is used as input for an internally developed model that applies the applicable funding methods to the liabilities derived and other inputs, such as plan assets and contributions, to generate many of the exhibits found in this report. Gallagher has an extensive review process whereby the results of the liability calculations are checked using detailed sample output, changes from year to year are summarized by source, and significant deviations from expectations are investigated. Other funding outputs are similarly reviewed in detail and at a high level for accuracy, reasonability, and consistency with prior results. Gallagher also reviews the model when significant changes are made to the third-party software. The review is performed by experts within the company who are familiar with applicable funding methods as well as the manner in which the model generates its output. Significant changes to the internal model that are applicable to multiple clients are generally developed, checked, and reviewed by multiple experts within the company who are familiar with the details of the required changes.

In our opinion the calculations also comply with Illinois law and, where applicable, the Statements of the Governmental Accounting Standards Board. We certify that the information presented herein is accurate and fairly portrays the actuarial position of the Plan as of January 1, 2024.

We completed the valuation in accordance with accepted actuarial procedures as prescribed by the Actuarial Standards Board. We are members of the American Academy of Actuaries and are experienced in performing actuarial valuations of public employee retirement systems. To the best of our knowledge, this report is complete and accurate and has been prepared in accordance with generally accepted actuarial principles and practice. We meet the qualification standards to render the actuarial opinions contained in this report and are available to answer questions about them.

Gallagher Benefit Services, Inc. (hereinafter "Gallagher")

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Principal, Retirement Actuary

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Senior Consultant, Retirement Actuary

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Executive Summary

Membership

Actives: As of January 1, 2024, there were 7,734 members in active service covered under the provisions of the Plan. The significant age, service, salary, and accumulated contribution information for these members is summarized below, along with corresponding figures from the last actuarial valuation one year earlier.

	January 1, 2024	January 1, 2023
Number of active employees [1]	7,734	7,409
Average age	48.2	48.7
Average years of service	11.6	12.4
Total annual valuation salary [2]	$742,630,832	$659,594,235
Average annual salary [2]	$97,254	$90,158
Total accumulated contributions	$728,236,741	$695,075,467
Average accumulated contributions [2]	$95,369	$95,008

1 Active statistics include all participants who are actively employed, which includes 11 participants this year and 10 participants last year who are on leave and 98 participants this year and 93 participants last year who have opted out of participating in the Plan and are only entitled to a return of their contributions.

2 The salary information for the 98 participants this year and 93 particpants last year who have opted out of participating in the Plan is not included.

The number of active members increased by 4.4% from the previous valuation date. The average age of the active members decreased by 0.5 years. The average service decreased by 6.5%. The total annual valuation salary increased by 12.6%. The average salary increased by 7.9% from the previous valuation.

Distributions of active members by age and service are given in Section 5.2.

Terminated Vested: In addition to the active members, there were 109 terminated vested members who did not elect to receive their accumulated contributions when they left covered employment. The significant age and annual benefit information for these terminated vested members is summarized below with comparative figures from the last actuarial valuation one year earlier.

	January 1, 2024	January 1, 2023
Number of deferred vested members [3]	109	150
Average age	59.8	57.1
Average annual benefit	$26,356	$27,147

3 Number of deferred vested members includes 0 in 2024 and 8 in 2023 who were pending cashouts after the valuation date. These members are not included in the calculation of the average benefit.

The number of terminated vested members decreased by 27.3% from the previous valuation. The average age of the terminated vested members increased by 2.7 years. The average annual pension benefit for these members decreased by 2.9% from the previous valuation.

Distributions of terminated vested members by age and pension benefit are given in Section 5.4.

Retirees and Beneficiaries: In addition to the active and terminated vested members, there were 8,210 retired members, 1,379 members with disability allowances and 1,248 beneficiaries who were receiving monthly benefit payments on the valuation date. The significant age and annual benefit information for these members are summarized below with comparative figures from the last actuarial valuation performed one year earlier.

	January 1, 2024	January 1, 2023
Number of members receiving payments		
➢ Retirees	8,210	8,128
➢ Disability Allowances	1,379	1,365
➢ Beneficiaries	1,248	1,248
➢ Total	10,837	10,741
Average age	72.0	71.7
Annual benefit amounts		
➢ Retirees	$280,379,432	$270,886,636
➢ Disability Allowances	$28,511,130	$27,362,523
➢ Beneficiaries	$17,583,595	$17,065,298
➢ Total	$326,474,157	$315,314,457
Average annual benefit payments	$30,126	$29,356

The number of members receiving payments increased by 1.0% from the previous valuation date. The average age of these members increased by 0.3 years. The total annual benefit payments for these members increased by 3.5% from the previous valuation date.

Distributions of retired members by age and benefit amounts are given in Section 5.3.

Plan Assets

The Plan's assets are held in trust and invested for the exclusive benefit of Plan members. The trust is funded by member and employer contributions and pays benefits directly to eligible members in accordance with Plan provisions. The assets are audited annually and are reported at fair value. On a fair value basis, the Plan has Net Assets Available for Benefits of $1,990.8 million as of January 1, 2024. This includes an increase of $88.9 million over the Net Assets Available for Benefits of $1,901.9 million as of January 1, 2023. During the prior year, the investment return was approximately 10.00%.

Starting with the January 1, 2017 valuation, the Board of Trustees adopted an actuarial value of assets to be used for funding purposes. This method recognizes differences of asset returns from their expected levels over a period of five years. The actuarial value of assets is $2,120.1 million as of January 1, 2024. This includes an increase of $44.1 million over the actuarial value of assets of $2,076.0 million as of January 1, 2023. During the prior year, the investment return on the actuarial value assets was 6.94%.

A summary of the assets held for investment, a summary of changes in assets, and the development of the actuarial value of assets is shown in Section 2.

Actuarial Experience

Differences between the expected experience based on the actuarial assumptions and the actual experience create changes in the actuarial accrued liability, actuarial value of assets, and the unfunded actuarial accrued liability from one year to the next. These changes create an actuarial gain if the experience is favorable and an actuarial loss if the experience is unfavorable. The Plan experienced a total net actuarial loss of $77.8 million during the prior year. This net loss is approximately 2.03% of the Plan's prior year actuarial accrued liability. The net loss is a combination of demographic experience and investment performance.

The demographic experience tracks actual changes in the Plan's population compared to the assumptions for decrements such as mortality, turnover, and retirement, as well as pay increases. The Plan experienced a demographic loss of $51.0 million during the year ending December 31, 2023. This loss increased the unfunded actuarial accrued liability by $51.0 million and decreased the funded ratio by 0.73%.

Continued tracking of the demographic experience is warranted in order to confirm the appropriateness of the actuarial assumptions. Details of the demographic, economic, and other assumptions used to value the Plan liabilities and normal cost can be found in Section 6.

On the asset side, the Plan experienced a gain on a fair value of assets basis. The actual rate of return on the fair value of plan assets was approximately 10.00% for the year ending December 31, 2023 compared to the assumption of 8.25%.

The rate of return on the actuarial value of plan assets for the year ending December 31, 2023 was approximately 6.94% compared to the assumption of 8.25%. The loss on the actuarial value of assets increased the unfunded actuarial accrued liability by $26.7 million and decreased the funded ratio by 0.69%. It should be noted that the Plan's assumed asset return of 8.25% is a long-term rate and short-term performance is not necessarily indicative of expected long-term future returns.

In our opinion, the economic assumptions comply with Actuarial Standards of Practice No. 27 and the demographic assumptions comply with Actuarial Standards of Practice No. 35. In our professional judgement, the combined effect of the assumptions is expected to have no significant bias.

A summary of the actuarial gains and losses experienced during the prior year is shown in Section 1.4.

Funded Status

The funded status is a measure of the progress that has been made in funding the Plan as of the valuation date. It is determined as a ratio of the actuarial value of assets divided by the total actuarial accrued liability on the valuation date. The funded ratio presented is appropriate for evaluating the need and level of future contributions but makes no assessment regarding the funded status of the Plan if the Plan were to settle (i.e., purchase annuities) a portion or all of its liabilities.

As of January 1, 2024, the funded ratio of the Plan is 54.39%. This represents an increase of 0.19% from the Plan's funded ratio of 54.20% as of January 1, 2023. Unless otherwise noted, the funded status shown in the report is based on the projected unit credit cost method.

A history of the plan's unfunded actuarial accrued liability and funded ratio is shown in Section 1.5.

Statutory Contributions

Actual required contribution rates were determined in accordance with 40 ILCS 5/22-101(e) using the projected unit credit cost method and calculated to produce an expected funded ratio of at least 60 percent no later than ten years after the valuation year through fiscal year end 2039 and 90 percent funding by fiscal year end 2059. Contribution rates reflect the issuance of bond or notes by the Authority, as defined in 70 ILCS 3605/12c. Authority contribution rates are adjusted by a debt service credit, for debt service paid in the prior year, of up to six percent of compensation per year from 2009 to 2040, as defined in 40 ILCS 5/22-101(e)(2).

Actuarial Math Contributions

While not required by 40 ILCS 5/22-101(e), white papers on funding policies for public sector plans developed over the past few years suggest a funding policy be sufficient to pay the normal cost on the entry age normal cost basis and amortize the unfunded actuarial accrued liability over a fixed period of 20 years. We will broadly refer to this type of policy as an Actuarial Math Funding Policy. For informational purposes, Gallagher has provided a contribution amount based on the Actuarial Math Funding Policy.

Under Actuarial Math, the normal cost represents the cost of the benefits that accrue during the year for active members under the Entry Age Normal Cost Method, plus a load for the expected administrative expenses to be paid during the fiscal year. The Entry Age Normal Cost is determined as a level percent of pay over each individual career attributable to the respective plan year. The normal cost for 2024 has been determined to be $61.6 million, or 8.29% of pay. This represents a decrease in the normal cost rate of 0.24% of pay from last year's normal cost rate of 8.53%.

Under Actuarial Math, the cost method under which the actuarial accrued liability is determined is the entry age normal cost method. Under the entry age normal cost method, the actuarial accrued liability (AAL) is equal to the present value of projected benefits less the present value of future benefits to be accrued. The AAL amount is compared to the actuarial value of assets to determine if the Plan is ahead or behind in funding as of the valuation date. The difference between the total actuarial accrued liability and the actuarial value of assets equals the amount of unfunded actuarial accrued liability (UAAL) or surplus (if negative) on the valuation date. This amount is amortized over 20 years as a level percent of pay and added to the normal cost to establish the actuarially determined contribution for the year suggested by public sector funding policy white papers. The Actuarial Math Contribution and associated funded status shown in this report is compliant with the definition of a reasonable actuarially determined contribution under ASOP 4 Section 3.21. The balance among benefit security, intergenerational equity, and stability or predictability of actuarially determined contributions, the timing and duration of expected benefit payments, the nature and frequency of plan amendments, and relevant input from the principal were taken into account when determining the actuarial cost method, smoothing period for the actuarial value of assets and the amortization period and method for any unfunded actuarial accrued liability.

The UAAL under the entry age normal cost method as of January 1, 2024 is $1,902.7 million. This represents an increase of $21.4 million in the unfunded actuarial accrued liability from last year's amount of $1,881.3 million. The annual payment required to amortize the unfunded actuarial accrued liability of $1,902.7 million as of January 1, 2024 is $157.9 million, or 21.27% of pay.

The total contribution suggested by actuarial math is the sum of the normal cost and the payment to the UAAL plus interest, or 30.75% of pay (8.29% of pay attributable to the normal cost plus 21.27% of pay attributable to the amortization of the unfunded plus 1.20% of pay for the mid-year interest adjustment).

The actuarial liabilities and development of the Actuarial Math Contribution is shown in the Comparative Summary and Section 1.1.

In our opinion, the measurement of the benefit obligations and determination of the actuarial cost of the Plan is performed in compliance with Actuarial Standards of Practice No. 4.

Accounting Information

The Governmental Accounting Standards Board (GASB) issues statements which establish financial reporting standards for defined benefit pension plans and accounting for the pension expenditures and expenses for governmental employers. The required financial reporting information for the Plan and the Employer under GASB Statement Nos. 67 and 68 can be found in Section 3.

Projections

As part of the annual actuarial valuation, a forecast of expected future valuation results is performed over a 30-year period beginning on the valuation date. This analysis provides a dynamic look into the

future to identify trends in future employer contributions and funded status. The forecast replaces active members who are assumed to decrement (terminate, retire, etc.) during the period with new members resulting in a stable active membership. The forecast assumes all actuarial assumptions are exactly realized each year during the forecast period. The results of these forecasts can be found in Section 4.

Changes in Plan Provisions

There have been no changes in the Plan provisions since the last actuarial valuation performed as of January 1, 2023. A summary of Plan and contribution provisions are outlined in Section 6.1.

Changes in Actuarial Assumptions, Methods, or Procedures

This valuation was prepared using demographic and economic assumptions that were recommended on the basis of the Experience Review covering the period from January 1, 2018 to December 31, 2022 and adopted by the Board at its July 2024 meeting. The following assumptions were updated:

- Termination Rates
- Retirement Rates
- Disability Rates
- Mortality
- Form of payment
- Salary Scale
- Marital Percentage
- Active Participant Counts and New Entrant Profiles for Projections

The net effect of the changes in the assumptions decreased the Plan's actuarial accrued liability by $25,442,731. There have been no other changes in the demographic or economic assumptions from those used in the prior valuation.

The actuarial assumptions, methods and procedures are outlined in Section 6.2 and Section 6.3.

Comparative Summary of Key Actuarial Valuation Results

	January 1, 2024	January 1, 2023
1. Investment Return Assumption	8.25 %	8.25 %
2. Membership Data		
a. Active Employees		
Number	7,734	7,409
Annualized Salaries (in thousands)	742,631	659,594
Average Pay	97,254	90,158
b. Terminated Participants with Vested Benefits		
Number	109	150
Total Monthly Accrued Benefit	239,401	321,241
Average Monthly Accrued Benefit	2,196	2,262
c. Retirees and Beneficiaries		
Number	9,458	9,376
Total Monthly Pension	24,830,252	23,995,995
Average Monthly Pension	2,625	2,559
d. Disability Allowances		
Number	1,379	1,365
Total Monthly Pension	2,375,927	2,280,210
Average Monthly Pension	1,723	1,670
3. Statutory Minimum Contribution Rates (as a percentage of Payroll)*		
a. Employer Contribution Rate		
Gross Employer Rate	27.590 %	27.590 %
Credit for Debt Repayment	6.000 %	6.000 %
Net Employer Rate	21.590 %	21.590 %
b. Employee Contribution Rate	13.795 %	13.795 %
4. Actuarial Math Contribution		
a. Amortization Payment for UAAL		
i. Amount	157,927,065	156,152,848
ii. As a % of pay	21.27 %	23.67 %
b. Normal Cost		
i. Entry age normal cost amount	59,166,794	53,770,406
ii. Administrative expenses	2,400,000	2,500,000
iii. Normal cost	61,566,794	56,270,406
iv. As a % of pay	8.29 %	8.53 %
c. Interest Adjustment to Mid-Year		
i. Amount	8,874,708	8,588,825
ii. As a % of pay	1.20 %	1.30 %
d. Actuarial Contribution		
i. Amount	228,368,567	221,012,079
ii. As a % of pay	30.75 %	33.51 %
5. Actuarial Funded Status ($ in thousands)		
a. Actuarial Accrued Liability	3,897,702	3,830,189
b. Actuarial Value of Assets (AVA)	2,120,094	2,075,985
c. Unfunded Accrued Liability	1,777,608	1,754,204
d. Funded Ratio	54.4 %	54.2 %
e. Market Value of Assets (MVA)	1,990,766	1,901,932
f. Return on MVA (prior year)	10.0 %	(8.9) %
g. Return on AVA (prior year)	6.9 %	5.8 %

* Contribution rate applicable for the plan year following the year of valuation.

Section 1 - Actuarial Funding Results

Section 1.1
Actuarial Liabilities and Normal Cost

Actuarial Accrued Liability	January 1, 2024	January 1, 2023
1. Active Members		
a. Retirement Benefits	961,105,377	991,171,978
b. Withdrawal Benefits	48,952,806	38,217,744
c. Disability Benefits	112,734,564	93,253,412
d. Death Benefits	13,801,315	12,699,996
Total	1,136,594,062	1,135,343,130
2. Inactive Members with Deferred Benefits	22,235,528	24,319,618
3. Retired Members and Beneficiaries Receiving Benefits	2,738,872,485	2,670,526,351
4. Total Actuarial Accrued Liability (1. + 2. + 3.)	**3,897,702,075**	**3,830,189,099**

Normal Cost	January 1, 2024	January 1, 2023
1. Active Members		
a. Retirement Benefits	52,577,585	54,415,765
b. Withdrawal Benefits	10,101,618	5,815,916
c. Disability Benefits	9,508,069	7,594,640
d. Death Benefits	1,205,608	1,065,492
2. Normal Cost	**73,392,880**	**68,891,813**
3. Total Normal Cost (As a % of pay)	**9.88%**	**10.44%**

Section 1.2
Actuarial (Gain) / Loss

Development of Actuarial (Gain) / Loss	Amount
1. Expected Actuarial Accrued Liability	
a. Actuarial Accrued Liability at January 1, 2023	3,830,189,099
b. Normal Cost at January 1, 2023	68,891,813
c. Interest on a. + b. to End of Year	321,674,175
d. Benefit Payments for 2023, with Interest to End of Year	348,646,505
e. Expected Actuarial Accrued Liability Before Changes (a. + b. + c. - d.)	3,872,108,582
f. Change in Actuarial Accrued Liability at January 1, 2024 due to	
Change in Actuarial Assumptions	(25,442,731)
g. Expected Actuarial Accrued Liability at January 1, 2024 (e. + f.)	3,846,665,851
2. Actuarial Accrued Liability at January 1, 2024	3,897,702,075
3. Liability (Gain) / Loss (2. – 1.g.)	51,036,224
4. Expected Actuarial Value of Assets	
a. Actuarial Value of Assets at January 1, 2023	2,075,985,048
b. Interest on a. to End of Year	171,268,766
c. Contributions Made for 2023	241,001,931
d. Interest on c. to End of Year	9,744,335
e. Benefit Payments and Administrative Expenses for 2023, with Interest to End of Year	351,184,922
f. Expected Actuarial Value of Assets at January 1, 2024	
(a. + b. + c. + d. – e.)	2,146,815,158
5. Actuarial Value of Assets as of January 1, 2024	2,120,094,260
6. Actuarial Value Asset (Gain) / Loss (4.f. - 5.)	26,720,898
7. Total Actuarial (Gain) / Loss (3. + 6.)	77,757,122

Section 1.3
Actuarial Balance Sheet

Financial Resources	January 1, 2024	January 1, 2023
1. Actuarial Value of Assets	2,120,094,260	2,075,985,048
2. Present Value of Future Contributions	567,895,769	526,022,512
3. Unfunded Actuarial Accrued Liability/(Reserve)	1,777,607,815	1,754,204,051
4. Total Assets (1 + 2 + 3)	4,465,597,844	4,356,211,611

Benefit Obligations	January 1, 2024	January 1, 2023
1. Present Value of Future Benefits		
a. Active Members	1,704,489,831	1,661,365,642
b. Inactive Members	22,235,528	24,319,618
c. Retirees, disabilities and beneficiaries	2,738,872,485	2,670,526,351
d. Total	4,465,597,844	4,356,211,611

Section 1.4
Analysis of Financial Experience

Analysis of Actuarial (Gains) and Losses Resulting from Differences Between Assumed Experience and Actual Experience

Type of (Gain) or Loss	Year End December 31, 2023	As a % of Last Year's AAL
(1) COLA Experience	0	0.00%
(2) Salary Experience	29,466,715	0.77%
(3) Retiree Mortality Experience	(1,617,132)	-0.04%
(4) Other (turnover, retirement ages, service purchase, etc.)		0.00%
(a) Unexpected Participant Pick Up	5,081,968	0.13%
(b) Unexpected Data Change for Decrementing Actives	7,899,877	0.21%
(c) Unexpected Data Change for Continuing Actives	190,165	0.00%
(d) Unexpected Data Change for Continuing Inactives	1,546,952	0.04%
(e) Unexpected Rehires	221,869	0.01%
(f) Difference between actual and expected benefit payments	(1,247,456)	-0.03%
(g) Miscellaneous	(4,967,648)	-0.13%
(h) Total	8,725,727	0.23%
(5) Active Decrements	8,423,141	0.22%
(6) New Entrants	6,037,773	0.16%
(7) Liability (Gain) or Loss During Year, (1) + (2) + (3) + (4)(h) + (5) + (6)	51,036,224	1.33%
(8) Investment Experience	26,720,898	0.70%
(9) Total (Gain) or Loss During Year before Change, (7) + (8)	77,757,122	2.03%

Section 1.5
History of UAAL and Funded Ratio
($'s in 000's)

Valuation Date	Actuarial Accrued Liability (AAL)	Actuarial Value of Assets (AVA)	Funded Ratio (AVA as a % of AAL)	Unfunded Actuarial Accrued Liability (UAAL)
January 1, 2024	3,897,702	2,120,094	54.39%	1,777,608
January 1, 2023	3,830,189	2,075,985	54.20%	1,754,204
January 1, 2022	3,740,656	2,057,053	54.99%	1,683,603
January 1, 2021	3,670,670	1,955,264	53.27%	1,715,406
January 1, 2020	3,583,859	1,883,411	52.55%	1,700,448
January 1, 2019	3,488,955	1,835,792	52.62%	1,653,163
January 1, 2018	3,423,218	1,802,216	52.65%	1,621,002
January 1, 2017	3,338,641	1,752,473	52.49%	1,586,168
January 1, 2016 *	3,267,121	1,743,216	53.36%	1,523,904
January 1, 2015 *	3,186,187	1,855,912	58.25%	1,330,275
January 1, 2014 *	3,105,567	1,892,714	60.95%	1,212,853
January 1, 2013 *	2,867,335	1,702,788	59.39%	1,164,547

* Actuarial Value of Assets is Fair Market Value

Section 1.6
Solvency Test

Comparative Summary of Accrued Liability and Actuarial Value of Assets

	Accrued Liability for:				Portion of Accrued Liability Covered by Actuarial Value of Assets		
Valuation as of January 1	(1) Active Member Contributions	(2) Retirees, Beneficiaries, TVRs and Disabled	(3) Active Member (Employer Financed Portion)	Actuarial Value of Assets[1]	(1)	(2)	(3)
2024	728,236,741	2,761,108,013	408,357,321	2,120,094,260	100.00 %	50.41 %	0.00 %
2023	695,075,467	2,694,845,969	440,267,663	2,075,985,048	100.00 %	51.24 %	0.00 %
2022	680,411,548	2,581,014,915	479,229,985	2,057,052,824	100.00 %	53.34 %	0.00 %
2021	634,800,523	2,520,628,472	515,241,175	1,955,264,394	100.00 %	52.39 %	0.00 %
2020	588,433,604	2,442,447,997	552,977,413	1,883,410,704	100.00 %	53.02 %	0.00 %

[1.] Excludes health care assets.

Section 1.7
Projected Actuarial Results

Projection of Funded Status based on Board Approved Contribution Rates

	Board Adopted Contribution Rates			Board Adopted Contributions					
Year	Employee Contribution Percent	Employer Contribution Percent	Total Percent	Employee Contribution	Employer Contribution	Total Contribution	Actuarial Accrued Liability	Actuarial Value of Assets	Funded Ratio
2024	13.795%	21.590%	35.385%	102,447,057	160,336,263	262,783,320	3,897,702,075	2,120,094,261	54.39%
2025	13.795%	21.590%	35.385%	105,168,280	164,595,153	269,763,433	3,936,106,381	2,155,135,878	54.75%
2026	13.795%	21.590%	35.385%	108,466,567	169,757,186	278,223,753	3,978,478,554	2,204,341,630	55.41%
2027	13.795%	21.590%	35.385%	112,009,522	175,302,140	287,311,662	4,017,437,348	2,224,733,611	55.38%
2028	13.795%	21.590%	35.385%	116,077,300	181,668,474	297,745,774	4,052,333,207	2,326,231,744	57.40%
2029	13.795%	21.590%	35.385%	120,384,825	188,410,029	308,794,854	4,083,539,220	2,431,929,022	59.55%
2030	13.795%	21.590%	35.385%	124,762,905	195,262,007	320,024,912	4,111,769,759	2,550,707,808	62.03%
2031	13.795%	21.590%	35.385%	129,277,239	202,327,232	331,604,471	4,137,970,766	2,684,433,804	64.87%
2032	13.795%	21.590%	35.385%	133,882,984	209,535,520	343,418,504	4,162,575,955	2,835,180,329	68.11%
2033	13.795%	21.590%	35.385%	138,468,752	216,712,544	355,181,296	4,187,504,431	3,006,477,557	71.80%
2034	13.795%	21.590%	35.385%	143,180,596	224,086,884	367,267,480	4,214,636,402	3,201,497,309	**75.96%**
2035	13.795%	21.590%	35.385%	148,046,840	231,702,870	379,749,710	4,244,797,499	3,423,162,564	80.64%
2036	13.795%	21.590%	35.385%	153,093,053	239,600,520	392,693,573	4,279,574,526	3,674,969,329	85.87%
2037	13.795%	21.590%	35.385%	158,305,244	247,757,936	406,063,180	4,320,698,429	3,960,862,134	91.67%
2038	13.795%	21.590%	35.385%	163,624,844	256,083,453	419,708,297	4,369,953,309	4,284,909,900	98.05%
2039	13.795%	21.590%	35.385%	169,040,294	264,558,983	433,599,277	4,428,943,105	4,650,970,102	105.01%
2040	13.795%	21.590%	35.385%	174,594,952	273,252,381	447,847,333	4,499,410,219	5,063,337,680	112.53%
2041	13.795%	27.590%	41.385%	180,274,905	360,549,810	540,824,715	4,582,551,625	5,526,367,660	120.60%
2042	13.795%	27.590%	41.385%	185,978,898	371,957,795	557,936,693	4,679,658,481	6,125,966,885	130.91%
2043	13.795%	27.590%	41.385%	191,727,159	383,454,318	575,181,477	4,791,132,109	6,793,837,496	141.80%

Section 2 - Plan Assets

Section 2.1
Statement of Net Plan Assets
($'s in 000's)

	As of December 31	
	2023	2022
ASSETS		
1. Total investments, at fair value	1,972,161	1,888,704
2. Invested securities lending cash collateral	40,595	60,542
3. Receivables:		
a. Employer contributions	11,996	11,001
b. Employee contributions	7,425	7,131
c. Securities sold, but not received	11,994	6,000
d. Accrued interest and dividends	1,671	1,403
e. Other	1,911	1,252
4. Total assets	2,047,753	1,976,033
LIABILITIES		
1. Payable upon return of securities	40,595	60,542
2. Accounts payable	2,496	2,307
3. Other payables	615	76
4. Securities purchased, but not paid	13,281	11,176
5. Total liabilities	56,987	74,101
Net assets held in trust for Plan benefits	**1,990,766**	**1,901,932**

Section 2.2
Changes in Net Plan Assets
($'s in 000's)

	As of December 31	
	2023	2022
ADDITIONS		
1. Net investment (loss) income	$ 185,369	$ (190,005)
2. Employer contributions	146,696	142,476
3. Employee contributions	94,306	92,134
4. Other income	-	-
Total additions	$ 426,371	$ 44,605
DEDUCTIONS		
1. Benefit payments	$ 321,254	$ 310,458
2. Contribution refunds, including interest	13,843	18,211
3. Administrative expenses	2,440	2,488
Total liabilities	$ 337,537	$ 331,157
NET ASSETS HELD IN TRUST FOR PLAN BENEFITS		
1. Beginning of year	$ 1,901,932	$ 2,188,484
2. Net (decrease) increase	88,834	(286,552)
End of year	**$ 1,990,766**	**$ 1,901,932**

Section 2.3
Actuarial Value of Assets

Development of Actuarial Value of Assets	8.25%		Amount
1. Actuarial Value of Assets as of January 1, 2023		$	2,075,985,048
2. Unrecognized Return as of January 1, 2023			(174,052,632)
3. Fair Value of Assets as of January 1, 2023		$	1,901,932,416
4. Contributions			
a. Member (includes purchased service)		$	94,305,748
b. Employer			146,696,183
c. Miscellaneous contributions			-
d. Total		$	241,001,931
5. Distributions			
a. Benefit payments		$	321,254,294
b. Refund of contributions			13,843,341
c. Administrative expenses			2,439,771
d. Total		$	337,537,406
6. Expected Return at 8.25% on			
a. Item 1.		$	171,268,766
b. Item 2.			(14,359,342)
c. Item 4.d.			9,744,335
d. Item 5.d.			13,647,516
e. Total [a. + b. + c. – d.]		$	153,006,243
7. Actual Return on Fair Value for Fiscal Year, Net of Investment Expenses		$	185,369,092
8. Return to be Spread for Fiscal Year (7. – 6.e) *		$	32,362,849
9. Total Fair Value of Assets as of January 1, 2024		$	1,990,766,033
10. Return to be Spread			

Fiscal Year	Return to be Spread	Unrecognized Percent	Unrecognized Return
2023	$ 32,362,849	80%	$ 25,890,279
2022	(366,651,273)	60%	(219,990,764)
2021	176,631,964	40%	70,652,786
2020	(29,402,641)	20%	(5,880,528)
2019	125,251,315	0%	-
		Total	$ (129,328,227)

11. Actuarial Value of Assets as of January 1, 2024 (9. – 10.)	**$**	**2,120,094,260**
12. Recognized Rate of Return for the Year on Actuarial Value of Assets		**6.94%**
13. Rate of Return for the Year on Fair Value of Assets (approximate)		**10.00%**

* Annual Return to be Spread calculation based on assumed 8.25% investment return which includes an assumption that all expenses and revenues are on average paid at mid-year.

Section 2.4
Historical Asset Rate of Return

Year Ending December 31	Fair Value Annual Recognized Rate of Return	Actuarial Value Annual Recognized Rate of Return
2023	10.00%	6.94%
2022	-8.88%	5.75%
2021	17.60%	9.82%
2020	7.60%	7.84%
2019	15.70%	7.57%
2018	-3.53%	6.99%

Section 2.5
Forecast of Expected Benefit Payments

Year Ending December 31	Active Members	Inactive Members	Total Payments
2024	20,347,243	328,165,391	348,512,635
2025	35,629,502	316,739,466	352,368,968
2026	50,990,426	308,269,675	359,260,101
2027	66,513,710	299,531,883	366,045,593
2028	81,003,796	290,404,958	371,408,755
2029	94,803,662	281,012,664	375,816,326
2030	108,115,997	271,431,556	379,547,553
2031	121,158,598	261,527,004	382,685,602
2032	132,246,282	251,391,888	383,638,170
2033	141,731,165	240,992,162	382,723,326
2034	153,757,570	230,437,181	384,194,751
2035	164,956,434	219,810,837	384,767,271
2036	175,196,609	209,067,004	384,263,614
2037	184,540,000	198,249,859	382,789,859
2038	193,173,843	187,479,891	380,653,735
2039	200,996,618	176,656,700	377,653,318
2040	208,178,109	165,915,891	374,094,000
2041	214,735,799	155,301,383	370,037,183
2042	220,858,558	144,849,828	365,708,386
2043	226,334,945	134,615,446	360,950,391
2044	231,530,289	124,604,368	356,134,657
2045	236,525,493	114,875,623	351,401,117
2046	241,259,612	105,464,059	346,723,671
2047	245,577,332	96,402,010	341,979,342
2048	249,566,161	87,718,981	337,285,142
2049	253,172,528	79,440,948	332,613,477
2050	256,701,674	71,589,902	328,291,576
2051	259,848,990	64,196,687	324,045,677
2052	262,653,174	57,254,900	319,908,074
2053	264,888,604	50,773,354	315,661,958
2054	266,224,388	44,762,561	310,986,949
2055	267,118,600	39,222,280	306,340,880
2056	266,841,565	34,148,246	300,989,810
2057	265,368,209	29,532,503	294,900,712
2058	262,619,033	25,363,420	287,982,454
2059	258,296,208	21,625,858	279,922,066
2060	252,948,337	18,301,263	271,249,600
2061	246,387,593	15,367,848	261,755,441
2062	238,911,884	12,801,333	251,713,216
2063	230,582,659	10,575,313	241,157,972
2064	221,550,302	8,661,930	230,212,233
2065	212,002,470	7,032,666	219,035,136
2066	201,853,487	5,658,789	207,512,276
2067	191,487,292	4,511,965	195,999,257
2068	180,895,333	3,564,683	184,460,016
2069	170,318,170	2,790,647	173,108,816
2070	159,780,594	2,165,021	161,945,616
2071	149,366,553	1,664,834	151,031,387
2072	139,131,434	1,269,258	140,400,692
2073	129,113,697	959,763	130,073,460
2074	119,345,903	720,171	120,066,075
2075	109,857,029	536,613	110,393,642
2076	100,669,216	397,383	101,066,600

Section 2.5
Forecast of Expected Benefit Payments, continued

Year Ending December 31	Active Members	Inactive Members	Total Payments
2077	91,810,815	292,780	92,103,594
2078	83,300,935	214,883	83,515,819
2079	75,163,618	157,329	75,320,946
2080	67,417,725	115,072	67,532,797
2081	60,084,224	84,202	60,168,426
2082	53,182,463	61,731	53,244,194
2083	46,729,625	45,410	46,775,035
2084	40,740,453	33,567	40,774,020
2085	35,225,249	24,964	35,250,213
2086	30,189,375	18,692	30,208,067
2087	25,633,540	14,095	25,647,635
2088	21,551,991	10,696	21,562,688
2089	17,933,218	8,157	17,941,375
2090	14,759,947	6,239	14,766,186
2091	12,009,418	4,770	12,014,188
2092	9,654,543	3,630	9,658,173
2093	7,664,263	2,739	7,667,002
2094	6,004,836	2,039	6,006,875
2095	4,640,666	1,493	4,642,159
2096	3,535,589	1,070	3,536,659
2097	2,653,894	749	2,654,643
2098	1,961,334	510	1,961,844
2099	1,426,157	338	1,426,495
2100	1,019,554	217	1,019,771
2101	716,109	134	716,243
2102	493,837	80	493,917
2103	334,160	46	334,207
2104	221,741	26	221,767
2105	144,224	14	144,238
2106	91,904	7	91,911
2107	57,360	4	57,364
2108	35,058	2	35,060
2109	20,984	1	20,985
2110	12,302	0	12,302
2111	7,067	0	7,068
2112	3,981	0	3,981
2113	2,199	0	2,199
2114	1,191	0	1,191
2115	633	0	633
2116	329	0	329
2117	168	0	168
2118	84	0	84
2119	40	0	40
2120	19	0	19
2121	8	0	8

Note: Forecast based on the present members without assumption about replacement members.

Section 3 - Accounting Information

Section 3.1
Actuarial Methods and Assumptions for GASB 67/68 Disclosure Purposes

The total pension liability as of December 31, 2023 was determined by rolling forward the total pension liability as of January 1, 2023 to December 31, 2023 using the following actuarial methods and assumptions, applied to all periods included in the measurement. All other assumptions such as retirement rates, termination rates, and disability rates used to determine the total pension liability are set forth in Section 6 - Basis of the Actuarial Valuation.

Valuation Date:	January 1, 2023
Actuarial Cost Method:	Entry Age Normal – Level Percentage of Pay
Amortization Method:	For pension expense; the difference between expected and actual liability experience and changes of assumptions are amortized over the average of the expected remaining service lives of all members. The difference between projected and actual earnings is amortized over a closed period of five years.
Mortality:	Active members and *Healthy pensioners,* including beneficiaries prior to their associated member's death*:* The SOA Public Mortality General Below Median generational with Improvement Scale MP-2018 with an adjustment for female participants. *Disabled pensioners:* The SOA Public Disability Mortality General Below Median generational with Improvement Scale MP-2018. Survivors*:* The SOA Public Survivor Mortality General Below Median generational with Improvement Scale MP-2018.
Experience Study:	The actuarial assumptions used were based on the results of an actuarial experience study for the period January 1, 2013 through December 31, 2017, which have been adopted by the Board.

Section 3.2
Schedule of Expected Changes in Net Pension Liability as of December 31, 2023

The GASB Statement No. 67 Change in Net Pension Liability

Schedule of Changes in Net Pension Liability		
Fiscal Year Ending	**December 31, 2023**	**December 31, 2022**
Total Pension Liability		
Service Cost	$ 53,770,406	$ 52,757,421
Interest	314,618,685	309,343,260
Changes of Benefit Terms	-	-
Difference between Expected and Actual Experience	36,006,814	32,650,177
Change of Assumptions	-	-
Benefit Payments, including Refund of Member Contributions	(335,097,635)	(328,668,360)
Net Change in Total Pension Liability	69,298,270	66,082,498
Total Pension Liability - Beginning of Year	$ 3,924,018,138	$ 3,857,935,640
Total Pension Liability - End of Year	$ 3,993,316,408	$ 3,924,018,138
Plan Fiduciary Net Position		
Employer Contributions	$ 146,696,183	$ 142,475,778
Member Contributions	94,305,748	92,134,551
Net Investment Income	185,369,092	(190,004,983)
Benefit Payments, including Refund of Member Contributions	(335,097,635)	(328,668,360)
Administrative Expenses	(2,439,771)	(2,488,345)
Other	-	-
Net Change in Plan Fiduciary Net Position	88,833,617	(286,551,359)
Plan Fiduciary Net Position - Beginning of Year	$ 1,901,932,416	$ 2,188,483,775
Plan Fiduciary Net Position - End of Year	$ 1,990,766,033	$ 1,901,932,416

Section 3.3
Net Pension Liability (Asset)

The GASB Statement No. 67 Net Pension Liability

Net Pension Liability (Asset)		
Valuation Date	**Dec. 31, 2023**	**Dec. 31, 2022**
Total Pension Liability	$ 3,993,316,408	$ 3,924,018,138
Plan Fiduciary Net Position	1,990,766,033	1,901,932,416
Net Pension Liability (Asset)	$ 2,002,550,375	$ 2,022,085,722
Plan Fiduciary Net Position as a Percentage of the Total Pension Liability (Asset)	49.85%	48.47%

Section 3.4
Sensitivity

The GASB Statement No. 67 Sensitivity of Net Pension Liability

Sensitivity of the Net Pension Liability to Changes in the Discount Rate			
December 31, 2023	**1% Decrease**	**Current**	**1% Increase**
Discount Rate	7.25%	8.25%	9.25%
Net Pension Liability (Asset)	$ 2,375,021,603	$ 2,002,550,375	$ 1,682,854,872

The discount rate used to measure the total pension liability was 8.25%. The projection of cash flows used to determine the discount rate assumed that the Plan's contributions will continue to follow the current funding policy. Based on those assumptions, the Plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. In the event of benefit payments not covered by the Plan's fiduciary net position, a municipal bond rate of 4.00% would be used to discount the benefit payments not covered by the Plan's fiduciary net position. The 4.00% rate equals the S&P Municipal Bond 20-Year High Grade Index at December 31, 2023. The rate was 4.31% as of December 31, 2022. Please see the supporting exhibits for additional detail.

Long-term expected rate of return. The long-term expected rate of return on system investments was determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of system investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation. Best estimates of long-term geometric rates of return for each major asset class included in the system's target asset allocation as of December 31, 2023 are summarized below:

Asset Class	Long-Term Expected Rate of Return
Inflation	2.34%
Fixed Income	4.45%
Domestic Equity	6.42%
International Equity	7.07%
Private Equity	7.96%
Real Estate	5.85%
Infrastructure	7.71%

Section 3.5
Pension Expense

The GASB Statement No. 68 Pension Expense

Pension Expense		
Measurement Year Ending	**December 31, 2023**	**December 31, 2022**
Service Cost	$ 53,770,406	$ 52,757,421
Interest	314,618,685	309,343,260
Projected Earnings on Plan Investments	(153,006,244)	(176,646,290)
Member Contributions	(94,305,748)	(92,134,551)
Administrative Expense	2,439,771	2,488,345
Current Period:		
Changes of Benefit Terms	-	-
Changes of Assumptions	-	-
Difference between Expected and Actual Experience	9,069,727	8,061,773
Difference between Expected and Actual Investment Earnings	(6,472,570)	73,330,255
Recognition of Prior Years:		
Deferred Inflows	(60,376,656)	(62,877,135)
Deferred Outflows	113,022,253	83,466,214
Others	-	-
Total Pension Expense	$ 178,759,625	$ 197,789,292

Section 3.6
Supporting Exhibits

Schedule of Deferred Inflows and Outflows

Measurement Date	2018	2019	2020	2021	2022	2023	Outflows	Inflows	Total
Amount Established	$ 7,455,309	$ 41,530,311	$ 62,819,793	$ 38,032,686	$ 32,650,177	$ 36,006,814			
Recognition Period	4.45	4.13	4.10	4.17	4.05	3.97			
Amount Recognized in FY									
2018	$ 1,675,350						$ 1,675,350	$ -	$ 1,675,350
2019	1,675,350	$ 10,055,766					11,731,116	-	11,731,116
2020	1,675,350	10,055,766	$ 15,321,901				27,053,017	-	27,053,017
2021	1,675,350	10,055,766	15,321,901	$ 9,120,549			36,173,566	-	36,173,566
2022	753,909	10,055,766	15,321,901	9,120,549	$ 8,061,773		43,313,898	-	43,313,898
2023	-	1,307,247	15,321,901	9,120,549	8,061,773	$ 9,069,727	42,881,197	-	42,881,197
2024	-	-	1,532,189	9,120,549	8,061,773	9,069,727	27,784,238	-	27,784,238
2025	-	-	-	1,550,490	8,061,773	9,069,727	18,681,990	-	18,681,990
2026	-	-	-	-	403,085	8,797,633	9,200,718	-	9,200,718
2027	-	-	-	-	-	-	-	-	-
Deferred Balance at 12/31									
2018	$ 5,779,959						$ 5,779,959	$ -	$ 5,779,959
2019	4,104,609	$ 31,474,545					35,579,154	-	35,579,154
2020	2,429,259	21,418,779	$ 47,497,892				71,345,930	-	71,345,930
2021	753,909	11,363,013	32,175,991	$ 28,912,137			73,205,050	-	73,205,050
2022	-	1,307,247	16,854,090	19,791,588	$ 24,588,404		62,541,329	-	62,541,329
2023	-	-	1,532,189	10,671,039	16,526,631	$ 26,937,087	55,666,946	-	55,666,946
2024	-	-	-	1,550,490	8,464,858	17,867,360	27,882,708	-	27,882,708
2025	-	-	-	-	403,085	8,797,633	9,200,718	-	9,200,718
2026	-	-	-	-	-	-	-	-	-

Amortization of Changes in Assumptions

Measurement Date	2018	2019	2020	2021	2022	2023	Outflows	Inflows	Total
Amount Established	$ (24,726,963)	$ -	$ -	$ -	$ -	$ -			
Recognition Period	4.45								
Amount Recognized in FY									
2018	$ (5,556,621)						$ -	$ (5,556,621)	$ -
2019	(5,556,621)	$ -					-	(5,556,621)	(5,556,621)
2020	(5,556,621)	-	$ -				-	(5,556,621)	(5,556,621)
2021	(5,556,621)	-	-	$ -			-	(5,556,621)	(5,556,621)
2022	(2,500,479)	-	-	-	$ -		-	(2,500,479)	(2,500,479)
2023	-	-	-	-	-	$ -	-	-	-
2024	-	-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-
2026	-	-	-	-	-	-	-	-	-
2027	-	-	-	-	-	-	-	-	-
Deferred Balance at 12/31									
2018	$ (19,170,342)						$ -	$ (19,170,342)	$ -
2019	(13,613,721)	$ -					-	(13,613,721)	(13,613,721)
2020	(8,057,100)	-	$ -				-	(8,057,100)	(8,057,100)
2021	(2,500,479)	-	-	$ -			-	(2,500,479)	(2,500,479)
2022	-	-	-	-	$ -		-	-	-
2023	-	-	-	-	-	$ -	-	-	-
2024	-	-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-
2026	-	-	-	-	-	-	-	-	-

Amortization of the Difference Between Projected and Actual Earnings

Measurement Date	2018	2019	2020	2021	2022	2023	Outflows	Inflows	Total
Amount Established	$ 211,667,813	$ (125,251,315)	$ 29,402,641	$ (176,631,965)	$ 366,651,273	$ (32,362,848)			
Recognition Period	5.00	5.00	5.00	5.00	5.00	5.00			
Amount Recognized in FY									
2018	$ 42,333,563						$ 42,333,563	$ -	$ 42,333,563
2019	42,333,563	$ (25,050,263)					42,333,563	(25,050,263)	17,283,300
2020	42,333,563	(25,050,263)	$ 5,880,528				48,214,091	(25,050,263)	23,163,828
2021	42,333,563	(25,050,263)	5,880,528	$ (35,326,393)			48,214,091	(60,376,656)	(12,162,565)
2022	42,333,561	(25,050,263)	5,880,528	(35,326,393)	$ 73,330,255		121,544,344	(60,376,656)	61,167,688
2023	-	(25,050,263)	5,880,528	(35,326,393)	73,330,255	$ (6,472,570)	79,210,783	(66,849,226)	12,361,557
2024	-	-	5,880,529	(35,326,393)	73,330,255	(6,472,570)	79,210,784	(41,798,963)	37,411,821
2025	-	-	-	(35,326,393)	73,330,255	(6,472,570)	73,330,255	(41,798,963)	31,531,292
2026	-	-	-	-	73,330,253	(6,472,570)	73,330,253	(6,472,570)	66,857,683
2027	-	-	-	-	-	(6,472,568)	-	(6,472,568)	(6,472,568)
Deferred Balance at 12/31									
2018	$ 169,334,250						$ 169,334,250	$ -	$ 169,334,250
2019	127,000,687	$ (100,201,052)					127,000,687	(100,201,052)	26,799,635
2020	84,667,124	(75,150,789)	$ 23,522,113				108,189,237	(75,150,789)	33,038,448
2021	42,333,561	(50,100,526)	17,641,585	$ (141,305,572)			59,975,146	(191,406,098)	(131,430,952)
2022	-	(25,050,263)	11,761,057	(105,979,179)	$ 293,321,018		305,082,075	(131,029,442)	174,052,633
2023	-	-	5,880,529	(70,652,786)	219,990,763	$ (25,890,278)	225,871,292	(96,543,064)	129,328,228
2024	-	-	-	(35,326,393)	146,660,508	(19,417,708)	146,660,508	(54,744,101)	91,916,407
2025	-	-	-	-	73,330,253	(12,945,138)	73,330,253	(12,945,138)	60,385,115
2026	-	-	-	-	-	(6,472,568)	-	(6,472,568)	(6,472,568)

Schedule of CTA Contributions ($'s in 000's)

	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014
Employer Portion of Required Contribution on a statutory basis	$ 142,352	$ 134,547	$ 131,630	$ 132,232	$ 116,367	$ 112,265	$ 106,662	$ 82,001	$ 81,731	$ 80,488
Actual Employer Contributions	$ 146,696	$ 142,476	$ 136,908	$ 135,832	$ 121,668	$ 117,115	$ 104,523	$ 83,855	$ 82,800	$ 82,268
Contribution deficiency (excess)	$ (4,344)	$ (7,929)	$ (5,278)	$ (3,600)	$ (5,301)	$ (4,850)	$ 2,139	$ (1,854)	$ (1,069)	$ (1,780)
Covered payroll	$ 689,458	$ 651,652	$ 637,524	$ 640,442	$ 645,799	$ 623,037	$ 595,047	$ 575,444	$ 573,548	$ 564,827
Contributions as a percentage of covered payroll	20.65%	20.65%	20.65%	20.65%	18.02%	18.02%	17.93%	14.25%	14.25%	14.25%

Notes to Schedule -

Valuation Date: Actuarially determined contribution rates are calculated as of January 1, one year prior to the end of the fiscal year in which contributions are reported

Other information:

1. The demographic assumptions were updated in 2019 to bring the assumptions more in line with actual plan experience.

Projection of Fiduciary Net Position

Year	Projected Beginning Fiduciary Net Position (a)	Projected Total Contributions* (b)	Projected Benefit Payments (c)	Projected Administrative Expense (d)	Projected Investment Earnings (e)	Projected Ending Fiduciary Net Position (f) = (a) + (b) - (c) - (d) + (e)
2024	1,990,766,033	223,795,190	337,374,631	2,400,000	159,548,847	2,034,335,439
2025	2,034,335,439	232,757,799	345,327,504	2,448,000	163,182,208	2,082,499,942
2026	2,082,499,942	232,774,211	353,125,044	2,496,960	166,839,189	2,126,491,338
2027	2,126,491,338	233,456,549	360,297,371	2,546,899	170,204,053	2,167,307,670
2028	2,167,307,670	234,913,532	366,448,545	2,597,837	173,379,543	2,206,554,362
2029	2,206,554,362	236,661,465	371,617,156	2,649,794	176,476,987	2,245,425,865
2030	2,245,425,865	238,536,774	375,918,999	2,702,790	179,583,632	2,284,924,482
2031	2,284,924,482	241,042,463	379,160,271	2,756,846	182,810,341	2,326,860,170
2032	2,326,860,170	244,037,849	380,796,294	2,811,983	186,322,769	2,373,612,511
2033	2,373,612,511	246,760,133	383,368,634	2,868,222	190,183,625	2,424,319,413
2034	2,424,319,413	250,310,991	384,950,661	2,925,587	194,444,230	2,481,198,386
2035	2,481,198,386	254,595,272	385,166,596	2,984,098	199,298,874	2,546,941,838
2036	2,546,941,838	259,661,082	383,953,917	3,043,780	204,974,151	2,624,579,374
2037	2,624,579,374	265,372,615	381,491,883	3,104,656	211,707,265	2,717,062,715
2038	2,717,062,715	271,486,173	378,162,692	3,166,749	219,716,425	2,826,935,872
2039	2,826,935,872	277,913,318	373,939,052	3,230,084	229,209,038	2,956,889,092
2040	2,956,889,092	284,797,025	369,173,842	3,294,686	240,398,563	3,109,616,152
2041	3,109,616,152	292,017,717	363,931,274	3,360,579	253,499,803	3,287,841,819
2042	3,287,841,819	299,461,583	358,448,744	3,427,791	268,723,351	3,494,150,218
2043	3,494,150,218	307,144,123	352,663,390	3,496,347	286,285,564	3,731,420,169
2044	3,731,420,169	315,040,747	346,962,672	3,566,274	306,407,283	4,002,339,254
2045	4,002,339,254	323,143,092	341,204,678	3,637,599	329,315,634	4,309,955,703
2046	4,309,955,703	331,537,738	335,461,428	3,710,351	355,262,681	4,657,584,343
2047	4,657,584,343	340,280,794	329,536,607	3,784,558	384,532,104	5,049,076,076
2048	5,049,076,076	349,407,284	323,671,975	3,860,249	417,433,242	5,488,384,378
2049	5,488,384,378	358,896,243	317,761,463	3,937,454	454,295,696	5,979,877,399
2050	5,979,877,399	368,755,253	312,100,932	4,016,203	495,468,182	6,527,983,698
2051	6,527,983,698	378,967,906	306,416,002	4,096,528	541,326,484	7,137,765,559
2052	7,137,765,559	389,474,348	300,515,599	4,178,458	592,293,547	7,814,839,397
2053	7,814,839,397	400,297,519	294,466,400	4,262,027	648,830,953	8,565,239,442
2054	8,565,239,442	411,502,513	287,973,670	4,347,268	711,451,075	9,395,872,092
2055	9,395,872,092	423,014,188	281,422,029	4,434,213	780,705,100	10,313,735,138
2056	10,313,735,138	434,969,629	274,332,513	4,522,897	857,195,253	11,327,044,610
2057	11,327,044,610	447,462,481	266,516,831	4,613,355	941,610,754	12,444,987,659
2058	12,444,987,659	460,533,718	258,002,699	4,705,622	1,034,710,078	13,677,523,133
2059	13,677,523,133	474,184,478	248,710,722	4,799,735	1,137,318,084	15,035,515,238
2060	15,035,515,238	488,410,803	238,941,017	4,895,730	1,250,318,773	16,530,408,068

*The contributions displayed contain both employer and employee contributions.

Since the projected investment earnings become greater than the projected benefit payments including administrative expenses, the Plan's fiduciary net position is sufficient to cover all the projected future benefit payments of current Plan members.

Actuarial Present Value of Projected Benefit Payments

Year	Projected Beginning Fiduciary Net Position	Projected Benefit Payments	Funded Portion of Projected Benefit Payments	Unfunded Portion of Projected Benefit Payments	8.25% Present Value of Funded Benefit Payments	4.00% Present Value of Unfunded Benefit Payments	8.25% Present Value of Benefit Payments Using Single Discount Rate
2024	1,990,766,033	337,374,631	337,374,631	-	311,662,477	-	311,662,477
2025	2,034,335,439	345,327,504	345,327,504	-	294,696,759	-	294,696,759
2026	2,082,499,942	353,125,044	353,125,044	-	278,384,342	-	278,384,342
2027	2,126,491,338	360,297,371	360,297,371	-	262,391,325	-	262,391,325
2028	2,167,307,670	366,448,545	366,448,545	-	246,532,101	-	246,532,101
2029	2,206,554,362	371,617,156	371,617,156	-	230,955,509	-	230,955,509
2030	2,245,425,865	375,918,999	375,918,999	-	215,823,604	-	215,823,604
2031	2,284,924,482	379,160,271	379,160,271	-	201,094,219	-	201,094,219
2032	2,326,860,170	380,796,294	380,796,294	-	186,569,895	-	186,569,895
2033	2,373,612,511	383,368,634	383,368,634	-	173,515,201	-	173,515,201
2034	2,424,319,413	384,950,661	384,950,661	-	160,952,644	-	160,952,644
2035	2,481,198,386	385,166,596	385,166,596	-	148,769,449	-	148,769,449
2036	2,546,941,838	383,953,917	383,953,917	-	136,998,666	-	136,998,666
2037	2,624,579,374	381,491,883	381,491,883	-	125,746,131	-	125,746,131
2038	2,717,062,715	378,162,692	378,162,692	-	115,148,983	-	115,148,983
2039	2,826,935,872	373,939,052	373,939,052	-	105,185,129	-	105,185,129
2040	2,956,889,092	369,173,842	369,173,842	-	95,930,462	-	95,930,462
2041	3,109,616,152	363,931,274	363,931,274	-	87,360,898	-	87,360,898
2042	3,287,841,819	358,448,744	358,448,744	-	79,487,139	-	79,487,139
2043	3,494,150,218	352,663,390	352,663,390	-	72,244,082	-	72,244,082
2044	3,731,420,169	346,962,672	346,962,672	-	65,659,376	-	65,659,376
2045	4,002,339,254	341,204,678	341,204,678	-	59,648,711	-	59,648,711
2046	4,309,955,703	335,461,428	335,461,428	-	54,175,231	-	54,175,231
2047	4,657,584,343	329,536,607	329,536,607	-	49,162,498	-	49,162,498
2048	5,049,076,076	323,671,975	323,671,975	-	44,607,458	-	44,607,458
2049	5,488,384,378	317,761,463	317,761,463	-	40,455,325	-	40,455,325
2050	5,979,877,399	312,100,932	312,100,932	-	36,706,386	-	36,706,386
2051	6,527,983,698	306,416,002	306,416,002	-	33,291,250	-	33,291,250
2052	7,137,765,559	300,515,599	300,515,599	-	30,161,836	-	30,161,836
2053	7,814,839,397	294,466,400	294,466,400	-	27,302,260	-	27,302,260
2054	8,565,239,442	287,973,670	287,973,670	-	24,665,375	-	24,665,375
2055	9,395,872,092	281,422,029	281,422,029	-	22,267,175	-	22,267,175
2056	10,313,735,138	274,332,513	274,332,513	-	20,051,941	-	20,051,941
2057	11,327,044,610	266,516,831	266,516,831	-	17,995,995	-	17,995,995
2058	12,444,987,659	258,002,699	258,002,699	-	16,093,391	-	16,093,391
2059	13,677,523,133	248,710,722	248,710,722	-	14,331,443	-	14,331,443
2060	15,035,515,238	238,941,017	238,941,017	-	12,719,154	-	12,719,154

Since the projected investment earnings become greater than the projected benefit payments including administrative expenses, the Plan's fiduciary net position is sufficient to cover all the projected future benefit payments of current Plan members.

Section 4 - Actuarial Funding Projections

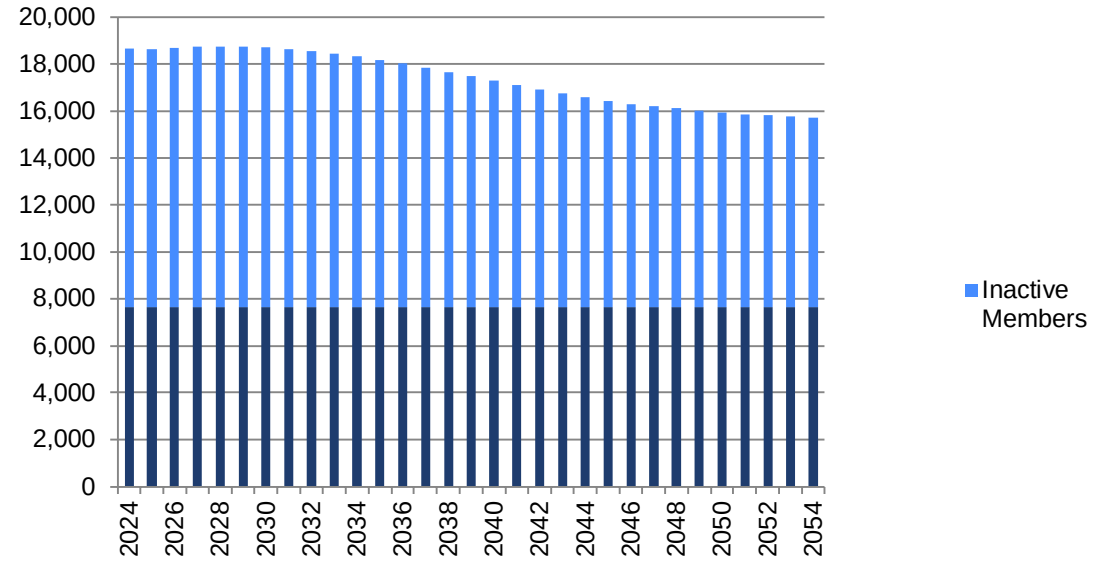
Section 4.1
Projection Assumptions and Methods

Key Assumptions

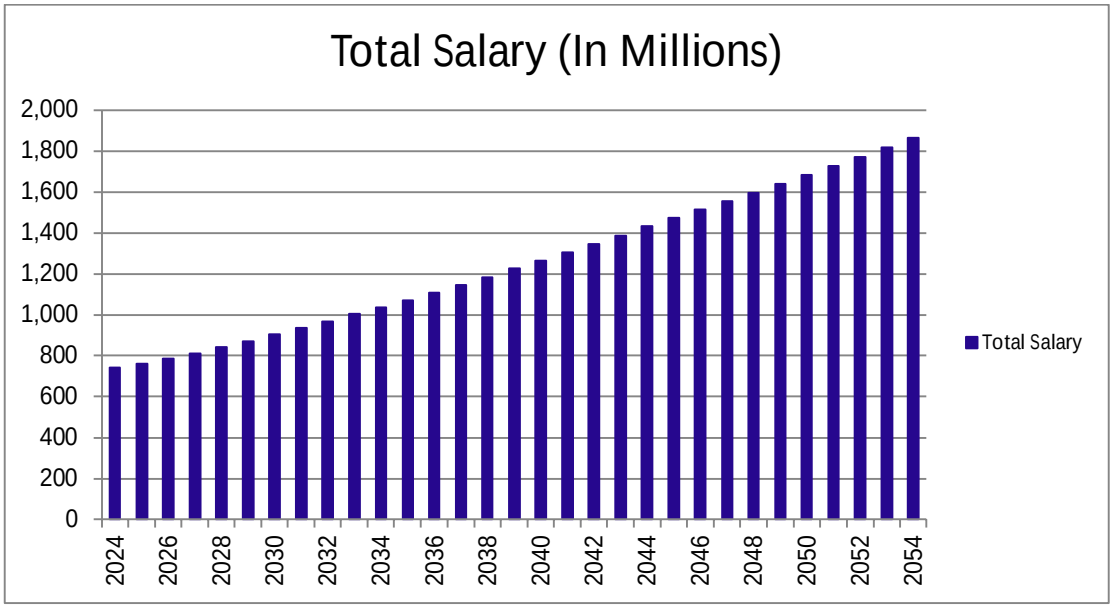
- 8.25% investment return on the Fair Value of Assets in all future years.
- The Actuarial Value of Assets is based on a five-year smoothing method.
- Actuarial assumptions and methods as described in Section 6. All future demographic experience is assumed to be exactly realized.
- The statutory contribution is contributed each year.
- Projections assume a 0% increase in the total active member population. All new future members are expected to enter the plan after 12 months of continuous service and contribution rates are determined as a percent of total payroll.

Section 4.2
Membership Projection

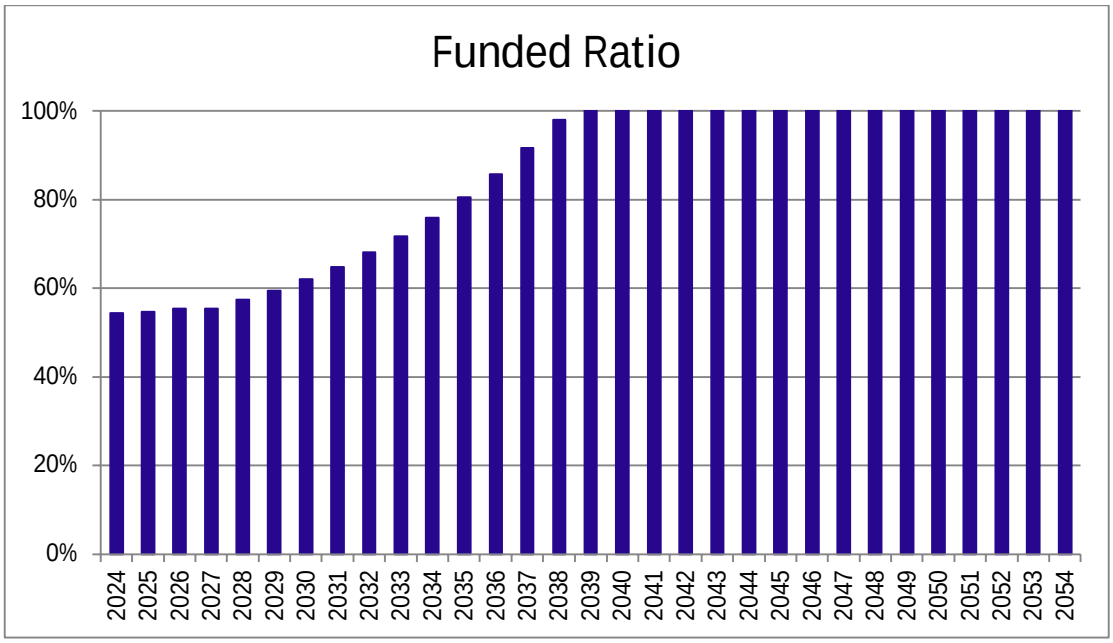
Projected Member Count



Projected Current and New Member Payroll



Section 4.3
Projection of Funded Status



Section 5 - Member Data

Section 5.1
Summary of Membership Data as of January 1, 2024
(Annual Salaries and Annual Benefits $ in 000's)

Active Employees

Item	Male	Female	Total
Number of Members [1]	5,190	2,544	7,734
Annual Salaries [2]	$529,411	$213,220	$742,631
Average Age [1]	48.74	47.04	48.18
Average Service [1]	12.18	10.34	11.57

Terminated Vested Employees

Item	Male	Female	Total
Number of Members	78	31	109
Annual Accrued Benefit	$2,112	$760	$2,873
Average Age	59.70	60.06	59.80

Retirees and Beneficiaries

Item	Male	Female	Total
Number of Members	6,526	2,932	9,458
Annual Retirement Benefit	$227,241	$70,722	$297,963
Average Age	73.15	72.85	73.06

Disability Allowances

Item	Male	Female	Total
Number of Members	716	663	1,379
Annual Disability Benefit	$15,722	$12,790	$28,511
Average Age	65.71	63.88	64.83

1 Active statistics include all participants who are actively employed, 11 participants who are on leave and 98 participants who have opted out of participating in the Plan and are only entitled to a return of their contributions.

2 The salary information for the 98 participants who have opted out of participating in the Plan is not included.

Some totals may not add due to rounding.

Section 5.2
Age and Service Distribution of Active Members as of January 1, 2024

Number of Participants

Age	Years of Service									Total
	Under 5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	Over 40	
Under 25	38	1	-	-	-	-	-	-	-	39
25-29	240	29	-	-	-	-	-	-	-	269
30-34	439	235	22	1	-	-	-	-	-	697
35-39	379	321	116	73	1	-	-	-	-	890
40-44	314	291	153	207	98	4	-	-	-	1,067
45-49	277	281	126	185	252	67	2	-	-	1,190
50-54	209	250	167	195	317	180	18	-	-	1,336
55-59	169	195	122	171	281	164	43	9	-	1,154
60-64	80	138	103	128	207	113	39	10	1	819
Over 65	17	50	50	35	50	37	18	6	10	273
Total	2,162	1,791	859	995	1,206	565	120	25	11	7,734

Section 5.3
Retirement Retiree and Beneficiary Data as of January 1, 2024

Number and Average Annual Allowance

Age Last Birthday	Number	Annual Allowance	Average Allowance
Retired Annuitants			
Under 50	16	$864,879	$54,055
50-54	148	$8,300,114	$56,082
55-59	542	$27,995,277	$51,652
60-64	925	$41,867,334	$45,262
65-69	1,468	$56,241,405	$38,312
70-74	1,683	$53,999,233	$32,085
75-79	1,744	$50,685,646	$29,063
Over 79	1,684	$40,425,544	$24,006
Total	8,210	$280,379,432	$34,151
Surviving Spouses			
Under 50	5	$62,722	$12,544
50-54	24	$365,626	$15,234
55-59	56	$903,884	$16,141
60-64	129	$1,968,968	$15,263
65-69	161	$2,575,975	$16,000
70-74	198	$3,204,044	$16,182
75-79	234	$3,343,874	$14,290
Over 79	441	$5,158,502	$11,697
Total	1,248	$17,583,595	$14,089
Disability Allowances			
Under 50	91	$1,873,674	$20,590
50-54	156	$3,578,006	$22,936
55-59	221	$5,441,831	$24,624
60-64	279	$6,595,485	$23,640
65-69	208	$4,504,432	$21,656
70-74	169	$2,990,599	$17,696
75-79	143	$2,107,204	$14,736
Over 79	112	$1,419,899	$12,678
Total	1,379	$28,511,130	$20,675

Section 5.4
Inactive Vested Employee Data as of January 1, 2024

Number and Average Accrued Benefit

Age Last Birthday	Number	Annual Accrued Benefit	Average Accrued Benefit
Terminated Vested [1]			
Under 35	-	-	N/A
35-39	1	$20,893	$20,893
40-44	-	-	N/A
45-49	3	$62,824	$20,941
50-54	19	$470,051	$24,740
55-59	27	$774,799	$28,696
60-64	50	$1,413,907	$28,278
65-69	8	$120,974	$15,122
Over 70	1	$9,368	$9,368
Total	109	$2,872,816	$26,356

Section 6 - Basis of the Actuarial Valuation

Section 6.1
Summary of Plan and Contribution Provisions

Eligibility—All full-time permanent employees of the Chicago Transit Authority are included in the Plan after completing 12 months of continuous service unless specifically excluded by the terms of a collective bargaining agreement. Exempt non-vested employees may opt out of the Plan. Chicago Transit Authority Board members are not included.

Contributions—The Chicago Transit Authority will contribute a percent of compensation for all participating employees and each participating employee will contribute a percent of his compensation to the Plan:

Annual Contributions to the Plan (Percentage of Compensation)	
Authority	Employees
21.590%	13.795%

For years through 2040, the amount paid by the Authority with respect to debt service on bonds issued for contribution to the Plan shall be treated as a credit against the amount of required contribution up to an amount not to exceed six percent of compensation paid by the Authority in the following year. The amount paid in debt service is always greater than six percent of projected compensation.

In order to be eligible for the credit, the debt service payment may not be paid with the proceeds of bonds or notes issued by the CTA for any calendar year after 2008. Gallagher has confirmed that the debt service payment for the year triggering the credit was not paid with the proceeds of bonds or notes issued by the CTA for any calendar year after 2008.

Minimum contributions as set forth elsewhere in this report may also apply.

Normal Retirement—The normal retirement age is 65. For employees retiring on or after January 1, 2001 the annual normal retirement pension is equal to the sum of (a) and (b) below, but not greater than 70.0% of the employee's average annual compensation:

(a) 1% of the employee's past service compensation as of May 31, 1948, for each full year of continuous service prior to June 1, 1949, plus
(b) 2.15% of average annual compensation for each year (and fraction of completed calendar months) of continuous service after June 1, 1949.

Average annual compensation is equal to the highest average compensation over any four calendar years out of the final 10 calendar years prior to normal retirement (or actual retirement, if later). If an employee has at least 20 years of service, his minimum annual pension is $2,220.

Early Retirement:

Employees hired before January 18, 2008: An employee may retire early after attaining age 55 and completing at least three years of continuous service, or after completion of 25 years of continuous service. The early retirement pension is equal to the accrued normal retirement pension based on compensation and service at early retirement, reduced by 5% for each year or fraction younger than age 65. The 5% per year reduction is not applied if the employee has at least 25 years of service. Employees hired after September 5, 2001 may retire early with unreduced benefits after attaining age 55 and completing at least 25 years of service.

Employees hired on and after January 18, 2008: An employee may retire with unreduced benefits upon attainment of age 64 with 25 years of service. An employee may retire with a benefit reduced as described above upon attainment of age 55 with 10 years of continuous service.

Disability Allowance:

An employee is eligible for a disability allowance if he becomes disabled after completing 10 years of service, or if his disability after completing five years of service is covered under the Workmen's Compensation Act. An employee is disabled if he either (a) is totally and permanently disabled or (b) is unable to return to work at their same job after receiving 26 weeks of benefits under the Authority's Group Accident and Sickness Insurance or from the Authority under the Workmen's Compensation Act. The disability allowance is equal to the normal retirement pension based on compensation and service at disability subject to a minimum annual pension of $4,800.

Death Benefits:

If an employee dies prior to retirement or disability and after one year of service, his contributions, accumulated with interest, are paid to his beneficiary. "Interest" is equal to the rate of interest earned by the Fund (to a maximum of 2%) prior to January 1, 1971, 1/2 of the rate of interest earned by the Fund (to a maximum of 3%) between January 1, 1971, and January 1, 1980, and 3% after December 31, 1979. If an employee dies after 90 days of service but prior to one year of service, his contributions, without interest, are paid to his beneficiary; and if he dies prior to 90 days of service, his contributions are not refunded.

If an employee is eligible for early retirement, he is automatically covered by a surviving spouse benefit, payable upon his death prior to retirement, in lieu of a return of his contributions. The spouse benefit is equal to 1/2 of the pension which would have been payable to the employee if he had retired on the first day of the month of his death and had elected an optional form of pension providing 1/2 of his reduced pension to his surviving spouse. Employees may elect not to be covered by this option and provide for the payment of their contributions with interest to their beneficiary in lieu thereof.

If an employee dies after his retirement pension has commenced, his beneficiary receives the excess, if any, of his contributions, accumulated with interest to his retirement date, over the sum of the pension payments made to him. However, if his surviving spouse is entitled to a pension after his death, such excess will not be paid to his beneficiary. At the death of the surviving spouse, the excess, if any, of the contributions accumulated with interest to his retirement date over the sum of the pension payments made to him and his surviving spouse will be paid.

A retired employee's beneficiary will receive a death benefit equal to the amount from the following schedule according to the employee's age and service at retirement:

Age	Service	Age + Service	Death Benefit
65	20	N/A	$8,000
60	N/A	90	$8,000
N/A	25	N/A	$8,000
N/A	N/A	94	$8,000
60-64	20	N/A	$6,000
55-59	20	N/A	$5,000
All Others			$2,000

Termination Benefits:

If an employee terminates his employment prior to eligibility for retirement or disability and after completing one year of service, he receives a refund of his contributions plus interest (3% after December 31, 1979). If he terminates after 90 days but prior to one year, he receives his contributions without interest, and if he terminates less than 90 days after hire, he receives no refund. If an employee has completed 10 years of continuous service and elects to leave his contributions in the Plan, he remains entitled to his normal retirement pension beginning at age 65 but based on his compensation and service at termination.

Optional Benefit Forms:

In lieu of a normal pension, an employee may elect an optional annuity of equivalent actuarial value providing payments of 1/2, 2/3, or all of his reduced pension to his spouse after his death (Option A).

Alternatively, an employee may elect an optional annuity of equivalent actuarial value providing payments of 1/2, 2/3, or all of his reduced pension to his spouse after his death with the further provision that his benefit will be restored to the full amount to him after the death of his spouse (Option B).

Retired Employees:

Benefits for retired employees have been valued according to benefits in effect at time of retirement as modified by subsequent amendments. Such benefits are kept on records maintained by the Authority.

Voluntary Early Retirement Incentive Program:

During 1997, the Plan was amended to offer enhanced retirement benefits to all employees who have at least 25 years of continuous service on or before December 31, 1999, and who have not retired prior to January 1, 1997. Those eligible on or before June 30, 1997, had to elect to participate during the period March 1, 1997, to June 30, 1997. Employees eligible during the period July 1, 1997, to December 31, 1999, must elect to participate between July 1, 1997, and February 28, 1998. All eligible employees who elect to participate must retire no later than December 31, 1999. The benefit is determined based on a formula multiplier of 2.40% of average annual compensation with the benefit cap at 70.0% of such average annual compensation.

Ad hoc increases in retiree benefits:
As part of the Arbitration Award ruling of November 13, 2003, the following ad hoc increases were given to retirees in payment status as of January 1, 2000:

(a) $75 per month for members retired before January 1,1980
(b) $50 per month for members who retired on or after January 1, 1980, but before January 1, 1991
(c) $40 per month for members who retired on or after January 1, 1991, but before January 1, 2000

As part of an Arbitration Award ruling of June 26, 2007, another ad hoc adjustment was made for participants.

Contribution Requirements Under P.A. 95-0708

Beginning January 18, 2008, the Authority shall make contributions to the Plan in an amount equal to 12 percent of compensation and participating employees shall make contributions in an amount equal to six percent of compensation. For years through 2040, the amount paid by the Authority with respect to debt service on bonds issued for contribution to the Retirement Plan shall be treated as a credit against the amount of required contribution, up to an amount not to exceed six percent of compensation paid by the Authority in the following year.

If the funded ratio is projected to decline below 60 percent in any year before 2040 using reasonable actuarial assumptions and the projected unit credit funding method, the contribution shall be increased so that the funded ratio is not projected to drop below 60 percent. If the funded ratio drops below 60 percent in any year before 2040, the contribution shall be increased so that the funded ratio is projected to reach 60 percent within 10 years. The increase in contributions shall be effective as of the January 1 following the determination, or 30 days following the determination, whichever is later. One-third of the increase in contributions shall be paid by participating employees and two-thirds by the Authority.

Beginning in 2040, the minimum contribution for each fiscal year shall be predetermined each year as the amount required to bring the total assets of the Plan up to 90 percent of the total actuarial liabilities by the end of 2059, using the projected unit credit funding actuarial cost method and reasonable actuarial assumptions. Participating employees shall be responsible for one-third of the required contribution and the Authority shall be responsible for two-thirds of the required contribution.

Beginning in 2060, the minimum contribution for each year shall be an amount needed to maintain the total assets of the Plan at 90 percent of the total actuarial liabilities of the Plan and the contribution shall be funded one-third by participating employees and two-thirds by the Authority.

Section 6.2
Description of Actuarial Methods and Valuation Procedures

A. Actuarial Cost Method

Liabilities and contributions shown in this report are computed using the **Projected Unit Credit Cost Method** of funding.

Sometimes called a “funding method,” this is a particular technique used by actuaries for establishing the amount and incidence of the annual actuarial cost of pension plan benefits, or normal cost, and the related unfunded actuarial accrued liability. Ordinarily the annual contribution to the plan is comprised of (1) the normal cost and (2) an amortization payment on the unfunded actuarial accrued liability.

Under the Projected Unit Credit Cost Method, the **Normal Cost** for the given year is computed as the present value of the unit of benefit attributable to that year for each active member. The Normal Cost for the Plan is determined by summing individual results for each active member.

The **Actuarial Accrued Liability** under this method at any point in time is equal to the present value of benefits accrued to the measurement date using a service pro-rate method.

The **Unfunded Actuarial Accrued Liability** is the excess of the Actuarial Accrued Liability over the Actuarial Value of Plan Assets actually on hand on the valuation date.

Under this method experience gains or losses, i.e., decreases or increases in accrued liabilities attributable to deviations in experience from the actuarial assumptions, adjust the Unfunded Actuarial Accrued Liability.

The **Funded Ratio** is the ratio of the actuarial value of assets to the Actuarial Accrued Liability.

B. Asset Valuation Method

The actuarial value of assets is based on a five-year smoothing method and is determined by spreading the effect of each year’s investment return in excess of or below the expected return. The Fair Value of assets at the valuation date is reduced by the sum of the following:

1. 80% of the return to be spread during the first year preceding the valuation date,
2. 60% of the return to be spread during the second year preceding the valuation date,
3. 40% of the return to be spread during the third year preceding the valuation date,
4. 20% of the return to be spread during the fourth year preceding the valuation date

C. Valuation Procedures

No actuarial liability is included for members who terminated non-vested prior to the valuation date, except those due a refund of contributions.

The compensation amounts used in the projection of benefits and liabilities were January 1, 2024 rates of pay provided by staff of the Retirement Board of Trustees.

No termination or retirement benefits were projected to be greater than the dollar limitation required by the Internal Revenue Code Section 415 for governmental plans.

Annual increases in salary were limited to the dollar amount defined under Internal Revenue Code Section 401(a)(17) for affected members.

Section 6.3
Summary of Actuarial Assumptions and Changes in Assumptions

Rate of Covered Pay: The rate of covered pay for participants has been estimated at $742,630,832 for 2024. The following adjustments were made to the actual covered earnings for 2023 supplied by the Authority:

(a) No earnings or a fractional year of earnings were submitted for employees with a work status date in 2023 who were hired during 2022. We have annualized the 2023 earnings and assumed minimum earnings with averages of those with similar service. (In the prior year we annualized the 2022 earnings and assumed minimum earnings of $50,750 per year for this group.)

(b) For employees on layoff, extended leave of absence, or inactive status, we have assumed minimum earnings with averages of those with similar service. (In the prior year we assumed minimum earnings of $50,750 per year.)

(c) For all employees, the 2024 salary was assumed to apply a half year increase based on the total salary scale which includes merit increases by service from the 2023 salary. (Prior year 2023 salary was assumed to increase 1.50% from 2022.)

Retiree Benefits: The benefit amounts received for retirees were compared to information received from the Authority for the prior valuation.

Earnings on Plan Assets: 8.25% per annum, compounded annually, net of investment expenses.

Compensation Increases: According to the following table, compounded annually, assumed end of year (includes inflation):

Current Year:

Years of Service	Rate
Less than 1	25.00%
1	18.00%
2	13.00%
3	13.00%
4	7.00%
>=5	3.75%

Prior Year:

Years of Service	Rate
1	11.00%
2	12.00%
3	16.00%
4	8.00%
>=5	3.50%

Mortality:

Current Year:

(a) *Active Members & Healthy Retirees* — The SOA Pub-2010 Below Median Amount Weighted Mortality Tables with Improvement Scale MP-2021 with a 13% increase adjustment for female participants.

(b) *Survivors* — The SOA Pub-2010 Below Median Amount Weighted Mortality Table with Improvement Scale MP-2021. Beneficiaries of current retirees are assumed to have the same mortality as active members and healthy retirees prior to the death of the member retiree.

(c) *Disabled Retirees* — The SOA Pub-2010 Disability Mortality General Below Median generational with Improvement Scale MP-2021.

Prior Year:

(d) *Active Members & Healthy Retirees* — The SOA Public Mortality General Below Median generational with Improvement Scale MP-2018 with a 13% increase adjustment for female participants.

(e) *Survivors* — The SOA Public Survivor Mortality General Below Median generational with Improvement Scale MP-2018. Beneficiaries of current retirees are assumed to have the same mortality as active members and healthy retirees prior to the death of the member retiree.

(f) *Disabled Retirees* — The SOA Public Disability Mortality General Below Median generational with Improvement Scale MP-2018.

Withdrawals from Service: According to the following table shown for illustrative ages:

Current Year:

	Less than 10 Years of Service	
	Rates of Termination for Reasons Other than Death or Disability	
Years of Service	Male	Female
0-1	7.25%	16.00%
2	7.25%	16.00%
3	7.25%	7.00%
4	7.25%	7.00%
5	5.75%	5.75%
6	5.00%	4.50%
7	4.00%	4.50%
8	4.00%	4.50%
9	4.00%	4.50%

Age	10+ Years of Service Rates of Termination for Reasons Other than Death or Disability
25	6.00%
30	6.00%
35	4.25%
40	3.25%
45	2.50%
50	2.50%
55 & Older	0.00%

Prior Year:

Age	Rates of Termination for Reasons Other than Death or Disability
25	8.50%
30	7.00%
35	4.90%
40	3.80%
45	3.20%
50	2.70%
55 & Older	0.00%

If service is 25 or greater, no withdrawal is assumed.

Recovery from disability without returning to work: Disabled members are not assumed to recover. For prior year, according to the following table as shown for illustrative ages:

Sample Attained Ages	Disabled Recovery [1]	
	Men	Women
30	3.419%	3.954%
35	2.899%	3.463%
40	2.215%	2.881%
45	1.392%	2.204%
50	0.549%	1.419%
55	0.029%	0.580%
60	0.000%	0.021%
65	0.000%	0.000%
70	0.000%	0.000%
75	0.000%	0.000%
80	0.000%	0.000%

1. Disability recovery after verification of the ability to return to work in the same position as determined by the Plan's Disability manager.

Disability Allowance: According to the following table as shown for illustrative ages:

Current Year:

	Rate of Disability	
Age	Male	Female
30 and under	0.10%	0.10%
35	0.25%	0.25%
40	0.35%	0.55%
45	0.56%	1.05%
50	0.86%	1.55%
55	1.16%	2.05%
60	1.46%	2.30%
65 & older	1.50%	2.55%

Prior Year:

Age	Rate of Disability
25	0.10%
30	0.10%
35	0.25%
40	0.50%
45	0.73%
50	0.85%
55	1.15%
60	1.25%
65 & older	1.25%

Service Retirements:

Current Year:

Age	Pre 1/19/2008 Hires Probability of Retirement		Post 1/18/2008 Hires Probability of Retirement	
	Service<25	Service>25	Service<25	Service>25
45-50	0.00%	18.00%	0.00%	0.00%
51-54	0.00%	14.00%	0.00%	0.00%
55	2.60%	19.25%	2.60%	2.60%
56	2.60%	19.25%	2.60%	2.60%
57	2.60%	19.25%	2.60%	2.60%
58	2.60%	19.25%	2.60%	2.60%
59	2.60%	19.25%	2.60%	2.60%
60	2.60%	19.25%	2.60%	2.60%
61	9.60%	30.00%	9.60%	9.60%
62	9.60%	30.00%	9.60%	9.60%
63	9.60%	30.00%	9.60%	9.60%
64	17.60%	30.00%	17.60%	17.60%
65	42.50%	42.50%	37.50%	37.50%
66	30.00%	30.00%	33.00%	33.00%
67	30.00%	30.00%	33.00%	33.00%
68	30.00%	30.00%	33.00%	33.00%
69	30.00%	30.00%	33.00%	33.00%
70-74	30.00%	30.00%	33.00%	33.00%
75	100.00%	100.00%	100.00%	100.00%

Prior Year:

Age	Pre 1/19/2008 Hires Probability of Retirement		Post 1/18/2008 Hires Probability of Retirement	
	Service<25	Service>25	Service<25	Service>25
45-54	0.00%	20.00%	0.00%	0.00%
55	2.00%	20.00%	2.00%	2.00%
56	2.00%	20.00%	2.00%	2.00%
57	2.50%	20.00%	2.50%	2.50%
58	3.00%	20.00%	3.00%	3.00%
59	3.50%	25.00%	3.50%	3.50%
60	4.00%	25.00%	4.00%	4.00%
61	5.00%	35.00%	5.00%	5.00%
62	15.00%	35.00%	15.00%	15.00%
63	15.00%	35.00%	15.00%	15.00%
64	20.00%	35.00%	20.00%	20.00%
65	30.00%	40.00%	30.00%	30.00%
66	30.00%	30.00%	30.00%	30.00%
67	30.00%	30.00%	30.00%	30.00%
68	30.00%	30.00%	30.00%	30.00%
69	30.00%	30.00%	30.00%	30.00%
70-74	30.00%	30.00%	30.00%	30.00%
75	100.00%	100.00%	100.00%	100.00%

Spouse Data:

Current year:

70% of employees eligible at retirement are assumed to be married, 28.57% of those married males are assumed to elect a 50% J&S option (Option A or B–50%), while 0% of the females are assumed to elect a 50% J&S option (Option A or B–50%), Of the males electing a 50% J&S, 75% are assumed to elect the pop up feature (Option B–50%) respectively. A wife is assumed to be 3 years younger than her husband. Actual dependent coverage data was used for participants retired as of the valuation date.

Prior year:

75% of employees eligible at retirement are assumed to be married, 40% of those married are assumed to elect a 50% J&S option (Option A or B–50%). Of those electing a 50% J&S, 75% are assumed to elect the pop up feature (Option B–50%) and the average equivalency factors to convert their accrued pension to a spouse option (Option A–50%) and (Option B-50%) are assumed to be 88% and 86%, respectively. A wife is assumed to be 3 years younger than her husband. Actual dependent coverage data was used for participants retired as of the valuation date.

Section 6.3
Summary of Actuarial Assumptions and Changes in Assumptions, continued

Miscellaneous and Technical Assumptions:

Pay Increase Timing:	End of (Fiscal) year.
Decrement Timing:	Decrements of all types are assumed to occur mid-year.
Eligibility Testing:	Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.
Benefit Service:	Exact fractional service from date of participation is used to determine the amount of benefit payable.
Decrement Relativity:	Decrement rates are used directly based on assumptions, without adjustment for multiple decrement table effects.
Decrement Operation:	Disability and turnover do not operate after 25 years of service.
Actuarial Math Contribution Expense Load:	Prior year expenses rounded to the nearest $100,000

Summary of changes since January 1, 2023 Valuation

This valuation was prepared using demographic and economic assumptions that were recommended on the basis of the Experience Review covering the period from January 1, 2018 to December 31, 2022 and adopted by the Board at its July 2024 meeting, The following assumptions were updated:

- Termination Rates
- Retirement Rates
- Disability Rates
- Mortality
- Form of payment
- Salary Scale
- Marital Percentage
- Active Participant Counts and New Entrant Profiles for Projections

The net effect of the changes in assumptions decreased the Plan's actuarial accrued liability by $25,442,731.

Section 7 – Risk Information

Actuarial Standard of Practice No. 51 Disclosures

Funding future retirement benefits prior to when those benefits become due involves assumptions regarding future economic and demographic experience. These assumptions are applied to calculate actuarial liabilities and the corresponding funded status of the Plan. However, to the extent future experience deviates from the assumptions used, variations will occur in these calculated values. These variations create risk to the Plan. Understanding the risks to the funding of the Plan is important. Actuarial Standard of Practice No. 51 (ASOP 51) requires certain disclosures of potential risks to the Plan and provides useful information for intended users of actuarial reports that determine Plan contributions or evaluate the adequacy of specified contribution levels to support benefit provisions. While this public pension plan is not subject to the funding provisions of ERISA, The Retirement Plan for Chicago Transit Authority Employees uses the information presented to assist in making contribution decisions.

Under ASOP 51, risk is defined as the potential of actual future measurements deviating from expected future measurements resulting from actual future experience deviating from actuarially assumed experience.

It is important to note that not all risk is "negative", but all risk should be understood and accepted based on knowledge, judgment and educated decisions. Future measurements may deviate in ways that produce "positive" or "negative" financial impacts to the Plan.

In the actuary's professional judgment, the following risks may reasonably be anticipated to significantly affect the plan's future financial condition.

- Investment risk – the risk that assets will not return as expected
- Interest rate risk – the risk that the general level of interest rates will increase or decrease significantly from current levels
- Contribution risk – the risk that the actual contribution made will be different than the actuarially determined contribution
- Asset liability mismatch - potential that changes in asset values are not matched by changes in the value of liabilities
- Longevity and other demographic risk – the risk that mortality or other demographic experience will be different from expected

The following information is provided to comply with ASOP 51 and furnish beneficial information on potential risks to the Plan. This list is not all-inclusive; it is an attempt to identify the most significant risks and how those risks might affect the results shown in this report.

Note that ASOP 51 does not require the actuary to evaluate the ability or willingness of the Plan sponsor to make contributions to the Plan. In addition, this valuation report in not intended to provide investment advice or to provide guidance on the management or reduction of risk. Gallagher welcomes the opportunity to assist in such matters as part of a separate project or projects utilizing the appropriate staff and resources for those objectives.

Section 7 - Risk Information, continued

Assessment of Risks

- Investment return - One type of investment risk is that assets materially underperform expected return.

    - Lower assets mean higher unfunded liability and larger contribution amounts. For example, if the trust earns 1% less than assumed each year for ten years, the projected fair value of assets would be approximately 10% lower than expected.
    - The five-year smoothing method used for the actuarial value of assets defers a portion of investment gain/loss in each of the previous five years. If the assumed return on assets consistently overestimates the actual return on assets, the actuarial value of assets will be consistently higher than the true market value. Consistent underestimation of the unfunded liability can prevent the Plan from achieving anticipated funding goals even when all minimum required contributions are made timely.

The plan invests in a diversified portfolio with the objective of maximizing investment returns at a reasonable level of risk. However, Actuarial Standard of Practice No. 4 ("ASOP 4") requires the actuary to disclose a Low-Default-Risk Obligation Measure ("LDROM") of plan liabilities and provide commentary to help intended users of this report understand the significance of the measure with respect to funded status, contributions, and participant benefit security.

The LDROM is to be based on "discount rates derived from low-default-risk fixed income securities whose cash flows are reasonably consistent with the pattern of benefits expected to be paid in the future." The LDROM shown here represents what the plan's liability would be if the plan invested its assets solely in a portfolio of high-quality bonds whose cash flows approximately match future benefit payments. Consequently, the difference between the LDROM and the Actuarial Accrued Liability can be thought of as representing the expected taxpayer savings / (cost) from investing in the plan's diversified portfolio compared to investing only in high-quality bonds. It may also be thought of as the cost of reducing investment risk.

As of January 1, 2024 the LDROM is $5,295,061,638 and is based on a 5.11% interest rate. The interest rate used for the LDROM was determined by calculating a single equivalent discount rate using projected benefit payments and the Buck Above Median Yield Curve as of December 31, 2023. Note the interest rate used for the LDROM is based on bond yields applicable at the time of the measurement and will therefore vary for different measurement dates. All other assumptions are the same as those used for funding as shown in this report.

Actuaries play a role in helping determine funding methods and policies that can achieve affordable and appropriate contributions and risk management. The funded status based on Actuarial Accrued Liability and the Actuarially Determined Contributions are determined using the expected return on assets which reflects the actual investment portfolio. Since the assets are not invested in an all-bond portfolio, the LDROM does not indicate the plan's funded status or progress, nor does it provide information on necessary plan contributions.

With respect to security of participant benefits, if this plan were to be funded on an LDROM basis, participant benefits currently accrued as of the measurement date may be considered more secure as investment risk may be significantly reduced. However, the assets being invested in a diversified portfolio does not mean the participant benefits are not secure. Security of participant benefits relies on a combination of the assets in the plan, the investment returns generated on those assets, and the promise of future contributions from the plan sponsors. Reducing investment risk by investing solely in bonds may significantly increase Actuarially Determined Contributions and therefore increase contribution risk by decreasing the ability of the plan sponsor to make necessary contributions to fund the benefits. Unnecessarily high contribution requirements in the near term may not be affordable and could imperil plan sustainability and benefit security. Participant benefits will remain secure if reasonable and appropriate contributions with managed risk are calculated and paid.

Section 7 - Risk Information, continued

- Asset growth does not keep pace with liability increases over time - One type of investment risk is that asset returns do not keep pace with liability growth over time. Plan liabilities are based on the discounted present value of anticipated future benefit payments. That present value grows at the discount rate as time passes and the future payouts move closer. If investment returns are lower than the rates used to discount liabilities, plan liabilities will increase more rapidly than plan assets. Over extended periods of time, such as those involved in pension obligations, these discrepancies can accumulate to significant shortfalls.

- Market shocks or regime changes - Invested assets are subject to significant disruptions from market shocks, such as the financial crisis of 2008/2009, or as a result of systemic regime changes that persist for years, such as historically low interest rates over the recent decade.

- Liability duration versus asset duration: Unless assets are explicitly structured to mimic the characteristics of plan liabilities, there is a risk that economic scenarios that effect interest rates will have a larger impact on liability than on assets. This is because plan liability is the discounted value of benefit payments that extend way out into future years, i.e., have a long duration. Even relatively small changes in interest rates can have a significant impact on plan liability; a decline in interest rates increases liability, while a rise in interest rates decreases liability. Plan investments typically have a shorter duration with respect to interest rate changes, often holding fixed income securities with lower durations than plan liabilities, and typically maintaining some moneys in equity investments that are not as directly sensitive to interest rate changes.

  For this Plan, a 1% decline in the discount rate used to value funding liabilities (from 8.25% to 7.25%), would increase the Plan's liabilities by approximately 9.35%.

- Salary increases - Plan costs are sensitive to salary increases, with higher rates leading to higher obligations. This is because benefits at retirement are pay related, meaning that higher pay generates higher benefit levels at retirement. Compensation increases greater than assumed lead to actuarial losses since projected benefits are higher than predicted by assumed rates.

- Longevity and other demographic risks - Potential that mortality or other demographic experience (retirement, turnover, disability) may be different than expected. As the Plan matures and the majority of participants reach (or have reached) retirement eligibility, risks associated when participants retire can become significant. The Plan provides for unreduced early retirement benefits after meeting certain age and service conditions. These benefits are highly subsidized and thus can be significantly more valuable than normal retirement benefits and regular early retirement benefits. The demographic assumptions used to determine the actuarial valuation attempt to account for unreduced early retirement based on historical plan experience. However, due to the unpredictable nature of such benefits, future experience could differ significantly from past experience.

  In addition to the risk that participants will not retire as expected, the Plan is subject to longevity risk the risk that participants will live longer (or shorter) than expected.

- Declining active workforce - since employer contributions are based on a percentage of participant's salaries, a declining active workforce will have the impact of the Plan potentially receiving lower contributions. In addition, if the required dollar amount of contributions remain level or increase, a declining active workforce will result in higher contribution rates in order to meet required contribution levels.

- Contribution risk – risk of not contributing an actuarially determined contribution. The Plan contribution is a statutory amount. There is a risk associated with the employer's contribution when the statutory amount and the actuarially determined contribution (Actuarial Math Contribution) amount differ. Actuarially determined contributions are calculated to adequately fund the Plan. Therefore, when the statutory contribution is lower than the actuarially determined contribution, there is an increased risk the Plan may not be sustainable in the long term.

Section 7 - Risk Information, continued

Historical Results

The following table shows selected historical values of key valuation measures. These items illustrate how actual volatility has impacted the Plan in recent years and gives additional context to the risks described above. Further information can be found in the actuarial valuation reports for each year.

Valuation Date	1/1/2020	1/1/2021	1/1/2022	1/1/2023	1/1/2024
Actuarial Value of Assets (Billion)	1.88	1.96	2.06	2.08	2.12
Asset Return in Prior Year	15.70%	7.60%	17.60%	-8.88%	10.00%
Investment gain/(loss) - AVA basis (Million)	(12.3)	(7.7)	29.9	(50.3)	(26.7)
Actuarial Accrued Liability (Billion)	3.58	3.67	3.74	3.83	3.90
Liability duration	9.50	9.66	9.58	9.48	9.35
The ratio of retired life* actuarial accrued liability to total actuarial accrued liability	67.5%	68.0%	68.4%	69.7%	70.3%
The ratio of cashflow to actuarial value of assets	-4.7%	-3.7%	-4.2%	-4.7%	-4.6%
The ratio of actuarial value of assets to participant payroll	298.3%	300.8%	312.9%	314.7%	285.5%
Normal cost (Million)	64.9	68.9	67.8	68.9	73.4
Discount rate	8.25%	8.25%	8.25%	8.25%	8.25%
Non-Investment gain/(loss) (Million)	(37.6)	(27.1)	(15.7)	(49.5)	(51.0)
Funding Policy contribution (Million)	130.4	134.2	135.7	136.2	160.3

* Retired members and beneficiaries

Commentary on Plan Maturity Measures

The ratio of retired life actuarial accrued liability to total actuarial accrued liability

A mature plan will often have a ratio above 60 - 65 percent. A higher percentage will generally indicate an increased need for asset / liability matching due to inability to absorb volatility in future returns.

The ratio of cashflow to actuarial value of assets

The cashflow as a percentage of assets means the fund may need to invest in more liquid assets to cover the benefit payments. More liquid assets may not garner the same returns as less liquid assets and therefore increase the investment risk. However, there may already be enough liquid assets to cover the benefit payments, less investment return is needed to cover the shortfall, or only a small portion of assets will need to be converted to cash. Therefore, the investment risk is likely not amplified at this time. This maturity measure should be monitored for continual negative trend with greater magnitude.

The ratio of actuarial value of assets to participant payroll

Plans that have higher asset-to-payroll ratios experience *more* volatile employer contributions (as a percentage of payroll) due to investment return. For example, if lower than expected asset return increases the unfunded liability of two plans by the same percent the plan with a higher assets-to-payroll ratio may experience higher contribution volatility than a plan with a lower asset-to-payroll ratio.

Glossary of Terms

Actuarial Accrued Liability	Total accumulated cost to fund pension benefits arising from service in all prior years.
Actuarial Cost Method	Technique used to assign or allocate, in a systematic and consistent manner, the expected cost of a pension plan for a group of plan members to the years of service that give rise to that cost.
Actuarial Present Value of Future Benefits	Amount which, together with future interest, is expected to be sufficient to pay all future benefits.
Actuarial Valuation	Study of probable amounts of future pension benefits and the contributions needed to fund those benefits.
Actuary	Person who performs mathematical calculations pertaining to pension and insurance benefits based on specific procedures and assumptions.
Normal Cost	That portion of the actuarial present value of benefits assigned to a particular year in respect to an individual participant or the plan as a whole.
Unfunded Actuarial Accrued Liability (UAAL)	The portion of the actuarial accrued liability not offset by plan assets.