



Clayton County, Georgia Public Employee Retirement System

Revised Actuarial Valuation Report as of July 1,
2020

January 2021



100 Galleria Parkway, SE
Suite 1060
Atlanta, GA 30339

January 26, 2021

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, 2020 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, 2020, and to verify that scheduled contributions will be sufficient to meet the minimum funding requirement for the fiscal year ending June 30, 2021. This report is a revision of the report dated December 7, 2020 and reflects revised asset data provided by Clayton County in January 2021.

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 26.73% (13.90% from the County and Water Authority, a 5.33% 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, 2020, the actuarial accrued liability was \$761,473,781. This compares to the market value of assets of \$444,687,441 (after an adjustment of \$1,530,654 for pending refunds) and the actuarial value of assets of \$457,324,804. The funded ratio as measured by the actuarial value of assets was 60.1% (vs. 66.7% 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, 2020 produced an overall loss of \$19,075,382. Below is a summary of the main sources of (gains) and losses during the year.

Investment performance	\$	8,348,607
Retirement experience		7,220,329
New entrants		637,676
Mortality experience		94,434
Salary increases		2,706,250
Other		68,086

Census and Financial Data

This valuation was performed using June 30, 2020 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 majority of demographic and economic assumptions have been changed as a result of an experience study recently performed by Buck. Details of these assumption changes can be found in Schedule E. Otherwise, there were no changes in methods, or plan provisions from the prior year.

Certification

The actuarial certification is included in Section VI of the report. We are available to answer any questions regarding the contents of this report. Kevin can be reached at 770-916-4184 and David can be reached at 602-803-6174.

Respectfully submitted,

Buck Global, LLC (Buck)



David J. Kershner, FSA, EA, MAAA, FCA
Principal



Kevin Spanier, ASA, EA, MAAA, FCA
Director

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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	7/1/2020	7/1/2019
Number of active participants	2,399	2,418
Annual compensation for year beginning on valuation date ¹	\$ 135,357,544	\$ 130,023,221
Number of retired participants and beneficiaries	1,471	1,399
Annual retirement benefits	\$ 44,035,932	\$ 40,949,270
Number of former participants with deferred benefits	316	301
Present value of accrued benefits	\$ 722,335,963	\$ 644,714,728
Actuarial accrued liability	\$ 761,473,781	\$ 670,655,451
Assets:		
Market value	\$ 444,687,441	\$ 443,276,297
Actuarial value	\$ 457,324,804	\$ 447,024,503
Unfunded actuarial accrued liability	\$ 304,148,977	\$ 223,630,948
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)	<u>5.33%</u>	<u>1.05%</u>
Total	26.73%	22.45%
County/Water Authority contribution rate:		
Normal cost	4.85%	3.94%
Amortization of unfunded actuarial accrued liability	9.05%	9.96%
Special budgeted contribution	<u>5.33%</u>	<u>1.05%</u>
Total	19.23%	14.95%

¹ Includes half-year salary increase assumed for upcoming plan year

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 2,399 active participants as of July 1, 2020 with annual compensation on July 1, 2020 totaling \$131,217,628.

The following table shows the number of retired participants and beneficiaries of deceased participants and their annual retirement benefits as of July 1, 2020.

Group	Number	Benefits
Normal and Early Retirements	1,235	\$ 39,861,585
Beneficiaries of Deceased Participants	172	2,879,093
Disability Retirements	<u>64</u>	<u>1,295,254</u>
Total	1,471	\$ 44,035,932

In addition, there are 316 former participants entitled to deferred annual benefits totaling \$4,362,260.

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, 2020 was \$444,687,441. The market return for the plan year ending June 30, 2020 was approximately 4.24%. The actuarial value of assets as of July 1, 2020 was \$457,324,804. Schedule B shows the development of the actuarial value of assets as of July 1, 2020.
- Schedule C shows the reconciliation of the market value of asset balances from July 1, 2019 to July 1, 2020.

Section IV - Comments on Valuation

- Schedule A outlines the results of the valuation. The System has total actuarial accrued liabilities of \$761,473,781. Of this amount, \$532,188,111 is for benefits payable to retired participants, beneficiaries and former participants entitled to deferred vested benefits, and \$229,285,670 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 \$457,324,804 as of July 1, 2020. The difference of \$304,148,977 is the unfunded actuarial accrued liability as of July 1, 2020.
- 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 12.35% of compensation (4.85% County/Water Authority and 7.50% participants) of payroll. This compares to 11.44% 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 \$722,335,963. When compared to the market value of assets of \$444,687,441, the System has insufficient assets to cover the present value of its accrued benefits.
- For the year ending June 30, 2020, the System experienced an overall actuarial loss of \$19,075,382. This loss is due to the net effect of a loss on the actuarial value of assets of \$8,348,607 and a liability loss of \$10,726,775. 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, 2020 valuation

Contribution	Percentage of Compensation
Payable by:	
Participants	7.50
County and Water Authority (regular)	13.90
County and Water Authority (special budgeted)	<u>5.33</u>
Total	26.73
Rate Applied To:	
Normal Cost	12.35
Amortization of Unfunded Actuarial Accrued Liability	<u>14.38</u>
Total	26.73

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 our 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 David Kershner and Kevin Spanier, the plan's Enrolled Actuaries. David is a Fellow of the Society of Actuaries, and Kevin is an Associate of the Society of Actuaries. Both are Members of the American Academy of Actuaries and have met the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

Buck Global, LLC (Buck)



David J. Kershner, FSA, EA, MAAA, FCA
Principal
Enrolled Actuary Number 20-05179



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

Schedule A - Results of the Valuation Prepared as of July 1, 2020

1. Actuarial Accrued Liabilities	
Present Value of Prospective Benefits Payable in Respect of:	
(a) Active participants	\$ 229,285,670
(b) Retired participants, beneficiaries, and former participants entitled to deferred vested benefits	<u>532,188,111</u>
(c) Total	\$ 761,473,781
2. Actuarial Value of Assets	<u>457,324,804</u>
3. Unfunded Actuarial Accrued Liability [1(c) minus 2]	\$ 304,148,977

Schedule B - Development of July 1, 2020 Actuarial Value of Assets

(1)	Market Value of Assets on July 1, 2019 including Contributions Receivable		\$ 443,276,297
(2)	Net Cash Flow		
	a. Contributions from Employer and Participants plus increase/(decrease) in Contributions Receivable		28,811,081
	b. Benefits and Administrative Expenses		<u>45,836,545</u>
	c. Net Cash Flow (2)a - (2)b		\$ (17,025,464)
(3)	Expected Investment Return, Net of Investment Expenses [(1) x .08] + [(2)c x .04]		\$ 34,781,085
(4)	Expected Market Value of Assets on July 1, 2020 including Contributions Receivable (1) + (2)c + (3)		\$ 461,031,918
(5)	Market Value of Assets on July 1, 2020, including Contributions Receivable		\$ 444,687,441
(6)	Gain/(Loss) on Market Value of Assets (5) - (4)		\$ (16,344,477)
(7)	Deferred Gains/(Losses) as of July 1, 2020		
		Total Gain/(Loss)	Amount Deferred
	Plan Year Ending June 30, 2020	\$ (16,344,77)	\$ (13,075,582)
	Plan Year Ending June 30, 2019	(5,506,641)	(3,303,985)
	Plan Year Ending June 30, 2018	(969,522)	(387,809)
	Plan Year Ending June 30, 2017	20,650,063	<u>4,130,013</u>
			\$ (12,637,363)
(8)	Preliminary Actuarial Value of Assets on July 1, 2020 (5) - (7)		\$ 457,324,804
(9)	80% of Market Value .80 x (5)		\$ 355,749,953
(10)	120% of Market Value 1.20 x (5)		\$ 533,624,929
(11)	Actuarial Value of Assets on July 1, 2020 Lesser of (10) and maximum of (8) and (9)		\$ 457,324,804

Schedule C - Assets of the Retirement System

Reconciliation of Market Value of Assets

Receipts

Employer and Participant Contributions		\$ 28,811,081
Investment Income		
Interest and Dividends	\$ 5,633,688	
Net Appreciation (Depreciation) in Fair Value of Investments	<u>12,802,920</u>	
Total Investment Income		<u>18,436,608</u>
Total Receipts		\$ 47,247,689

Disbursements

Benefits Paid		\$ 45,107,590
Increase in Pending Refunds ¹		170,533
Administrative Expenses		<u>558,422</u>
Total Disbursements		\$ 45,836,545

Excess of Receipts Over Disbursements \$ 1,411,144

Reconciliation of Asset Balances

Market Value at July 1, 2019, including contributions receivable		\$ 443,276,297
Excess of Receipts Over Disbursements		<u>1,411,144</u>
Market Value at July 1, 2020, including contributions receivable		\$ 444,687,441

¹ Unpaid Pending Refunds amount of \$1,360,121 was subtracted from the July 1, 2019 Market Value of Assets, and \$1,530,654 was subtracted from the July 1, 2020 Market Value of Assets. The difference of \$170,533 was added to the annual disbursements during the year.

Schedule D - Development of Experience Gain/(Loss)

1. Actual Unfunded Accrued Liability as of July 1, 2019		\$ 223,630,948
2. Expected Change in Unfunded Liability During Plan Year Ending June 30, 2020		
a. Total Normal Cost (beginning of year)	\$ 13,870,207	
b. Assumption Changes	58,513,702	
c. Plan Changes	0	
d. Interest on Normal Cost and Unfunded Liability	19,000,092	
e. Actual Employer and Participant Contributions with Interest	<u>(29,941,354)</u>	
f. Total Expected Change	\$ 61,442,647	
3. Expected Unfunded Accrued Liability as of July 1, 2020		\$ 285,073,595
4. Actual Unfunded Accrued Liability as of July 1, 2020		\$ 304,148,977
5. Experience Gain/(Loss) ¹ (3) – (4)		\$ (19,075,382)

¹ Liability related portion of experience Gain/(Loss): \$ (10,726,775)
 Asset related portion of experience Gain/(Loss): \$ (8,348,607)

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

Age	Annual Rate of:				Disability
	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

Age	Annual Rate of:				Disability
	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

Age	Annual Rate of:				Disability
	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

Age	Annual Rate of:				Disability
	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		.275	.275
61	.400	.400	.400		.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 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%
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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-2019

Non-Safety Non-annuitants

Pub-2010 Amount Weighted General Employees Below-Median table, projected with Mortality Improvement Scale MP-2019

Non-Safety Disabled Participants

Pub-2010 Amount Weighted Non-Safety Disabled Retiree table, 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

Safety Non-Annuitants

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

Safety Disabled Participants

Pub-2010 Amount Weighted Public Safety Disabled Retiree table, projected with Mortality Improvement Scale MP-2019

Survivor Beneficiaries

Pub-2010 Amount Weighted Contingent Survivor Below-Median table, projected with Mortality Improvement Scale MP-2019

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 7/1/2020¹

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%

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 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

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.

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

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).

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

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

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.

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.

Schedule E - Outline of Actuarial Assumptions and Methods

(continued)

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.

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

Effective 7/1/2016

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

Effective 7/1/2015

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.

Effective 7/1/2012

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

Effective 7/1/2008

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

Effective 7/1/2007

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

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

Effective 7/1/2006

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.

Effective 7/1/2005

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

Effective 7/1/2003

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.

Effective 7/1/2001

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, 2020

Active members

Number	2,399
Average age	41.90
Average service	8.05

Terminated vested members

Number	316
Average age	52.03
Average annual retirement benefits	\$ 13,805

Retired members

Number	1,235
Average age	68.32
Average annual retirement benefits	\$ 32,277

Disabled members

Number	64
Average age	63.69
Average annual retirement benefits	\$ 20,238

Survivors and beneficiaries of members

Number	172
Average age	68.22
Average annual retirement benefits	\$ 16,739

Total Number of Members

4,186

Schedule G - Member Statistics (continued)

Age Service Table (all Active Participants)

Attained Age	Completed Years of Service										Total
	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	
Under 25	56	90	2	0	0	0	0	0	0	0	148
Avg. Pay	40,574	44,569	*	0	0	0	0	0	0	0	43,080
25 to 29	93	180	51	1	0	0	0	0	0	0	325
Avg. Pay	43,479	46,777	52,100	*	0	0	0	0	0	0	46,707
30 to 34	70	152	104	38	1	0	0	0	0	0	365
Avg. Pay	44,725	48,989	54,072	58,192	*	0	0	0	0	0	50,625
35 to 39	32	81	82	59	36	1	0	0	0	0	291
Avg. Pay	48,495	49,596	52,917	61,485	65,912	*	0	0	0	0	54,920
40 to 44	20	74	68	43	36	23	0	0	0	0	264
Avg. Pay	47,436	52,973	55,425	56,947	63,137	76,819	0	0	0	0	57,296
45 to 49	16	64	58	64	41	43	19	3	0	0	308
Avg. Pay	*	50,406	55,323	63,593	63,912	73,713	*	*	0	0	61,531
50 to 54	20	51	56	59	27	55	34	17	0	0	319
Avg. Pay	56,870	50,365	50,183	56,620	61,601	77,711	85,730	*	0	0	63,189
55 to 59	15	39	51	50	27	21	14	4	0	0	221
Avg. Pay	*	45,164	49,181	55,694	53,541	75,894	*	*	0	0	56,298
60 to 64	5	18	31	33	21	4	2	1	0	0	115
Avg. Pay	*	*	62,025	52,228	56,748	*	*	*	0	0	55,904
65 to 69	0	6	5	10	3	2	0	0	0	0	26
Avg. Pay	0	*	*	*	*	*	0	0	0	0	55,339
70 & up	1	5	2	6	1	2	0	0	0	0	17
Avg. Pay	*	*	*	*	*	*	0	0	0	0	38,669
Total	328	760	510	363	193	151	69	25	0	0	2,399
Avg. Pay	45,179	48,412	53,416	58,040	61,117	75,544	83,884	92,176			54,697

* 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

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

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	07/01/16	07/01/17	07/01/18	07/01/19	Current Valuation 07/01/20
Liabilities and Assets at Valuation Date					
• Actuarial Accrued Liability (AAL)	576,994,028	595,939,772	626,611,182	670,655,451	761,473,781
- Normal Cost	12,502,299	12,499,017	12,991,239	13,870,207	15,893,200
• Actuarial Value of Assets (AVA)	402,094,096	418,794,365	435,729,754	447,024,503	457,324,804
- Funded Percent (AVA)	70%	70%	70%	67%	60%
• Market Value of Assets (MVA)	373,563,784	412,200,258	429,646,173	443,276,297	444,687,441
- Funded Percent (MVA)	65%	69%	69%	66%	58%
Contributions and Disbursements for Plan Year Ended					
	2016	2017	2018	2019	2020
• Actuarially Calculated Contribution	22,922,056	23,622,900	23,347,830	25,167,364	28,811,081
• Actual Contribution	22,922,056	23,622,900	23,347,830	25,167,364	28,811,081
• Disbursements	32,645,435	35,063,950	37,348,391	39,816,334	45,836,545
Rates of Return for Plan Year Ended					
	2016	2017	2018	2019	2020
• Assumed	8.00%	8.00%	8.00%	8.00%	8.00%
• AVA	6.61%	7.10%	7.51%	6.06%	6.23%
• MVA	-1.17%	13.60%	7.76%	6.70%	4.24%
Maturity Measures at Valuation Date					
• Payroll	115,329,415	115,215,822	120,122,372	130,023,221	135,357,544
- Asset Volatility Ratio (MVA / Payroll)	3.2	3.6	3.6	3.4	3.3
- Liability Volatility Ratio (AAL / Payroll)	5.0	5.2	5.2	5.2	5.6
• Retiree and Beneficiary (In-pay) Liability	378,685,550	394,010,657	419,204,349	449,763,632	532,188,111
- Percent of Total Liability	66%	66%	67%	67%	70%
• Contributions minus Disbursements in Prior Year	(9,723,379)	(11,441,050)	(14,000,561)	(14,648,970)	(17,025,464)
- Percent Average Market Value of Assets	-2.6%	-2.9%	-3.3%	-3.4%	-3.8%

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).