Clayton County, Georgia Public Employee Retirement System

Actuarial Valuation Report as of July 1, 2021

January 2022

100 Galleria Parkway, SE
Suite 1060
Atlanta, GA 30339

January 14, 2022

Pension Board
Clayton County, Georgia
Public Employee Retirement System
112 Smith Street
Jonesboro, GA 30236

Members of the Board:

We are pleased to submit the results of the July 1, 2021 actuarial valuation of the Clayton County, Georgia Public Employee Retirement System (the System). The purpose of this report is to provide a summary of the funded status of the System as of July 1, 2021, and to verify that scheduled contributions will be sufficient to meet the minimum funding requirement for the fiscal year ending June 30, 2022. This report is a revision of the report dated November 19, 2021 and reflects revised asset data provided by Clayton County.

Use of this report for any other purpose may not be appropriate and may result in mistaken conclusions due to failure to understand applicable assumptions, methodologies, or inapplicability of the report for that purpose. Because of the risk of misinterpretation of actuarial results, you should ask Buck Global, LLC (Buck) to review any statement you wish to make on the results contained in this report. Buck will not accept any liability for any such statement made without prior review.

Summary of Valuation Results

It is the Board's funding policy to keep the System in compliance with the minimum funding requirements under Title 47, Chapter 20 of the Official Code of Georgia, which requires that contributions are sufficient to fund the annual cost of benefit accruals and amortize the unfunded liability within a 30-year period. This valuation determines that contributions of 24.71% (13.90% from the County and Water Authority, a 3.31% special budgeted contribution from the County and Water Authority, and 7.50% from Participants) are sufficient to meet the minimum contribution requirements based on the actuarial assumptions and methods used in the valuation.

As of July 1, 2021, the actuarial accrued liability was $782,922,539. This compares to the market value of assets of $573,580,302 (after an adjustment of $1,359,096 for pending refunds) and the actuarial value of assets of $501,131,466. The funded ratio as measured by the actuarial value of assets was 64.0% (vs. 60.1% one year ago).

Where presented, references to "funded ratio" and "unfunded accrued liability" typically are measured on an actuarial value of assets basis. It should be noted that the same measurements using market value of assets would result in different funded ratios and unfunded accrued liabilities. Moreover, 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 System if the System were to settle (i.e. purchase annuities) for a portion or all of its liabilities.

Under the plan sponsor’s funding policy of maintaining the System in compliance with the minimum funding requirements under Title 47, Chapter 20 of the Official Code of Georgia while contributing at least 13.9% of pay and no future expected gains or losses, future System contributions are expected to eventually remain level at 13.9% of pay and the funded status is expected to increase.

Future actuarial measurements may differ significantly from current measurements due to System experience differing 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 System provisions or applicable law. An analysis of the potential range of such future differences is beyond the scope of this valuation.

Summary of System Experience

The experience for the plan year ending June 30, 2021 produced an overall gain of $16,109,771. Below is a summary of the main sources of (gains) and losses during the year.

Investment performance	$	(19,222,429)
Retirement experience		3,827,111
New entrants		1,082,552
Mortality experience		(1,220,131)
Salary increases		512,580
Other		(1,089,454)

Census and Financial Data

This valuation was performed using June 30, 2021 employee and financial data supplied by Clayton County. Buck did not audit this data, although it was reviewed for reasonableness and consistency with the prior year’s information. The results of the valuation are dependent on the accuracy of the data.

Assessment of Risks

Actuarial Standard of Practice No. 51 (“ASOP 51”) applies to funding calculations such as those presented in this report and requires certain disclosures of potential risks. Schedule H contains an assessment of the key risks applicable to the System.

Use of Models

Actuarial Standard of Practice No. 56 (“ASOP 56”) provides guidance to actuaries when performing actuarial services with respect to designing, developing, selecting, modifying, using, reviewing, or evaluating models. Buck 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 System using data and assumptions as of the measurement date under the funding methods specified in this report. The output from the third-party vendor software is used as input to an internally developed model that applies applicable funding methods and policies to the liabilities derived and other inputs, such as System assets and contributions, to generate many of the exhibits found in this report. Buck 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 outputs and the internal model are similarly reviewed in detail and at a high level for accuracy, reasonability and consistency with prior results. Buck also reviews the third-party model when significant changes are made to the 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. If significant changes are made to the internal model, extra checking and review are completed. 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.

Changes in Actuarial Assumptions, Methods and Plan Provisions

The mortality improvement projection scale was updated from Scale MP-2019 to Scale MP-2020. The expected salary increase on July 1, 2021 was decreased from 6.75% to 3.00% for County participants. Otherwise, there were no changes in assumptions, methods, or plan provisions from the prior year.

Certification

The actuarial certification is included in Section VI of the report. I am available to answer any questions regarding the contents of this report. Kevin can be reached at 770-916-4184.

Respectfully submitted,

Buck Global, LLC (Buck)

Kevin Spanier, ASA, EA, MAAA, FCA
Director

Table of Contents

Section

Schedule

Section I - Summary of Principal Results

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

Valuation Date	7/1/2021	7/1/2020
Number of active participants	2,584	2,399
Annual compensation for year beginning on valuation date	$ 140,221,885	$ 135,357,544
Number of retired participants and beneficiaries	1,531	1,471
Annual retirement benefits	$ 46,612,834	$ 44,035,932
Number of former participants with deferred benefits	333	316
Present value of accrued benefits	$ 746,640,884	$ 722,335,963
Actuarial accrued liability	$ 782,922,539	$ 761,473,781
Assets:		
Market value	$ 573,580,302	$ 444,687,441
Actuarial value	$ 501,131,466	$ 457,324,804
Unfunded actuarial accrued liability	$ 281,791,073	$ 304,148,977
Amortization period for unfunded actuarial accrued liability	30 years	30 years
Contribution rates:		
Participants	7.50%	7.50%
County/Water Authority (normal)	13.90%	13.90%
County/Water Authority (special budgeted)	3.31%	5.33%
Total	24.71%	26.73%
County/Water Authority contribution rate:		
Normal cost	4.34%	4.85%
Amortization of unfunded actuarial accrued liability	9.56%	9.05%
Special budgeted contribution	3.31%	5.33%
Total	17.21%	19.23%

Section II - Participant Data

All full-time employees and elected officials of Clayton County and the Clayton County Water Authority are covered under the System. The valuation included 2,584 active participants as of July 1, 2021 with annual compensation on July 1, 2021 totaling $140,221,885.

The following table shows the number of retired participants and beneficiaries of deceased participants and their annual retirement benefits as of July 1, 2021.

Group	Number	Benefits
Normal and Early Retirements	1,292	$ 42,130,006
Beneficiaries of Deceased Participants	178	3,251,143
Disability Retirements	61	1,231,685
Total	1,531	$ 46,612,834

In addition, there are 333 former participants entitled to deferred annual benefits totaling $4,834,289.

Section III - Assets

- The amount of assets taken into account in this valuation is based on the unaudited financial statements provided by Clayton County.
- The market value of assets as of July 1, 2021 was $573,580,302. The market return for the plan year ending June 30, 2021 was approximately 31.84%. The actuarial value of assets as of July 1, 2021 was $501,131,466. Schedule B shows the development of the actuarial value of assets as of July 1, 2021.
- Schedule C shows the reconciliation of the market value of asset balances from July 1, 2020 to July 1, 2021.

Section IV - Comments on Valuation

- Schedule A outlines the results of the valuation. The System has total actuarial accrued liabilities of $782,922,539. Of this amount, $560,660,850 is for benefits payable to retired participants, beneficiaries and former participants entitled to deferred vested benefits, and $222,261,689 is for active members' benefits expected to be paid based on service as of the valuation date. The System has an actuarial value of assets of $501,131,466 as of July 1, 2021. The difference of $281,791,073 is the unfunded actuarial accrued liability as of July 1, 2021.
- The regular contributions to the System consist of normal cost contributions and unfunded accrued liability amortization contributions. The normal cost contribution covers the cost of benefits accruing and System administrative expenses expected to be paid during the upcoming year. The normal cost contribution rate for the County and Water Authority participants combined is 11.84% of compensation (4.34% County/Water Authority and 7.50% participants) of payroll. This compares to 12.35% of payroll last year.
- Another measure of the funding is the present value of the benefits accrued as of the valuation date. This value does not include any allowance for future salary increases affecting the benefits earned to date. This amount is $746,640,884. When compared to the market value of assets of $573,580,302, the System has insufficient assets to cover the present value of its accrued benefits.
- For the year ending June 30, 2021, the System experienced an overall actuarial gain of $16,109,771. This gain is due to the net effect of a gain on the actuarial value of assets of $19,222,429 offset by a liability loss of $3,112,658. Schedule D shows the development of this loss.

Section V - Contributions Payable under the Retirement System

The following table summarizes the contribution rates based on the July 1, 2021 valuation

Contribution	Percentage of Compensation
Payable by:	
Participants	7.50
County and Water Authority (regular)	13.90
County and Water Authority (special budgeted)	3.31
Total	24.71
Rate Applied To:	
Normal Cost	11.84
Amortization of Unfunded Actuarial Accrued Liability	12.87
Total	24.71

Section VI – Enrolled Actuary's Statement

The actuarial assumptions used to value the System for funding purposes were selected by the System sponsor in consultation with us based on a recently-completed experience study for the period July 1, 2014 to June 30, 2019. All assumptions represent our best estimate of anticipated experience under the System. Based on the foregoing, the cost results and actuarial exhibits for funding presented in this report were determined on a consistent and objective basis in accordance with applicable Actuarial Standards of Practice and generally accepted actuarial procedures.

To the best of my knowledge, the information in this report is complete and accurate and meets the requirements and intent of Georgia Public Retirement System Law, Code Title 47, Chapter 20. The Clayton County, Georgia Public Employees Retirement System is in compliance with the Minimum Funding Standards specified in Code Section 47-20-10, and meets the funding policy of the System's Board, which is to maintain the System's compliance with such standards.

The report was prepared under the supervision of Kevin Spanier, the plan's Enrolled Actuary. Kevin is an Associate of the Society of Actuaries and a member of the American Academy of Actuaries and has met the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

Buck Global, LLC (Buck)

Kevin Spanier, ASA, EA, MAAA, FCA
Director
Enrolled Actuary Number 20-08105

Schedule A - Results of the Valuation Prepared as of July 1, 2021

1.	Actuarial Accrued Liabilities		
	Present Value of Prospective Benefits Payable in Respect of:		
	(a) Active participants	$	222,261,689
	(b) Retired participants, beneficiaries, and former participants entitled to deferred vested benefits		560,660,850
	(c) Total	$	782,922,539
2.	Actuarial Value of Assets		501,131,466
3.	Unfunded Actuarial Accrued Liability [1(c) minus 2]	$	281,791,073

Schedule B - Development of July 1, 2021 Actuarial Value of Assets

(1)	Market Value of Assets on July 1, 2020 including Contributions Receivable	$ 444,687,441
(2)	Net Cash Flow	
	a. Contributions from Employer and Participants plus increase/(decrease) in Contributions Receivable	37,776,590
	b. Benefits and Administrative Expenses[1]	48,737,377
	c. Net Cash Flow (2)a - (2)b	$ (10,960,787)
(3)	Expected Investment Return, Net of Investment Expenses [(1) x .0775] + [(2)c x .03875]	$ 34,038,546
(4)	Expected Market Value of Assets on July 1, 2021 including Contributions Receivable (1) + (2)c + (3)	$ 467,765,200
(5)	Market Value of Assets on July 1, 2021, including Contributions Receivable	$ 573,580,302
(6)	Gain/(Loss) on Market Value of Assets (5) - (4)	$ 105,815,102
(7)	Deferred Gains/(Losses) as of July 1, 2021	

	Total Gain/(Loss)	Amount Deferred
Plan Year Ending June 30, 2021	$ 105,815,102	$ 84,652,082
Plan Year Ending June 30, 2020	(16,344,77)	(9,806,686)
Plan Year Ending June 30, 2019	(5,506,641)	(2,202,656)
Plan Year Ending June 30, 2018	(969,522)	(193,904)
		$ 72,448,836

(8)	Preliminary Actuarial Value of Assets on July 1, 2021 (5) - (7)	$ 501,131,466
(9)	80% of Market Value .80 x (5)	$ 458,864,241
(10)	120% of Market Value 1.20 x (5)	$ 688,296,362
(11)	Actuarial Value of Assets on July 1, 2021 Lesser of (10) and maximum of (8) and (9)	$ 501,131,466

[1] Unpaid Pending Refunds amount of $1,530,654 was subtracted from the July 1, 2020 Market Value of Assets, and $1,359,096 was subtracted from the July 1, 2021 Market Value of Assets. The difference of $171,558 was subtracted from the annual disbursements during the year.

Schedule C - Assets of the Retirement System

Reconciliation of Market Value of Assets

Receipts		
Employer and Participant Contributions		$ 37,776,590
Investment Income		
Interest and Dividends	$ 6,157,691	
Net Appreciation (Depreciation) in Fair Value of Investments	133,695,957	
Total Investment Income		139,853,648
Total Receipts		$ 177,630,238
Disbursements		
Benefits Paid		$ 48,408,800
Change in Pending Refunds[1]		(171,558)
Administrative Expenses		500,135
Total Disbursements		$ 48,737,377
Excess of Receipts Over Disbursements		$ 128,892,861
Reconciliation of Asset Balances		
Market Value at July 1, 2020, including contributions receivable		$ 444,687,441
Excess of Receipts Over Disbursements		128,892,861
Market Value at July 1, 2021, including contributions receivable		$ 573,580,302

[1] Unpaid Pending Refunds amount of $1,530,654 was subtracted from the July 1, 2020 Market Value of Assets, and $1,359,096 was subtracted from the July 1, 2021 Market Value of Assets. The difference of $171,558 was subtracted from the annual disbursements during the year.

Schedule D - Development of Experience Gain/(Loss)

1.	Actual Unfunded Accrued Liability as of July 1, 2020		$ 304,148,977
2.	Expected Change in Unfunded Liability During Plan Year Ending June 30, 2021		
	a. Total Normal Cost (beginning of year)	$ 15,893,200	
	b. Assumption Changes	(7,731,483)	
	c. Plan Changes	0	
	d. Interest on Normal Cost and Unfunded Liability	24,803,269	
	e. Actual Employer and Participant Contributions with Interest	(39,213,119)	
	f. Total Expected Change	$ (6,248,133)	
3.	Expected Unfunded Accrued Liability as of July 1, 2021		$ 297,900,844
4.	Actual Unfunded Accrued Liability as of July 1, 2021		$ 281,791,073
5.	Experience Gain/(Loss)[1] (3) – (4)		$ 16,109,771

[1] Liability related portion of experience Gain/(Loss): $ (3,112,658)
Asset related portion of experience Gain/(Loss): $ 19,222,429

Schedule E - Outline of Actuarial Assumptions and Methods

Interest Rate

7.75% per annum, net of investment expenses.

Separations before Retirement – Hired Before 1/1/2016

Representative values of the assumed annual rates of withdrawal and disability are as follows:

County

	Annual Rate of:				
	Withdrawal				Disability
Age	Years 0-1	Years 1-2	Years 2-6	Years 7+	
25	20.00%	16.00%	10.00%	9.50%	.07%
30	20.00	16.00	10.00	9.50	.08
35	20.00	16.00	10.00	8.25	.09
40	20.00	16.00	10.00	5.25	.11
45	20.00	16.00	10.00	4.50	.16
50	20.00	16.00	10.00	4.50	.24
55	20.00	16.00	10.00	3.25	.40
60	20.00	16.00	10.00	3.00	.84
64	20.00	16.00	10.00	3.00	1.49

Water

	Annual Rate of:				
	Withdrawal				Disability
Age	Years 0-1	Years 1-2	Years 2-6	Years 7+	
25	15.00%	7.00%	7.00%	6.25%	.07%
30	15.00	7.00	7.00	4.25	.08
35	15.00	7.00	7.00	4.25	.09
40	15.00	7.00	7.00	3.50	.11
45	15.00	7.00	7.00	2.50	.16
50	15.00	7.00	7.00	2.00	.24
55	15.00	7.00	7.00	2.00	.40
60	15.00	7.00	7.00	2.00	.84
64	15.00	7.00	7.00	2.00	1.49

Schedule E - Outline of Actuarial Assumptions and Methods (continued)

Separations before Retirement – Hired on or After 1/1/2016

Representative values of the assumed annual rates of withdrawal and disability are as follows:

County

	Annual Rate of:				
	Withdrawal				Disability
Age	Years 0-1	Years 1-2	Years 2-9	Years 10+	
25	20.00%	16.00%	10.00%	9.50%	.07%
30	20.00	16.00	10.00	9.50	.08
35	20.00	16.00	10.00	8.25	.09
40	20.00	16.00	10.00	5.25	.11
45	20.00	16.00	10.00	4.50	.16
50	20.00	16.00	10.00	4.50	.24
55	20.00	16.00	10.00	3.25	.40
60	20.00	16.00	10.00	3.00	.84
64	20.00	16.00	10.00	3.00	1.49

Water

	Annual Rate of:				
	Withdrawal				Disability
Age	Years 0-1	Years 1-2	Years 2-9	Years 10+	
25	15.00%	7.00%	7.00%	6.25%	.07%
30	15.00	7.00	7.00	4.25	.08
35	15.00	7.00	7.00	4.25	.09
40	15.00	7.00	7.00	3.50	.11
45	15.00	7.00	7.00	2.50	.16
50	15.00	7.00	7.00	2.00	.24
55	15.00	7.00	7.00	2.00	.40
60	15.00	7.00	7.00	2.00	.84
64	15.00	7.00	7.00	2.00	1.49

Schedule E - Outline of Actuarial Assumptions and Methods (continued)

Rates of Retirement – Hired Before 1/1/2016

Representative values of the assumed annual rates of early and normal retirement are as follows:

	Annual Rate of Retirement					
	Safety			General		
	Years 7-14	Years 15-24	Years 25+	Years 7-14	Years 15-24	Years 25+
50			.100			.040
51			.100			.040
52			.225			.120
53			.400			.180
54			.475			.300
55		.175	.625		.950	.300
56		.175	.250		.950	.300
57		.175	.250		.950	.300
58		.175	.250		.950	.100
59		.175	.250		.950	.250
60	.400	.400	.400	.225	.275	.275
61	.400	.400	.400	.125	.175	.330
62	.400	.400	.400	.220	.275	.330
63	.600	.600	.600	.125	.275	.330
64	.600	.600	.600	.150	.275	.330
65	1.000	1.000	1.000	.500	.600	.600
66	1.000	1.000	1.000	.300	.300	.300
67	1.000	1.000	1.000	.300	.300	.300
68	1.000	1.000	1.000	.300	.300	.300
69	1.000	1.000	1.000	.300	.300	.300
70	1.000	1.000	1.000	1.000	1.000	1.000

Note: Employees who terminate with a vested benefit and greater than 15 years of service are assumed to commence at age 55 with a subsidized early retirement pension. Other deferred vested employees are assumed to commence at normal retirement age.

Schedule E - Outline of Actuarial Assumptions and Methods (continued)

Rates of Retirement – Hired on or After 1/1/2016

Representative values of the assumed annual rates of early and normal retirement are as follows:

	Annual Rate of Retirement					
	Safety			General		
	Years 10-14	Years 15-24	Years 25+	Years 10-14	Years 15-24	Years 25+
50			.100			
51			.100			
52			.225			
53			.400			
54			.475			
55		.175	.625			.300
56		.175	.250			.300
57		.175	.250			.300
58		.175	.250			.100
59		.175	.250			.250
60	.400	.400	.400	.225	.275	.275
61	.400	.400	.400	.125	.175	.330
62	.400	.400	.400	.220	.275	.330
63	.600	.600	.600	.125	.275	.330
64	.600	.600	.600	.150	.275	.330
65	1.000	1.000	1.000	.500	.600	.600
66	1.000	1.000	1.000	.300	.300	.300
67	1.000	1.000	1.000	.300	.300	.300
68	1.000	1.000	1.000	.300	.300	.300
69	1.000	1.000	1.000	.300	.300	.300
70	1.000	1.000	1.000	1.000	1.000	1.000

Note: Employees who terminate with a vested benefit and greater than 15 years of service are assumed to commence at age 60 with a subsidized early retirement pension. Other deferred vested employees are assumed to commence at normal retirement age.

Schedule E - Outline of Actuarial Assumptions and Methods (continued)

Salary Increases

County Employees

Valuation Year beginning 7/1/2021:	3.00%
Valuation Year beginning 7/1/2022:	5.75%
Valuation Years beginning 7/1/2023 and thereafter:	4.75%

Water Employees

4.00%

Mortality

Non-Safety Retirees

Pub-2010 Amount Weighted General Retiree Below-Median table with a load of 2.85%, projected with Mortality Improvement Scale MP-2020

Non-Safety Non-annuitants

Pub-2010 Amount Weighted General Employees Below-Median table, projected with Mortality Improvement Scale MP-2020

Non-Safety Disabled Participants

Pub-2010 Amount Weighted Non-Safety Disabled Retiree table, projected with Mortality Improvement Scale MP-2020

Safety Retirees

Pub-2010 Amount Weighted Public Safety Retiree Below-Median table, projected with Mortality Improvement Scale MP-2020

Safety Non-Annuitants

Pub-2010 Amount Weighted Public Safety Employee Below-Median table, projected with Mortality Improvement Scale MP-2020

Safety Disabled Participants

Pub-2010 Amount Weighted Public Safety Disabled Retiree table, projected with Mortality Improvement Scale MP-2020

Survivor Beneficiaries

Pub-2010 Amount Weighted Contingent Survivor Below-Median table, projected with Mortality Improvement Scale MP-2020

Future Administrative Expenses

Administrative expenses are assumed to be 0.350% of payroll.

Schedule E - Outline of Actuarial Assumptions and Methods (continued)

Frequency of optional payment forms

30% of retirees elect a 5-year certain and life form of payment.
20% of retirees elect a 10-year certain and life form of payment.
20% of retirees elect a joint & survivor 50% form of payment.
30% of retirees elect a joint & survivor 100% form of payment.

Loading or Contingency Reserves

A 2.00% load on active liabilities is applied to reflect potential use of accumulated sick leave upon retirement

Spouses

Males are assumed to be three years older than their spouse and females are assumed to be the same age as their spouse.

It is assumed that 85% of the males are married and 65% of females are married.

Valuation Assets

Actuarial Value, as developed in Schedule B. The actuarial value of assets is based on a 5-year smoothing of market value gains and losses. The actuarial value of assets is limited to a range between 80% and 120% of market value.

Schedule E - Outline of Actuarial Assumptions and Methods (continued)

Valuation Funding Method

- Projected unit credit cost method. Gains and losses are reflected in the unfunded actuarial accrued liability.
- The unfunded accrued liability is amortized over an open period of 30 years. Amortization payments increase annually by assumed inflation. Since the minimum contribution used for compliance with Georgia statute is determined based upon a 30-year amortization approach that restarts each year, absent contributions being made in excess of the minimum contribution or future actuarial gains, the emerging unfunded accrued liability will not be amortized. However, the System is funded based on a fixed 13.9% of pay plus any special budgeted percentage of pay needed to meet the minimum contribution under Georgia statute. It is expected as the funded status of the System improves, the 13.9% of pay contribution will be greater than the minimum contribution under Georgia statute and excess contributions will be created and eventually eliminate the unfunded accrued liability.
- Projected benefits were limited by the dollar limitation required by the Internal Revenue Code Section 415 as it applies to governmental plans and compensation limited by Section 401(a)(17).

Inflation

2.75% per annum (used for the amortization of unfunded actuarial accrued liability).

Contribution Timing

Employee contributions are assumed to occur bi-weekly and County contributions quarterly.

Historical Assumption Changes

Effective 7/1/2021

Salary Increases

Prior Year:

County Employees

Valuation Years beginning 7/1/2020 & 7/1/2021:	6.75%
Valuation Year beginning 7/1/2022:	5.75%
Valuation Years beginning 7/1/2023 and thereafter:	4.75%

Water Employees

Valuation Years beginning 7/1/2020 and thereafter:	4.00%

Current Year:

County Employees

Valuation Year beginning 7/1/2021:	3.00%
Valuation Year beginning 7/1/2022:	5.75%
Valuation Years beginning 7/1/2023 and thereafter:	4.75%

Water Employees

Valuation Years beginning 7/1/2020 and thereafter:	4.00%

Mortality Improvement Scale

Prior Year: Scale MP-2019

Current Year: Scale MP-2020

Schedule E - Outline of Actuarial Assumptions and Methods (continued)

Effective 7/1/2020[1]

Interest Rate

Prior Year: 8.00% per annum, net of investment expenses.

Current Year: 7.75% per annum, net of investment expenses.

Retirement & Withdrawal Rates

Rates of retirement and withdrawal have been updated as a result of the experience study.

Salary Increases

Prior Year: 3% per annum through 6/30/2023, and 4% per annum thereafter.

Current Year:

County Employees

Valuation Years beginning 7/1/2020 & 7/1/2021:	6.75%
Valuation Year beginning 7/1/2022:	5.75%
Valuation Years beginning 7/1/2023 and thereafter:	4.75%

Water Employees

Valuation Years beginning 7/1/2020 and thereafter:	4.00%

Mortality for Healthy Annuitants

Prior Year: RP2014 Blue Collar mortality table rolled back to 2010, with a load of 7.75%, and projected with fully generational mortality improvements based on the Buck Modified MP2018 projection scale.

Current Year: Non-Safety Retirees:
Pub-2010 Amount Weighted General Retiree Below-Median table with a load of 2.85%, projected with Mortality Improvement Scale MP-2019

Safety Retirees:
Pub-2010 Amount Weighted Public Safety Retiree Below-Median table, projected with Mortality Improvement Scale MP-2019

Mortality for Healthy Non-annuitants

Prior Year: RP2014 Blue Collar mortality table rolled back to 2010 and projected with fully generational mortality improvements based on the Buck Modified MP2018 projection scale.

Current Year: Non-Safety:
Pub-2010 Amount Weighted General Employees Below-Median table, projected with Mortality Improvement Scale MP-2019

Safety:
Pub-2010 Amount Weighted Public Safety Employee Below-Median table, projected with Mortality Improvement Scale MP-2019

[1] Based on an experience study for the period July 1, 2014 to June 30, 2019.

Schedule E - Outline of Actuarial Assumptions and Methods (continued)

Mortality for Disabled Participants

Prior Year:	RP2014 Disabled mortality table rolled back to 2010 and projected with fully generational mortality improvements based on the Buck Modified MP2018 projection scale.
Current Year:	Non-Safety: Pub-2010 Amount Weighted Non-Safety Disabled Retiree table, projected with Mortality Improvement Scale MP-2019 Safety: Pub-2010 Amount Weighted Public Safety Disabled Retiree table, projected with Mortality Improvement Scale MP-2019

Mortality for Contingent Beneficiaries

Prior Year:	The applicable participant mortality was applied to any contingent beneficiaries.
Current Year:	Pub-2010 Amount Weighted Contingent Survivor Below-Median table, projected with Mortality Improvement Scale MP-2019

Future administrative expenses

Prior Year:	Expenses assumed to be 0.325% of payroll.
Current Year:	Expenses assumed to be 0.350% of payroll.

Loading or Contingency Reserves

Prior Year:	A 0.10% load on active liabilities is applied to reflect potential use of accumulated sick leave upon retirement.
Current Year:	A 2.00% load on active liabilities is applied to reflect potential use of accumulated sick leave upon retirement.

Spouses

Prior Year:	The male is assumed to be three years older than the female, and it is assumed that 85% of the participants are married.
Current Year:	Males are assumed to be three years older than their spouse and females are assumed to be the same age as their spouse. It is assumed that 85% of the males are married and 65% of females are married.

Frequency of optional payment forms

Prior Year:	100% of retirees elect the normal form of payment (5-year certain and life).
Current Year:	30% of retirees elect a 5-year certain and life form of payment. 20% of retirees elect a 10-year certain and life form of payment. 20% of retirees elect a joint & survivor 50% form of payment. 30% of retirees elect a joint & survivor 100% form of payment.

Inflation

Prior Year:	3.00% per annum (used for the amortization of unfunded actuarial liability).
Current Year:	2.75% per annum (used for the amortization of unfunded actuarial liability).

Schedule E - Outline of Actuarial Assumptions and Methods (continued)

Effective 7/1/2019

Mortality for Healthy Annuitants

Prior Year: RP2014 Blue Collar mortality table rolled back to 2010, with a load of 7.75%, and projected with fully generational mortality improvements based on the Buck Modified MP2017 projection scale.

Current Year: RP2014 Blue Collar mortality table rolled back to 2010, with a load of 7.75%, and projected with fully generational mortality improvements based on the Buck Modified MP2018 projection scale.

Mortality for Healthy Non-annuitants

Prior Year: RP2014 Blue Collar mortality table rolled back to 2010 and projected with fully generational mortality improvements based on the Buck Modified MP2017 projection scale.

Current Year: RP2014 Blue Collar mortality table rolled back to 2010 and projected with fully generational mortality improvements based on the Buck Modified MP2018 projection scale.

Mortality for Disabled Participants

Prior Year: RP2014 Disabled mortality table rolled back to 2010 and projected with fully generational mortality improvements based on the Buck Modified MP2017 projection scale.

Current Year: RP2014 Disabled mortality table rolled back to 2010 and projected with fully generational mortality improvements based on the Buck Modified MP2018 projection scale.

Effective 7/1/2018

None

Effective 7/1/2017

Mortality for Healthy Annuitants

Prior Year: RP2014 blue collar base rates with a load of 7.75% with fully generational mortality improvements based on the Modified Buck MP2014 projection scale.

Current Year: RP2014 Blue Collar mortality table rolled back to 2010, with a load of 7.75%, and projected with fully generational mortality improvements based on the Buck Modified MP2017 projection scale.

Mortality for Healthy Non-annuitants

Prior Year: RP2014 blue collar base rates with fully generation mortality improvements based on the Modified Buck MP2014 projection scale.

Current Year: RP2014 Blue Collar mortality table rolled back to 2010 and projected with fully generational mortality improvements based on the Buck Modified MP2017 projection scale.

Mortality for Disabled Participants

Prior Year: RP2014 disabled base rates with Modified Buck MP 2014 projection scale.

Current Year: RP2014 Disabled mortality table rolled back to 2010 and projected with fully generational mortality improvements based on the Buck Modified MP2017 projection scale.

Mortality for Disabled Participants

Prior Year: RP2014 disabled base rates with Modified Buck MP 2014 projection scale.

Current Year: RP2014 Disabled mortality table rolled back to 2010 and projected with fully generational mortality improvements based on the Buck Modified MP2017 projection scale.

Schedule E - Outline of Actuarial Assumptions and Methods (continued)

Effective 7/1/2016

For new members hired after January 1, 2016, assumed rates of retirement and termination were implemented to correspond with the new vesting and retirement eligibility requirements. Sample rates of retirement and termination are shown above.

Effective 7/1/2015

The mortality table for healthy participants was changed to the RP2014 blue collar base rates with a load of 7.75% with fully generational mortality improvements based on the Modified Buck MP 2014 projection scale. For non-annuitants, the mortality table was changed to RP2014 blue collar base rates with fully generation mortality improvements based on the Modified Buck MP 2014 projection scale. The mortality table for disabled participants was changed RP2014 disabled base rates with Modified Buck MP 2014 projection scale. The assumption for Future Administration expenses was changed to 0.325% of payroll.

Effective 7/1/2014

The assumed rates of salary increase were adjusted to 2.00% for 4 years, 3.00% for the next 5 years, and 4.00% thereafter. The mortality table for healthy participants was changed to the RP-2000 blue collar base rates increased by 7.5% to reflect actual plan experience, generationally projected using Scale BB for annuitants and the RP-2000 blue collar base rates, generationally projected using Scale BB for non-annuitants. The mortality table for disabled participants was changed to the RP-2000 disabled mortality table. The assumed rates of retirement and termination were changed to better reflect anticipated experience. The asset valuation method was changed to reflect a 5-year smoothing of market value gains and losses beginning with gains and losses for the period July 1, 2013 – June 30, 2014. The Actuarial Value of Assets is limited to an 80% - 120% market value corridor.

Effective 7/1/2013

The assumed rates of salary increase were adjusted from 3% for the next 9 years and 4% thereafter to 0% for the upcoming year for County employees, 2% for the upcoming year for Water Authority employees, 3% for the next 9 years for all employees and 4% thereafter for all employees. The mortality table was changed to the RP 2000 Mortality Table with a 10% load projected to the year 2019 with Blue Collar adjustment.

Effective 7/1/2012

The assumed rates of salary increase were adjusted from 3% for the next 10 years and 4% for the following 20 years to 0% for the upcoming year for County employees, 1% for the upcoming year for Water Authority employees, 3% for the next 9 years for all employees and 4% thereafter for all employees. The mortality table was changed to the RP 2000 Mortality Table with a 10% load projected to the year 2018 with Blue Collar adjustment.

Schedule E - Outline of Actuarial Assumptions and Methods (continued)

Effective 7/1/2011

The mortality table was changed from the RP 2000 Mortality Table with Blue Collar adjustments to the RP 2000 Mortality Table with a 10% load projected to the year 2017 with Blue Collar adjustment; the assumed rates of salary increase was adjusted from a flat 4% to 0% for the upcoming year, 3% for the next 10 years and 4% thereafter; and the assumed rate of inflation used as an amortization adjustment was changed from a flat 4% to 3% for the next 11 years and 4% thereafter.

Effective 7/1/2009

The salary scale assumption decreased from 5.3% annually to 4.0% annually.

Effective 7/1/2008

The mortality table for employees (both before and after retirement) changed from the 1983 Group Annuity Mortality Table to the RP-2000 Mortality Table with Blue Collar Adjustment.

Effective 7/1/2004

The expense assumption has been lowered to .20% of payroll to reflect true level of administrative expense. The retirement table has been changed to produce expected results that more closely match recent experience. The salary scale has increased from 5.0% to 5.3%.

Effective 7/1/2003

The mortality table for employees (both before and after retirement) changed from the 1971 Group Annuity Mortality Table set back 1 year to the 1983 Group Annuity Mortality Table. The withdrawal table for employees changed to a 3-year select-and-ultimate table to reflect recent plan experience.

Effective 7/1/2001

The mortality table has been set back one year.

Schedule F - Summary of the Main Benefit and Contribution Provisions

Effective Date

July 1, 1971.

Plan Year and Fiscal Year

July 1 to June 30.

Type of Plan

A cost-sharing multiple-employer defined benefit pension plan administered by a public employee retirement system funded by the System sponsors (Clayton County and the Clayton County Water Authority) and Participant contributions.

Employees Covered

Full-time employees, including Commissioners, persons appointed by Commissioners, judicial secretaries, Probate Court Judge, magistrate, Court Clerks, Sheriff and Chief Deputy, Tax Commissioner and Deputy, and Water Authority employees and appointees.

Effective November 1, 2010, any employee who is enrolled or becomes an active participant or member in the Employees Retirement System of Georgia or the Georgia State Employees' Pension and Savings Plan (or any successor plan) will not be covered under this System. This amendment was not reflected in the July 1, 2010 valuation.

Effective July 1, 2012, State Court Law Clerks are now eligible to participate in the System.

Credited Service

Service from employment. Effective January 1, 1999, each Participant's sick leave in excess of the allowable amount, as of the last pay period of each calendar year, shall be placed in reserve status to be used in determining Credited Service at the Participant's termination of employment. Certain employees' service with The City of Forest Park Water and Sewer Department is included as Credited Service.

Normal Retirement Benefit

Eligibility – Hired Before 1/1/2016

The earlier of age 60 and 7 years of participation (5 years of participation for sworn safety personnel hired prior to June 1, 2001), or age 55 and 25 years of credited service. Effective January 1, 1999, a Participant may elect to apply sick leave reserve as an age credit in determining the attainment of Normal Retirement Age.

Eligibility – Hired on or After 1/1/2016

General Members

- Normal retirement at age 62 with 10 years of service

Public Safety Members

- Normal retirement at age 60 with 10 years of service or 55 with 25 years of service

Schedule F - Summary of the Main Benefit and Contribution Provisions (continued)

Basic Monthly Benefit

2.5% of average monthly salary multiplied by years of credited service up to 32.

For members hired before January 1, 2016, average monthly compensation is based on the 36 highest consecutive months of service during the last 60 months of service. For members hired on or after January 1, 2016, average monthly compensation is based on the last 60 months of service.

Cost of Living Adjustments

Annual 2.0% cost of living increase effective beginning July 1, 2009 for those who have received their 84th monthly benefit payment prior to July 1.

For new employees hired after 1/1/2016, COLA is discretionary and provided on an ad-hoc basis.

Early Retirement Benefit

Eligibility – Hired Before 1/1/2016

The earlier of age 50 and 25 years of credited service or age 55 and 15 years of credited service.

Eligibility – Hired on or After 1/1/2016

General Members

- Early retirement at age 60 with 15 years of service or age 55 with 25 years of service

Public Safety Members

- Early retirement at age 55 with 15 years of service or age 50 with 25 years of service

Benefit

If the participant has 25 years of credited service, the benefit is reduced 1/2% for each month age is less than 55. If the participant has less than 25 years of credited service, the benefit is reduced 1/2% for each month age is less than 60.

Disability Retirement

Eligibility

3 years of credited service for in line-of-duty; 7 years of credited service for other than in line-of-duty if hired prior to 1/1/2016; 10 years of credited service for other than in line-of-duty if hired on or after 1/1/2016.

Benefit

The greater of 30% of participants' monthly rate of compensation as of the date of disability and participants' accrued benefit as of disability retirement date, unreduced for early commencement.

Late Retirement Benefit

Eligibility

Retirement after eligibility for normal retirement.

Benefit

Normal retirement benefit based on average monthly salary and service at actual date of retirement.

Schedule F - Summary of the Main Benefit and Contribution Provisions (continued)

Deferred Vested Benefit

Eligibility – Hired Before 1/1/2016

7 years of credited service.

Eligibility – Hired on or After 1/1/2016

10 years of credited service.

Benefit

100% of accrued benefit commencing at normal retirement age. If the member has 15 years of credited service, he/she may receive a reduced benefit commencing at early retirement age.

Pre-Retirement Death Benefit

In Line-of-Duty

Eligibility

Participation in the System.

Benefit

Survivor portion of the 50% Joint and Survivor benefit payable immediately (unreduced for early commencement) if married. If not married, payments are unreduced and paid for 60 months.

Other than Line-of-Duty

Eligibility

7 years of service.

Benefit

Same as in line-of-duty benefit if greater than age 50. If under age 50, 50% of the deferred vested benefit reduced for early retirement payable at early retirement date if married. If not married, the benefit reduced for early retirement is paid for 60 months starting at early retirement age.

Excess Benefits for Water Authority

Participants Only

Benefits in excess of the Internal Revenue Code 415 (m) limits are funded by the Water Authority as the benefits become payable but are not included in the valuation.

Normal Form of Payment

5 years certain and life annuity.

Optional Forms of Payment

- 100%, 75%, or 50% joint and survivor annuity
- Life annuity with 120 months certain

Schedule F - Summary of the Main Benefit and Contribution Provisions (continued)

Participant Contributions

Each participant contributes 7.5% of compensation beginning July 1, 2015. Contribution rate from July 1, 2006 through June 30, 2014 was 5.5% of compensation. Contribution rate from August 8, 1998 through June 30, 2006 was 3.5% of compensation and for July 1, 1995 through August 7, 1998 was 2.0% of compensation. If a participant terminates employment before meeting the requirements for any of the above benefits, he/she is entitled to receive a return of his/her contributions with 5% interest.

Any participant or beneficiary may elect to receive a refund of contributions with interest in lieu of any other benefit payable under the System.

Participant contributions are "picked-up" by the County (i.e., taken out of pre-tax income).

Historical Provision Changes

<u>Effective 7/1/2016</u>

For new members hired after January 1, 2016:

- 10-year vesting
- Final average compensation based on final 5 years of service
- Discretionary, ad-hoc COLA
- Change in normal and early retirement eligibility:

  General Members
    - Early retirement at age 60 with 15 years of service or age 55 with 25 years of service
    - Normal retirement at age 62 with 10 years of service

  Public Safety Members
    - Early retirement at age 55 with 15 years of service or age 50 with 25 years of service
    - Normal retirement at age 60 with 10 years of service or 55 with 25 years of service

<u>Effective 7/1/2015</u>

The County and Water Authority contribution rate was increased to 13.9% from 12.9%.

The participant contribution rate was increased from 5.5% to 7.5%.

For employees hired on or after January 1, 2016 a new tier of benefits will apply.

<u>Effective 7/1/2012</u>

State Court Law Clerks are now eligible to participate in the System.

<u>Effective 7/1/2008</u>

Eliminated the 60-month certain and 114-month certain optional forms of payment for annuity starting dates after December 31, 2008.

<u>Effective 7/1/2007</u>

Adjusted accrued benefits of three people as of their normal retirement age.

Schedule F - Summary of the Main Benefit and Contribution Provisions (continued)

<u>Effective 7/1/2006</u>

Added an annual 2.0% cost of living increase effective beginning July 1, 2009 for those who have received their 84th monthly benefit payment prior to July 1.

Increased participant contributions from 3.5% to 5.5%.

Granted a one-time 4.0% benefit increase to current participants, spouses and beneficiaries who were receiving benefits as of January 1, 2001.

Added a minimum monthly allowance of $300 (after the above benefit increases) to any participant, spouse or beneficiary receiving benefits as of July 1, 2006.

Added an Excess Benefit Arrangement providing benefits in excess of IRS Code Sec. 415 for Water Authority employees funded entirely and separately by the Water Authority.

<u>Effective 7/1/2005</u>

Added the 60-month certain and 114-month certain optional forms of payment.

<u>Effective 7/1/2003</u>

The County and Water Authority contribution rate was increased to 12.9% from 12.4% and it is now applied to compensation under the System rather than total compensation.

The definition of compensation excludes certain forms of premium pay.

The compensation limit has been increased to $200,000.

The mortality table used to convert benefits to optional forms of payment has been changed to the table prescribed under Revenue Ruling 2001-62.

The Social Security Leveling Option has been removed as an optional form of payment.

The normal form of payment for persons receiving disability payments has been changed from a life annuity to a life annuity with 60 months guaranteed. Upon death, payments to beneficiaries will continue according to the election chosen for the disability payments.

The method for computing final average earnings was clarified.

The basis for actuarial equivalence for maximum benefit limit purposes has been changed.

<u>Effective 7/1/2001</u>

Normal Retirement Age for non-Safety Personnel was amended from age 65 with 5 years of credited service to age 60 with 7 years of credited service.

For Safety Personnel hired after 6/1/2001, 7 years of credited service is required for Normal Retirement.

Funding rate increased from 12.15% to 12.40%.

The pre-Retirement Death Benefit was changed from 50% of the Normal Fund Payment as if employment continued to normal retirement to the survivor portion of the 50% Joint and Survivor benefit (unreduced for early commencement). If the participant is single, the Normal Fund Payment is paid as a 5-year certain only benefit.

Schedule G - Member Statistics

		June 30, 2021
Active members		
Number		2,584
Average age		41.30
Average service		7.34
Terminated vested members		
Number		333
Average age		52.33
Average annual retirement benefits	$	14,517
Retired members		
Number		1,292
Average age		68.51
Average annual retirement benefits	$	32,608
Disabled members		
Number		61
Average age		64.30
Average annual retirement benefits	$	20,192
Survivors and beneficiaries of members		
Number		178
Average age		69.69
Average annual retirement benefits	$	18,265
Total Number of Members		4,448

Schedule G - Member Statistics (continued)

Age Service Table (all Active Participants)

	Completed Years of Service										
Attained Age	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & up	Total
Under 25	84	88	3	0	0	0	0	0	0	0	175
Avg. Pay	39,592	43,752	*	0	0	0	0	0	0	0	41,871
25 to 29	143	201	50	0	0	0	0	0	0	0	394
Avg. Pay	43,531	46,914	56,711	0	0	0	0	0	0	0	46,929
30 to 34	84	169	118	35	0	0	0	0	0	0	406
Avg. Pay	42,430	47,604	54,987	61,040	0	0	0	0	0	0	49,837
35 to 39	38	95	84	55	29	3	0	0	0	0	304
Avg. Pay	48,740	50,121	53,295	65,071	63,825	*	0	0	0	0	55,181
40 to 44	38	76	61	48	44	26	0	0	0	0	293
Avg. Pay	48,006	54,027	59,059	56,620	68,073	72,396	0	0	0	0	58,458
45 to 49	25	56	52	49	38	44	14	0	0	0	278
Avg. Pay	38,639	52,771	56,773	67,012	63,785	75,790	*	0	0	0	61,566
50 to 54	21	69	44	59	30	48	27	19	0	0	317
Avg. Pay	42,513	56,824	50,975	59,328	55,292	78,977	84,684	*	0	0	62,771
55 to 59	23	53	53	46	18	26	13	4	0	0	236
Avg. Pay	43,041	47,212	53,079	58,073	*	75,685	*	*	0	0	57,697
60 to 64	11	26	32	32	15	9	5	1	0	0	131
Avg. Pay	*	46,906	51,814	56,998	*	*	*	*	0	0	54,960
65 to 69	5	5	4	10	4	2	0	0	0	0	30
Avg. Pay	*	*	*	*	*	*	0	0	0	0	51,184
70 & up	1	6	2	7	2	2	0	0	0	0	20
Avg. Pay	*	*	*	*	*	*	0	0	0	0	45,083
Total	473	844	503	341	180	160	59	24	0	0	2,584
Avg. Pay	43,088	48,926	54,822	60,321	61,452	75,442	85,926	91,719			54,265

* Pay information for cells with less than 20 employees have not been disclosed.

Schedule H – ASOP 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, current contribution requirements and the funded status of the System. To the extent future experience deviates from the assumptions used, variations will occur in these calculated values. These variations create risk to the System.

Understanding the risks to the funding of the System is important. Actuarial Standard of Practice No. 51 ("ASOP 51") requires certain disclosures of potential risks to the System and provides useful information for intended users of actuarial reports that determine System contributions or evaluate the adequacy of specified contribution levels to support benefit provisions.
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, judgement and educated decisions. Future measurements may deviate in ways that produce positive or negative financial impacts to the System.

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

- Investment risk – potential that the investment return will be different than the 7.75% expected in the actuarial valuation
- Long-term return on investment risk – potential that changes in long-term capital market assumptions or the System's asset allocation will create the need to update the long-term return on investment assumption
- Contribution risk – the risk that the actual contribution made will be different than the actuarially determined contribution
- Payroll growth risk – the risk that actual growth in payroll will be different than expected
- Longevity and other demographic risk – the risk that mortality or other demographic experience will be different than expected

The following information is provided to comply with ASOP 51 and furnish beneficial information on potential risks to the System. 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 System sponsor to make contributions to the System when due, or to assess the likelihood or consequences of potential future changes in law. In addition, this valuation report is not intended to provide investment advice or to provide guidance on the management or reduction of risk. Buck 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.

Investment risk

Risk that assets returns don't keep pace with liability growth:

- If System investments do not achieve the assumed 7.75% return over the long term, contributions will continue to increase in order to cover the deficiency

Schedule H – ASOP 51 Disclosures (continued)

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. These shocks or changes will increase the risk that investments will underperform the expected return. They may also lead to a need to lower the long-term return on assets assumption.

Long-term return on investment risk

Inherent in the long-term return on investment assumption is the expectation that the current rate will be used until the last benefit payment of the System is made. There is a risk that sustained changes in economic conditions, changes in long-term future capital market assumptions or changes to the System's asset allocations will necessitate an update to the long-term return on investment assumption used.

- Under a lower long-term return on investment assumption, less investment return is available to pay System benefits. This may lead to an increased need for employer contributions.
- The liabilities will be higher at a lower rate of return because future benefits will have a lower discount rate applied when calculating the present value.
- A 1% decrease in the long-term return on investment assumption will increase accrued liabilities by approximately 13%.

Contribution risk

There is a risk associated when the actual contribution amount and actuarially determined contribution (ADC) amount differ.

- The unfunded accrued liability is amortized over an open period of 30 years. Since the minimum contribution used for compliance with Georgia statute is determined based upon a 30-year amortization approach that restarts each year, absent contributions being made in excess of the minimum contribution or future actuarial gains, the emerging unfunded accrued liability will not be amortized.
- However, the System is funded based on a fixed 13.9% of pay plus any special budgeted percentage of pay needed to meet the minimum contribution under Georgia statute. It is expected as the funded status of the System improves, the fixed 13.9% of pay contribution will be greater than the minimum contribution under Georgia statute and excess contributions will be created and eventually eliminate the unfunded accrued liability.

Payroll growth risk

Risk that future payroll will grow at a rate different than the expected:

- Payroll growth impacts both the liabilities as well as the amortization calculation
- Amortization calculation is determined assuming contributions will increase as a percentage of payroll; therefore, lower payroll than expected means the actual contributions will not be sufficient to cover the current amortization payment
- If payroll does not grow at assumed rate, liabilities would be less than expected. However, the contributions as a percentage of payroll may increase

Demographic risks

The risk that actual future demographic experience will differ from what is predicted based on the actuarial assumptions:

- As the System matures and the majority of participants reach (or have reached) retirement eligibility, risks associated with retirement timing can become significant
- The System provides for subsidized early retirement benefits after meeting certain age and service conditions. These benefits can be significantly more valuable than normal retirement benefits

Schedule H – ASOP 51 Disclosures (continued)

Historical Results and Maturity Measures

The following table shows selected historical values of key valuation measures. These items illustrate how actual volatility has impacted the System 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	07/01/17	07/01/18	07/01/19	07/01/20	Current Valuation 07/01/21
Liabilities and Assets at Valuation Date					
• Actuarial Accrued Liability (AAL)	595,939,772	626,611,182	670,655,451	761,473,781	782,922,539
- Normal Cost	12,499,017	12,991,239	13,870,207	15,893,200	15,779,545
• Actuarial Value of Assets (AVA)	418,794,365	435,729,754	447,024,503	457,324,804	501,131,466
- Funded Percent (AVA)	70%	70%	67%	60%	64%
• Market Value of Assets (MVA)	412,200,258	429,646,173	443,276,297	444,687,441	573,580,302
- Funded Percent (MVA)	69%	69%	66%	58%	73%
Contributions and Disbursements for Plan Year Ended	2017	2018	2019	2020	2021
• Actuarially Calculated Contribution	23,622,900	23,347,830	25,167,364	28,811,081	37,776,590
• Actual Contribution	23,622,900	23,347,830	25,167,364	28,811,081	37,776,590
• Disbursements	35,063,950	37,348,391	39,816,334	45,836,545	48,737,377
Rates of Return for Plan Year Ended	2017	2018	2019	2020	2021
• Assumed	8.00%	8.00%	8.00%	8.00%	7.75%
• AVA	7.10%	7.51%	6.06%	6.23%	12.12%
• MVA	13.60%	7.76%	6.70%	4.24%	31.84%
Maturity Measures at Valuation Date					
• Payroll	115,215,822	120,122,372	130,023,221	135,357,544	140,221,885
- Asset Volatility Ratio (MVA / Payroll)	3.6	3.6	3.4	3.3	4.1
- Liability Volatilty Ratio (AAL / Payroll)	5.2	5.2	5.2	5.6	5.6
• Retiree and Beneficiary (In-pay) Liability	394,010,657	419,204,349	449,763,632	532,188,111	560,660,850
- Percent of Total Liability	66%	67%	67%	70%	72%
• Contributions minus Disbursements in Prior Year	(11,441,050)	(14,000,561)	(14,648,970)	(17,025,464)	(10,960,787)
- Percent Average Market Value of Assets	-2.9%	-3.3%	-3.4%	-3.8%	-2.2%

Volatility Ratios

Plans with higher asset-to-payroll ratios experience more volatile employer contributions (as a percentage of payroll) due to investment return. Plans with higher liability-to-payroll ratios experience more volatile employer contributions (as a percentage of payroll) due to changes in liability.

Retiree Percent of Total AAL

A higher percentage of liability concentrated in retirees indicates a mature plan. An increasing percentage may indicate a need for a less risky and / or more liquid asset allocation which may lead to a lower long-term return on asset assumption and increased costs.

Contributions Minus Benefits Paid

If net cash flow is materially negative, as a percentage of market value, assets may need to be liquidated to pay out benefits or assets may need to be invested in more liquid assets. This may lead to a higher risk of not earning the assumed return on assets (i.e. investment risk is amplified).