

City of New Orleans Employees' Retirement System

Actuarial Valuation and Review as of January 1, 2023



This report has been prepared at the request of the Board of Trustees to assist in administering the System. This valuation report may not otherwise be copied or reproduced in any form without the consent of the Board of Trustees and may only be provided to other parties in its entirety, unless expressly authorized by Segal. The measurements shown in this actuarial valuation may not be applicable for other purposes.

© 2023 by The Segal Group, Inc. All rights reserved.

Segal



2727 Paces Ferry Road SE, Building One Suite 1400
Atlanta, GA 30339-4053
segalco.com
T 678.306.3100

May 12, 2023

Board of Trustees
City of New Orleans Employees' Retirement System
1300 Perdido Street, Suite 1E12
New Orleans, LA 70112

Dear Board Members:

We are pleased to submit this Actuarial Valuation and Review as of January 1, 2023. It summarizes the actuarial data used in the valuation, analyzes the preceding year's experience, and establishes the funding requirements for fiscal 2023.

This report was prepared in accordance with generally accepted actuarial principles and practices at the request of the Board to assist in administering the Retirement System. The census information and financial information on which our calculations were based was prepared by the staff of the System. That assistance is gratefully acknowledged.

Segal does not audit the data provided. The accuracy and comprehensiveness of the data is the responsibility of those supplying the data. To the extent we can, however, Segal does review the data for reasonableness and consistency. Based on our review of the data, we have no reason to doubt the substantial accuracy of the information on which we have based this report and we have no reason to believe there are facts or circumstances that would affect the validity of these results.

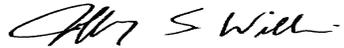
The measurements shown in this actuarial valuation may not be applicable for other purposes. Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements; and changes in plan provisions or applicable law.

The actuarial calculations were directed under the supervision of Jeffrey S. Williams. I am a member of the American Academy of Actuaries and I meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein. To the best of my knowledge, the information supplied in this actuarial valuation is complete and accurate. Further, in my opinion, the assumptions as approved by the Board are reasonable and take into account the experience of the Plan and reasonable expectations.

Board of Trustees
May 12, 2023
Page 3

We look forward to reviewing this report at your next meeting and to answering any questions.

Sincerely,
Segal



Jeffrey S. Williams, FCA, ASA, MAAA
Vice President and Consulting Actuary
Enrolled Actuary No. 23-7009

Table of Contents

Section 1: Actuarial Valuation Summary.....	5
Purpose and basis.....	5
Valuation highlights	6
Summary of key valuation results.....	8
Important information about actuarial valuations.....	9
Section 2: Actuarial Valuation Results	11
Participant information.....	11
Actuarial experience	18
Actuarially determined contribution	22
Schedule of funding progress through December 31, 2022	24
Risk.....	26
GFOA funded liability by type	28
Section 3: Supplemental Information	30
Exhibit A: Table of Plan Demographics	30
Exhibit B: Reconciliation of Participant Data	31
Exhibit C: Summary Statement of Income and Expenses on a Market Value Basis	32
Exhibit D: Summary Statement of Plan Assets	33
Exhibit E: Development of the Fund through December 31, 2022	34
Exhibit F: Table of Amortization Bases.....	35
Section 4: Actuarial Valuation Basis	36
Exhibit I: Actuarial Assumptions, Methods and Models.....	36
Exhibit II: Summary of Plan Provisions.....	39
Appendix A: Definition of Pension Terms	42

Section 1: Actuarial Valuation Summary

Purpose and basis

This report has been prepared by Segal to present a valuation of the System as of January 1, 2023. The valuation was performed to determine whether the assets and contributions are sufficient to provide the prescribed benefits. The measurements shown in this actuarial valuation may not be applicable for other purposes. In particular, the measures herein are not necessarily appropriate for assessing the sufficiency of System assets to cover the estimated cost of settling the System's benefit obligations.

The contribution requirements presented in this report are based on:

- The benefit provisions of the System, as administered by the Board;
- The characteristics of covered active participants, inactive vested participants, and retired participants and beneficiaries as of December 31, 2022, provided by the Administrative Office;
- The assets of the Plan as of December 31, 2022, provided by the Administrative Office;
- Economic assumptions regarding future salary increases and investment earnings;
- Other actuarial assumptions regarding employee terminations, retirement, death, etc. and
- The funding policy adopted by the System and the employers.

Certain disclosure information required by GASB Statements No. 67 and 68 as of December 31, 2022 for the System is provided in a separate report.

Section 1: Actuarial Valuation Summary

Valuation highlights

1. Segal strongly recommends an actuarial funding method that targets 100% funding of the actuarial accrued liability. Generally, this implies payments that are ultimately at least enough to cover normal cost, interest on the unfunded actuarial accrued liability and the principal balance. The funding policy adopted by the City meets this standard.
2. The actuarially determined contribution (ADC) for the upcoming year is \$26,969,460, an increase of \$2,519,163 from last year. The contributions as a percentage of payroll increased from 17.18% of payroll to 18.15% of payroll.
3. Actual contributions made during the year ending December 31, 2022 of \$25,665,015 were 104.97% of the actuarially determined contribution (ADC). In the prior year, actual contributions were \$21,651,850, 90.32% of the prior year ADC.
4. The funded ratio (the ratio of the actuarial value of assets to actuarial accrued liability) is 58.83%, compared to the prior year funded ratio of 59.59%. This ratio is one measure of funding status, and its history is a measure of funding progress. Using the market value of assets, the funded ratio is 53.25%, compared to 65.91% as of the prior valuation date. These measurements are not necessarily appropriate for assessing the sufficiency of the System assets to cover the estimated cost of settling the System's benefit obligation or the need for or the amount of future contributions.
5. The unfunded actuarial accrued liability is \$326.4 million, which is an increase of \$13.7 million since the prior valuation.
6. Effective with this valuation, the compensation for purposes of calculating a pension is no longer capped at \$150,000 and is now capped at the Internal Revenue Code Section 401(a)(17) limit. This change increased the unfunded actuarial accrued liability by \$3,120,186 and increased the ADC by \$596,934 or 0.40% of payroll.
7. The total actuarial loss from all sources is \$11,737,211, or 1.49% of actuarial accrued liability.
8. The total actuarial loss from investment experience is \$7,331,779, or 0.93% of actuarial accrued liability.
9. The net experience loss from sources other than investment experience was 0.56% of the actuarial accrued liability. This loss was primarily due to new active participants and retirement experience different than expected.
10. The rate of return on the market value of assets was -13.56% for the year ending December 31, 2022. The return on the actuarial value of assets was 5.62% for the same period due to the recognition of prior years' investment gains and losses. This resulted in an actuarial loss when measured against the assumed rate of return of 7.25%. This actuarial investment loss increased the average employer contribution rate by 0.3% of pay. Given the low fixed income interest rate environment, target asset allocation and expectations of future investment returns for various asset classes, we advise the Board to continue to monitor actual and anticipated investment returns relative to the assumed long-term rate of return on investments of 7.25%.
11. The actuarial value of assets is 110.48% of the market value of assets. The investment experience in the past years has only been partially recognized in the actuarial value of assets. As the deferred net loss is recognized in future years, the cost of the

Section 1: Actuarial Valuation Summary

Plan is likely to increase unless the net loss is offset by future experience. The recognition of the market gains/losses of \$44,253,290 will also have an impact on the future funded ratio. If the net deferred losses were recognized immediately in the actuarial value of assets, the ADC would increase from 18.15% to 20.10% of payroll.

12. It is important to note that this actuarial valuation is based on plan assets as of December 31, 2022. The Plan's funded status does not reflect short-term fluctuations of the market, but rather is based on the market values on the last day of the plan year. Moreover, this actuarial valuation does not include any possible short-term or long-term impacts on mortality of the covered population that may emerge after December 31, 2022 due to COVID-19. Segal is available to prepare projections of potential outcomes of market conditions and other demographic experience upon request.
13. Since the actuarial valuation results are dependent on a given set of assumptions, there is a risk that emerging results may differ significantly as actual experience proves to be different from the assumptions. We have not been engaged to perform a detailed analysis of the potential range of the impact of risk relative to the System's future financial condition but have included a brief discussion of some risks that may affect the System in *Section 2*. A more detailed assessment would provide the Board with a better understanding of the inherent risks.
14. This report constitutes an actuarial valuation for the purpose of determining the actuarially determined contribution under the Plan's funding policy and measuring the progress of that funding policy. The Net Pension Liability (NPL) and Pension Expense under Governmental Accounting Standards Board (GASB) Statements No. 67 and No. 68, for inclusion in the Plan and employer's financial statements as of December 31, 2022, will be provided separately.

Section 1: Actuarial Valuation Summary

Summary of key valuation results

		2023	2022
Contributions for plan year beginning January 1:	• Actuarially determined employer contributions	\$26,969,460	\$24,450,297
	• Actuarially determined employer contributions as a percent of payroll	18.15%	17.18%
	• Actual employer contributions	--	25,665,015
Actuarial accrued liability for plan year beginning January 1:	• Retired participants and beneficiaries	\$497,712,463	\$481,485,234
	• Inactive vested participants	28,992,285	34,152,546
	• Active participants	266,120,523	258,186,299
	• Total actuarial accrued liability	792,825,271	773,824,079
	• Normal cost including administrative expenses	13,070,548	11,620,167
Assets for plan year beginning January 1:	• Market value of assets (MVA)	\$422,174,414	\$510,029,851
	• Actuarial value of assets (AVA)	466,427,804	461,092,638
	• Actuarial value of assets as a percentage of market value of assets	110.48%	90.41%
Funded status for plan year beginning January 1:	• Unfunded actuarial accrued liability on market value of assets	\$370,650,857	\$263,794,228
	• Funded percentage on MVA basis	53.25%	65.91%
	• Unfunded actuarial accrued liability on actuarial value of assets	\$326,397,467	\$312,731,441
	• Funded percentage on AVA basis	58.83%	59.59%
Demographic data for plan year beginning January 1:	• Number of retired participants and beneficiaries	2,157	2,134
	• Number of inactive vested participants	421	376
	• Number of active participants	2,731	2,693
	• Total Payroll	\$148,581,198	\$142,338,647
	• Average compensation	\$54,406	\$52,855

Section 1: Actuarial Valuation Summary

Important information about actuarial valuations

An actuarial valuation is a budgeting tool with respect to the financing of future projected obligations of a pension plan. It is an estimated forecast – the actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan.

In order to prepare a valuation, Segal relies on a number of input items. These include:

Plan provisions	Plan provisions define the rules that will be used to determine benefit payments, and those rules, or the interpretation of them, may change over time. Even where they appear precise, outside factors may change how they operate. It is important to keep Segal informed with respect to plan provisions and administrative procedures, and to review the plan summary included in our report to confirm that Segal has correctly interpreted the plan of benefits.
Participant information	An actuarial valuation for a plan is based on data provided to the actuary by the City. Segal does not audit such data for completeness or accuracy, other than reviewing it for obvious inconsistencies compared to prior data and other information that appears unreasonable. It is important for Segal to receive the best possible data and to be informed about any known incomplete or inaccurate data.
Financial information	Part of the cost of a plan will be paid from existing assets — the balance will need to come from future contributions and investment income. The valuation is based on the asset values as of the valuation date, typically reported by the City. A snapshot as of a single date may not be an appropriate value for determining a single year's contribution requirement, especially in volatile markets. Plan sponsors often use an "actuarial value of assets" that differs from market value to gradually reflect year-to-year changes in the market value of assets in determining the contribution requirements.
Actuarial assumptions	In preparing an actuarial valuation, Segal starts by developing a forecast of the benefits to be paid to existing plan participants for the rest of their lives and the lives of their beneficiaries. This requires actuarial assumptions as to the probability of death, disability, withdrawal, and retirement of participants in each year, as well as forecasts of the plan's benefits for each of those events. In addition, the benefits forecasted for each of those events in each future year reflect actuarial assumptions as to salary increases and cost-of-living adjustments. The forecasted benefits are then discounted to a present value, typically based on an estimate of the rate of return that will be achieved on the plan's assets. All of these factors are uncertain and unknowable. Thus, there will be a range of reasonable assumptions, and the results may vary materially based on which assumptions are selected within that range. That is, there is no right answer (except with hindsight). It is important for any user of an actuarial valuation to understand and accept this constraint. The actuarial model may use approximations and estimates that will have an immaterial impact on our results. In addition, the actuarial assumptions may change over time, and while this can have a significant impact on the reported results, it does not mean that the previous assumptions or results were unreasonable or wrong.

Section 1: Actuarial Valuation Summary

Models

Segal valuation results are based on proprietary actuarial modeling software. The actuarial valuation models generate a comprehensive set of liability and cost calculations that are presented to meet regulatory, legislative and client requirements. Our Actuarial Technology and Systems unit, comprised of both actuaries and programmers, is responsible for the initial development and maintenance of these models. The models have a modular structure that allows for a high degree of accuracy, flexibility and user control. The client team programs the assumptions and the plan provisions, validates the models, and reviews test lives and results, under the supervision of the responsible actuary.

The user of Segal's actuarial valuation (or other actuarial calculations) should keep the following in mind:

The actuarial valuation is prepared at the request of the City. Segal is not responsible for the use or misuse of its report, particularly by any other party.

An actuarial valuation is a measurement at a specific date — it is not a prediction of a plan's future financial condition. Accordingly, Segal did not perform an analysis of the potential range of financial measurements, except where otherwise noted.

If the City is aware of any event or trend that was not considered in this valuation that may materially change the results of the valuation, Segal should be advised, so that we can evaluate it.

Segal does not provide investment, legal, accounting, or tax advice. Segal's valuation is based on our understanding of applicable guidance in these areas and of the plan provisions, but they may be subject to alternative interpretations. The City should look to their other advisors for expertise in these areas.

While Segal maintains extensive quality assurance procedures, an actuarial valuation involves complex computer models and numerous inputs. In the event that an inaccuracy is discovered after presentation of Segal's valuation, Segal may revise that valuation or make an appropriate adjustment in the next valuation.

Segal's report shall be deemed to be final and accepted by the City upon delivery and review. Trustees should notify Segal immediately of any questions or concerns about the final content.

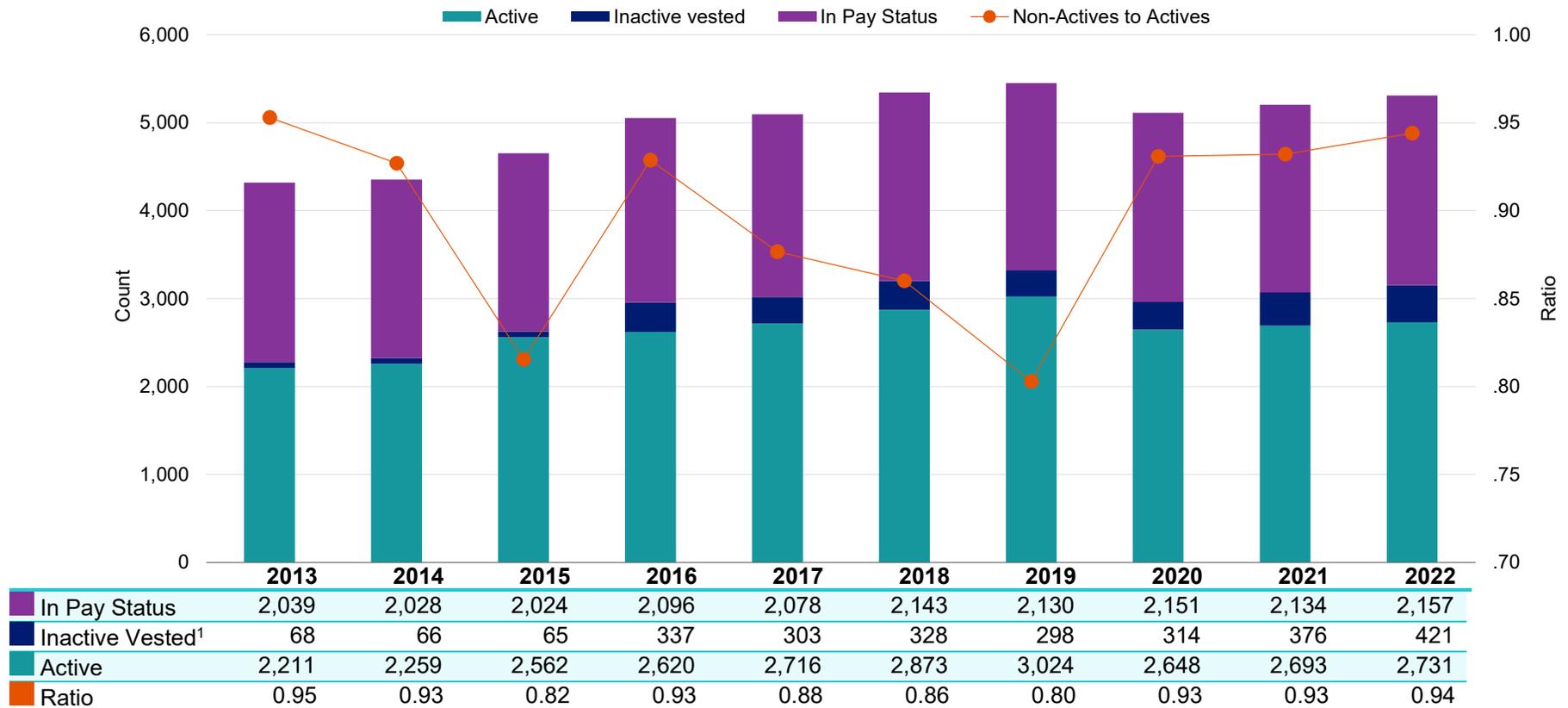
As Segal has no discretionary authority with respect to the management or assets of the System, it is not a fiduciary in its capacity as actuaries and consultants with respect to the System.

Section 2: Actuarial Valuation Results

Participant information

This section presents a summary of significant statistical data on covered participants.

Participant Population as of December 31



¹ Excluding terminated participants due a refund of employee contributions

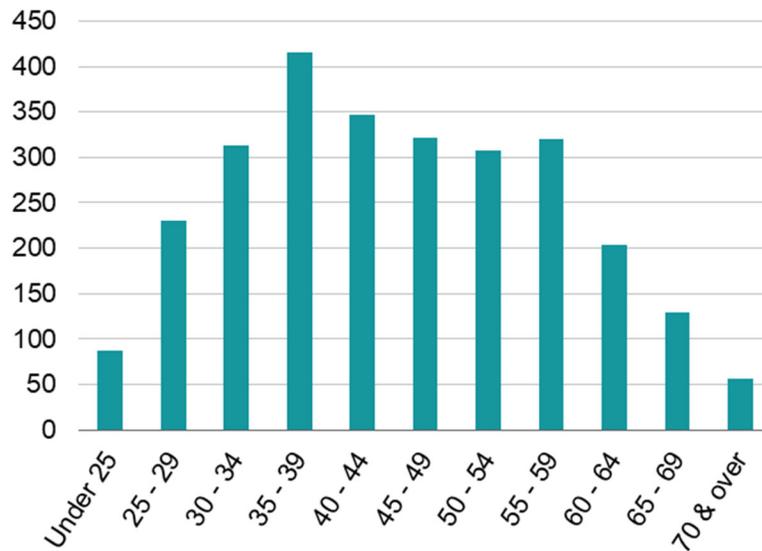
Section 2: Actuarial Valuation Results

Active participants

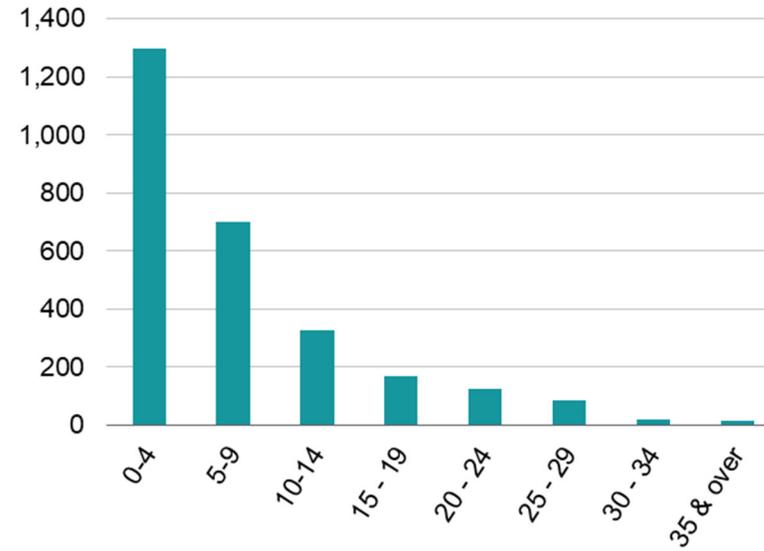
As of December 31,	2022	2021	Change
Active participants	2,731	2,693	1.4%
Average age	45.5	45.4	0.1
Average years of service	7.5	7.8	-0.2
Average compensation	\$54,406	\$52,855	2.9%

Distribution of Active Participants as of December 31, 2022

Actives by Age



Actives by Years of Service



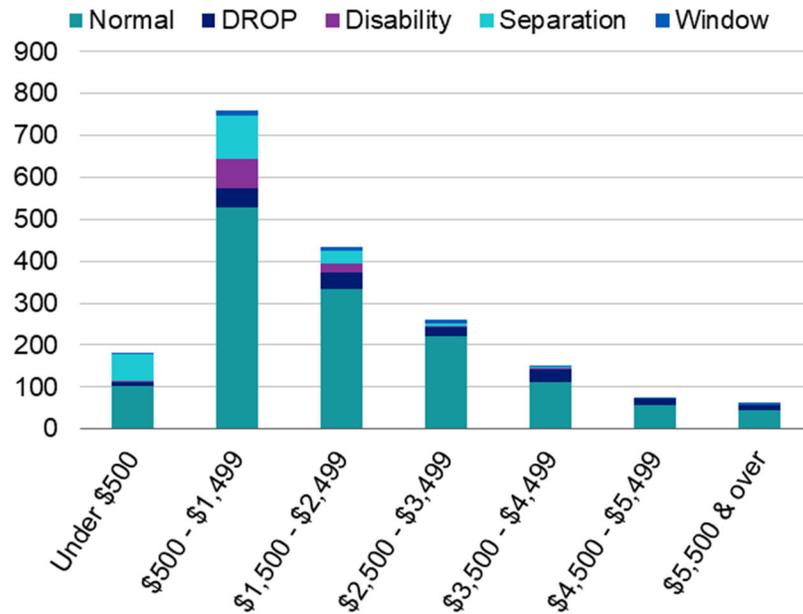
Section 2: Actuarial Valuation Results

Retired participants and beneficiaries

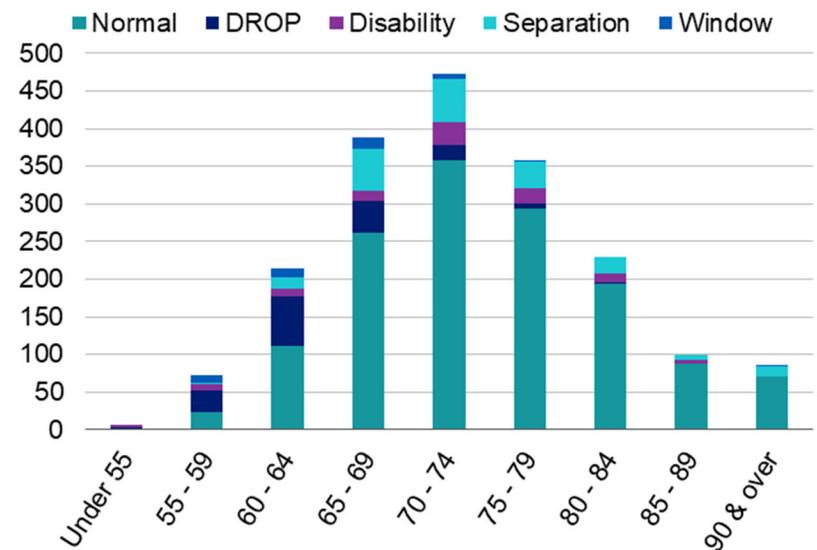
As of December 31,	2022	2021	Change
Retired participants	1,928	1,908	1.0%
Beneficiaries	229	226	1.3%
Average age	73.4	73.2	0.2
Average amount	\$1,913	\$1,880	1.8%
Total monthly amount	4,125,791	4,011,380	2.9%

Distribution of Retired Participants and Beneficiaries as of December 31, 2022

Retired Participants by Type and Monthly Amount



Retired Participants by Type and Age



Section 2: Actuarial Valuation Results

Historical plan population

Participant Data Statistics: 2013 – 2022

Year Ended December 31	Active Participants			Retired Participants and Beneficiaries		
	Count	Average Age	Average Service	Count	Average Age	Average Monthly Amount
2013	2,211	45.0	9.4	2,039	71.3	\$1,557
2014	2,259	44.4	8.6	2,028	71.4	1,617
2015	2,562	44.0	8.3	2,024	71.8	1,629
2016	2,620	44.0	7.8	2,096	71.7	1,707
2017	2,716	44.1	7.5	2,078	72.3	1,758
2018	2,873	44.2	7.3	2,143	72.0	1,770
2019	3,024	44.4	6.3	2,130	72.3	1,808
2020	2,648	45.1	7.8	2,151	72.7	1,848
2021	2,693	45.4	7.8	2,134	73.2	1,880
2022	2,731	45.5	7.5	2,157	73.4	1,913

Note: Average age, service, and monthly amounts prior to 2018 are estimated based on valuation reports from the prior actuary.

Section 2: Actuarial Valuation Results

It is desirable to have level and predictable plan costs from one year to the next. For this reason, the Board has approved an asset valuation method that gradually adjusts to market value. Under this valuation method, the full value of market fluctuations is not recognized in a single year and, as a result, the asset value and the plan costs are more stable. The amount of the adjustment to recognize market value is treated as income, which may be positive or negative. Realized and unrealized gains and losses are treated equally and, therefore, the sale of assets has no immediate effect on the actuarial value.

Determination of Actuarial Value of Assets for Year Ended December 31, 2022

1	Market value of assets, December 31, 2022				\$422,174,414
2	Calculation of unrecognized return	Original Amount¹	Percent Deferred²	Unrecognized Amount³	
	(a) Year ended December 31, 2022	-\$104,070,330	80%	-\$83,256,264	
	(b) Year ended December 31, 2021	38,336,192	60%	23,001,714	
	(c) Year ended December 31, 2020	24,087,406	40%	9,634,962	
	(d) Year ended December 31, 2019	31,830,992	20%	6,366,198	
	(e) Year ended December 31, 2018	-44,582,900	0%	0	
	(k) Total unrecognized return				-\$44,253,390
3	Preliminary actuarial value: (1) - (2k)				466,427,804
4	Adjustment to be within 30% corridor				0
5	Final actuarial value of assets as of December 31, 2022: (3) + (4)				\$466,427,804
6	Actuarial value as a percentage of market value: (5) ÷ (1)				110.5%
7	Amount deferred for future recognition: (1) - (5)				-\$44,253,390

¹ Total return minus expected return on a market value basis

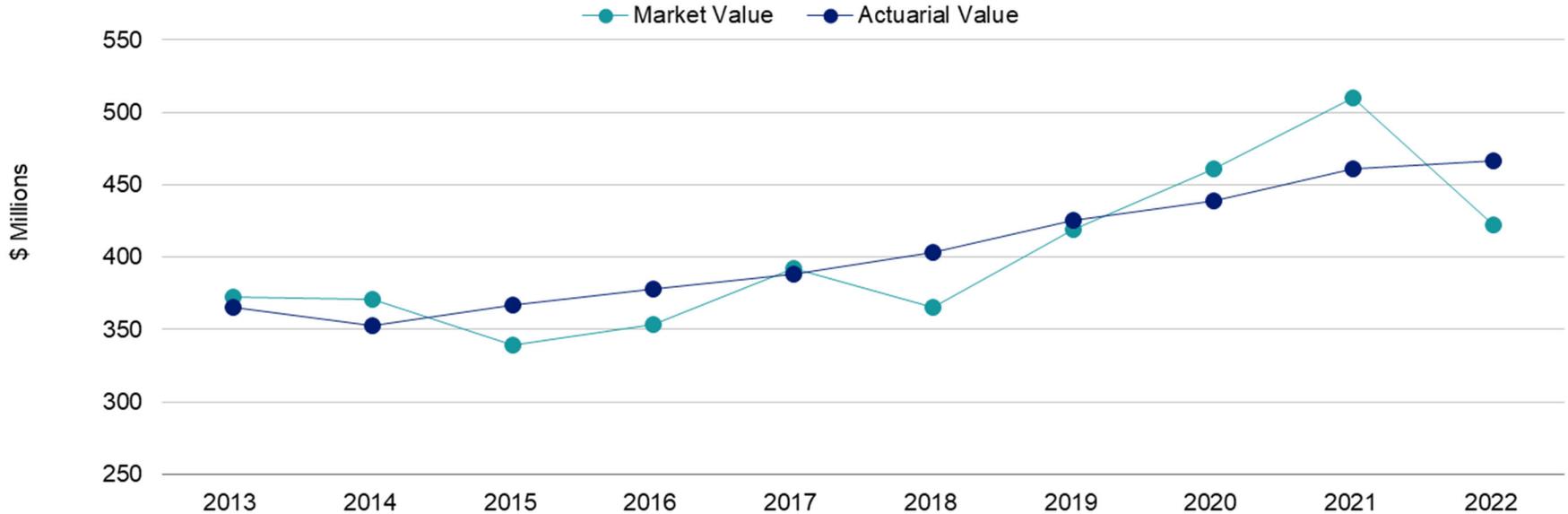
² Percent deferred applies to the current valuation year

³ Recognition at 20% per year over five years

Section 2: Actuarial Valuation Results

Asset history for years ended December 31

Actuarial Value of Assets vs Market Value of Asset



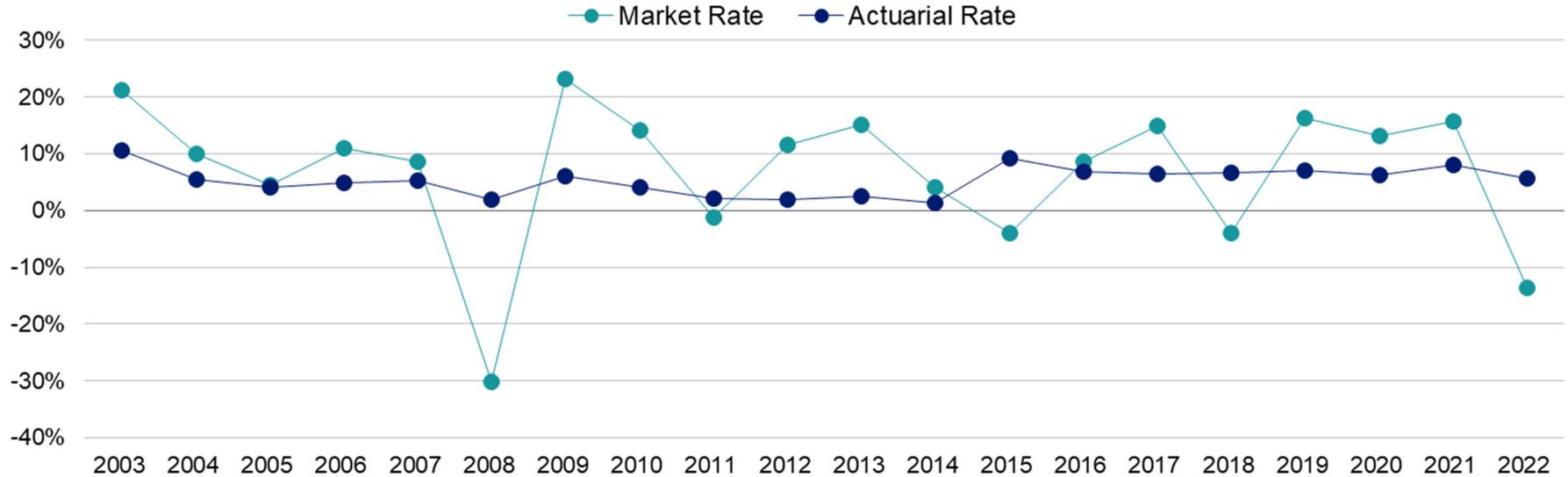
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Actuarial Value	\$365.10	\$352.92	\$367.27	\$377.75	\$388.23	\$403.02	\$425.08	\$439.15	\$461.09	\$466.43
Market Value	372.46	370.75	339.10	353.61	391.83	365.74	418.97	460.64	510.03	422.17

Because actuarial planning is long term, it is useful to see how the assumed investment rate of return has followed actual experience over time. The chart below shows the rate of return on an actuarial basis compared to the actual market value investment return for the last 20 years, including averages over select time periods. As described earlier in this section, the actuarial asset valuation method gradually recognizes fluctuations in the market value rate of return. The goal of this is to stabilize the actuarial rate of return and to produce more level pension plan costs.

Section 2: Actuarial Valuation Results

Historical investment returns

Market and Actuarial Rates of Return for Years Ended December 31



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Market rate	21.30%	9.93%	4.56%	11.05%	8.62%	-30.18%	23.13%	14.11%	-1.30%	11.55%	15.17%	4.16%	-3.88%	8.62%	14.97%	-4.03%	16.27%	13.09%	15.77%	-13.56%
Actuarial rate	10.55%	5.39%	4.02%	4.94%	5.30%	1.99%	6.06%	4.02%	2.10%	1.98%	2.57%	1.31%	9.29%	6.82%	6.52%	6.60%	6.97%	6.31%	8.12%	5.62%

Average Rates of Return	Actuarial Value	Market Value
Most recent five-year average return:	7.13%	4.76%
Most recent ten-year average return:	6.38%	6.04%
Most recent 15-year average return:	5.35%	4.51%
20-year average return:	5.51%	6.05%

Section 2: Actuarial Valuation Results

Actuarial experience

To calculate any actuarially determined contribution, assumptions are made about future events that affect the amount and timing of benefits to be paid and assets to be accumulated. Each year actual experience is measured against the assumptions. If overall experience is more favorable than anticipated (an actuarial gain), any contribution requirement will decrease from the previous year. On the other hand, any contribution requirement will increase if overall actuarial experience is less favorable than expected (an actuarial loss).

Taking account of experience gains or losses in one year without making a change in assumptions reflects the belief that the single year's experience was a short-term development and that, over the long term, experience will return to the original assumptions. For contribution requirements to remain stable, assumptions should approximate experience. If assumptions are changed, the contribution requirement is adjusted to take into account a change in experience anticipated for all future years.

Actuarial Experience for Year Ended December 31, 2022

1	Net loss from investments ¹	-\$7,331,779
2	Net loss from administrative expenses	-354,903
3	Net loss from other experience	<u>-4,050,529</u>
4	Net experience loss: 1 + 2 + 3 +4	-\$11,737,211

¹ Compensation is annualized for those hired during the prior plan year

Section 2: Actuarial Valuation Results

Investment experience

A major component of projected asset growth is the assumed rate of return. The assumed return should represent the expected long-term rate of return, based on the Plan's investment policy. The rate of return on the market value of assets was -13.56% for the year ended December 31, 2022.

For valuation purposes, the assumed rate of return on the actuarial value of assets is 7.25%. The actual rate of return on an actuarial basis for the 2022 Plan Year was 5.62%. Since the actual return for the year was greater than the assumed return, the Plan experienced an actuarial gain during the year ended December 31, 2022 with regard to its investments.

Investment Experience

		Year Ended December 31, 2022	
		Market Value	Actuarial Value
1	Net investment income	-\$67,819,470	\$25,371,133
2	Average value of assets	500,011,868	451,074,655
3	Rate of return: 1 ÷ 2	-13.56%	5.62%
4	Assumed rate of return	7.25%	7.25%
5	Expected investment income: 2 x 4	36,250,860	32,702,912
6	Investment gain/(loss): 1 - 5	-\$104,070,330	-\$7,331,779

Section 2: Actuarial Valuation Results

Non-investment experience

Administrative expenses

Administrative expenses for the year ended December 31, 2022 totaled \$615,589, as compared to the assumption of \$284,677.

Other experience

There are other differences between the expected and the actual experience that appear when the new valuation is compared with the projections from the previous valuation. These include:

- Mortality experience (more or fewer than expected deaths),
- The extent of turnover among participants,
- Retirement experience (earlier or later than projected),
- The number of disability retirements (more or fewer than projected), and
- Salary increases (greater or smaller than projected)

The net loss from this other experience for the year ended December 31, 2022 amounted to \$4,050,529, which is 0.5% of the actuarial accrued liability.

Actuarial assumptions

There are no assumption changes reflected in this report

Details on actuarial assumptions and methods are in *Section 4, Exhibit I*.

Plan provisions

The compensation for purposes of calculating a pension is no longer capped at \$150,000 and is now capped at the Internal Revenue Code Section 401(a)(17) limit.

A summary of plan provisions is in *Section 4, Exhibit II*.

Section 2: Actuarial Valuation Results

Unfunded Actuarial Accrued Liability

Development of Unfunded Actuarial Accrued Liability for Year Ended December 31, 2022

1	Unfunded actuarial accrued liability at beginning of year		\$312,731,441
2	Total normal cost at beginning of year		11,620,167
3	Total expected contributions		-35,173,029
4	Interest on 1, 2 & 3		<u>22,361,491</u>
5	Expected unfunded actuarial accrued liability		\$311,540,070
6	Changes due to:		
	(a) Net experience (gain)/loss	\$11,737,211	
	(b) Plan provisions	<u>3,120,186</u>	
	Total changes		<u>\$14,857,397</u>
7	Unfunded actuarial accrued liability at end of year		\$326,397,467

Section 2: Actuarial Valuation Results

Actuarially determined contribution

The actuarially determined contribution is equal to the employer normal cost payment and a payment on the unfunded actuarial accrued liability. As of January 1, 2023, the actuarially determined contribution is \$26,969,460, or 18.15% of projected payroll.

The contribution requirement as of January 1, 2023 is based on the data previously described, the actuarial assumptions and plan provisions described in *Section 4*, including all changes affecting future costs adopted at the time of the actuarial valuation, actuarial gains and losses, and changes in the actuarial assumptions.

Actuarially Determined Contribution

	2023		2022	
	Amount	% of Payroll	Amount	% of Payroll
1 Total normal cost	\$12,773,384	8.60%	\$11,335,490	7.96%
2 Administrative expenses	297,164	0.20%	284,677	0.20%
3 Expected employee contributions	<u>-8,914,932</u>	<u>-6.00%</u>	<u>-8,540,319</u>	<u>-6.00%</u>
4 Employer normal cost: (1) + (2) + (3)	\$4,155,617	2.80%	\$3,079,848	2.16%
5 Actuarial accrued liability	\$792,825,271		\$773,824,079	
6 Actuarial value of assets	<u>466,427,804</u>		<u>461,092,638</u>	
7 Unfunded actuarial accrued liability: (5) - (6)	\$326,397,467		\$312,731,441	
8 Payment on unfunded actuarial accrued liability	22,813,843	15.35%	21,370,449	15.01%
9 Actuarially determined contribution: (4) + (8)	\$26,969,460	18.15%	\$24,450,297	17.18%
10 Payroll	\$148,582,198		\$142,338,647	

Section 2: Actuarial Valuation Results

Reconciliation of actuarially determined contribution

The chart below details the changes in the actuarially determined contribution from the prior valuation to the current year's valuation.

Reconciliation of Actuarially Determined Contribution from January 1, 2022 to January 1, 2023

		Amount	% of Payroll
1	Actuarially determined contribution as of January 1, 2022	\$24,450,297	17.18%
2	Effect of plan amendment	596,934	0.42%
4	Effect of expected change in amortization payment due to payroll growth	534,261	0.38%
9	Effect of investment loss	479,096	0.34%
10	Effect of other gains and losses on accrued liability	287,873	0.20%
11	Net effect of other changes, including composition and number of participants	<u>620,999</u>	<u>0.44%</u>
12	Total change	\$2,519,163	1.78%
13	Total change in percentage due to payroll change		-0.81%
14	Actuarially determined contribution as of January 1, 2023	\$26,969,460	18.15%

Section 2: Actuarial Valuation Results

Schedule of funding progress through December 31, 2022

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded/ (Overfunded) AAL (UAAL) (b) - (a)	Funded Ratio (a) / (b)	Covered Compensation (c)	UAAL as a Percentage of Covered Compensation [(b) - (a)] / (c)
01/01/2019	\$403,015,342	\$658,352,626	\$255,337,284	61.22%	\$128,530,078	198.66%
01/01/2020	425,079,078	723,145,441	298,066,363	58.78%	149,538,039	199.32%
01/01/2021	439,149,127	746,340,322	307,191,195	58.84%	135,779,772	226.24%
01/01/2022	461,092,638	773,824,079	312,731,441	59.59%	142,338,647	219.71%
01/01/2023	466,427,804	792,825,271	326,397,467	58.83%	148,582,198	219.67%

Section 2: Actuarial Valuation Results

History of employer contributions

History of Employer Contributions: 2014 – 2023

Year Ended December 31	Actuarially Determined Employer Contribution (ADC)		Actual Employer Contribution		
	Amount	Percentage of Covered Compensation	Amount	Percentage of Covered Compensation	Percent Contributed
2014	\$20,871,424	22.58%	\$20,306,887	21.97%	97.30%
2015	21,891,996	22.51%	22,447,281	23.08%	102.54%
2016	22,713,296	21.49%	27,304,527	25.83%	120.21%
2017	26,857,512	23.25%	27,169,921	23.52%	101.16%
2018	28,015,495	23.19%	31,065,227	25.71%	110.89%
2019	28,689,759	22.32%	33,884,678	26.36%	118.11%
2020	22,890,640	15.31%	32,615,183	21.81%	142.48%
2021	23,973,368	17.66%	21,651,850	15.95%	90.32%
2022	24,450,297	17.18%	25,665,015	18.03%	104.97%
2023	26,969,460	18.15%	--	--	--

Section 2: Actuarial Valuation Results

Risk

The actuarial valuation results are dependent on a single set of assumptions; however, there is a risk that emerging results may differ significantly as actual experience proves to be different from the current assumptions.

We have not been engaged to perform a detailed analysis of the potential range of the impact of risk relative to the Plan's future financial condition but have included a brief discussion of some risks that may affect the Plan.

- Investment Risk (the risk that returns will be different than expected)

If the actual return on market value for the prior plan year were 1% different (either higher or lower), the unfunded actuarial liability would change by 1.53%, or about \$5,000,119, disregarding the asset smoothing method.

Since the Plan's assets are much larger than contributions, investment performance may create volatility in the actuarially determined contribution requirements. For example, for the prior plan year, if the actual return on market value were 1% different, the actuarially determined contribution would increase or decrease by \$326,733 (0.22% of payroll), disregarding asset smoothing.

The market value rate of return over the last 20 years has ranged from a low of -30.18% to a high of 23.13%.

- Longevity Risk (the risk that mortality experience will be different than expected)

The actuarial valuation includes an expectation of future improvement in life expectancy. Emerging plan experience that does not match these expectations will result in either an increase or decrease in the actuarially determined contribution.

- Contribution Risk (the risk that actual contributions will be different from actuarially determined contribution)

The Plan's funding policy requires payment of the actuarially determined contribution. As long as this policy is adhered to, contribution risk is negligible.

- Demographic Risk (the risk that participant experience will be different than assumed)

Examples of this risk include:

- Actual retirements occurring earlier or later than assumed. The value of retirement plan benefits is sensitive to the rate of benefit accruals and any early retirement subsidies that apply.
- More or less active participant turnover than assumed.
- There are external factors including legislative or financial reporting changes that could impact the Plan's funding and disclosure requirements. While we do not assume any changes in such external factors, it is important to understand that they could have significant consequences for the Plan.

Past experience can help demonstrate the sensitivity of key results to the Plan's actual experience. Over the past six years:

Section 2: Actuarial Valuation Results

- The non-investment gain(loss) for a year has ranged from a loss of \$23,462,607 to a gain of \$14,885,424.
- The funded percentage on the actuarial value of assets has ranged from a low of 58.8% to a high of 61.2% since 2018.

- Maturity Measures

As pension plans mature, the cash needed to fulfill benefit obligations will increase over time. Therefore, cash flow projections and analysis should be performed to assure that the Plan's asset allocation is aligned to meet emerging pension liabilities.

Currently the Plan has a non-active to active participant ratio of 0.94.

Section 2: Actuarial Valuation Results

GFOA funded liability by type

The Actuarial Accrued Liability represents the present value of benefits earned, calculated using the Plan's actuarial cost method. The Actuarial Value of Assets reflects the financial resources available to liquidate the liability. The portion of the liability covered by assets reflects the extent to which accumulated plan assets are sufficient to pay future benefits, and is shown for liabilities associated with employee contributions, pensioner liabilities, and other liabilities. The Government Finance Officers Association (GFOA) recommends that the funding policy aim to achieve a funded ratio of 100 percent.

GFOA Funded Liability by Type as of December 31

	2023	2022
Actuarial accrued liability (AAL)		
Active member contributions	\$54,984,252	\$54,590,311
Retirees and beneficiaries	497,712,463	481,485,234
Active and inactive members (employer-financed)	<u>240,128,556</u>	<u>237,748,534</u>
Total	\$792,825,271	\$773,824,079
Actuarial value of assets	466,427,804	461,092,638
Cumulative portion of AAL covered		
Active member contributions	100.00%	100.00%
Retirees and beneficiaries	82.67%	84.43%
Active and inactive members (employer-financed)	0.00%	0.00%

Section 2: Actuarial Valuation Results

Actuarial balance sheet

An overview of the Plan's funding is given by an Actuarial Balance Sheet. In this approach, first the amount and timing of all future payments that will be made by the Plan for current participants is determined. Then these payments are discounted at the valuation interest rate to the date of the valuation, thereby determining the present value, referred to as the "liability" of the Plan.

Second, this liability is compared to the assets. The "assets" for this purpose include the net amount of assets already accumulated by the Plan, the present value of future member contributions, the present value of future employer normal cost contributions, and the present value of future employer amortization payments for the unfunded actuarial accrued liability.

Actuarial Balance Sheet

	Year Ended	
	December 31, 2022	December 31, 2021
Liabilities		
Present value of benefits for retired participants and beneficiaries	\$497,712,463	\$481,485,234
Present value of benefits for inactive vested participants	28,992,285	34,152,546
Present value of benefits for active participants	<u>345,240,790</u>	<u>329,772,261</u>
Total liabilities	\$871,945,538	\$845,410,041
Assets		
Total valuation value of assets	\$466,427,804	\$461,092,638
Present value of future contributions by members	54,943,092	53,217,610
Present value of future employer contributions for:		
Entry age cost	24,177,175	18,368,352
Unfunded actuarial accrued liability	<u>326,397,467</u>	<u>312,731,441</u>
Total of current and future assets	\$871,945,538	\$845,410,041

Section 3: Supplemental Information

Exhibit A: Table of Plan Demographics

Category	Year Ended December 31		Change From Prior Year
	2022	2021	
Active participants in valuation:			
Number	2,731	2,693	1.4%
Average age	45.5	45.4	0.1
Average years of service	7.5	7.8	-0.3
Average compensation	\$54,406	\$52,855	2.9%
Account balances	54,984,252	54,590,311	0.7%
Number with unknown age and/or service information	0	0	N/A
Total active vested participants	1,435	1,444	-0.6%
Inactive participants			
Inactive vested participants	421	376	12.0%
Retired participants:			
Number in pay status	1,823	1,797	1.4%
Average age	73.2	73.0	0.2
Average monthly benefit	\$2,045	\$2,011	1.7%
Disabled participants:			
Number in pay status	105	111	-5.4%
Average age	71.2	71.0	0.2
Average monthly benefit	\$1,257	\$1,254	0.2%
Beneficiaries:			
Number in pay status	229	226	1.3%
Average age	76.2	76.2	0.0
Average monthly benefit	\$1,159	\$1,140	1.7%

Section 3: Supplemental Information

Exhibit B: Reconciliation of Participant Data

	Active Participants	Inactive Vested Participants	Disableds	Retired Participants	Beneficiaries	Total
Number as of January 1, 2022	2,693	376	111	1,797	226	5,203
New participants	562	N/A	N/A	N/A	17	579
Terminations – with vested rights	-117	117	0	0	0	0
Terminations – without vested rights	-193	N/A	N/A	N/A	N/A	-193
Retirements	-48	-48	N/A	96	N/A	0
New disabilities	-1	0	1	N/A	N/A	0
Return to work	0	0	0	0	N/A	0
Death	0	0	-7	-70	-14	-91
Lump sum cash-outs	-170	-19	0	0	0	-189
Rehire	5	-5	N/A	0	N/A	0
Certain period expired	N/A	N/A	0	0	0	0
Data adjustments	0	0	0	0	0	0
Active participants no longer accruing benefits	0	0	N/A	N/A	N/A	0
New Beneficiary	0	0	0	0	0	0
Number as of January 1, 2023	2,731	421	105	1,823	229	5,309

Section 3: Supplemental Information

Exhibit C: Summary Statement of Income and Expenses on a Market Value Basis

	Year Ended December 31, 2022	Year Ended December 31, 2021
Net assets at market value at the beginning of the year	\$510,029,851	\$460,642,035
Contribution and other income:		
Employer contributions	\$25,665,015	\$21,651,850
Member contributions	8,743,683	8,509,475
Other contributions	<u>764,331</u>	<u>965,183</u>
<i>Total contribution income</i>	<i>\$35,173,029</i>	<i>\$31,126,508</i>
Investment income:		
Investment income	-\$66,887,175	\$72,408,859
Less investment fees	<u>-932,295</u>	<u>-1,457,787</u>
<i>Net investment income</i>	<i><u>-\$67,819,470</u></i>	<i><u>\$70,951,072</u></i>
Total income available for benefits	-\$32,646,441	\$102,077,580
Less benefit payments and administrative expenses:		
Administrative expenses	-\$615,589	-\$560,127
Benefit Payments	<u>-54,593,407</u>	<u>-52,129,637</u>
<i>Net benefit payments and administrative expenses</i>	<i>-\$55,208,996</i>	<i>-\$52,689,764</i>
Change in market value of assets	-\$87,855,437	\$49,387,816
Net assets at market value at the end of the year	\$422,174,414	\$510,029,851

Section 3: Supplemental Information

Exhibit D: Summary Statement of Plan Assets

	December 31, 2022	December 31, 2021
Cash equivalents	\$25,598,916	\$24,969,026
Total accounts receivable	2,986,281	1,480,444
Investments:		
Stocks and Equity	\$204,842,072	\$294,898,389
Alternatives	112,761,187	100,239,648
Fixed Income	<u>78,854,125</u>	<u>90,267,122</u>
Total investments at market value	<u>\$396,457,384</u>	<u>\$485,405,159</u>
Total assets	\$425,042,581	\$511,854,629
Total accounts payable	<u>-2,868,167</u>	<u>-1,824,778</u>
Net assets at market value	\$422,174,414	\$510,029,851
Net assets at actuarial value	\$466,427,804	\$461,092,638

Section 3: Supplemental Information

Exhibit E: Development of the Fund through December 31, 2022

Year Ended December 31	Employer Contributions	Employee Contributions	Other Income	Net Investment Return ¹	Admin. Expenses ²	Benefit Payments	Market Value of Assets at Year-End	Actuarial Value of Assets at Year-End	Actuarial Value as a Percent of Market Value
2013	\$18,544,682	\$5,953,535	\$1,483,869	\$50,131,156	\$0	\$42,265,089	\$372,455,614	\$365,102,483	98.0%
2014	20,306,887	6,193,573	1,677,851	15,155,075	0	45,038,930	370,750,070	352,915,906	95.2%
2015	22,447,281	6,490,092	1,622,658	-14,044,748	0	48,166,703	339,098,650	367,274,453	108.3%
2016	27,304,527	7,444,419	1,106,421	28,611,585	0	49,956,004	353,609,598	377,748,008	106.8%
2017	27,169,921	7,677,009	729,180	51,906,523	296,496	49,264,915	391,827,316	388,233,310	99.1%
2018	31,065,227	8,246,577	507,195	-15,589,616	243,972	50,075,418	365,737,309	403,015,342	110.2%
2019	33,884,678	9,134,139	264,650	59,043,437	376,002	48,716,880	418,971,331	425,079,078	101.5%
2020	32,615,183	8,851,861	261,920	54,015,335	316,687	53,756,908	460,642,035	439,149,127	95.3%
2021	21,651,850	8,509,475	965,183	70,951,072	560,127	52,129,637	510,029,851	461,092,638	90.4%
2022	25,665,015	8,743,683	764,331	-67,819,470	615,589	54,593,407	422,174,414	466,427,804	110.5%

¹ On a market basis, net of investment fees

² Information not available in prior actuary's reports

Section 3: Supplemental Information

Exhibit F: Table of Amortization Bases

Type	Date Established	Initial Period	Initial Amount	Annual Payment ¹	Years Remaining	Outstanding Balance
Initial UAL	01/01/2020	25	\$239,946,779	\$16,884,943	22.00	\$240,513,912
Actuarial Gain	01/01/2020	25	-12,750,278	-897,231	22.00	-12,780,415
Change in Assumptions	01/01/2020	25	70,869,862	4,987,079	22.00	71,037,369
Actuarial Loss	01/01/2021	25	6,288,682	431,738	23.00	6,309,170
Change in Assumptions	01/01/2021	25	-4,226,362	-290,153	23.00	-4,240,132
Plan Amendment	01/01/2021	25	2,955,892	202,932	23.00	2,965,523
Plan Amendment	01/01/2021	25	3,386,082	232,465	23.00	3,397,114
Actuarial Loss	01/01/2022	25	13,986,907	936,825	24.00	14,020,718
Change in Asset Method	01/01/2022	25	-8,717,521	-583,889	24.00	-8,738,595
Actuarial Loss	01/01/2023	25	10,792,617	705,245	25.00	10,792,617
Plan Amendment	01/01/2023	25	3,120,186	203,889	25.00	3,120,186
Total				\$22,813,843		\$326,397,467

¹ Level percentage of payroll

Section 4: Actuarial Valuation Basis

Exhibit I: Actuarial Assumptions, Methods and Models

Rationale for Assumptions	The information and analysis used in selecting each demographic assumption that has a significant effect on this actuarial valuation is from the 2011 – 2016 Actuarial Experience Study as performed by another actuary.
Net Investment Return:	7.25%
Salary Increases:	Age-based annual rates ranging from 10% to 3.2%
Mortality Rates:	<p><i>Healthy Pre-Retirement:</i> PubG-2010 Employee Mortality Tables, amount-weighted, projected generationally with Scale MP-2020</p> <p><i>Healthy Post-Retirement:</i> PubG-2010 General Healthy Retiree Tables, amount-weighted, projected generationally with Scale MP-2020</p> <p><i>Disabled:</i> PubNS-2010 Non-Safety Disabled Retiree Tables, amount-weighted, projected generationally with Scale MP-2020</p>

Termination Rates before Retirement:

Age	Rate (%)				
	Mortality ¹		Withdrawal after 5 years of Service ³		
	Male	Female	Disability ²	Male	Female
20	0.037	0.013	0.1650	20.00	18.00
30	0.036	0.015	0.1650	15.00	12.00
40	0.066	0.036	0.1350	7.00	6.00
50	0.149	0.083	0.5250	7.00	6.00
60	0.319	0.186	0.0000	7.00	6.00
70	0.703	0.489	0.0000	7.00	6.00
80	1.730	1.330	0.0000	7.00	6.00
90	1.730	1.330	0.0000	7.00	6.00

¹ Mortality rates shown for base table.

² All disabilities are assumed to be Ordinary Disabilities.

³ For the first five years of service, turnover is as shown on the next page.

Section 4: Actuarial Valuation Basis

		Turnover during first five years of service		
		Rate %		
		Years of Service	Male	Female
		0 but less than 1	35.0	35.0
		1 but less than 2	30.0	25.0
		2 but less than 3	20.0	20.0
		3 but less than 4	20.0	20.0
		4 but less than 5	15.0	15.0
Retirement Rates:		Age	Rate %	
		Less than 60	30.0	
		60	40.0	
		61-65	30.0	
		65-69	40.0	
		70	100.0	
Weighted Average Retirement Age:	Age 60, determined as follows: The weighted average retirement age for each participant is calculated as the sum of the product of each potential current or future retirement age times the probability of surviving from current age to that age and then retiring at that age, assuming no other decrements. The overall weighted retirement age is the average of the individual retirement ages based on all the active participants included in the January 1, 2023 actuarial valuation.			
Retirement Age for Inactive Vested Participants:	62			
Payroll Increase:	2.25%			
Administrative Expenses:	0.2% of payroll			
Unknown Data for Participants:	Same as those exhibited by participants with similar known characteristics. If not specified, participants are assumed to be male.			
Benefit Election:	All participants are assumed to elect life only form of payment.			
Actuarial Value of Assets:	Market value of assets less unrecognized returns in each of the last five years. Unrecognized return is equal to the difference between the actual market return and the expected return on the actuarial value, and is recognized over a five-year period, further adjusted, if necessary, to be within 20% of the market value.			
Actuarial Cost Method:	Entry Age Actuarial Cost Method. Entry Age is the age at date of employment, or, if date is unknown, current age minus years of service. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are allocated by service, with Normal Cost determined using the plan of benefits applicable to each participant.			

Section 4: Actuarial Valuation Basis

Justification for Change in Actuarial Assumptions:

There have been no changes in actuarial assumptions since the last valuation.

Section 4: Actuarial Valuation Basis

Exhibit II: Summary of Plan Provisions

This exhibit summarizes the major provisions of the Plan included in the valuation. It is not intended to be, nor should it be interpreted as, a complete statement of all plan provisions.

Plan Year:	January 1 through December 31
Plan Status:	Ongoing
Normal Retirement:	
<u>Members Hired Prior to January 1, 2018</u>	
<i>Eligibility</i>	Age 65 and 5 years of service
<i>Amount</i>	2.5% of average compensation times creditable service for the first 25 years plus 4.0% of average compensation times creditable service thereafter
<i>Average Annual Compensation</i>	Average annual compensation for highest consecutive 60-month period.
<u>Members Hired on or After January 1, 2018</u>	
<i>Eligibility</i>	Age 65 and 5 years of service
<i>Amount</i>	2.5% of average compensation times creditable service
<i>Average Annual Compensation</i>	Average annual compensation for highest consecutive 60-month period.
Unreduced Early Retirement:	
<u>Members Hired Prior to January 1, 2018</u>	
<i>Eligibility</i>	Any age with 30 years of service or age plus service equals 80
<i>Amount</i>	Normal Retirement amount, unreduced
<u>Members Hired on or After January 1, 2018</u>	
<i>Eligibility</i>	Any age with 30 years of service, age 62 with 20 years of service, or age plus service equals 80
<i>Amount</i>	Normal Retirement amount, unreduced
Early Retirement:	
<i>Eligibility</i>	Age 60 and 10 years of service
<i>Amount</i>	Normal Retirement amount, reduced by 3% per year prior to age 62

Section 4: Actuarial Valuation Basis

Minimum Retirement Benefit:	\$3,600 per year for any member with at least 10 years of creditable service
Ordinary Disability:	
<i>Eligibility</i>	Any age with 10 years of service
<i>Amount</i>	75% of the benefit the member would have earned had they worked until age 65
Accidental Disability:	
<i>Eligibility</i>	Disability occurs as a result of an accident sustained while in the actual performance of duty, without willful negligence on the member's part
<i>Amount</i>	65% of the member's compensation for the 12 months preceding the accident, offset by any payments received from Workers Compensation
Vesting:	5 years of service
Spouse's Pre-Retirement Death Benefit:	
<u>Death while an Active Member</u>	
<i>Member had less than three years of service at date of death</i>	Refund of member contributions plus interest
<i>Member had at least three years of service at date of death</i>	Refund of member contributions plus interest plus 25% of the member's base pensionable earnings in the year preceding death plus 5% of the member's base pensionable earnings for each full year in excess of three years
<u>Death after Separation from Service</u>	
<i>Not Retirement Eligible</i>	Refund of member contributions plus interest
<i>Retirement Eligible</i>	Survivor's portion of 100% Joint and Survivor benefit with Pop-Up, payable as if member retired immediately prior to death
Post-Retirement Death Benefit:	Based on form of payment chosen by member upon retirement
DROP:	Members eligible for Normal Retirement or Unreduced Early Retirement may elect to defer receipt of their retirement benefits while continuing employment*. Upon the effective date of participating in the DROP, a member's years of service and Average Monthly Compensation become frozen for purposes of determining pension benefits. Additional service beyond the date of DROP participation no longer accrues any additional benefits under the Retirement System. Benefits that would have been payable are accumulated at interest to date of termination and paid in a single lump sum or in substantially equal payments over a period designated by the member but not to exceed 119 months. The interest rate shall be determined annually by the Trustees and credited as of each December 31 st . *Members with at least 10 years of creditable service as of January 1, 2018 have a maximum DROP period of five (5) years; all other members have a maximum DROP period of three (3) years.

Section 4: Actuarial Valuation Basis

Contribution Rates:

Member

6.0% of pensionable compensation

Employer

Actuarial Determined Contribution less member contributions

Future Benefit Increases

Participants who retired in 2022 under the Voluntary Retirement Option receive annual increases of 1% of monthly benefit plus an annual payment to the member or surviving beneficiary of \$50 for each full year of employment (\$1,000 minimum) for the 10-year period beginning January 1, 2022.

Changes in Plan Provisions:

The compensation for purposes of calculating a pension is no longer capped at \$150,000 and is now capped at the Internal Revenue Code Section 401(a)(17) limit.

Appendix A: Definition of Pension Terms

The following list defines certain technical terms for the convenience of the reader:

Actuarial Accrued Liability for Actives:	The equivalent of the accumulated normal costs allocated to the years before the valuation date.
Actuarial Accrued Liability for Retirees and Beneficiaries:	Actuarial Present Value of lifetime benefits to existing retirees and beneficiaries. This sum takes account of life expectancies appropriate to the ages of the annuitants and the interest that the sum is expected to earn before it is entirely paid out in benefits.
Actuarial Cost Method:	A procedure allocating the Actuarial Present Value of Future Benefits to various time periods; a method used to determine the Normal Cost and the Actuarial Accrued Liability that are used to determine the actuarially determined contribution.
Actuarial Gain or Loss:	A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions, during the period between two Actuarial Valuation dates. To the extent that actual experience differs from that assumed, Actuarial Accrued Liabilities emerge which may be the same as forecasted, or may be larger or smaller than projected. Actuarial gains are due to favorable experience, e.g., assets earn more than projected, salary increases are less than assumed, members retire later than assumed, etc. Favorable experience means actual results produce actuarial liabilities not as large as projected by the actuarial assumptions. On the other hand, actuarial losses are the result of unfavorable experience, i.e., actual results yield actuarial liabilities that are larger than projected.
Actuarially Equivalent:	Of equal Actuarial Present Value, determined as of a given date and based on a given set of Actuarial Assumptions.
Actuarial Present Value (APV):	The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions. Each such amount or series of amounts is: Adjusted for the probable financial effect of certain intervening events (such as changes in compensation levels, marital status, etc.) Multiplied by the probability of the occurrence of an event (such as survival, death, disability, withdrawal, etc.) on which the payment is conditioned, and Discounted according to an assumed rate (or rates) of return to reflect the time value of money.

Appendix A: Definition of Pension Terms

Actuarial Present Value of Future Benefits:	The Actuarial Present Value of benefit amounts expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age, anticipated future compensation, and future service credits. The Actuarial Present Value of Future Benefits includes the liabilities for active members, retired members, beneficiaries receiving benefits, and inactive members entitled to either a refund of member contributions or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would provide sufficient assets to pay all projected benefits and expenses when due.
Actuarial Valuation:	The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a plan, as well as Actuarially Determined Contributions.
Actuarial Value of Assets (AVA):	The value of the Plan's assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets, but commonly plans use a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the Actuarially Determined Contribution.
Actuarially Determined:	Values that have been determined utilizing the principles of actuarial science. An actuarially determined value is derived by application of the appropriate actuarial assumptions to specified values determined by provisions of the Plan.
Actuarially Determined Contribution (ADC):	The employer's periodic required contributions, expressed as a dollar amount or a percentage of covered plan compensation, determined under the Plan's funding policy. The ADC consists of the Employer Normal Cost and the Amortization Payment.
Amortization Method:	A method for determining the Amortization Payment. The most common methods used are level dollar and level percentage of payroll. Under the Level Dollar method, the Amortization Payment is one of a stream of payments, all equal, whose Actuarial Present Value is equal to the Unfunded Actuarial Accrued Liability. Under the Level Percentage of Pay method, the Amortization Payment is one of a stream of increasing payments, whose Actuarial Present Value is equal to the Unfunded Actuarial Accrued Liability. Under the Level Percentage of Pay method, the stream of payments increases at the assumed rate at which total covered payroll of all active members will increase.
Amortization Payment:	The portion of the pension plan contribution, or ADC, that is intended to pay off the Unfunded Actuarial Accrued Liability.

Appendix A: Definition of Pension Terms

Assumptions or Actuarial Assumptions:	<p>The estimates upon which the cost of the Plan is calculated, including:</p> <p><u>Investment return</u> - the rate of investment yield that the Plan will earn over the long-term future;</p> <p><u>Mortality rates</u> - the rate or probability of death at a given age for employees and retirees;</p> <p><u>Retirement rates</u> - the rate or probability of retirement at a given age or service;</p> <p><u>Disability rates</u> - the rate or probability of disability retirement at a given age;</p> <p><u>Withdrawal rates</u> - the rate or probability at which employees of various ages are expected to leave employment for reasons other than death, disability, or retirement;</p> <p><u>Salary increase rates</u> - the rates of salary increase due to inflation, real wage growth and merit and promotion increases.</p>
Closed Amortization Period:	<p>A specific number of years that is counted down by one each year, and therefore declines to zero with the passage of time. For example, if the amortization period is initially set at 20 years, it is 19 years at the end of one year, 18 years at the end of two years, etc. See Open Amortization Period.</p>
Decrements:	<p>Those causes/events due to which a member's status (active-inactive-retiree-beneficiary) changes, that is: death, retirement, disability, or withdrawal.</p>
Defined Benefit Plan:	<p>A retirement plan in which benefits are defined by a formula based on the member's compensation, age and/or years of service.</p>
Defined Contribution Plan:	<p>A retirement plan, such as a 401(k) plan, a 403(b) plan, or a 457 plan, in which the contributions to the plan are assigned to an account for each member, the plan's earnings are allocated to each account, and each member's benefits are a direct function of the account balance.</p>
Employer Normal Cost:	<p>The portion of the Normal Cost to be paid by the employer. This is equal to the Normal Cost less expected member contributions.</p>
Experience Study:	<p>A periodic review and analysis of the actual experience of the Plan that may lead to a revision of one or more actuarial assumptions. Actual rates of decrement and salary increases are compared to the actuarially assumed values and modified based on recommendations from the Actuary.</p>
Funded Ratio:	<p>The ratio of the Actuarial Value of Assets (AVA) to the Actuarial Accrued Liability (AAL). Plans sometimes also calculate a market funded ratio, using the Market Value of Assets (MVA), rather than the AVA.</p>

Appendix A: Definition of Pension Terms

GASB 67 and GASB 68:	Governmental Accounting Standards Board (GASB) Statements No. 67 and No. 68. These are the governmental accounting standards that set the accounting rules for public retirement systems and the employers that sponsor or contribute to them. Statement No. 68 sets the accounting rules for the employers that sponsor or contribute to public retirement systems, while Statement No. 67 sets the rules for the systems themselves.
Investment Return:	The rate of earnings of the Plan from its investments, including interest, dividends and capital gain and loss adjustments, computed as a percentage of the average value of the fund. For actuarial purposes, the investment return often reflects a smoothing of the capital gains and losses to avoid significant swings in the value of assets from one year to the next.
Net Pension Liability (NPL):	The Net Pension Liability is equal to the Total Pension Liability minus the Plan Fiduciary Net Position.
Normal Cost:	The portion of the Actuarial Present Value of Future Benefits and expenses allocated to a valuation year by the Actuarial Cost Method. Any payment with respect to an Unfunded Actuarial Accrued Liability is not part of the Normal Cost (see Amortization Payment). For pension plan benefits that are provided in part by employee contributions, Normal Cost refers to the total of member contributions and employer Normal Cost unless otherwise specifically stated.
Open Amortization Period:	An open amortization period is one which is used to determine the Amortization Payment but which does not change over time. If the initial period is set as 30 years, the same 30-year period is used in each future year in determining the Amortization Period.
Plan Fiduciary Net Position:	Market value of assets.
Total Pension Liability (TPL):	The actuarial accrued liability under the entry age normal cost method and based on the blended discount rate as described in GASB 67 and 68.
Unfunded Actuarial Accrued Liability:	The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. This value may be negative, in which case it may be expressed as a negative Unfunded Actuarial Accrued Liability, also called the Funding Surplus or an Overfunded Actuarial Accrued Liability.
Valuation Date or Actuarial Valuation Date:	The date as of which the value of assets is determined and as of which the Actuarial Present Value of Future Benefits is determined. The expected benefits to be paid in the future are discounted to this date.